RA80-**

PDP-11 UDA DRV FMTR
CZUDEA0

AH-S837A-MC
FICHE 1 OF 2

OCT 1981
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PDP-11 UDA DRV FMTR
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AH-S837A-MC
FICHE 2 OF 2

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digital

.REM &

IDENTIFICATION

PRODUCT CODE: AC-S836A-MC

PRODUCT NAME: CZUDEAO PDP-11 UDA DISK DRV FMTR

PRODUCT DATE: 10-JULY-81

MAINTAINER: DIAGNOSTIC ENGINEERING

TABLE OF CONTENTS

1.0 GENERAL INFORMATION

1.1 PROGRAM ABSTRACT

THIS DIAGNOSTIC HAS BEEN WRITTEN FOR USE WITH THE DIAGNOSTIC RUNTIME SERVICES SOFTWARE (SUPERVISOR). THESE SERVICES PROVIDE THE INTERFACE TO THE OPERATOR AND TO THE SOFTWARE ENVIRONMENT. THIS PROGRAM CAN BE USED WITH XXDP+, ACT, APT, SLIDE AND PAPER TAPE. FOR A COMPLETE DESCRIPTION OF THE RUNTIME SERVICES, REFER TO THE XXDP+ USER'S MANUAL. THERE IS A BRIEF DESCRIPTION OF THE RUNTIME SERVICES IN SECTION 2 OF THIS DOCUMENT.

THIS DOCUMENT DESCRIBES THE USAGE OF THE UNIBUS DISK ADAPTER (UDA) DISK FORMATTER FROM THE USER'S VIEWPOINT. THIS DOCUMENT DOES NOT DESCRIBE THE ACTUAL FORMATTING OF THE MEDIA, BUT RATHER THE POSSIBLE INTERACTIONS WITH A HUMAN OPERATOR.

THERE ARE FOUR GENERAL MODES OF FORMATTER OPERATION:

O BUILD - THIS MODE IS GENERALLY USED BY MANUFACTURING PERSONAL TO INITIALLY FORMAT A NEW MEDIA. IT USES DATA STORED ON THE MEDIA, FROM A LOCATION WHICH IS NORMALLY INACCESSABLE, TO LOCATE AND REVECTOR THE BAD BLOCKS ON THE MEDIA.

O REFORMAT - THIS MODE IS USED TO FORMAT A MEDIA WHICH HAS BEEN PREVIOUSLY FORMATTED, AND IS BEING REFORMATTED TO CLEAR EXISTING DATA OR TO CHANGE THE MODE OF THE MEDIA (512/576 BYTES PER SECTOR). IT IS ASSUMED THAT THE FACTORY CONTROL TABLE (FCT) IS STILL IN TACT.

O RESTORE - THIS MODE WILL ONLY BE RUN BY DIGITAL FIELD CIRCUS PERSONAL. IT PROVIDES AN EXTERNAL COPY OF THE FCT, PRODUCED AT BUILD TIME AND STORED OFFLINE BY DIGITAL, TO THE UDA FORMATTER.

O RECONSTRUCT - THIS MODE IS USED WHEN NONE OF THE OTHER MODES ARE POSSIBLE. IT DETECTS BAD BLOCKS BY PREFORMING REPETATIVE READ CHECKS OF EACH SECTOR. FOR THIS REASON, A RECONSTRUCT RUN TAKES CONSIDERABLY LONGER THAN THE OTHER MODES.

1.2 SYSTEM REQUIREMENTS

PDP-11 PROCESSOR
28K MEMORY
TERMINAL
PROGRAM LOAD DEVICE
UDA50 CONTROLLER
1 OR MORE SDI COMPATIBLE DISK DRIVE

1.3 RELATED DOCUMENTS AND STANDARDS

DEC STD 166

2.0 OPERATING INSTRUCTIONS

THIS SECTION CONTAINS A BRIEF DESCRIPTION OF THE RUNTIME SERVICES.

FOR DETAILED INFORMATION, REFER TO THE XXDP+ USER'S MANUAL (CHQUS).

2.1 COMMANDS

THERE ARE ELEVEN LEGAL COMMANDS FOR THE DIAGNOSTIC RUNTIME SERVICES (SUPERVISOR). THIS SECTION LISTS THE COMMANDS AND GIVES A VERY BRIEF DESCRIPTION OF THEM. THE XXDP+ USER'S MANUAL HAS MORE DETAILS.

COMMAND	EFFECT
START	START THE DIAGNOSTIC FROM AN INITIAL STATE
RESTART	START THE DIAGNOSTIC WITHOUT INITIALIZING
CONTINUE	CONTINUE AT TEST THAT WAS INTERRUPTED (AFTER ^C)
PROCEED	CONTINUE FROM AN ERROR HALT
EXIT	RETURN TO XXDP+ MONITOR (XXDP+ OPERATION ONLY!)
ADD	ACTIVATE A UNIT FOR TESTING (ALL UNITS ARE CONSIDERED TO BE ACTIVE AT START TIME
DROP	DEACTIVATE A UNIT
PRINT	PRINT STATISTICAL INFORMATION (IF IMPLEMENTED BY THE DIAGNOSTIC - SECTION 4.0)
DISPLAY	TYPE A LIST OF ALL DEVICE INFORMATION
FLAGS	TYPE THE STATE OF ALL FLAGS (SEE SECTION 2.3)
ZFLAGS	CLEAR ALL FLAGS (SEE SECTION 2.3)

A COMMAND CAN BE RECOGNIZED BY THE FIRST THREE CHARACTERS. SO YOU MAY, FOR EXAMPLE, TYPE ''STA'' INSTEAD OF ''START''.

2.2 SWITCHES

THERE ARE SEVERAL SWITCHES WHICH ARE USED TO MODIFY SUPERVISOR OPERATION. THESE SWITCHES ARE APPENDED TO THE LEGAL COMMANDS. ALL OF THE LEGAL SWITCHES ARE TABULATED BELOW WITH A BRIEF DESCRIPTION OF EACH. IN THE DESCRIPTIONS BELOW, A DECIMAL NUMBER IS DESIGNATED BY ''DDDDD''.

SWITCH	EFFECT
/TESTS:LIST	EXECUTE ONLY THOSE TESTS SPECIFIED IN THE LIST. LIST IS A STRING OF TEST NUMBERS, FOR EXAMPLE - /TESTS:1:5:7-10. THIS LIST WILL CAUSE TESTS 1,5,7,8,9,10 TO BE RUN. ALL OTHER TESTS WILL NOT BE RUN.
/PASS:DDDDD	EXECUTE DDDDD PASSES (DDDDD = 1 TO 64000)
/FLAGS:FLGS	SET SPECIFIED FLAGS. FLAGS ARE DESCRIBED IN SECTION 2.3.
/EOP:DDDDD	REPORT END OF PASS MESSAGE AFTER EVERY DDDDD PASSES ONLY. (DDDDD = 1 TO 64000)
/UNITS:LIST	TEST/ADD/DROP ONLY THOSE UNITS SPECIFIED IN THE LIST. LIST EXAMPLE - /UNITS:0:5:10-12 USE UNITS 0,5,10,11,12 (UNIT NUMBERS = 0-63)

EXAMPLE OF SWITCH USAGE:

```
START/TESTS:1-5/PASS:1000/EOP:100
```

THE EFFECT OF THIS COMMAND WILL BE: 1) TESTS 1 THROUGH 5 WILL BE EXECUTED, 2) ALL UNITS WILL TESTED 1000 TIMES AND 3) THE END OF PASS MESSAGES WILL BE PRINTED AFTER EACH 100 PASSES ONLY. A

SWITCH CAN BE RECOGNIZED BY THE FIRST THREE CHARACTERS. YOU MAY, FOR EXAMPLE, TYPE "/TES:1-5" INSTEAD OF "/TESTS:1-5".

BELOW IS A TABLE THAT SPECIFIES WHICH SWITCHES CAN BE USED BY EACH COMMAND.

	TESTS	PASS	FLAGS	EOP	UNITS
START	X	X	X	X	X
RESTART	X	X	X	X	X
CONTINUE		X	X	X	
PROCEED			X		
DROP					X
ADD					X
PRINT					
DISPLAY					X
FLAGS					
ZFLAGS					
EXIT					

2.3 FLAGS

FLAGS ARE USED TO SET UP CERTAIN OPERATIONAL PARAMETERS SUCH AS LOOPING ON ERROR. ALL FLAGS ARE CLEARED AT STARTUP AND REMAIN CLEARED UNTIL EXPLICITLY SET USING THE FLAGS SWITCH. FLAGS ARE ALSO CLEARED AFTER A START COMMAND UNLESS SET USING THE FLAG SWITCH. THE ZFLAGS COMMAND MAY ALSO BE USED TO CLEAR ALL FLAGS. WITH THE EXCEPTION OF THE START AND ZFLAGS COMMANDS, NO COMMANDS AFFECT THE STATE OF THE FLAGS; THEY REMAIN SET OR CLEARED AS SPECIFIED BY THE LAST FLAG SWITCH.

FLAG	EFFECT
HOE	HALT ON ERROR - CONTROL IS RETURNED TO RUNTIME SERVICES COMMAND MODE
LOE	LOOP ON ERROR
IER*	INHIBIT ALL ERROR REPORTS
IBR*	INHIBIT ALL ERROR REPORTS EXCEPT FIRST LEVEL (FIRST LEVEL CONTAINS ERROR TYPE, NUMBER, PC, TEST AND UNIT)
IXR*	INHIBIT EXTENDED ERROR REPORTS (THOSE CALLED BY PRINTX MACRO'S)
PRI	DIRECT MESSAGES TO LINE PRINTER
PNT	PRINT TEST NUMBER AS TEST EXECUTES
BOE	"BELL" ON ERROR
UAM	UNATTENDED MODE (NO MANUAL INTERVENTION)
ISR	INHIBIT STATISTICAL REPORTS (DOES NOT APPLY TO DIAGNOSTICS WHICH DO NOT SUPPORT STATISTICAL REPORTING)
IDR	INHIBIT PROGRAM DROPPING OF UNITS
ADR	EXECUTE AUTODROP CODE
LOT	LOOP ON TEST
EVL	EXECUTE EVALUATION (ON DIAGNOSTICS WHICH HAVE EVALUATION SUPPORT)

*ERROR MESSAGES ARE DESCRIBED IN SECTION 3.1

SEE THE XXDP+ USER'S MANUAL FOR MORE DETAILS ON FLAGS. YOU MAY SPECIFY MORE THAN ONE FLAG WITH THE FLAG SWITCH. FOR EXAMPLE, TO CAUSE THE PROGRAM TO LOOP ON ERROR, INHIBIT ERROR REPORTS AND TYPE A ''BELL'' ON ERROR, YOU MAY USE THE FOLLOWING STRING:

```
/FLAGS:LOE:IER:BOE
```

2.4 HARDWARE QUESTIONS

THE DM PROGRAM (CURRENTLY KDUBA0.PAK) AND THE HOST PORTION OF THE FORMATTER (CURRENTLY ZDUBA0.BIN) MUST EXIST ON THE BOOT DEVICE. THE FORMATTER IS STARTED BY ENTERING:

```
RUN ZDUBA0
```

WHEN THE HOST PORTION HAS BEEN LOADED, SEVERAL UNINFORMATIVE STATEMENTS WILL BE PRINTED, AND THEN THE FOLLOWING PROMPT WILL APPEAR:

```
DR>
```

RESPOND WITH:

```
START/PASS:1
```

THE NEXT QUESTION LOGGED WILL BE AN OPTION TO CHANGE THE DEFAULT RUN PARAMATERS OF THE FORMATTER. THE QUESTION IS

```
CHANGE HW (L)?
```

THE CURRENT DEFAULTS ARE FOR ONE UDA AT ADDRESS 172150, FORMAT THE DRIVE WITH A UNIT PLUG NUMBER OF 0 USING THE EXISTING FCT, AND STOP IF THAT FCT IS BAD. IF THESE DEFAULTS ARE ACCEPTABLE ENTER ''N'' AND THE FORMAT WILL BEGIN. IF YOU ENTER ''Y'' THEN YOU WILL HAVE TO ANSWER THE FOLLOWING QUESTIONS

```
UNITS (D)?
```

THE ANSWER TO THIS QUESTION DEFINES HOW MANY UDAS ARE TO RUN FORMATTERS CONCURRENTLY. A VALID RESPONSE IS A DECIMAL NUMBER FROM 1 TO 64 (MEMORY AVAILABILITY PERMITTING). THE FOLLOWING BLOCK OF QUESTIONS WILL BE REPEATED ONCE FOR EACH UNIT (UDA).

QUESTION 1: UNIBUS ADDRESS OF UDA (A)? XXXXXX

WHERE XXXXXX IS THE CURRENT DEFAULT (INITIALLY 172150). ENTER THE APPROPRIATE EVEN ADDRESS OR ENTER <CR> TO TAKE THE DEFAULT.

QUESTION 2: UNIT NUMBER TO FORMAT (D)? X

X IS THE CURRENT DEFAULT (INITIALLY 0). ENTER THE NUMBER ON THE UNIT PLUG OF THE DRIVE TO BE FORMATTED (DO NOT CONFUSE THE UNIT NUMBER, 0-63, ASSIGNED BY XXDP+ WITH THE UNIT NUMBER OF THE DRIVE).

QUESTION 3: USE RESIDENT FCT (L)? X

X IS THE CURRENT DEFAULT (INITIALLY Y). IF THIS QUESTION IS ANSWERED "Y" THEN A REFORMAT MODE FORMAT WILL BE PREFORMED AND THE NEXT QUESTION POSED IS NUMBER 4. IF THIS QUESTION IS ANSWERED "N" THE NEXT QUESTION POSED IS NUMBER 5.

QUESTION 4: STOP IF RESIDENT FCT IS BAD (L)? X
X IS THE CURRENT DEFAULT (INITIALLY Y). IF THIS QUESTION IS ANSWERED "Y" A REFORMAT MODE FORMAT WILL BE PERFORMED, AND NO FURTHER QUESTIONS WILL BE ASKED. THE FORMAT (OF THIS DRIVE ONLY) WILL BE ABORTED IF THE FCT IS UNUSABLE. IF THIS QUESTION IS ANSWERED "N" THEN A RECONSTRUCT MODE FORMAT WILL BE PREFORMED EVEN IF THE FCT CAN NOT BE USED. QUESTIONING CONTINUES WITH QUESTION 6.

QUESTION 5: DOWN LINE LOAD FCT (L)? X

X IS THE CURRENT DEFAULT (INITIALLY N). ANSWERING THIS QUESTION "Y" RESULTS IN A RESTORE MODE FORMAT BEING RUN, AND NO MORE QUESTIONS WILL BE ASKED. ANSWERING "N" CAUSES QUESTION 6 TO BE ASKED.

QUESTION 6:

SERIAL NUMBER TO BE ASSIGNED (TOTAL 4 WORDS) WORD 1? (D)
WORD 2? (D)
WORD 3? (D)
WORD 4? (D)

THIS IS THE SERIAL NUMBER TO BE ASSIGNED TO THE DISK IF THE FCT WAS NOT USED. THERE IS NO DEFAULT VALUE, A NON-ZERO VALUE SHOULD BE CHOSEN AND IT SHOULD BE UNIQUE WITHIN THE INSTALLATION. NO FURTHER QUESTIONS ARE ASK.

NOTE THAT ONCE THE QUESTIONS HAVE BEEN ANSWERED FOR EACH UNIT, THOSE ANSWERS BECOME THE DEFAULT FOR THAT UNIT.

IF QUESTION 5 WAS ANSWERED "Y", THEN QUESTION 7 IS ASKED.

QUESTION 7: ENTER FILE NAME FOR DOWN LINE LOAD (A)? XXXXXX.YYY

XXXXXX.YYY IS THE FILE NAME AND EXTENTION OF THE BAD SECTOR FILE IS USED BY THE FORMATTER. IF A NONEXISTENT FILE IS SPECIFIED, THE THE FORMATTER PRONTS A LOOK UP ERROR AND RETURNS TO THE MONITOR.

2.5 SOFTWARE QUESTIONS

AFTER YOU HAVE ANSWERED THE HARDWARE QUESTIONS OR AFTER A RESTART OR CONTINUE COMMAND, THE RUNTIME SERVICES WILL ASK FOR SOFTWARE PARAMETERS. THESE PARAMETERS WILL GOVERN SOME DIAGNOSTIC SPECIFIC OPERATION MODES. YOU WILL BE PROMPTED BY "CHANGE SW (L) ?" IF YOU WISH TO CHANGE ANY PARAMETERS, ANSWER BY TYPING "Y". THE SOFTWARE QUESTIONS AND THE DEFAULT VALUES ARE DESCRIBED IN THE NEXT PARAGRAPH(S).

THE FOLLOWING QUESTION MUST BE ANSWERED:

```
        DATE VAX FORMAT (TOTAL 4 WORDS) WORD 1? (D)
        WORD 2? (D)
        WORD 3? (D)
        WORD 4? (D)
```

THIS IS THE DATE TO BE ASSIGNED TO THE MOST RECENT DATE OF FORMAT FCT OF EACH DRIVE FORMATTED. THE DEFAULT IS ZERO.

2.6 QUICK START-UP PROCEDURE (XXDP+)

TO START-UP THIS PROGRAM:

1. BOOT XXDP+
2. GIVE THE DATE AND ANSWER THE LSI AND 50HZ (IF THERE IS A CLOCK) QUESTIONS
3. TYPE ''R NAME'', WHERE NAME IS THE NAME OF THE BIN OR BIC FILE FOR THIS PROGRAM
4. TYPE ''START''
5. ANSWER THE ''CHANGE HW'' QUESTION WITH ''Y''
6. ANSWER ALL THE HARDWARE QUESTIONS
7. ANSWER THE ''CHANGE SW'' QUESTION WITH ''N''

WHEN YOU FOLLOW THIS PROCEDURE YOU WILL BE USING ONLY THE DEFAULTS FOR FLAGS AND SOFTWARE PARAMETERS. THESE DEFAULTS ARE DESCRIBED IN SECTIONS 2.3 AND 2.5.

3.0 MESSAGES

3.1 ERROR MESSAGES

IF AN ERROR WAS ENCOUNTERED DURING FORMATTING, THE MESSAGE

```
UDA FORMATTER ERROR OCCURED
        ERROR NUMBER REPORTED WAS XXX
        ERROR CODE WAS YYYYYY DECIMAL
        ERROR NUMBER MEANS:
        EXPLAINATION
UNIT X - REMOVED FROM TESTING FOR REMAINDER OF PASS.
```

IS LOGGED. XXX REPRESENTS THE INTERNAL FORMATTER ERROR NUMBER. IF THIS ERROR NUMBER IS KNOWN BY THE HOST PORTION OF THE FORMATTER, THEN THE ASCII MESSAGE DESCRIBING THIS ERROR IS ALSO LOGGED. YYYYYY IS AN ADDITIONAL ERROR CODE. AN EXPLAINATION IS REPORTED WITH EACH ERROR.

3.2 OTHER MESSAGES

ONCE THE FORMATTER BEGINS EXECUTING, THIS MESSAGE IS PRINTED.

```
        FORMAT(S) BEGUN
```

ONCE A CYLINDER HAS BEEN FORMATTED, THIS MESSAGE APPEARS.

UNIT X - CYLINDER YYY COMPLETED

A CAUTIONARY MESSAGE APPEARS IF THE UDA50 HAS NOT COMMUNICATED WITH THE HOST.

THE UDA HAS NOT RESPONDED LATELY

THIS COULD OCCUR IF THE UDA IS DOING A LONG SERIES OF CALCULATIONS OR INDEED IS HUNG.

4.0 PERFORMANCE AND PROGRESS REPORTS

AT THE END OF EACH PASS, THE PASS COUNT IS GIVEN ALONG WITH THE TOTAL NUMBER OF ERRORS REPORTED SINCE THE DIAGNOSTIC WAS STARTED. THE ''EOP'' SWITCH CAN BE USED TO CONTROL HOW OFTEN THE END OF PASS MESSAGE IS PRINTED. SECTION 2.2 DESCRIBES SWITCHES.

THE FORMAT HAS BEEN SUCCESSFULLY COMPLETED WHEN THE MESSAGE

FORMAT SUCCESSFULLY COMPLETED

IS LOGGED.

&

2
3

```
      2                                          .TITLE  CZUDEAO PDP-11 UDA DISK FORMATTER
      3                                          .SBTTL  PROGRAM HEADER
      4                                          .NLIST  CND,LD,BEX
      5
      6                                          .MCALL  SVC
      7 000000                                   SVC                                   ; INITIALIZE SUPERVISOR MACROS
                  000003                   C$REVISION=3
                  000003                   C$EDIT=3
                  177777                   SVCINS=-1
                  177777                   SVCTST=-1
                  177777                   SVCSUB=-1
                  177777                   SVCGBL=-1
                  177777                   SVCTAG=-1
                  000012                   .RADIX        10
                  000000                   C$RESERV=0
                  000001                   C$ETST=1
                  000002                   C$BSUB=2
                  000003                   C$ESUB=3
                  000004                   C$BSEG=4
                  000005                   C$ESEG=5
                  000006                   C$CLP1=6
                  000007                   C$RDBU=7
                  000010                   C$ESCAPE=8
                  000011                   C$INIT=9
                  000012                   C$CLEAN=10
                  000013                   C$TPRI=11
                  000014                   C$PNTB=12
                  000015                   C$PNTX=13
                  000016                   C$PNTS=14
                  000017                   C$PNTF=15
                  000020                   C$INLP=16
                  000021                   C$RFLA=17
                  000022                   C$BRK=18
                  000023                   C$MSG=19
                  000024                   C$DRPT=20
                  000025                   C$RPT=21
                  000026                   C$GETB=22
                  000027                   C$GETW=23
                  000030                   C$GPLO=24
                  000031                   C$MEM=25
                  000032                   C$EXIT=26
                  000033                   C$RESET=27
                  000034                   C$OPEN=28
                  000035                   C$CLOS=29
                  000036                   C$CVEC=30
                  000037                   C$SVEC=31
                  000040                   C$GPRI=32
                  000041                   C$SPRI=33
                  000042                   C$GPHRD=34
                  000043                   C$GMAN=35
                  000044                   C$DCLN=36
                  000045                   C$CEFG=37
                  000046                   C$SEFG=38
                  000047                   C$REFG=39
                  000050                   C$MANI=40
                  000051                   C$DODU=41
                  000052                   C$AU=42
```

```
        000053                  C$DU=43
        000054                  C$ERSF=44
        000055                  C$ERDF=45
        000056                  C$ERHRD=46
        000057                  C$ERSOFT=47
        000060                  C$ERROR=48
        000061                  C$AUTO=49
        000062                  C$CLCK=50
        000377                  C$QIO=255
        000010                  .RADIX          8
        000035                  E$LOAD=35
        002100                  E$END=2100
        000000                  T$TESTNUM=0
        000000                  T$SUBNUM=0
        000000                  T$ERRNUM=0
        010000                  T$TAGNUM=10000
        010000                  T$LSYM=10000
        177777                  T$TAGLEV=-1
        177777                  T$NESTLEV=-1
        177777                  T$SAVLEV=-1
        177777                  T$SEGLEV=-1
        177777                  T$TSTMAC=-1
        000000                  T$TSTSEQ=0
        000000                  T$PTNUM=0
        000000                  T$LAST=0
        000000                  T$GMANID=0
        000000                  F$MOD=0
        000001                  F$TEST=1
        000002                  F$SUB=2
        000003                  F$SEG=3
        000004                  F$HARD=4
        000005                  F$SOFT=5
        000006                  F$INIT=6
        000007                  F$CLEAN=7
        000010                  F$SRV=10
        000011                  F$MSG=11
        000012                  F$RPT=12
        000013                  F$HW=13
        000014                  F$SW=14
        000015                  F$AU=15
        000016                  F$DU=16
        000017                  F$PWR=17
        000020                  F$AUTO=20
        000021                  F$PROT=21
        000040                  F$BGN=40
        000041                  F$END=41
        000050                  F$JMP=50
        000041                  I$MOD=F$END
        000041                  I$TST=F$END
        000041                  I$SUB=F$END
        000041                  I$SEG=F$END
        000041                  I$INIT=F$END
        000041                  I$CLN=F$END
        000041                  I$SRV=F$END
        000041                  I$MSG=F$END
        000041                  I$RPT=F$END
        000041                  I$AU=F$END
```

```
                 000041               I$DU=F$END
                 000041               I$PWR=F$END
                 000041               I$SETUP=F$END
                 000041               I$PTAB=F$END
                 000041               I$AUTO=F$END
                 000041               I$PROT=F$END
                 000000               G$PRML=0
                 000001               G$PRMA=1
                 000002               G$PRMD=2
                 000003               G$DISP=3
                 000004               G$XFER=4
                 000000               G$NO=0*^D8
                 000010               G$YES=1*^D8
                 000000               G$RADB=0*^D16
                 000020               G$RADO=1*^D16
                 000040               G$RADD=2*^D16
                 000120               G$RADL=5*^D16
                 000140               G$RADA=6*^D16
                 000376               G$OFSIZE=^D254
                 000372               G$DELM=^D250
                 000400               G$OFFSET=1*^D256
                 000400               X$OFFSET=1*^D256
                 000200               G$CNTOP=1*^D128
                 000400               G$EXCP=1*^D256
                 000001               G$LOLIM=1
                 000002               G$HILIM=2
                 000000               X$ALWAYS=0*^D16
                 000020               X$TRUE=1*^D16
                 000040               X$FALSE=2*^D16
                 000000               O$BGNSFT=0
                 000000               O$BGNRPT=0
                 000000               O$GNSW=0
                 000000               O$APTS=0
                 000000               O$AU=0
                 000000               O$DU=0
                 000000               O$ERRTBL=0
                 000000               O$SETUP=0
                 000000               O$POINTER=0
                 010000               S$LSYM=T$LSYM
                 000167               J$JMP=167
                                      .IIF NDF ASSEMBLY,      ASSEMBLY=10
                                      .IIF NDF DIAGMCALLS,    DIAGMCALLS=0
                                      .IF EQ DIAGMCALLS
                                      .MCALL M$MCHIGH
         000000                       M$MCHIGH
                                      .ENDC
                                      .IF EQ ASSEMBLY-10
                                      .MCALL M$MCLOW
         000000                       M$MCLOW
                                      .ENDC

                                      ;       CHANGE THE VALUES OF THE SVC... SYMBOLS TO BE ZERO IF YOU WISH
                                      ;       TO ALIGN THE MACRO CALLS AND THEIR EXPANSIONS.  CHANGE THE
                                      ;       SYMBOLS TO BE MINUS-ONE TO NOT LIST THE EXPANSIONS.  YOU MAY
                                      ;       CHANGE THE SYMBOLS AT ANY POINT IN THIS PROGRAM.

                 000000               SVCINS= 0        ; INSTRUCTIONS
```

```
                000000          SVCTST= 0       ; TEST TAGS
                000000          SVCSUB= 0       ; SUBTEST TAGS
                000000          SVCGBL= 0       ; GLOBAL TAGS
                000000          SVCTAG= 0       ; OTHER TAGS


      000000                            .ENABL  ABS
                                        .ENABL  AMA
                002000                  .       =       2000

      002000                            BGNMOD
                                .MCALL  M$GNGBL,M$PUSH
                                .IF NE  F$END-I$MOD
                                .ERROR  ;'BGNMOD'' IN MOD
                                .MEXIT
                                .IFF
                000040          I$MOD=F$BGN
                                .ENDC
                                .IF NB
                                M$GNGBL
                                .ENDC
      002000                    M$PUSH  T$NS,T$NESTLEV,F$MOD
                                .MCALL  M$INCR,M$SETS
      002000                    M$INCR  T$NESTLEV
                000000          T$NESTLEV=T$NESTLEV+1
      002000                    M$SETS  T$NS,\T$NESTLEV,F$MOD
                000000          T$NS0=F$MOD

                                ;++
                                ; THE PROGRAM HEADER IS THE INTERFACE BETWEEN
                                ; THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
                                ;--

      002000                            POINTER BGNRPT,BGNSW,BGNSFT,ERRTBL,BGNSETUP
                                .IRP PX,<BGNRPT,BGNSW,BGNSFT,ERRTBL,BGNSETUP,,,,>
                                .IF IDN <ALL>,<PX>
                                O$BGNSFT=1
                                O$BGNRPT=1
                                O$GNSW=1
                                O$APTS=1
                                O$AU=1
                                O$DU=1
                                O$ERRTBL=1
                                O$SETUP=1
                                O$POINTER=1
                                .MEXIT
                                .ENDC
                                .IF IDN <NONE>,<PX>
                                O$BGNSFT=0
                                O$BGNRPT=0
                                O$GNSW=0
                                O$APTS=0
                                O$AU=0
                                O$DU=0
                                O$ERRTBL=0
                                O$SETUP=0
                                O$POINTER=1
```

```
.MEXIT
.ENDC
.IF IDN <BGNSFT>,<PX>
O$BGNSFT=1
O$POINTER=1
.ENDC
.IF IDN <BGNRPT>,<PX>
O$BGNRPT=1
O$POINTER=1
.ENDC
.IF IDN <BGNSW>,<PX>
O$GNSW=1
O$POINTER=1
.ENDC
.IF IDN <APTSTAT>,<PX>
O$APTS=1
O$POINTER=1
.ENDC
.IF IDN <BGNAU>,<PX>
O$AU=1
O$POINTER=1
.ENDC
.IF IDN <BGNDU>,<PX>
O$DU=1
O$POINTER=1
.ENDC
.IF IDN <ERRTBL>,<PX>
O$ERRTBL=1
O$POINTER=1
.ENDC
.IF IDN <BGNSETUP>,<PX>
O$SETUP=1
O$POINTER=1
.ENDC
.ENDM
.IF IDN <ALL>,<BGNRPT>
O$BGNSFT=1
O$BGNRPT=1
O$GNSW=1
O$APTS=1
O$AU=1
O$DU=1
O$ERRTBL=1
O$SETUP=1
O$POINTER=1
.MEXIT
.ENDC
.IF IDN <NONE>,<BGNRPT>
O$BGNSFT=0
O$BGNRPT=0
O$GNSW=0
O$APTS=0
O$AU=0
O$DU=0
O$ERRTBL=0
O$SETUP=0
O$POINTER=1
```

```
                                .MEXIT
                                .ENDC
                                .IF IDN <BGNSFT>,<BGNRPT>
                                O$BGNSFT=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <BGNRPT>,<BGNRPT>
        000001                  O$BGNRPT=1
        000001                  O$POINTER=1
                                .ENDC
                                .IF IDN <BGNSW>,<BGNRPT>
                                O$GNSW=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <APTSTAT>,<BGNRPT>
                                O$APTS=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <BGNAU>,<BGNRPT>
                                O$AU=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <BGNDU>,<BGNRPT>
                                O$DU=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <ERRTBL>,<BGNRPT>
                                O$ERRTBL=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <BGNSETUP>,<BGNRPT>
                                O$SETUP=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <ALL>,<BGNSW>
                                O$BGNSFT=1
                                O$BGNRPT=1
                                O$GNSW=1
                                O$APTS=1
                                O$AU=1
                                O$DU=1
                                O$ERRTBL=1
                                O$SETUP=1
                                O$POINTER=1
                                .MEXIT
                                .ENDC
                                .IF IDN <NONE>,<BGNSW>
                                O$BGNSFT=0
                                O$BGNRPT=0
                                O$GNSW=0
                                O$APTS=0
                                O$AU=0
                                O$DU=0
                                O$ERRTBL=0
                                O$SETUP=0
                                O$POINTER=1
                                .MEXIT
```

```
                                .ENDC
                                .IF IDN <BGNSFT>,<BGNSW>
                                O$BGNSFT=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <BGNRPT>,<BGNSW>
                                O$BGNRPT=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <BGNSW>,<BGNSW>
          000001                O$GNSW=1
          000001                O$POINTER=1
                                .ENDC
                                .IF IDN <APTSTAT>,<BGNSW>
                                O$APTS=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <BGNAU>,<BGNSW>
                                O$AU=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <BGNDU>,<BGNSW>
                                O$DU=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <ERRTBL>,<BGNSW>
                                O$ERRTBL=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <BGNSETUP>,<BGNSW>
                                O$SETUP=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <ALL>,<BGNSFT>
                                O$BGNSFT=1
                                O$BGNRPT=1
                                O$GNSW=1
                                O$APTS=1
                                O$AU=1
                                O$DU=1
                                O$ERRTBL=1
                                O$SETUP=1
                                O$POINTER=1
                                .MEXIT
                                .ENDC
                                .IF IDN <NONE>,<BGNSFT>
                                O$BGNSFT=0
                                O$BGNRPT=0
                                O$GNSW=0
                                O$APTS=0
                                O$AU=0
                                O$DU=0
                                O$ERRTBL=0
                                O$SETUP=0
                                O$POINTER=1
                                .MEXIT
                                .ENDC
```

```
                                .IF IDN <BGNSFT>,<BGNSFT>
        000001                  O$BGNSFT=1
        000001                  O$POINTER=1
                                .ENDC
                                .IF IDN <BGNRPT>,<BGNSFT>
                                O$BGNRPT=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <BGNSW>,<BGNSFT>
                                O$GNSW=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <APTSTAT>,<BGNSFT>
                                O$APTS=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <BGNAU>,<BGNSFT>
                                O$AU=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <BGNDU>,<BGNSFT>
                                O$DU=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <ERRTBL>,<BGNSFT>
                                O$ERRTBL=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <BGNSETUP>,<BGNSFT>
                                O$SETUP=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <ALL>,<ERRTBL>
                                O$BGNSFT=1
                                O$BGNRPT=1
                                O$GNSW=1
                                O$APTS=1
                                O$AU=1
                                O$DU=1
                                O$ERRTBL=1
                                O$SETUP=1
                                O$POINTER=1
                                .MEXIT
                                .ENDC
                                .IF IDN <NONE>,<ERRTBL>
                                O$BGNSFT=0
                                O$BGNRPT=0
                                O$GNSW=0
                                O$APTS=0
                                O$AU=0
                                O$DU=0
                                O$ERRTBL=0
                                O$SETUP=0
                                O$POINTER=1
                                .MEXIT
                                .ENDC
                                .IF IDN <BGNSFT>,<ERRTBL>
```

```
                              O$BGNSFT=1
                              O$POINTER=1
                              .ENDC
                              .IF IDN <BGNRPT>,<ERRTBL>
                              O$BGNRPT=1
                              O$POINTER=1
                              .ENDC
                              .IF IDN <BGNSW>,<ERRTBL>
                              O$GNSW=1
                              O$POINTER=1
                              .ENDC
                              .IF IDN <APTSTAT>,<ERRTBL>
                              O$APTS=1
                              O$POINTER=1
                              .ENDC
                              .IF IDN <BGNAU>,<ERRTBL>
                              O$AU=1
                              O$POINTER=1
                              .ENDC
                              .IF IDN <BGNDU>,<ERRTBL>
                              O$DU=1
                              O$POINTER=1
                              .ENDC
                              .IF IDN <ERRTBL>,<ERRTBL>
          000001              O$ERRTBL=1
          000001              O$POINTER=1
                              .ENDC
                              .IF IDN <BGNSETUP>,<ERRTBL>
                              O$SETUP=1
                              O$POINTER=1
                              .ENDC
                              .IF IDN <ALL>,<BGNSETUP>
                              O$BGNSFT=1
                              O$BGNRPT=1
                              O$GNSW=1
                              O$APTS=1
                              O$AU=1
                              O$DU=1
                              O$ERRTBL=1
                              O$SETUP=1
                              O$POINTER=1
                              .MEXIT
                              .ENDC
                              .IF IDN <NONE>,<BGNSETUP>
                              O$BGNSFT=0
                              O$BGNRPT=0
                              O$GNSW=0
                              O$APTS=0
                              O$AU=0
                              O$DU=0
                              O$ERRTBL=0
                              O$SETUP=0
                              O$POINTER=1
                              .MEXIT
                              .ENDC
                              .IF IDN <BGNSFT>,<BGNSETUP>
                              O$BGNSFT=1
```

```
                                O$POINTER=1
                                .ENDC
                                .IF IDN <BGNRPT>,<BGNSETUP>
                                O$BGNRPT=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <BGNSW>,<BGNSETUP>
                                O$GNSW=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <APTSTAT>,<BGNSETUP>
                                O$APTS=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <BGNAU>,<BGNSETUP>
                                O$AU=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <BGNDU>,<BGNSETUP>
                                O$DU=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <ERRTBL>,<BGNSETUP>
                                O$ERRTBL=1
                                O$POINTER=1
                                .ENDC
                                .IF IDN <BGNSETUP>,<BGNSETUP>
          000001                O$SETUP=1
          000001                O$POINTER=1
                                .ENDC
                                .IF IDN <ALL>,<>
                                O$BGNSFT=1
                                O$BGNRPT=1
                                O$GNSW=1
                                O$APTS=1
                                O$AU=1
                                O$DU=1
                                O$ERRTBL=1
                                O$SETUP=1
                                O$POINTER=1
                                .MEXIT
                                .ENDC
                                .IF IDN <NONE>,<>
                                O$BGNSFT=0
                                O$BGNRPT=0
                                O$GNSW=0
                                O$APTS=0
                                O$AU=0
                                O$DU=0
                                O$ERRTBL=0
                                O$SETUP=0
                                O$POINTER=1
                                .MEXIT
                                .ENDC
                                .IF IDN <BGNSFT>,<>
                                O$BGNSFT=1
                                O$POINTER=1
```

```
.ENDC
.IF IDN <BGNRPT>,<>
O$BGNRPT=1
O$POINTER=1
.ENDC
.IF IDN <BGNSW>,<>
O$GNSW=1
O$POINTER=1
.ENDC
.IF IDN <APTSTAT>,<>
O$APTS=1
O$POINTER=1
.ENDC
.IF IDN <BGNAU>,<>
O$AU=1
O$POINTER=1
.ENDC
.IF IDN <BGNDU>,<>
O$DU=1
O$POINTER=1
.ENDC
.IF IDN <ERRTBL>,<>
O$ERRTBL=1
O$POINTER=1
.ENDC
.IF IDN <BGNSETUP>,<>
O$SETUP=1
O$POINTER=1
.ENDC
.IF IDN <ALL>,<>
O$BGNSFT=1
O$BGNRPT=1
O$GNSW=1
O$APTS=1
O$AU=1
O$DU=1
O$ERRTBL=1
O$SETUP=1
O$POINTER=1
.MEXIT
.ENDC
.IF IDN <NONE>,<>
O$BGNSFT=0
O$BGNRPT=0
O$GNSW=0
O$APTS=0
O$AU=0
O$DU=0
O$ERRTBL=0
O$SETUP=0
O$POINTER=1
.MEXIT
.ENDC
.IF IDN <BGNSFT>,<>
O$BGNSFT=1
O$POINTER=1
.ENDC
```

```
.IF IDN <BGNRPT>,<>
O$BGNRPT=1
O$POINTER=1
.ENDC
.IF IDN <BGNSW>,<>
O$GNSW=1
O$POINTER=1
.ENDC
.IF IDN <APTSTAT>,<>
O$APTS=1
O$POINTER=1
.ENDC
.IF IDN <BGNAU>,<>
O$AU=1
O$POINTER=1
.ENDC
.IF IDN <BGNDU>,<>
O$DU=1
O$POINTER=1
.ENDC
.IF IDN <ERRTBL>,<>
O$ERRTBL=1
O$POINTER=1
.ENDC
.IF IDN <BGNSETUP>,<>
O$SETUP=1
O$POINTER=1
.ENDC
.IF IDN <ALL>,<>
O$BGNSFT=1
O$BGNRPT=1
O$GNSW=1
O$APTS=1
O$AU=1
O$DU=1
O$ERRTBL=1
O$SETUP=1
O$POINTER=1
.MEXIT
.ENDC
.IF IDN <NONE>,<>
O$BGNSFT=0
O$BGNRPT=0
O$GNSW=0
O$APTS=0
O$AU=0
O$DU=0
O$ERRTBL=0
O$SETUP=0
O$POINTER=1
.MEXIT
.ENDC
.IF IDN <BGNSFT>,<>
O$BGNSFT=1
O$POINTER=1
.ENDC
.IF IDN <BGNRPT>,<>
```

```
O$BGNRPT=1
O$POINTER=1
.ENDC
.IF IDN <BGNSW>,<>
O$GNSW=1
O$POINTER=1
.ENDC
.IF IDN <APTSTAT>,<>
O$APTS=1
O$POINTER=1
.ENDC
.IF IDN <BGNAU>,<>
O$AU=1
O$POINTER=1
.ENDC
.IF IDN <BGNDU>,<>
O$DU=1
O$POINTER=1
.ENDC
.IF IDN <ERRTBL>,<>
O$ERRTBL=1
O$POINTER=1
.ENDC
.IF IDN <BGNSETUP>,<>
O$SETUP=1
O$POINTER=1
.ENDC
.IF IDN <ALL>,<>
O$BGNSFT=1
O$BGNRPT=1
O$GNSW=1
O$APTS=1
O$AU=1
O$DU=1
O$ERRTBL=1
O$SETUP=1
O$POINTER=1
.MEXIT
.ENDC
.IF IDN <NONE>,<>
O$BGNSFT=0
O$BGNRPT=0
O$GNSW=0
O$APTS=0
O$AU=0
O$DU=0
O$ERRTBL=0
O$SETUP=0
O$POINTER=1
.MEXIT
.ENDC
.IF IDN <BGNSFT>,<>
O$BGNSFT=1
O$POINTER=1
.ENDC
.IF IDN <BGNRPT>,<>
O$BGNRPT=1
```

```
                                  O$POINTER=1
                                  .ENDC
                                  .IF IDN <BGNSW>,<>
                                  O$GNSW=1
                                  O$POINTER=1
                                  .ENDC
                                  .IF IDN <APTSTAT>,<>
                                  O$APTS=1
                                  O$POINTER=1
                                  .ENDC
                                  .IF IDN <BGNAU>,<>
                                  O$AU=1
                                  O$POINTER=1
                                  .ENDC
                                  .IF IDN <BGNDU>,<>
                                  O$DU=1
                                  O$POINTER=1
                                  .ENDC
                                  .IF IDN <ERRTBL>,<>
                                  O$ERRTBL=1
                                  O$POINTER=1
                                  .ENDC
                                  .IF IDN <BGNSETUP>,<>
                                  O$SETUP=1
                                  O$POINTER=1
                                  .ENDC
                                  .IF EQ O$POINTER
                                  .ERROR  ;ILL. ARGS. ON ''POINTER''
                                  .ENDC

                                  ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                                  ;       IF ANY OPTIONAL POINTERS ARE NOT TO BE USED IN THE ''HEADER'', CHANGE
                                  ;       ''POINTER'' TO CONTAIN THE CORRECT ARGUMENTS.  IF NO OPTIONAL
                                  ;       POINTERS ARE TO BE USED, CHANGE ''POINTER'' TO BE ''POINTER NONE''.
                                  ;         ARGUMENT          OPTION
                                  ;         --------          ------
                                  ;         BGNRPT            REPORT CODE
                                  ;         BGNSW             SOFTWARE TABLE
                                  ;         BGNSFT            SOFTWARE TABLE QUESTIONS
                                  ;         BGNAU             ADD CODE
                                  ;         BGNDU             DROP CODE
                                  ;         ERRTBL            ERROR TABLE
                                  ;         BGNSETUP          ASSEMBLED P-TABLES
                                  ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

   002000                                   HEADER  ZUDFA0,B,0,1800.,1,PRI07
                                  .MCALL    M$HAPT,M$HNAP
   002000                         M$HAPT    ZUDFA0,B,0,1800.,1,PRI07
                                  .MCALL    M$GNGBL,M$GNINS,M$BYTE,M$DATA
                                  .IF B     ZUDFA0
                                  .ERROR    ; MISSING DIAG. NAME
                                  .MEXIT
                                  .ENDC
   002000                         M$GNGBL L$NAME,<<;DIAGNOSTIC NAME>>
                                  .MCALL  M$GEN
                                  .IF NB,L$NAME
                                  .IF NB,<;DIAGNOSTIC NAME>
```

```
    002000                     M$GEN   L$NAME,:,SVCGBL,<;DIAGNOSTIC NAME>
                               .IF LE  SVCGBL
    002000                     L$NAME::                  ;DIAGNOSTIC NAME
                               .MEXIT
                               .ENDC
                               .LIST
                                                                             L$NAME::
                                       .NLIST
                               .ENDC
                               .IF B,<;DIAGNOSTIC NAME>
                               M$GEN   L$NAME,:,SVCGBL,< >
                               .ENDC
                               .ENDC
           000007              T$ARGCNT=^D7
                               .IRPC   CHAR,<ZUDFA0>
                               M$GNINS <.ASCII /CHAR/>
                               T$ARGCNT=T$ARGCNT-1
                               .IF LT T$ARGCNT
                               .ERROR  ;PROG NAME TOO BIG
                               .MEXIT
                               .ENDC
                               .ENDM
    002000                     M$GNINS <.ASCII /Z/>
                               .IF LT SVCINS
                               .ASCII /Z/
                               .MEXIT
                               .ENDC
                               .IF EQ SVCINS
    002000      132                    .ASCII /Z/
                               .MEXIT
                               .ENDC
                               .IF GT SVCINS
                               .LIST
                                                                             .ASCII /Z/
                                             .NLIST
                               .ENDC
           000006              T$ARGCNT=T$ARGCNT-1
                               .IF LT T$ARGCNT
                               .ERROR  ;PROG NAME TOO BIG
                               .MEXIT
                               .ENDC
    002001                     M$GNINS <.ASCII /U/>
                               .IF LT SVCINS
                               .ASCII /U/
                               .MEXIT
                               .ENDC
                               .IF EQ SVCINS
    002001      125                    .ASCII /U/
                               .MEXIT
                               .ENDC
                               .IF GT SVCINS
                               .LIST
                                                                             .ASCII /U/
                                             .NLIST
                               .ENDC
           000005              T$ARGCNT=T$ARGCNT-1
                               .IF LT T$ARGCNT
```

```
                                        .ERROR  ;PROG NAME TOO BIG
                                        .MEXIT
                                        .ENDC
      002002                            M$GNINS <.ASCII /D/>
                                        .IF LT SVCINS
                                        .ASCII /D/
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      002002     104                           .ASCII /D/
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                             .ASCII /D/
                                                     .NLIST
                                        .ENDC
             000004                     T$ARGCNT=T$ARGCNT-1
                                        .IF LT T$ARGCNT
                                        .ERROR  ;PROG NAME TOO BIG
                                        .MEXIT
                                        .ENDC
      002003                            M$GNINS <.ASCII /F/>
                                        .IF LT SVCINS
                                        .ASCII /F/
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      002003     106                           .ASCII /F/
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                             .ASCII /F/
                                                     .NLIST
                                        .ENDC
             000003                     T$ARGCNT=T$ARGCNT-1
                                        .IF LT T$ARGCNT
                                        .ERROR  ;PROG NAME TOO BIG
                                        .MEXIT
                                        .ENDC
      002004                            M$GNINS <.ASCII /A/>
                                        .IF LT SVCINS
                                        .ASCII /A/
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      002004     101                           .ASCII /A/
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                             .ASCII /A/
                                                     .NLIST
                                        .ENDC
             000002                     T$ARGCNT=T$ARGCNT-1
                                        .IF LT T$ARGCNT
```

```
                                        .ERROR  ;PROG NAME TOO BIG
                                        .MEXIT
                                        .ENDC
    002005                              M$GNINS <.ASCII /0/>
                                        .IF LT SVCINS
                                        .ASCII /0/
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
    002005     060                              .ASCII /0/
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                                .ASCII /0/
                                                        .NLIST
                                        .ENDC
            000001                      T$ARGCNT=T$ARGCNT-1
                                        .IF LT T$ARGCNT
                                        .ERROR  ;PROG NAME TOO BIG
                                        .MEXIT
                                        .ENDC
            000001                      .REPT   T$ARGCNT
                                        M$BYTE  0
                                        .ENDR
    002006                              M$BYTE  0
                                        .MCALL  M$GNINS
                                        .IRP    N,<0>
                                        M$GNINS <.BYTE  N>
                                        .ENDM
    002006                              M$GNINS <.BYTE  0>
                                        .IF LT SVCINS
                                        .BYTE   0
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
    002006     000                              .BYTE   0
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                                .BYTE   0
                                                        .NLIST
                                        .ENDC
    002007                              M$BYTE  0
                                        .MCALL  M$GNINS
                                        .IRP    N,<0>
                                        M$GNINS <.BYTE  N>
                                        .ENDM
    002007                              M$GNINS <.BYTE  0>
                                        .IF LT SVCINS
                                        .BYTE   0
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
    002007     000                              .BYTE   0
                                        .MEXIT
```

```
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                            .BYTE   0
                                          .NLIST
                                .ENDC
                                .IF NB B
     002010                     M$DATA  L$REV,.ASCII,</B/>,<<;REVISION LEVEL>>
                                .MCALL  M$GNGBL,M$GNINS
                                .IF NB <;REVISION LEVEL>
     002010                     M$GNGBL L$REV,<<;REVISION LEVEL>>
                                .MCALL  M$GEN
                                .IF NB,L$REV
                                .IF NB,<;REVISION LEVEL>
     002010                     M$GEN   L$REV,:,SVCGBL,<;REVISION LEVEL>
                                .IF LE  SVCGBL
     002010                     L$REV::                 ;REVISION LEVEL
                                .MEXIT
                                .ENDC
                                .LIST
                                                                       L$REV::
                                     .NLIST
                                .ENDC
                                .IF B,<;REVISION LEVEL>
                                M$GEN   L$REV,:,SVCGBL,< >
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF B <;REVISION LEVEL>
                                M$GNGBL L$REV
                                .ENDC
     002010                     M$GNINS <.ASCII /B/>
                                .IF LT SVCINS
                                .ASCII  /B/
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     002010     102                  .ASCII  /B/
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                            .ASCII  /B/
                                          .NLIST
                                .ENDC
                                .IFF
                                .ERROR  ; MISSING REV. LEVEL
                                M$DATA  L$REV,.ASCII,</?/>,<<;REVISION LEVEL>>
                                .ENDC
                                .IF NB 0
     002011                     M$DATA  L$DEPO,.ASCII,</0/>,<<;0>>
                                .MCALL  M$GNGBL,M$GNINS
                                .IF NB <;0>
     002011                     M$GNGBL L$DEPO,<<;0>>
                                .MCALL  M$GEN
                                .IF NB,L$DEPO
                                .IF NB,<;0>
```

```
      002011                  M$GEN   L$DEPO,:,SVCGBL,<;0>
                              .IF LE  SVCGBL
      002011                  L$DEPO::                ;0
                              .MEXIT
                              .ENDC
                              .LIST
                                                                                    L$DEPO::
                                      .NLIST
                              .ENDC
                              .IF B,<;0>
                              M$GEN   L$DEPO,:,SVCGBL,< >
                              .ENDC
                              .ENDC
                              .ENDC
                              .IF B <;0>
                              M$GNGBL L$DEPO
                              .ENDC
      002011                  M$GNINS <.ASCII /0/>
                              .IF LT SVCINS
                              .ASCII  /0/
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
      002011        060               .ASCII  /0/
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                                          .ASCII  /0/
                                              .NLIST
                              .ENDC
                              .IFF
                              .ERROR  ; MISSING DEPO.
                              M$DATA  L$DEPO,.ASCII,</?/>,<<;0>>
                              .ENDC
                              .IF EQ O$SETUP
                              M$DATA  L$UNIT,.WORD,0,<<;NUMBER OF UNITS>>
                              .IFF
      002012                  M$DATA  L$UNIT,.WORD,T$PTHV,<<;NUMBER OF UNITS>>
                              .MCALL  M$GNGBL,M$GNINS
                              .IF NB <;NUMBER OF UNITS>
      002012                  M$GNGBL L$UNIT,<<;NUMBER OF UNITS>>
                              .MCALL  M$GEN
                              .IF NB,L$UNIT
                              .IF NB,<;NUMBER OF UNITS>
      002012                  M$GEN   L$UNIT,:,SVCGBL,<;NUMBER OF UNITS>
                              .IF LE  SVCGBL
      002012                  L$UNIT::                ;NUMBER OF UNITS
                              .MEXIT
                              .ENDC
                              .LIST
                                                                                    L$UNIT::
                                      .NLIST
                              .ENDC
                              .IF B,<;NUMBER OF UNITS>
                              M$GEN   L$UNIT,:,SVCGBL,< >
                              .ENDC
```

```
                              .ENDC
                              .ENDC
                              .IF B <;NUMBER OF UNITS>
                              M$GNGBL L$UNIT
                              .ENDC
     002012                   M$GNINS <.WORD  T$PTHV>
                              .IF LT SVCINS
                              .WORD   T$PTHV
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
     002012  000001                   .WORD   T$PTHV
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                                  .WORD   T$PTHV
                                        .NLIST
                              .ENDC
                              .ENDC
                              .IF B   1800.
                              .ERROR  ; LONGEST TEST TIME MISSING
                              M$DATA  L$TIML,.WORD,0,<<;LONGEST TEST TIME>>
                              .IFF
     002014                   M$DATA  L$TIML,.WORD,1800.,<<;LONGEST TEST TIME>>
                              .MCALL  M$GNGBL,M$GNINS
                              .IF NB <;LONGEST TEST TIME>
     002014                   M$GNGBL L$TIML,<<;LONGEST TEST TIME>>
                              .MCALL  M$GEN
                              .IF NB,L$TIML
                              .IF NB,<;LONGEST TEST TIME>
     002014                   M$GEN   L$TIML,:,SVCGBL,<;LONGEST TEST TIME>
                              .IF LE  SVCGBL
     002014                   L$TIML::                ;LONGEST TEST TIME
                              .MEXIT
                              .ENDC
                              .LIST
                                                                             L$TIML::
                                   .NLIST
                              .ENDC
                              .IF B,<;LONGEST TEST TIME>
                              M$GEN   L$TIML,:,SVCGBL,< >
                              .ENDC
                              .ENDC
                              .ENDC
                              .IF B <;LONGEST TEST TIME>
                              M$GNGBL L$TIML
                              .ENDC
     002014                   M$GNINS <.WORD  1800.>
                              .IF LT SVCINS
                              .WORD   1800.
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
     002014  003410                   .WORD   1800.
                              .MEXIT
                              .ENDC
```

```
                                        .IF GT SVCINS
                                        .LIST
                                                                                                  .WORD   1800.
                                                     .NLIST
                                        .ENDC
                                        .ENDC
      002016                            M$DATA  L$HPCP,.WORD,L$HARD,<<;POINTER TO H.W. QUES.>>
                                        .MCALL  M$GNGBL,M$GNINS
                                        .IF NB <;POINTER TO H.W. QUES.>
      002016                            M$GNGBL L$HPCP,<<;POINTER TO H.W. QUES.>>
                                        .MCALL  M$GEN
                                        .IF NB,L$HPCP
                                        .IF NB,<;POINTER TO H.W. QUES.>
      002016                            M$GEN   L$HPCP,:,SVCGBL,<;POINTER TO H.W. QUES.>
                                        .IF LE  SVCGBL
      002016                            L$HPCP::                ;POINTER TO H.W. QUES.
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                                           L$HPCP::
                                              .NLIST
                                        .ENDC
                                        .IF B,<;POINTER TO H.W. QUES.>
                                        M$GEN   L$HPCP,:,SVCGBL,< >
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF B <;POINTER TO H.W. QUES.>
                                        M$GNGBL L$HPCP
                                        .ENDC
      002016                            M$GNINS <.WORD  L$HARD>
                                        .IF LT SVCINS
                                        .WORD   L$HARD
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      002016  014734                          .WORD   L$HARD
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                                  .WORD   L$HARD
                                                     .NLIST
                                        .ENDC
                                        .IF EQ O$BGNSFT
                                        M$DATA  L$SPCP,.WORD,0,<<;POINTER TO S.W. QUES.>>
                                        .IFF
      002020                            M$DATA  L$SPCP,.WORD,L$SOFT,<<;POINTER TO S.W. QUES.>>
                                        .MCALL  M$GNGBL,M$GNINS
                                        .IF NB <;POINTER TO S.W. QUES.>
      002020                            M$GNGBL L$SPCP,<<;POINTER TO S.W. QUES.>>
                                        .MCALL  M$GEN
                                        .IF NB,L$SPCP
                                        .IF NB,<;POINTER TO S.W. QUES.>
      002020                            M$GEN   L$SPCP,:,SVCGBL,<;POINTER TO S.W. QUES.>
                                        .IF LE  SVCGBL
      002020                            L$SPCP::                ;POINTER TO S.W. QUES.
```

```
                                .MEXIT
                                .ENDC
                                .LIST
                                                                              L$SPCP::
                                        .NLIST
                                .ENDC
                                .IF B,<;POINTER TO S.W. QUES.>
                                M$GEN   L$SPCP,:,SVCGBL,< >
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF B <;POINTER TO S.W. QUES.>
                                M$GNGBL L$SPCP
                                .ENDC
002020                          M$GNINS <.WORD  L$SOFT>
                                .IF LT SVCINS
                                .WORD   L$SOFT
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
002020  015350                          .WORD   L$SOFT
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                    .WORD   L$SOFT
                                              .NLIST
                                .ENDC
                                .ENDC
002022                          M$DATA  L$HPTP,.WORD,L$HW,<<;PTR. TO DEF. H.W. PTABLE>>
                                .MCALL  M$GNGBL,M$GNINS
                                .IF NB <;PTR. TO DEF. H.W. PTABLE>
002022                          M$GNGBL L$HPTP,<<;PTR. TO DEF. H.W. PTABLE>>
                                .MCALL  M$GEN
                                .IF NB,L$HPTP
                                .IF NB,<;PTR. TO DEF. H.W. PTABLE>
002022                          M$GEN   L$HPTP,:,SVCGBL,<;PTR. TO DEF. H.W. PTABLE>
                                .IF LE  SVCGBL
002022                          L$HPTP::                ;PTR. TO DEF. H.W. PTABLE
                                .MEXIT
                                .ENDC
                                .LIST
                                                                              L$HPTP::
                                        .NLIST
                                .ENDC
                                .IF B,<;PTR. TO DEF. H.W. PTABLE>
                                M$GEN   L$HPTP,:,SVCGBL,< >
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF B <;PTR. TO DEF. H.W. PTABLE>
                                M$GNGBL L$HPTP
                                .ENDC
002022                          M$GNINS <.WORD  L$HW>
                                .IF LT SVCINS
                                .WORD   L$HW
                                .MEXIT
```

```
                                         .ENDC
                                         .IF EQ SVCINS
      002022  002130                             .WORD   L$HW
                                         .MEXIT
                                         .ENDC
                                         .IF GT SVCINS
                                         .LIST
                                                                                                  .WORD   L$HW
                                                      .NLIST
                                         .ENDC
                                         .IF EQ O$GNSW
                                         M$DATA  L$SPTP,.WORD,0,<<;PTR. TO S.W. PTABLE>>
                                         .IFF
      002024                             M$DATA  L$SPTP,.WORD,L$SW,<<;PTR. TO S.W. PTABLE>>
                                         .MCALL  M$GNGBL,M$GNINS
                                         .IF NB <;PTR. TO S.W. PTABLE>
      002024                             M$GNGBL L$SPTP,<<;PTR. TO S.W. PTABLE>>
                                         .MCALL  M$GEN
                                         .IF NB,L$SPTP
                                         .IF NB,<;PTR. TO S.W. PTABLE>
      002024                             M$GEN   L$SPTP,:,SVCGBL,<;PTR. TO S.W. PTABLE>
                                         .IF LE  SVCGBL
      002024                             L$SPTP::                ;PTR. TO S.W. PTABLE
                                         .MEXIT
                                         .ENDC
                                         .LIST
                                                                                           L$SPTP::
                                                 .NLIST
                                         .ENDC
                                         .IF B,<;PTR. TO S.W. PTABLE>
                                         M$GEN   L$SPTP,:,SVCGBL,< >
                                         .ENDC
                                         .ENDC
                                         .ENDC
                                         .IF B <;PTR. TO S.W. PTABLE>
                                         M$GNGBL L$SPTP
                                         .ENDC
      002024                             M$GNINS <.WORD  L$SW>
                                         .IF LT SVCINS
                                         .WORD   L$SW
                                         .MEXIT
                                         .ENDC
                                         .IF EQ SVCINS
      002024  002150                             .WORD   L$SW
                                         .MEXIT
                                         .ENDC
                                         .IF GT SVCINS
                                         .LIST
                                                                                                  .WORD   L$SW
                                                      .NLIST
                                         .ENDC
                                         .ENDC
      002026                             M$DATA  L$LADP,.WORD,L$LAST,<<;DIAG. END ADDRESS>>
                                         .MCALL  M$GNGBL,M$GNINS
                                         .IF NB <;DIAG. END ADDRESS>
      002026                             M$GNGBL L$LADP,<<;DIAG. END ADDRESS>>
                                         .MCALL  M$GEN
```

```
                            .IF NB,L$LADP
                            .IF NB,<;DIAG. END ADDRESS>
002026                      M$GEN   L$LADP,:,SVCGBL,<;DIAG. END ADDRESS>
                            .IF LE  SVCGBL
002026                      L$LADP::                ;DIAG. END ADDRESS
                            .MEXIT
                            .ENDC
                            .LIST
                                                                        L$LADP::
                                    .NLIST
                            .ENDC
                            .IF B,<;DIAG. END ADDRESS>
                            M$GEN   L$LADP,:,SVCGBL,< >
                            .ENDC
                            .ENDC
                            .ENDC
                            .IF B <;DIAG. END ADDRESS>
                            M$GNGBL L$LADP
                            .ENDC
002026                      M$GNINS <.WORD  L$LAST>
                            .IF LT SVCINS
                            .WORD   L$LAST
                            .MEXIT
                            .ENDC
                            .IF EQ SVCINS
002026  015560                      .WORD   L$LAST
                            .MEXIT
                            .ENDC
                            .IF GT SVCINS
                            .LIST
                                                                             .WORD   L$LAST
                                            .NLIST
                            .ENDC
                            .IF EQ O$APTS
002030                      M$DATA  L$STA,.WORD,0,<<;RESERVED FOR APT STATS>>
                            .MCALL  M$GNGBL,M$GNINS
                            .IF NB <;RESERVED FOR APT STATS>
002030                      M$GNGBL L$STA,<<;RESERVED FOR APT STATS>>
                            .MCALL  M$GEN
                            .IF NB,L$STA
                            .IF NB,<;RESERVED FOR APT STATS>
002030                      M$GEN   L$STA,:,SVCGBL,<;RESERVED FOR APT STATS>
                            .IF LE  SVCGBL
002030                      L$STA::                 ;RESERVED FOR APT STATS
                            .MEXIT
                            .ENDC
                            .LIST
                                                                        L$STA::
                                    .NLIST
                            .ENDC
                            .IF B,<;RESERVED FOR APT STATS>
                            M$GEN   L$STA,:,SVCGBL,< >
                            .ENDC
                            .ENDC
                            .ENDC
                            .IF B <;RESERVED FOR APT STATS>
                            M$GNGBL L$STA
```

```
                                   .ENDC
      002030                       M$GNINS <.WORD  0>
                                   .IF LT SVCINS
                                   .WORD   0
                                   .MEXIT
                                   .ENDC
                                   .IF EQ SVCINS
      002030  000000                       .WORD   0
                                   .MEXIT
                                   .ENDC
                                   .IF GT SVCINS
                                   .LIST
                                                                                      .WORD   0
                                               .NLIST
                                   .ENDC
                                   .IFF
                                   M$DATA  L$STA,.WORD,0,<<;RESERVED FOR APT STATS>>
                                   .ENDC
      002032                       M$DATA  L$CO,.WORD,0
                                   .MCALL  M$GNGBL,M$GNINS
                                   .IF NB
                                   M$GNGBL L$CO,<>
                                   .ENDC
                                   .IF B
      002032                       M$GNGBL L$CO
                                   .MCALL  M$GEN
                                   .IF NB,L$CO
                                   .IF NB,
                                   M$GEN   L$CO,:,SVCGBL,
                                   .ENDC
                                   .IF B,
      002032                       M$GEN   L$CO,:,SVCGBL,< >
                                   .IF LE  SVCGBL
      002032                       L$CO::
                                   .MEXIT
                                   .ENDC
                                   .LIST
                                                                               L$CO::
                                           .NLIST
                                   .ENDC
                                   .ENDC
                                   .ENDC
      002032                       M$GNINS <.WORD  0>
                                   .IF LT SVCINS
                                   .WORD   0
                                   .MEXIT
                                   .ENDC
                                   .IF EQ SVCINS
      002032  000000                       .WORD   0
                                   .MEXIT
                                   .ENDC
                                   .IF GT SVCINS
                                   .LIST
                                                                                      .WORD   0
                                               .NLIST
                                   .ENDC
                                   .IF B   1
```

```
                                .ERROR  ; MISSING DIAG. TYPE
                                M$DATA  L$DTYP,.WORD,0,<<;DIAGNOSTIC TYPE>>
                                .IFF
                                .IF IDN 0,1
                                M$DATA  L$DTYP,.WORD,1,<<;DIAGNOSTIC TYPE>>
                                .IFF
                                .IF IDN 1,1
     002034                     M$DATA  L$DTYP,.WORD,1,<<;DIAGNOSTIC TYPE>>
                                .MCALL  M$GNGBL,M$GNINS
                                .IF NB <;DIAGNOSTIC TYPE>
     002034                     M$GNGBL L$DTYP,<<;DIAGNOSTIC TYPE>>
                                .MCALL  M$GEN
                                .IF NB,L$DTYP
                                .IF NB,<;DIAGNOSTIC TYPE>
     002034                     M$GEN   L$DTYP,:,SVCGBL,<;DIAGNOSTIC TYPE>
                                .IF LE  SVCGBL
     002034                     L$DTYP::                  ;DIAGNOSTIC TYPE
                                .MEXIT
                                .ENDC
                                .LIST
                                                                                L$DTYP::
                                        .NLIST
                                .ENDC
                                .IF B,<;DIAGNOSTIC TYPE>
                                M$GEN   L$DTYP,:,SVCGBL,< >
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF B <;DIAGNOSTIC TYPE>
                                M$GNGBL L$DTYP
                                .ENDC
     002034                     M$GNINS <.WORD  1>
                                .IF LT SVCINS
                                .WORD   1
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     002034  000001                     .WORD   1
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                     .WORD   1
                                                .NLIST
                                .ENDC
                                .IFF
                                M$DATA  L$DTYP,.WORD,0,<<;DIAGNOSTIC TYPE>>
                                .ERROR  ; INVALID DIAG. TYPE (0=DIAG, 1=EXERCISER)
                                .ENDC
                                .ENDC
                                .ENDC
     002036                     M$DATA  L$APT,.WORD,0,<<;APT EXPANSION>>
                                .MCALL  M$GNGBL,M$GNINS
                                .IF NB <;APT EXPANSION>
     002036                     M$GNGBL L$APT,<<;APT EXPANSION>>
                                .MCALL  M$GEN
                                .IF NB,L$APT
```

```
                                    .IF NB,<;APT EXPANSION>
     002036                         M$GEN    L$APT,:,SVCGBL,<;APT EXPANSION>
                                    .IF LE   SVCGBL
     002036                         L$APT::                  ;APT EXPANSION
                                    .MEXIT
                                    .ENDC
                                    .LIST
                                                                                  L$APT::
                                          .NLIST
                                    .ENDC
                                    .IF B,<;APT EXPANSION>
                                    M$GEN    L$APT,:,SVCGBL,< >
                                    .ENDC
                                    .ENDC
                                    .ENDC
                                    .IF B <;APT EXPANSION>
                                    M$GNGBL L$APT
                                    .ENDC
     002036                         M$GNINS <.WORD  0>
                                    .IF LT SVCINS
                                    .WORD   0
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
     002036  000000                       .WORD   0
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                                        .WORD   0
                                                .NLIST
                                    .ENDC
     002040                         M$DATA  L$DTP,.WORD,L$DISPATCH,<<;PTR. TO DISPATCH TABLE>>
                                    .MCALL  M$GNGBL,M$GNINS
                                    .IF NB <;PTR. TO DISPATCH TABLE>
     002040                         M$GNGBL L$DTP,<<;PTR. TO DISPATCH TABLE>>
                                    .MCALL  M$GEN
                                    .IF NB,L$DTP
                                    .IF NB,<;PTR. TO DISPATCH TABLE>
     002040                         M$GEN    L$DTP,:,SVCGBL,<;PTR. TO DISPATCH TABLE>
                                    .IF LE   SVCGBL
     002040                         L$DTP::                  ;PTR. TO DISPATCH TABLE
                                    .MEXIT
                                    .ENDC
                                    .LIST
                                                                                  L$DTP::
                                          .NLIST
                                    .ENDC
                                    .IF B,<;PTR. TO DISPATCH TABLE>
                                    M$GEN    L$DTP,:,SVCGBL,< >
                                    .ENDC
                                    .ENDC
                                    .ENDC
                                    .IF B <;PTR. TO DISPATCH TABLE>
                                    M$GNGBL L$DTP
                                    .ENDC
     002040                         M$GNINS <.WORD  L$DISPATCH>
```

```
                                .IF LT SVCINS
                                .WORD   L$DISPATCH
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     002040  002124                     .WORD   L$DISPATCH
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                .WORD   L$DISPATCH
                                          .NLIST
                                .ENDC
                                .IF B PRIO7
                                M$DATA  L$PRIO,.WORD,0,<<;DIAGNOSTIC RUN PRIORITY>>
                                .IFF
     002042                     M$DATA  L$PRIO,.WORD,PRIO7,<<;DIAGNOSTIC RUN PRIORITY>>
                                .MCALL  M$GNGBL,M$GNINS
                                .IF NB <;DIAGNOSTIC RUN PRIORITY>
     002042                     M$GNGBL L$PRIO,<<;DIAGNOSTIC RUN PRIORITY>>
                                .MCALL  M$GEN
                                .IF NB,L$PRIO
                                .IF NB,<;DIAGNOSTIC RUN PRIORITY>
     002042                     M$GEN   L$PRIO,:,SVCGBL,<;DIAGNOSTIC RUN PRIORITY>
                                .IF LE  SVCGBL
     002042                     L$PRIO::                ;DIAGNOSTIC RUN PRIORITY
                                .MEXIT
                                .ENDC
                                .LIST
                                                                           L$PRIO::
                                     .NLIST
                                .ENDC
                                .IF B,<;DIAGNOSTIC RUN PRIORITY>
                                M$GEN   L$PRIO,:,SVCGBL,< >
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF B <;DIAGNOSTIC RUN PRIORITY>
                                M$GNGBL L$PRIO
                                .ENDC
     002042                     M$GNINS <.WORD  PRIO7>
                                .IF LT SVCINS
                                .WORD   PRIO7
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     002042  000340                     .WORD   PRIO7
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                .WORD   PRIO7
                                          .NLIST
                                .ENDC
                                .ENDC
     002044                     M$HNAP
                                .MCALL  M$DATA,M$WORD,M$GNINS
```

```
        002044                          M$DATA  L$ENVI,.WORD,0,<<;FLAGS DESCRIBE HOW IT WAS SETUP>>
                                        .MCALL  M$GNGBL,M$GNINS
                                        .IF NB <;FLAGS DESCRIBE HOW IT WAS SETUP>
        002044                          M$GNGBL L$ENVI,<<;FLAGS DESCRIBE HOW IT WAS SETUP>>
                                        .MCALL  M$GEN
                                        .IF NB,L$ENVI
                                        .IF NB,<;FLAGS DESCRIBE HOW IT WAS SETUP>
        002044                          M$GEN   L$ENVI,:,SVCGBL,<;FLAGS DESCRIBE HOW IT WAS SETUP>
                                        .IF LE  SVCGBL
        002044                          L$ENVI::                ;FLAGS DESCRIBE HOW IT WAS SETUP
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                                        L$ENVI::
                                                .NLIST
                                        .ENDC
                                        .IF B,<;FLAGS DESCRIBE HOW IT WAS SETUP>
                                        M$GEN   L$ENVI,:,SVCGBL,< >
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF B <;FLAGS DESCRIBE HOW IT WAS SETUP>
                                        M$GNGBL L$ENVI
                                        .ENDC
        002044                          M$GNINS <.WORD  0>
                                        .IF LT SVCINS
                                        .WORD   0
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
        002044  000000                          .WORD   0
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        .WORD   0
                                                        .NLIST
                                        .ENDC
        002046                          M$DATA  L$EXP1,.WORD,0,<<;EXPANSION WORD>>
                                        .MCALL  M$GNGBL,M$GNINS
                                        .IF NB <;EXPANSION WORD>
        002046                          M$GNGBL L$EXP1,<<;EXPANSION WORD>>
                                        .MCALL  M$GEN
                                        .IF NB,L$EXP1
                                        .IF NB,<;EXPANSION WORD>
        002046                          M$GEN   L$EXP1,:,SVCGBL,<;EXPANSION WORD>
                                        .IF LE  SVCGBL
        002046                          L$EXP1::                ;EXPANSION WORD
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                                        L$EXP1::
                                                .NLIST
                                        .ENDC
                                        .IF B,<;EXPANSION WORD>
                                        M$GEN   L$EXP1,:,SVCGBL,< >
                                        .ENDC
```

```
                        .ENDC
                        .ENDC
                        .IF B <;EXPANSION WORD>
                        M$GNGBL L$EXP1
                        .ENDC
002046                  M$GNINS <.WORD  0>
                        .IF LT SVCINS
                        .WORD   0
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
002046  000000                  .WORD   0
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                        .WORD   0
                                        .NLIST
                        .ENDC
002050                  M$DATA  L$MREV,.BYTE,C$REVISION,<<;SVC REV AND EDIT #>>
                        .MCALL  M$GNGBL,M$GNINS
                        .IF NB <;SVC REV AND EDIT #>
002050                  M$GNGBL L$MREV,<<;SVC REV AND EDIT #>>
                        .MCALL  M$GEN
                        .IF NB,L$MREV
                        .IF NB,<;SVC REV AND EDIT #>
002050                  M$GEN   L$MREV,:,SVCGBL,<;SVC REV AND EDIT #>
                        .IF LE  SVCGBL
002050                  L$MREV::                ;SVC REV AND EDIT #
                        .MEXIT
                        .ENDC
                        .LIST
                                                                L$MREV::
                                .NLIST
                        .ENDC
                        .IF B,<;SVC REV AND EDIT #>
                        M$GEN   L$MREV,:,SVCGBL,< >
                        .ENDC
                        .ENDC
                        .ENDC
                        .IF B <;SVC REV AND EDIT #>
                        M$GNGBL L$MREV
                        .ENDC
002050                  M$GNINS <.BYTE  C$REVISION>
                        .IF LT SVCINS
                        .BYTE   C$REVISION
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
002050     003                  .BYTE   C$REVISION
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                        .BYTE   C$REVISION
                                        .NLIST
                        .ENDC
```

```
002051                  M$GNINS <.BYTE  C$EDIT>
                        .IF LT SVCINS
                        .BYTE   C$EDIT
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
002051     003                  .BYTE   C$EDIT
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                        .BYTE   C$EDIT
                                        .NLIST
                        .ENDC
002052                  M$DATA  L$EF,.WORD,0     ,<<;DIAG. EVENT FLAGS>>
                        .MCALL  M$GNGBL,M$GNINS
                        .IF NB <;DIAG. EVENT FLAGS>
002052                  M$GNGBL L$EF,<<;DIAG. EVENT FLAGS>>
                        .MCALL  M$GEN
                        .IF NB,L$EF
                        .IF NB,<;DIAG. EVENT FLAGS>
002052                  M$GEN   L$EF,:,SVCGBL,<;DIAG. EVENT FLAGS>
                        .IF LE  SVCGBL
002052                  L$EF::                   ;DIAG. EVENT FLAGS
                        .MEXIT
                        .ENDC
                        .LIST
                                                                   L$EF::
                                .NLIST
                        .ENDC
                        .IF B,<;DIAG. EVENT FLAGS>
                        M$GEN   L$EF,:,SVCGBL,< >
                        .ENDC
                        .ENDC
                        .ENDC
                        .IF B <;DIAG. EVENT FLAGS>
                        M$GNGBL L$EF
                        .ENDC
002052                  M$GNINS <.WORD  0>
                        .IF LT SVCINS
                        .WORD   0
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
002052  000000                  .WORD   0
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                        .WORD   0
                                        .NLIST
                        .ENDC
002054                  M$WORD  0
                        .MCALL  M$GNINS
                        .IRP    N,<0>
                        M$GNINS <.WORD  N>
                        .ENDM
```

```
        002054                          M$GNINS <.WORD  0>
                                        .IF LT SVCINS
                                        .WORD   0
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
        002054  000000                          .WORD   0
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                      .WORD   0
                                                        .NLIST
                                        .ENDC
        002056                          M$DATA  L$SPC,.WORD,0
                                        .MCALL  M$GNGBL,M$GNINS
                                        .IF NB
                                        M$GNGBL L$SPC,<>
                                        .ENDC
                                        .IF B
        002056                          M$GNGBL L$SPC
                                        .MCALL  M$GEN
                                        .IF NB,L$SPC
                                        .IF NB,
                                        M$GEN   L$SPC,:,SVCGBL,
                                        .ENDC
                                        .IF B,
        002056                          M$GEN   L$SPC,:,SVCGBL,< >
                                        .IF LE  SVCGBL
        002056                          L$SPC::
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                          L$SPC::
                                                .NLIST
                                        .ENDC
                                        .ENDC
                                        .ENDC
        002056                          M$GNINS <.WORD  0>
                                        .IF LT SVCINS
                                        .WORD   0
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
        002056  000000                          .WORD   0
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                      .WORD   0
                                                        .NLIST
                                        .ENDC
        002060                          M$DATA  L$DEVP,.WORD,L$DVTYP          ,<<; POINTER TO DEVICE TYPE LIST>>
                                        .MCALL  M$GNGBL,M$GNINS
                                        .IF NB <; POINTER TO DEVICE TYPE LIST>
        002060                          M$GNGBL L$DEVP,<<; POINTER TO DEVICE TYPE LIST>>
                                        .MCALL  M$GEN
```

```
                                        .IF NB,L$DEVP
                                        .IF NB,<; POINTER TO DEVICE TYPE LIST>
      002060                            M$GEN   L$DEVP,:,SVCGBL,<; POINTER TO DEVICE TYPE LIST>
                                        .IF LE  SVCGBL
      002060                            L$DEVP::                ; POINTER TO DEVICE TYPE LIST
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                                        L$DEVP::
                                                .NLIST
                                        .ENDC
                                        .IF B,<; POINTER TO DEVICE TYPE LIST>
                                        M$GEN   L$DEVP,:,SVCGBL,< >
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF B <; POINTER TO DEVICE TYPE LIST>
                                        M$GNGBL L$DEVP
                                        .ENDC
      002060                            M$GNINS <.WORD  L$DVTYP>
                                        .IF LT SVCINS
                                        .WORD   L$DVTYP
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      002060  002224                            .WORD   L$DVTYP
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                              .WORD   L$DVTYP
                                                        .NLIST
                                        .ENDC
                                        .IF EQ O$BGNRPT
                                        M$DATA  L$REPP,.WORD,0,<<;PTR. TO REPORT CODE>>
                                        .IFF
      002062                            M$DATA  L$REPP,.WORD,L$RPT,<<;PTR. TO REPORT CODE>>
                                        .MCALL  M$GNGBL,M$GNINS
                                        .IF NB <;PTR. TO REPORT CODE>
      002062                            M$GNGBL L$REPP,<<;PTR. TO REPORT CODE>>
                                        .MCALL  M$GEN
                                        .IF NB,L$REPP
                                        .IF NB,<;PTR. TO REPORT CODE>
      002062                            M$GEN   L$REPP,:,SVCGBL,<;PTR. TO REPORT CODE>
                                        .IF LE  SVCGBL
      002062                            L$REPP::                ;PTR. TO REPORT CODE
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                                        L$REPP::
                                                .NLIST
                                        .ENDC
                                        .IF B,<;PTR. TO REPORT CODE>
                                        M$GEN   L$REPP,:,SVCGBL,< >
                                        .ENDC
                                        .ENDC
                                        .ENDC
```

```
                                .IF B <;PTR. TO REPORT CODE>
                                M$GNGBL L$REPP
                                .ENDC
     002062                     M$GNINS <.WORD  L$RPT>
                                .IF LT SVCINS
                                .WORD   L$RPT
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     002062  013656                     .WORD   L$RPT
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                .WORD   L$RPT
                                                .NLIST
                                .ENDC
                                .ENDC
     002064                     M$DATA  L$EXP4,.WORD,0
                                .MCALL  M$GNGBL,M$GNINS
                                .IF NB
                                M$GNGBL L$EXP4,<>
                                .ENDC
                                .IF B
     002064                     M$GNGBL L$EXP4
                                .MCALL  M$GEN
                                .IF NB,L$EXP4
                                .IF NB,
                                M$GEN   L$EXP4,:,SVCGBL,
                                .ENDC
                                .IF B,
     002064                     M$GEN   L$EXP4,:,SVCGBL,< >
                                .IF LE  SVCGBL
     002064                     L$EXP4::
                                .MEXIT
                                .ENDC
                                .LIST
                                                                          L$EXP4::
                                        .NLIST
                                .ENDC
                                .ENDC
                                .ENDC
     002064                     M$GNINS <.WORD  0>
                                .IF LT SVCINS
                                .WORD   0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     002064  000000                     .WORD   0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                .WORD   0
                                                .NLIST
                                .ENDC
     002066                     M$DATA  L$EXP5,.WORD,0
```

```
                              .MCALL  M$GNGBL,M$GNINS
                              .IF NB
                              M$GNGBL L$EXP5,<>
                              .ENDC
                              .IF B
      002066                  M$GNGBL L$EXP5
                              .MCALL  M$GEN
                              .IF NB,L$EXP5
                              .IF NB,
                              M$GEN   L$EXP5,:,SVCGBL,
                              .ENDC
                              .IF B,
      002066                  M$GEN   L$EXP5,:,SVCGBL,< >
                              .IF LE  SVCGBL
      002066                  L$EXP5::
                              .MEXIT
                              .ENDC
                              .LIST
                                                                         L$EXP5::
                                      .NLIST
                              .ENDC
                              .ENDC
                              .ENDC
      002066                  M$GNINS <.WORD  0>
                              .IF LT SVCINS
                              .WORD   0
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
      002066  000000                  .WORD   0
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                              .WORD   0
                                              .NLIST
                              .ENDC
                              .IF EQ O$AU
      002070                  M$DATA L$AUT,.WORD,0,<<;PTR. TO ADD UNIT CODE>>
                              .MCALL  M$GNGBL,M$GNINS
                              .IF NB <;PTR. TO ADD UNIT CODE>
      002070                  M$GNGBL L$AUT,<<;PTR. TO ADD UNIT CODE>>
                              .MCALL  M$GEN
                              .IF NB,L$AUT
                              .IF NB,<;PTR. TO ADD UNIT CODE>
      002070                  M$GEN   L$AUT,:,SVCGBL,<;PTR. TO ADD UNIT CODE>
                              .IF LE  SVCGBL
      002070                  L$AUT::                 ;PTR. TO ADD UNIT CODE
                              .MEXIT
                              .ENDC
                              .LIST
                                                                         L$AUT::
                                      .NLIST
                              .ENDC
                              .IF B,<;PTR. TO ADD UNIT CODE>
                              M$GEN   L$AUT,:,SVCGBL,< >
                              .ENDC
```

```
                        .ENDC
                        .ENDC
                        .IF B <;PTR. TO ADD UNIT CODE>
                        M$GNGBL L$AUT
                        .ENDC
002070                  M$GNINS <.WORD  0>
                        .IF LT SVCINS
                        .WORD   0
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
002070  000000                  .WORD   0
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                        .WORD   0
                                        .NLIST
                        .ENDC
                        .IFF
                        M$DATA L$AUT,.WORD,L$AU,<<;PTR. TO ADD UNIT CODE>>
                        .ENDC
                        .IF EQ O$DU
002072                  M$DATA L$DUT,.WORD,0,<<;PTR. TO DROP UNIT CODE>>
                        .MCALL  M$GNGBL,M$GNINS
                        .IF NB <;PTR. TO DROP UNIT CODE>
002072                  M$GNGBL L$DUT,<<;PTR. TO DROP UNIT CODE>>
                        .MCALL  M$GEN
                        .IF NB,L$DUT
                        .IF NB,<;PTR. TO DROP UNIT CODE>
002072                  M$GEN   L$DUT,:,SVCGBL,<;PTR. TO DROP UNIT CODE>
                        .IF LE  SVCGBL
002072                  L$DUT::                 ;PTR. TO DROP UNIT CODE
                        .MEXIT
                        .ENDC
                        .LIST
                                                                L$DUT::
                                .NLIST
                        .ENDC
                        .IF B,<;PTR. TO DROP UNIT CODE>
                        M$GEN   L$DUT,:,SVCGBL,< >
                        .ENDC
                        .ENDC
                        .ENDC
                        .IF B <;PTR. TO DROP UNIT CODE>
                        M$GNGBL L$DUT
                        .ENDC
002072                  M$GNINS <.WORD  0>
                        .IF LT SVCINS
                        .WORD   0
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
002072  000000                  .WORD   0
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
```

```
                        .LIST
                                                                         .WORD   0
                                .NLIST
                        .ENDC
                        .IFF
                        M$DATA L$DUT,.WORD,L$DU,<<;PTR. TO DROP UNIT CODE>>
                        .ENDC
002074                  M$DATA  L$LUN,.WORD,0                 ,<<;LUN FOR EXERCISERS TO FILL>>
                        .MCALL  M$GNGBL,M$GNINS
                        .IF NB <;LUN FOR EXERCISERS TO FILL>
002074                  M$GNGBL L$LUN,<<;LUN FOR EXERCISERS TO FILL>>
                        .MCALL  M$GEN
                        .IF NB,L$LUN
                        .IF NB,<;LUN FOR EXERCISERS TO FILL>
002074                  M$GEN   L$LUN,:,SVCGBL,<;LUN FOR EXERCISERS TO FILL>
                        .IF LE  SVCGBL
002074                  L$LUN::                    ;LUN FOR EXERCISERS TO FILL
                        .MEXIT
                        .ENDC
                        .LIST
                                                                     L$LUN::
                            .NLIST
                        .ENDC
                        .IF B,<;LUN FOR EXERCISERS TO FILL>
                        M$GEN   L$LUN,:,SVCGBL,< >
                        .ENDC
                        .ENDC
                        .ENDC
                        .IF B <;LUN FOR EXERCISERS TO FILL>
                        M$GNGBL L$LUN
                        .ENDC
002074                  M$GNINS <.WORD  0>
                        .IF LT SVCINS
                        .WORD   0
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
002074  000000              .WORD   0
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                         .WORD   0
                                .NLIST
                        .ENDC
002076                  M$DATA  L$DESP,.WORD,L$DESC           ,<<;POINTER TO DIAG. DESCRIPTION>>
                        .MCALL  M$GNGBL,M$GNINS
                        .IF NB <;POINTER TO DIAG. DESCRIPTION>
002076                  M$GNGBL L$DESP,<<;POINTER TO DIAG. DESCRIPTION>>
                        .MCALL  M$GEN
                        .IF NB,L$DESP
                        .IF NB,<;POINTER TO DIAG. DESCRIPTION>
002076                  M$GEN   L$DESP,:,SVCGBL,<;POINTER TO DIAG. DESCRIPTION>
                        .IF LE  SVCGBL
002076                  L$DESP::                   ;POINTER TO DIAG. DESCRIPTION
                        .MEXIT
                        .ENDC
```

```
                        .LIST
                                                                                L$DESP::
                                .NLIST
                        .ENDC
                        .IF B,<;POINTER TO DIAG. DESCRIPTION>
                        M$GEN   L$DESP,:,SVCGBL,< >
                        .ENDC
                        .ENDC
                        .ENDC
                        .IF B <;POINTER TO DIAG. DESCRIPTION>
                        M$GNGBL L$DESP
                        .ENDC
002076                  M$GNINS <.WORD  L$DESC>
                        .IF LT SVCINS
                        .WORD   L$DESC
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
002076  002260                  .WORD   L$DESC
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                                .WORD   L$DESC
                                        .NLIST
                        .ENDC
002100                  M$DATA  L$LOAD,EMT,E$LOAD               ,<<;GENERATE SPECIAL AUTOLOAD EMT>>
                        .MCALL  M$GNGBL,M$GNINS
                        .IF NB <;GENERATE SPECIAL AUTOLOAD EMT>
002100                  M$GNGBL L$LOAD,<<;GENERATE SPECIAL AUTOLOAD EMT>>
                        .MCALL  M$GEN
                        .IF NB,L$LOAD
                        .IF NB,<;GENERATE SPECIAL AUTOLOAD EMT>
002100                  M$GEN   L$LOAD,:,SVCGBL,<;GENERATE SPECIAL AUTOLOAD EMT>
                        .IF LE  SVCGBL
002100                  L$LOAD::                ;GENERATE SPECIAL AUTOLOAD EMT
                        .MEXIT
                        .ENDC
                        .LIST
                                                                                L$LOAD::
                                .NLIST
                        .ENDC
                        .IF B,<;GENERATE SPECIAL AUTOLOAD EMT>
                        M$GEN   L$LOAD,:,SVCGBL,< >
                        .ENDC
                        .ENDC
                        .ENDC
                        .IF B <;GENERATE SPECIAL AUTOLOAD EMT>
                        M$GNGBL L$LOAD
                        .ENDC
002100                  M$GNINS <EMT    E$LOAD>
                        .IF LT SVCINS
                        EMT     E$LOAD
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
002100  104035                  EMT     E$LOAD
```

```
                            .MEXIT
                            .ENDC
                            .IF GT SVCINS
                            .LIST
                                                                                    EMT      E$LOAD
                                           .NLIST
                            .ENDC
                            .IF EQ O$ERRTBL
                            M$DATA  L$ETP,.WORD,0,<<;POINTER TO ERRTBL>>
                            .IFF
  002102                    M$DATA  L$ETP,.WORD,L$ERRTBL,<<;POINTER TO ERRTBL>>
                            .MCALL  M$GNGBL,M$GNINS
                            .IF NB <;POINTER TO ERRTBL>
  002102                    M$GNGBL L$ETP,<<;POINTER TO ERRTBL>>
                            .MCALL  M$GEN
                            .IF NB,L$ETP
                            .IF NB,<;POINTER TO ERRTBL>
  002102                    M$GEN   L$ETP,:,SVCGBL,<;POINTER TO ERRTBL>
                            .IF LE  SVCGBL
  002102                    L$ETP::                  ;POINTER TO ERRTBL
                            .MEXIT
                            .ENDC
                            .LIST
                                                                              L$ETP::
                                 .NLIST
                            .ENDC
                            .IF B,<;POINTER TO ERRTBL>
                            M$GEN   L$ETP,:,SVCGBL,< >
                            .ENDC
                            .ENDC
                            .ENDC
                            .IF B <;POINTER TO ERRTBL>
                            M$GNGBL L$ETP
                            .ENDC
  002102                    M$GNINS <.WORD  L$ERRTBL>
                            .IF LT SVCINS
                            .WORD   L$ERRTBL
                            .MEXIT
                            .ENDC
                            .IF EQ SVCINS
  002102  002160                 .WORD   L$ERRTBL
                            .MEXIT
                            .ENDC
                            .IF GT SVCINS
                            .LIST
                                                                                    .WORD    L$ERRTBL
                                           .NLIST
                            .ENDC
                            .ENDC
  002104                    M$DATA  L$ICP,.WORD,L$INIT,<<;PTR. TO INIT CODE>>
                            .MCALL  M$GNGBL,M$GNINS
                            .IF NB <;PTR. TO INIT CODE>
  002104                    M$GNGBL L$ICP,<<;PTR. TO INIT CODE>>
                            .MCALL  M$GEN
                            .IF NB,L$ICP
                            .IF NB,<;PTR. TO INIT CODE>
  002104                    M$GEN   L$ICP,:,SVCGBL,<;PTR. TO INIT CODE>
```

```
                        .IF LE  SVCGBL
002104                  L$ICP::                 ;PTR. TO INIT CODE
                        .MEXIT
                        .ENDC
                        .LIST
                                                                        L$ICP::
                                .NLIST
                        .ENDC
                        .IF B,<;PTR. TO INIT CODE>
                        M$GEN   L$ICP,:,SVCGBL,< >
                        .ENDC
                        .ENDC
                        .ENDC
                        .IF B <;PTR. TO INIT CODE>
                        M$GNGBL L$ICP
                        .ENDC
002104                  M$GNINS <.WORD  L$INIT>
                        .IF LT SVCINS
                        .WORD   L$INIT
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
002104  013672                  .WORD   L$INIT
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                            .WORD   L$INIT
                                    .NLIST
                        .ENDC
002106                  M$DATA  L$CCP,.WORD,L$CLEAN,<<;PTR. TO CLEAN-UP CODE>>
                        .MCALL  M$GNGBL,M$GNINS
                        .IF NB <;PTR. TO CLEAN-UP CODE>
002106                  M$GNGBL L$CCP,<<;PTR. TO CLEAN-UP CODE>>
                        .MCALL  M$GEN
                        .IF NB,L$CCP
                        .IF NB,<;PTR. TO CLEAN-UP CODE>
002106                  M$GEN   L$CCP,:,SVCGBL,<;PTR. TO CLEAN-UP CODE>
                        .IF LE  SVCGBL
002106                  L$CCP::                 ;PTR. TO CLEAN-UP CODE
                        .MEXIT
                        .ENDC
                        .LIST
                                                                        L$CCP::
                                .NLIST
                        .ENDC
                        .IF B,<;PTR. TO CLEAN-UP CODE>
                        M$GEN   L$CCP,:,SVCGBL,< >
                        .ENDC
                        .ENDC
                        .ENDC
                        .IF B <;PTR. TO CLEAN-UP CODE>
                        M$GNGBL L$CCP
                        .ENDC
002106                  M$GNINS <.WORD  L$CLEAN>
                        .IF LT SVCINS
                        .WORD   L$CLEAN
```

```
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     002106  014526                     .WORD   L$CLEAN
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                  .WORD   L$CLEAN
                                               .NLIST
                                .ENDC
     002110                     M$DATA  L$ACP,.WORD,L$AUTO,<<;PTR. TO AUTO CODE>>
                                .MCALL  M$GNGBL,M$GNINS
                                .IF NB <;PTR. TO AUTO CODE>
     002110                     M$GNGBL L$ACP,<<;PTR. TO AUTO CODE>>
                                .MCALL  M$GEN
                                .IF NB,L$ACP
                                .IF NB,<;PTR. TO AUTO CODE>
     002110                     M$GEN   L$ACP,:,SVCGBL,<;PTR. TO AUTO CODE>
                                .IF LE  SVCGBL
     002110                     L$ACP::                 ;PTR. TO AUTO CODE
                                .MEXIT
                                .ENDC
                                .LIST
                                                                             L$ACP::
                                        .NLIST
                                .ENDC
                                .IF B,<;PTR. TO AUTO CODE>
                                M$GEN   L$ACP,:,SVCGBL,< >
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF B <;PTR. TO AUTO CODE>
                                M$GNGBL L$ACP
                                .ENDC
     002110                     M$GNINS <.WORD  L$AUTO>
                                .IF LT SVCINS
                                .WORD   L$AUTO
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     002110  014524                     .WORD   L$AUTO
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                  .WORD   L$AUTO
                                               .NLIST
                                .ENDC
     002112                     M$DATA  L$PRT,.WORD,L$PROT,<<;PTR. TO PROTECT TABLE>>
                                .MCALL  M$GNGBL,M$GNINS
                                .IF NB <;PTR. TO PROTECT TABLE>
     002112                     M$GNGBL L$PRT,<<;PTR. TO PROTECT TABLE>>
                                .MCALL  M$GEN
                                .IF NB,L$PRT
                                .IF NB,<;PTR. TO PROTECT TABLE>
     002112                     M$GEN   L$PRT,:,SVCGBL,<;PTR. TO PROTECT TABLE>
```

```
                                        .IF LE  SVCGBL
       002112                           L$PRT::                 ;PTR. TO PROTECT TABLE
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                                     L$PRT::
                                                .NLIST
                                        .ENDC
                                        .IF B,<;PTR. TO PROTECT TABLE>
                                        M$GEN   L$PRT,:,SVCGBL,< >
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF B <;PTR. TO PROTECT TABLE>
                                        M$GNGBL L$PRT
                                        .ENDC
       002112                           M$GNINS <.WORD  L$PROT>
                                        .IF LT SVCINS
                                        .WORD   L$PROT
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
       002112  013664                           .WORD   L$PROT
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                            .WORD   L$PROT
                                                        .NLIST
                                        .ENDC
       002114                           M$DATA  L$TEST,.WORD,0,<<;TEST NUMBER>>
                                        .MCALL  M$GNGBL,M$GNINS
                                        .IF NB <;TEST NUMBER>
       002114                       -   M$GNGBL L$TEST,<<;TEST NUMBER>>
                                        .MCALL  M$GEN
                                        .IF NB,L$TEST
                                        .IF NB,<;TEST NUMBER>
       002114                           M$GEN   L$TEST,:,SVCGBL,<;TEST NUMBER>
                                        .IF LE  SVCGBL
       002114                           L$TEST::                ;TEST NUMBER
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                                     L$TEST::
                                                .NLIST
                                        .ENDC
                                        .IF B,<;TEST NUMBER>
                                        M$GEN   L$TEST,:,SVCGBL,< >
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF B <;TEST NUMBER>
                                        M$GNGBL L$TEST
                                        .ENDC
       002114                           M$GNINS <.WORD  0>
                                        .IF LT SVCINS
                                        .WORD   0
```

```
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
002114  000000                  .WORD   0
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                .WORD   0
                                        .NLIST
                        .ENDC
002116                  M$DATA  L$DLY,.WORD,0,<<;DELAY COUNT>>
                        .MCALL  M$GNGBL,M$GNINS
                        .IF NB <;DELAY COUNT>
002116                  M$GNGBL L$DLY,<<;DELAY COUNT>>
                        .MCALL  M$GEN
                        .IF NB,L$DLY
                        .IF NB,<;DELAY COUNT>
002116                  M$GEN   L$DLY,:,SVCGBL,<;DELAY COUNT>
                        .IF LE  SVCGBL
002116                  L$DLY::                 ;DELAY COUNT
                        .MEXIT
                        .ENDC
                        .LIST
                                                        L$DLY::
                                .NLIST
                        .ENDC
                        .IF B,<;DELAY COUNT>
                        M$GEN   L$DLY,:,SVCGBL,< >
                        .ENDC
                        .ENDC
                        .ENDC
                        .IF B <;DELAY COUNT>
                        M$GNGBL L$DLY
                        .ENDC
002116                  M$GNINS <.WORD  0>
                        .IF LT SVCINS
                        .WORD   0
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
002116  000000                  .WORD   0
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                .WORD   0
                                        .NLIST
                        .ENDC
002120                  M$DATA  L$HIME,.WORD,0,<<;PTR. TO HIGH MEM>>
                        .MCALL  M$GNGBL,M$GNINS
                        .IF NB <;PTR. TO HIGH MEM>
002120                  M$GNGBL L$HIME,<<;PTR. TO HIGH MEM>>
                        .MCALL  M$GEN
                        .IF NB,L$HIME
                        .IF NB,<;PTR. TO HIGH MEM>
002120                  M$GEN   L$HIME,:,SVCGBL,<;PTR. TO HIGH MEM>
```

```
                                        .IF LE  SVCGBL
     002120                             L$HIME::                    ;PTR. TO HIGH MEM
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                                                L$HIME::
                                                .NLIST
                                        .ENDC
                                        .IF B,<;PTR. TO HIGH MEM>
                                        M$GEN   L$HIME,:,SVCGBL,< >
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF B <;PTR. TO HIGH MEM>
                                        M$GNGBL L$HIME
                                        .ENDC
     002120                             M$GNINS <.WORD  0>
                                        .IF LT SVCINS
                                        .WORD   0
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
     002120  000000                             .WORD   0
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                                       .WORD   0
                                                       .NLIST
                                        .ENDC
                                        .IF EQ O$POINTER
                                        .ERROR  ;'POINTER'  UST PRECEDE 'HEADER''
                                        .ENDC
   50
```

```
                                          .SBTTL  DISPATCH TABLE

                                    ;++
                                    ; THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.
                                    ; IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.
                                    ;--

  002122                                  DISPATCH 1
                                    .MCALL  M$WORD,M$GNGBL
          000012                    .RADIX  10
  002122                            M$WORD \1
                                    .MCALL  M$GNINS
                                    .IRP    N,<1>
                                    M$GNINS <.WORD  N>
                                    .ENDM
  002122                            M$GNINS <.WORD  1>
                                    .IF LT SVCINS
                                    .WORD   1
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
  002122  000001                          .WORD    1
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                              .WORD   1
                                                 .NLIST
                                    .ENDC
  002124                            M$GNGBL L$DISPATCH
                                    .MCALL  M$GEN
                                    .IF NB,L$DISPATCH
                                    .IF NB,
                                    M$GEN   L$DISPATCH,:,SVCGBL,
                                    .ENDC
                                    .IF B,
  002124                            M$GEN   L$DISPATCH,:,SVCGBL,< >
                                    .IF LE  SVCGBL
  002124                            L$DISPATCH::
                                    .MEXIT
                                    .ENDC
                                    .LIST
                                                                        L$DISPATCH::
                                          .NLIST
                                    .ENDC
                                    .ENDC
          000001                    T$TEMP=1
          000001                    .REPT   1
                                    .IRP    N,<\T$TEMP>
                                    M$WORD  T'N
                                    .ENDM
                                    T$TEMP=T$TEMP + 1
                                    .ENDR
                                    .IRP    N,<\T$TEMP>
                                    M$WORD  T'N
                                    .ENDM
  002124                            M$WORD  T1
```

```
                                .MCALL  M$GNINS
                                .IRP    N,<T1>
                                M$GNINS <.WORD  N>
                                .ENDM
     002124                     M$GNINS <.WORD  T1>
                                .IF LT SVCINS
                                .WORD   T1
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     002124  014534                     .WORD   T1
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   T1
                                          .NLIST
                                .ENDC
             000002             T$TEMP=T$TEMP + 1
             000010             .RADIX  8
    9
```

```
                                        .SBTTL  DEFAULT HARDWARE P-TABLE

                                ;++
                                ; THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES OF
                                ; THE TEST-DEVICE PARAMETERS.  THE STRUCTURE OF THIS TABLE
                                ; IS IDENTICAL TO THE STRUCTURE OF THE HARDWARE P-TABLES,
                                ; AND IS USED AS A ''TEMPLATE'' FOR BUILDING THE P-TABLES.
                                ;--

   002126                               BGNHW   DFPTBL
                                .MCALL  M$PUSH,M$INCR,M$GNINS,M$GNGBL
   002126                       M$PUSH  T$NS,T$NESTLEV,F$HW
                                .MCALL  M$INCR,M$SETS
   002126                       M$INCR  T$NESTLEV
            000001              T$NESTLEV=T$NESTLEV+1
   002126                       M$SETS  T$NS,\T$NESTLEV,F$HW
            000013              T$NS1=F$HW
            010000              T$$HW=T$TAGNUM
   002126                       M$INCR  T$TAGNUM
            010001              T$TAGNUM=T$TAGNUM+1
                                .IRP    N,<\T$$HW>
                                M$GNINS <.WORD  L'N-L$HW/2>
                                .ENDM
   002126                       M$GNINS <.WORD  L10000-L$HW/2>
                                .IF LT SVCINS
                                .WORD   L10000-L$HW/2
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
   002126   000007                      .WORD   L10000-L$HW/2
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                        .WORD   L10000-L$HW/2
                                                .NLIST
                                .ENDC
   002130                       M$GNGBL L$HW
                                .MCALL  M$GEN
                                .IF NB,L$HW
                                .IF NB,
                                M$GEN   L$HW,:,SVCGBL,
                                .ENDC
                                .IF B,
   002130                       M$GEN   L$HW,:,SVCGBL,< >
                                .IF LE  SVCGBL
   002130                       L$HW::
                                .MEXIT
                                .ENDC
                                .LIST
                                                                                L$HW::
                                        .NLIST
                                .ENDC
                                .ENDC
   002130                       M$GNGBL DFPTBL
                                .MCALL  M$GEN
                                .IF NB,DFPTBL
```

```
                                        .IF NB,
                                        M$GEN   DFPTBL,:,SVCGBL,
                                        .ENDC
                                        .IF B,
     002130                             M$GEN   DFPTBL,:,SVCGBL,< >
                                        .IF LE  SVCGBL
     002130                             DFPTBL::
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                                        DFPTBL::
                                                .NLIST
                                        .ENDC
                                        .ENDC
 11
 12  002130   172150                            .WORD   172150          ; UDAIP ADDRESS
 13  002132   000000                            .WORD   0               ; UNIT NUMBER
 14  002134   000003                            .WORD   USERES+STPBAD   ; STARTUP FLAGS
 15  002136   000000  000000  000000            .WORD   0,0,0,0         ; SERIAL NUMBER
 16
 17  002146                                     ENDHW
                                        .MCALL  M$POP,M$GNTAG,M$ENDERR
     002146                             M$POP   T$NS,T$NESTLEV,T$TEMP
                                        .MCALL  M$GETS,M$DECR
                                        .IF LT  T$NESTLEV
                                        .ERROR  T$NESTLEV       ; MACRO T$NS UNDERFLOW
                                        .MEXIT
                                        .ENDC
     002146                             M$GETS  T$NS,\T$NESTLEV,T$TEMP
              000013                    T$TEMP=T$NS1
     002146                             M$DECR  T$NESTLEV
              000000                    T$NESTLEV=T$NESTLEV-1
                                        .IF EQ  F$HW-T$TEMP
     002146                             M$GNTAG L,T$$HW
                                        .MCALL  M$GEN
     002146                             M$GEN   L,\T$$HW,SVCTAG
                                        .IF LE  SVCTAG
     002146                             L10000:
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                                        L10000:
                                                .NLIST
              010000                    S$LSYM=T$LSYM
                                        .IFF
                                        M$ENDERR        ENDHW,T$TEMP
                                        .ENDC
 18
 19  002146                                     BGNSW   SFTBL
                                        .MCALL  M$PUSH,M$INCR,M$GNINS,M$GNGBL
     002146                             M$PUSH  T$NS,T$NESTLEV,F$SW
                                        .MCALL  M$INCR,M$SETS
     002146                             M$INCR  T$NESTLEV
              000001                    T$NESTLEV=T$NESTLEV+1
     002146                             M$SETS  T$NS,\T$NESTLEV,F$SW
              000014                    T$NS1=F$SW
              010001                    T$$SW=T$TAGNUM
```

```
      002146                                 M$INCR  T$TAGNUM
              010002                         T$TAGNUM=T$TAGNUM+1
                                             .IRP    N,<\T$$SW>
                                             M$GNINS <.WORD  L'N-L$SW/2>
                                             .ENDM
      002146                                 M$GNINS <.WORD  L10001-L$SW/2>
                                             .IF LT SVCINS
                                             .WORD   L10001-L$SW/2
                                             .MEXIT
                                             .ENDC
                                             .IF EQ SVCINS
      002146  000004                                 .WORD   L10001-L$SW/2
                                             .MEXIT
                                             .ENDC
                                             .IF GT SVCINS
                                             .LIST
                                                                                             .WORD   L10001-L$SW/2
                                                             .NLIST
                                             .ENDC
      002150                                 M$GNGBL L$SW
                                             .MCALL  M$GEN
                                             .IF NB,L$SW
                                             .IF NB,
                                             M$GEN   L$SW,:,SVCGBL,
                                             .ENDC
                                             .IF B,
      002150                                 M$GEN   L$SW,:,SVCGBL,< >
                                             .IF LE  SVCGBL
      002150                                 L$SW::
                                             .MEXIT
                                             .ENDC
                                             .LIST
                                                                                      L$SW::
                                                     .NLIST
                                             .ENDC
                                             .ENDC
      002150                                 M$GNGBL SFTBL
                                             .MCALL  M$GEN
                                             .IF NB,SFTBL
                                             .IF NB,
                                             M$GEN   SFTBL,:,SVCGBL,
                                             .ENDC
                                             .IF B,
      002150                                 M$GEN   SFTBL,:,SVCGBL,< >
                                             .IF LE  SVCGBL
      002150                                 SFTBL::
                                             .MEXIT
                                             .ENDC
                                             .LIST
                                                                                      SFTBL::
                                                     .NLIST
                                             .ENDC
                                             .ENDC
   20 002150  000001  000002  000003  DATE:  .WORD   1,2,3,4         ; VAX FORMAT DATE
   21 002160                                         ENDSW
                                             .MCALL  M$POP,M$GNTAG,M$ENDERR
      002160                                 M$POP   T$NS,T$NESTLEV,T$TEMP
```

```
                                        .MCALL  M$GETS,M$DECR
                                        .IF LT  T$NESTLEV
                                        .ERROR  T$NESTLEV         ; MACRO T$NS UNDERFLOW
                                        .MEXIT
                                        .ENDC
      002160                            M$GETS  T$NS,\T$NESTLEV,T$TEMP
             000014                     T$TEMP=T$NS1
      002160                            M$DECR  T$NESTLEV
             000000                     T$NESTLEV=T$NESTLEV-1
                                        .IF EQ  F$SW-T$TEMP
      002160                            M$GNTAG L,T$$SW
                                        .MCALL  M$GEN
      002160                            M$GEN   L,\T$$SW,SVCTAG
                                        .IF LE  SVCTAG
      002160                            L10001:
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                                      L10001:
                                                .NLIST
             010000                     S$LSYM=T$LSYM
                                        .IFF
                                        M$ENDERR        ENDSW,T$TEMP
                                        .ENDC
   22
   23 002160                                    ENDMOD
                                        .MCALL  M$POP,M$ENDERR
                                        .IF EQ  F$BGN-I$MOD
             000041                     I$MOD=F$END
                                        .IFF
                                        .ERROR  ; MISSING 'BGNMOD''
                                        .MEXIT
                                        .ENDC
      002160                            M$POP   T$NS,T$NESTLEV,T$TEMP
                                        .MCALL  M$GETS,M$DECR
                                        .IF LT  T$NESTLEV
                                        .ERROR  T$NESTLEV         ; MACRO T$NS UNDERFLOW
                                        .MEXIT
                                        .ENDC
      002160                            M$GETS  T$NS,\T$NESTLEV,T$TEMP
             000000                     T$TEMP-T$NS0
      002160                            M$DECR  T$NESTLEV
             177777                     T$NESTLEV=T$NESTLEV-1
                                        .IF NE F$MOD-T$TEMP
                                        M$ENDERR        ENDMOD,T$TEMP
                                        .ENDC
```

```
                        ;       .TITLE  GLOBAL AREAS
                                .SBTTL  GLOBAL EQUATES SECTION

                        ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                        ;     NOTE:  THE ASSEMBLER DIRECTIVE '.GLOBL' SHOULD NOT BE USED ANYWHERE IN
                        ;            YOUR DIAGNOSTIC PROGRAM.  INSTEAD, USE THE DOUBLE-EQUATE (==) OR
                        ;            DOUBLE-COLON (::) TO DEFINE GLOBAL VALUES.  HELP-MESSAGES GIVEN
                        ;            BELOW EXPLAIN WHERE TO USE THE DOUBLE-EQUATE AND DOUBLE-COLON
                        ;            DIRECTIVES.
                        ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

002160                          BGNMOD
                        .MCALL  M$GNGBL,M$PUSH
                        .IF NE  F$END-I$MOD
                        .ERROR  ;'BGNMOD'' IN MOD
                        .MEXIT
                        .IFF
        000040          I$MOD=F$BGN
                        .ENDC
                        .IF NB
                        M$GNGBL
                        .ENDC
002160                  M$PUSH  T$NS,T$NESTLEV,F$MOD
                        .MCALL  M$INCR,M$SETS
002160                  M$INCR  T$NESTLEV
        000000          T$NESTLEV=T$NESTLEV+1
002160                  M$SETS  T$NS,\T$NESTLEV,F$MOD
        000000          T$NS0=F$MOD

                        ;++
                        ; THE GLOBAL EQUATES SECTION CONTAINS PROGRAM EQUATES THAT
                        ; ARE USED IN MORE THAN ONE TEST.
                        ;--

                        ;
                        ;       EQUATES THAT ARE ADDED TO THIS SECTION MUST BE DEFINED WITH A
                        ;       DOUBLE-EQUATE (==); THIS WILL MAKE THEM GLOBAL EQUATES.
                        ;       FOR EXAMPLE, AN ERROR STATUS BIT COULD BE DEFINED AS ERR==BIT15.
                        ;

002160                          EQUALS
                        ;
                        ; BIT DIFINITIONS
                        ;
        100000          BIT15== 100000
        040000          BIT14== 40000
        020000          BIT13== 20000
        010000          BIT12== 10000
        004000          BIT11== 4000
        002000          BIT10== 2000
        001000          BIT09== 1000
        000400          BIT08== 400
        000200          BIT07== 200
        000100          BIT06== 100
        000040          BIT05== 40
        000020          BIT04== 20
        000010          BIT03== 10
```

```
        000004                  BIT02== 4
        000002                  BIT01== 2
        000001                  BIT00== 1
                                ;
        001000                  BIT9==  BIT09
        000400                  BIT8==  BIT08
        000200                  BIT7==  BIT07
        000100                  BIT6==  BIT06
        000040                  BIT5==  BIT05
        000020                  BIT4==  BIT04
        000010                  BIT3==  BIT03
        000004                  BIT2==  BIT02
        000002                  BIT1==  BIT01
        000001                  BIT0==  BIT00
                                ;
                                ; EVENT FLAG DEFINITIONS
                                ;   EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
                                ;
        000040                  EF.START==      32.                     ; START COMMAND WAS ISSUED
        000037                  EF.RESTART==    31.                     ; RESTART COMMAND WAS ISSUED
        000036                  EF.CONTINUE==   30.                     ; CONTINUE COMMAND WAS ISSUED
        000035                  EF.NEW==        29.                     ; A NEW PASS HAS BEEN STARTED
        000034                  EF.PWR==        28.                     ; A POWER-FAIL/POWER-UP OCCURRED
                                ;
                                ;
                                ; PRIORITY LEVEL DEFINITIONS
                                ;
        000340                  PRI07== 340
        000300                  PRI06== 300
        000240                  PRI05== 240
        000200                  PRI04== 200
        000140                  PRI03== 140
        000100                  PRI02== 100
        000040                  PRI01== 40
        000000                  PRI00== 0
                                ;
                                ;OPERATOR FLAG BITS
                                ;
        000004                  EVL==        4
        000010                  LOT==       10
        000020                  ADR==       20
        000040                  IDU==       40
        000100                  ISR==      100
        000200                  UAM==      200
        000400                  BOE==      400
        001000                  PNT==     1000
        002000                  PRI==     2000
        004000                  IXE==     4000
        010000                  IBE==    10000
        020000                  IER==    20000
        040000                  LOE==    40000
        100000                  HOE==   100000
```

```
                                    ;UDA BIT DEFINITIONS

                                    ;UDASA REGISTER UNIVERSAL READ BITS

          004000                    SA.S1=  004000                   ;STEP 1 STATUS BIT
          010000                    SA.S2=  010000                   ;STEP 2 STATUS BIT
          020000                    SA.S3=  020000                   ;STEP 3 STATUS BIT
          040000                    SA.S4=  040000                   ;STEP 4 STATUS BIT
          100000                    SA.ERR= 100000                   ;ERROR INDICATOR

                                    ;UDASA REGISTER ERROR STATUS BITS

          003777                    SA.ERC= 003777                   ;ERROR CODE

                                    ;UDASA REGISTER READ MASK/READ RESPONSE/WRITE VALUES

          000004                    RNGLEN  =       4                ; NUMBER OF WORDS IN COMMAND..
                                                                     ; ...AND RESPONSE RING COMBINED
          003777                    IN.MS1  =       003777           ; MASK FOR RESPONSE 1
          004000                    IN.RS1  =       004000           ; EXPECTED RESPONSE 1 (AFTER MASKING)
          100000                    IN.WT1  =       100000           ; WRITE 1

          003500                    IN.MS2  =       003500
          010200                    IN.RS2  =       010200
                                    ;                                ; WRITE 2 IS THE RING ADDRESS

          002000                    IN.MS3  =       002000
          020000                    IN.RS3  =       020000
          000000                    IN.WT3  =       000000           ; HIGH ORDER RING ADDR - UNUSED

          003777                    IN.MS4  =       003777
          040000                    IN.RS4  =       040000
          000001                    SA.GO=  000001                   ;GO BIT TO START UDA FIRMWARE
```

```
                                ;COMMAND/MESSAGE DESCRIPTOR BIT DEFINITIONS

        100000                  RG.OWN= 100000                  ;SET WHEN UDA OWNS RING
        040000                  RG.FLG= 040000                  ;FLAG BIT

                                ;OFFSETS INTO HOST COMMUNICATIONS AREA WITH ONE DESCRIPTOR TO EACH RING
                                ;AND TWO PACKET AND BUFFER AREAS.

        000004                  HC.RSZ=  4.                     ;SIZE OF RING IN BYTES
        000060                  HC.PSZ= 48.                     ;SIZE OF COMMAND AND MESSAGE PACKETS
        000032                  HC.BSZ= 26.                     ;SIZE OF BUFFER

        000010                  HC.RESZ = 8.                    ; SIZE OF RING ENVELOPE

                                ;*************************************************************************
                                ;
                                ;       OFFSETS FROM C.RING(R5) WHERE R5 -> CONTROLLER TABLE
                                ;
                                ;*************************************************************************

        000000                  HC.MSG= 0                       ; MESSAGE RING START
        000002                          HC.MCT= HC.MSG+2.       ; MESSAGE RING CONTROL WORD
        000004                  HC.CMD= HC.MSG+HC.RSZ           ; COMMAND RING START
        000006                          HC.CCT=HC.CMD+2         ; COMMAND RING CONTROL WORDS
        000010                  HC.MEV= HC.CMD+HC.RSZ           ; MESSAGE ENVELOPE
        000012                  HC.VC = HC.MEV+2                ; VIRTUAL CIRCUIT + CREDIT FIELD
        000014                  HC.MPK= HC.VC+2                 ; MESSAGE PACKET START
        000074                  HC.CEV= HC.MPK+HC.PSZ           ; START OF COMMANDD PACKKET ENVELOPE
        000100                  HC.CPK= HC.CEV+4                ; COMMAND PACKET START
        000160                  HC.BF1= HC.CPK+HC.PSZ           ; FIRST BUFFER
        000212                  HC.BF2= HC.BF1+HC.BSZ           ; SECOND BUFFER

        000254                  HC.SIZ= HC.BF2+HC.BSZ+HC.RESZ   ;TOTAL SIZE OF HOST COMM AREA
                                                                ; INCLUDING THE RING ENVELOPE HEADER

        001001                  DUP.VC  =       1001            ; VIRTUAL CIRCUIT + CREDIT FIELD FOR DUP
```

```
;
;                 +-----------------------------------------------+
;                 !        RING ENVELOPE HEADER                   !   HC.RESZ BYTES
;                 !                                               !
;                 +-----------------------------------------------+
;       HC.MSG    !        MESSAGE RING                           !   HC.RSZ  BYTES
;       HC.MCT    !                                               !
;                 +-----------------------------------------------+
;       HC.CMD    !        COMMAND RING                           !   HC.RSZ BYTES
;       HC.CCT    !                                               !
;                 +-----------------------------------------------+
;       HC.MEV    !        MESSAGE ENVELOPE HEADER                !    4 BYTES
;                 !                                               !
;                 +-----------------------------------------------+
;       HC.MPK    !        MESSAGE PACKET                         !   HC.PSZ BYTES
;                 !                                               !
;                 !                                               !
;                 !                                               !
;                 +-----------------------------------------------+
;       HC.CEV    !        COMMAND ENVELOPE HEADER                !    4 BYTES
;                 !                                               !
;                 +-----------------------------------------------+
;       HC.CPK    !        COMMAND PACKET                         !   HC.PSZ BYTES
;                 !                                               !
;                 !                                               !
;                 !                                               !
;                 +-----------------------------------------------+
;       HC.BF1    !        BUFFER # 1 (DATA SENT TO DM)           !   HC.BSZ BYTES
;                 !                                               !
;                 !                                               !
;                 !                                               !
;                 +-----------------------------------------------+
;       HC.BF2    !        BUFFER # 2 (DATA RECEIVED FROM DM)     !   HC.BSZ BYTES
;                 !                                               !
;                 !                                               !
;                 !                                               !
;                 +-----------------------------------------------+
```

```
                        ;COMMAND PACKET OPCODES

                        ;OP.MWR=31                      ;MAINTENANCE WRITE COMMAND
        000200          OP.END= 200                     ;END PACKET FLAG
        000002          OP.DLE= 2                       ; DOWN LINE LOAD AND EXECUTE DUP PROGRAM
        000004          OP.SND=4                        ; SEND DATA
        000005          OP.RCV=5                        ; RECEIVE DATA

                        ;NOTE: END PACKET OPCODES (ALSO CALLED ENDCODES) ARE FORMED BY ADDING THE END
                        ;PACKET FLAG TO THE COMMAND OPCODE. THE UNKNOWN COMMAND END PACKET CONTAINS
                        ;JUST THE END PACKET FLAG IN ITS OPCODE FIELD.
```

```
                        ;COMMAND MODIFIERS

        020000          MD.CMP= 020000                  ;COMPARE
        100000          MD.EXP= 100000                  ;EXPRESS REQUEST
        040000          MD.ERR= 040000                  ;FORCE ERROR
        004000          MD.SFT= 004000                  ;SOFTWARE WORDS SUPPLIED
        002000          MD.SCH= 002000                  ;SUPPRESS CACHING (HIGH SPEED)
        001000          MD.SCL= 001000                  ;SUPPRESS CACHING (LOW SPEED)
        000100          MD.SEC= 000100                  ;SUPPRESS ERROR CORRECTION
        000020          MD.SER= 000020                  ;SUPPRESS ERROR RECOVERY
        000010          MD.SSH= 000010                  ;SUPPRESS SHADOWING
        000400          MD.WBN= 000400                  ;WRITE-BACK (NON-VOLATILE)
        000200          MD.WBV= 000200                  ;WRITE BACK (VOLATILE)
        000040          MD.ORD= 000040                  ;WRITE SHOW SET IN ORDER
        000001          MD.SPD= 000001                  ;SPIN-DOWN
        000002          MD.FEU= 000002                  ;FLUSH ENTIRE UNIT
        000003          MD.VOL= 000003                  ;VOLATILE ONLY
        010000          MD.NXU= 010000                  ;NEXT UNIT

                        ;END PACKET FLAGS

        000200          EF.BBR= 000200                  ;BAD BLOCK REPORTED
        000100          EF.BBU= 000100                  ;BAD BLOCK UNREPORTED
        000040          EF.SHE= 000040                  ;SHADOW SET ERROR
        000017          EF.SDF= 000017                  ;SOFTWAREW WORDS DIFFERENT:
        000010          EF.SD3= 000010                  ;  SOFTWARE WORDS BYTE 3 DIFFERENT
        000004          EF.SD2= 000004                  ;  SOFTWARE WORDS BYTE 2 DIFFERENT
        000002          EF.SD1= 000002                  ;  SOFTWARE WORDS BYTE 1 DIFFERENT
        000001          EF.SD0= 000001                  ;  SOFTWARE WORDS BYTE 0 DIFFERENT


                        ;UNIT FLAGS

        000001          UF.AVL= 000001                  ;AVAILABLE PENDING
        020000          UF.CMR= 020000                  ;COMPARE READS
        010000          UF.CMW= 010000                  ;COMPARE WRITES
        004000          UF.RPL= 004000                  ;HOST INITIATED BAD BLOCK REPLACEMENT
        100000          UF.INA= 100000                  ;INACTIVE SHADOW SET UNIT
        000006          UF.MLT= 000006                  ;MULTI-UNIT DRIVE (TWO BIT FIELD):
        000002          UF.FRS= 000002                  ;  FIRST UNIT
        000004          UF.LST= 000004                  ;  LAST UNIT
        000006          UF.MDL= 000006                  ;  MIDDLE UNIT
        000100          UF.RMV= 000100                  ;REMOVEABLE MEDIA
        002000          UF.SCH= 002000                  ;SUPPRESS CACHING (HIGH SPEED)
        001000          UF.SCL= 001000                  ;SUPPRESS CACHING (LOW SPEED)
        000400          UF.WBN= 000400                  ;WRITE-BACK (NON-VOLATILE)
        040000          UF.WPR= 040000                  ;WRITE PROTECT
        000010          UF.576= 000010                  ;576 BYTE SECTORS
```

```
                        ;CONTROLLER FLAGS

        000001          CF.RPL= 000001                          ;CONTROLLER INITIATED BAD BLOCK REPLACEMENT
        100000          CF.AVL= 100000                          ;ENABLE AVAILABLE ATTENTION MESSAGES
        040000          CF.MSC= 040000                          ;ENABLE MISCELLANEOUS ERROR LOG MESSAGES
        020000          CF.OTH= 020000                          ;ENABLE OTHER HOST'S ERROR LOG MESSAGES
        010000          CF.THS= 010000                          ;ENABLE THIS HOST'S ERROR LOG MESSAGES
        000002          CF.SHD= 000002                          ;SHADOWING
        000004          CF.576= 000004                          ;576 BYTE SECTORS

                        ;COMMAND PACKET OFFSETS

                        ;               GENERIC COMMAND PACKET OFFSETS:
        000000          P.CRF=   0.                             ;COMMAND REFERENCE NUMBER
        000004          P.UNIT=  4.                             ;UNIT NUMBER
        000010          P.OPCD=  8.                             ;OPCODE
        000012          P.MOD=   10.                            ;MODIFIERS
        000014          P.BCNT= 12.                             ;BYTE COUNT
        000020          P.BUFF= 16.                             ;BUFFER DESCRIPTOR
        000020          P.UADR= P.BUFF                          ;UNIBUS ADDRESS OF BUFFER DESCRIPTOR
        000034          P.LBN=   28.                            ;LOGICAL BLOCK NUMBER
        000040          P.SFTW= 32.                             ;SOFTWARE WORDS

                        ;               ABORT AND GET COMMAND STATUS COMMAND PACKET OFFSETS:
        000014          P.OTRF= 12.                             ;OUTSTANDING REFERENCE NUMBER

                        ;               ONLINE AND SET UNIT CHARACTERISTICS COMMAND PACKET OFFSETS:
        000014          P.UNFL= 12.                             ;UNIT FLAGS
        000016          P.SHUN= 14.                             ;SHADOW UNIT
        000020          P.UNTI= 16.                             ;UNIT IDENTIFIER
        000030          P.HSTI= 24.                             ;HOST IDENTIFIER
        000034          P.ELGF= 28.                             ;ERROR LOG FLAGS

                        ;               REPLACE COMMAND PACKET OFFSETS:
        000014          P.RBN=   12.                            ;REPLACEMENT BLOCK NUMBER

                        ;               SET CONTROLLER CHARACTERISTICS COMMAND PACKET OFFSETS:
        000014          P.CNTF= 12.                             ;CONTROLLER FLAGS
        000016          P.HTMO= 14.                             ;HOST TIMEOUT
        000020          P.USEF= 16.                             ;USE FRACTION
        000024          P.TIME= 20.                             ;QUAD-WORD TIME AND DATE

                        ;               MAINTENANCE READ AND MAINTENANCE WRITE COMMAND PACKET OFFSETS:
        000034          P.RGID= 28.                             ;REGION ID
        000040          P.RGOF= 32.                             ;REGION OFFSET

                        ;       DUP PACKET OFFSETS

        000014          P.TRLN  =       12.             ; TRANSFER LENGTH
        000020          P.MAIN  =       16.             ; HOST ADDRESS OF MAIN DM CODE
        000034          P.OVRL  =       28.             ; HOST ADDRESS OF OVERLAY CODE

                        ;       DUP HEADER OFFSETS

        000000          HDR.MN  =       0               ; OFFSET TO SIZE OF MAIN PROGRAM
        000004          HDR.OV  =       4               ; OFFSET TO SIZE OF OVERLAYS
```

```
                                 ;END PACKET OFFSETS

                                 ;          GENERIC END PACKET OFFSETS:
          000000                 P.CRF=   0.                           ;COMMAND REFERENCE NUMBER
          000004                 P.UNIT=  4.                           ;UNIT NUMBER
          000010                 P.OPCD=  8.                           ;OPCODE (ALSO CALLED ENDCODE)
          000011                 P.FLGS=  9.                           ;END PACKET FLAGS
          000012                 P.STS=  10.                           ;MODIFIERS
          000014                 P.BCNT= 12.                           ;BYTE COUNT
          000034                 P.FBBK= 28.                           ;FIRST BAD BLOCK
          000040                 P.SFTW= 32.                           ;SOFTWARE WORDS

                                 ;          GET COMMAND STATUS END PACKET OFFSETS:
          000014                 P.OTRF= 12.                           ;OUTSTANDING REFERENCE NUMBER
          000020                 P.CMST= 16.                           ;COMMAND STATUS

                                 ;          GET UNIT STATUS END PACKET OFFSETS:
          000014                 P.UNFL= 12.                           ;UNIT FLAGS
          000016                 P.SHUN= 14.                           ;SHADOW UNIT
          000020                 P.SHST= 16.                           ;SHADOW STATUS
          000022                 P.CYL=  18.                           ;CYLINDER SIZE
          000024                 P.GRP=  20.                           ;GROUP SIZE
          000026                 P.TRCK= 22.                           ;TRACK SIZE
          000030                 P.RCTS= 24.                           ;RCT TABLE SIZE
          000032                 P.RCTP= 26.                           ;RCT PAD SIZE
          000034                 P.RBNS= 28.                           ;RBN / TRACK
          000035                 P.RCTC= 29.                           ;RCT COPIES

                                 ;          ONLINE AND SET UNIT CHARACTERISTICS
          000014                 P.UNFL= 12.                           ;UNIT FLAGS
          000016                 P.SHUN= 14.                           ;SHADOW UNIT
          000020                 P.UNTI= 16.                           ;UNIT IDENTIFIER
          000030                 P.HSTI= 24.                           ;HOST IDENTIFIER
          000034                 P.UNCL= 28.                           ;UNIT COMMAND LIMIT
          000040                 P.UNSZ= 32.                           ;UNIT SIZE
          000044                 P.VSER= 36.                           ;VOLUME SERIAL NUMBER

                                 ;          SET CONTROLLER CHARACTERISTICS END PACKET OFFSETS:
          000014                 P.CNTF= 12.                           ;CONTROLLER FLAGS
          000016                 P.CTMO= 14.                           ;CONTROLLER TIMEOUT
          000020                 P.CNCL= 16.                           ;CONTROLLER COMMAND LIMIT
          000024                 P.CNTI= 20.                           ;CONTROLLER ID

                                 ;ERROR LOG ATTENTION MESSAGE PACKET OFFSETS

          000000                 P.CRF=   0.                           ;COMMAND REFERENCE NUMBER
          000004                 P.UNIT=  4.                           ;UNIT NUMBER
          000006                 P.CNT=   6.                           ;COUNT
          000010                 P.OPCD=  8.                           ;OPCODE
          000011                 P.FLGS=  9.                           ;ERROR LOG FLAGS
          000012                 P.SZOF= 10.                           ;SIZE OR OFFSET
          000014                 P.LGDT= 12.                           ;START OF ERROR LOG DATA
```

```
                        ;ERROR LOG FLAGS

        000200          EF.FRS= 000200                  ;FIRST PACKET
        000100          EF.LST= 000100                  ;LAST PACKET
        000001          EF.MIS= 000001                  ;MESSAGE MISSING

                        ;ERROR LOG MESSAGE OFFSETS

        000000          L.EVNT=  0.                     ;EVENT CODE
        000002          L.SLOT=  2.                     ;SLOT NUMBER
        000004          L.CNTI=  4.                     ;CONTROLLER IDENTIFIER
        000014          L.CNTI= 12.                     ;CONTROLLER SOFTWARE REVISION
        000015          L.CHVR= 13.                     ;CONTROLLER HARDWARE REVISION
        000016          L.UNTI= 14.                     ;UNIT IDENTIFIER
        000026          L.USVR= 22.                     ;UNIT SOFTWARE REVISION
        000027          L.UHVR= 23.                     ;UNIT HARDWARE REVISION
        000030          L.ERLC= 24.                     ;ERROR LOCATION
        000034          L.CYL=  28.                     ;CYLINDER
        000040          L.GRP=  32.                     ;GROUP
        000041          L.TRCK= 33.                     ;TRACK
        000042          L.SCTR= 34.                     ;SECTOR
        000044          L.VSER= 36.                     ;VOLUME SERIAL NUMBER
        000050          L.DATA= 40.                     ;EVENT DEPENDENT DATA

                        ;STATUS AND EVENT CODE DEFINITIONS

        000037          ST.MSK= 37                      ;STATUS / EVENT CODE MASK
        000040          ST.SUB= 40                      ;SUB-CODE MULTIPLIER
        000000          ST.SUC=  0                      ;SUCCESS
        000001          ST.CMD=  1                      ;INVALID COMMAND
        000002          ST.ABO=  2                      ;COMMAND ABORTED
        000003          ST.SHE=  3                      ;SHADOW SET ERROR
        000004          ST.OFL=  4                      ;UNIT-OFFLINE
        000005          ST.AVL=  5                      ;UNIT-AVAILABLE
        000006          ST.WPR=  6                      ;WRITE PROTECTED
        000007          ST.CMP=  7                      ;COMPARE ERROR
        000010          ST.DAT= 10                      ;DATA ERROR
        000011          ST.HST= 11                      ;HOST BUFFER ACCESS ERROR
        000012          ST.CNT= 12                      ;CONTROLLER ERROR
        000013          ST.DRV= 13                      ;DRIVE ERROR
        000037          ST.DIA= 37                      ;MESSAGE FROM AN INTERNAL DIAGNOSTIC
```

```
                                ;CONTROLLER TABLE DEFINITIONS
                                ;
                                ;ONE TABLE WILL BE SET UP BY INITIALIZE SECTION FOR EACH UDA SELECTED
                                ;FOR TESTING.  TABLES ARE LINKED, A NULL (ZERO) LINK IS THE END OF THE TABLE.
                                ;
                                ;THE FIRST TABLE IS POINTED TO BY THE CONTENTS OF TSTTAB.
                                ;THE NUMBER OF TABLES IS CONTAINED IN CTRLRS.

        000000                  C.NEXT= 0                       ; ADDR OF NEXT CONTROLLER TABLE
        000002                  C.UADR= C.NEXT+2                ; UNIBUS ADDRESS OF UDAIP REGISTER
        000004                  C.UNIT= C.UADR+2
        000177                          CT.UNT= 000177          ; LOGICAL UNIT NUMBER (FIRST)
        100000                          CT.AVL= BIT15           ; SET WHEN NOT AVAILABLE FOR TESTING
        000006                  C.VEC=  C.UNIT+2
        000777                          CT.VEC= 000777          ; VECTOR ADDRESS
        007000                          CT.BRL= 007000          ; BR LEVEL
        000010                  C.RING= C.VEC+2                 ; RING BUFFER ADDRESS
        000012                  C.TO=   C.RING+2                ; TIMEOUT COUNTER
        000014                  C.FLG=  C.TO+2                  ; FLAGS
        000001                          CT.LD=  BIT0            ; DM PROGRAM LOADED
        000002                          CT.RN=  BIT1            ; DM PROGRAM RUNNING
        000004                          CT.CMD= BIT2            ; COMMAND ISSUED, WAITING FOR RESPONSE
        000010                          CT.MSG= BIT3            ; MESSAGE RESPONSE RECEIVED
                                                                ; WHENEVER THIS BIT IS SET, CT.CMD IS CLEARED
        000020                          CT.REQ= BIT4            ; BUFFER HAS BEEN GIVEN TO UDA FOR REQUEST
                                                                ; SET WHENEVER MAINTENANCE READ COMMAND
                                                                ; GIVEN TO UDA
        000016                  C.REF=  C.FLG+2                 ; COMMAND REFERENCE NUMBER
        000020                  C.UNUM= C.REF+2                 ; DRIVE UNIT NUMBER
        000022                  C.DFLG= C.UNUM+2                ; DOWN LINE LOAD FLAGS (USER SUPPLIED)
        000024                  C.FBUF= C.DFLG+2                ; ADDRESS OF FCT DLL BUFFER
        000026                  C.FBLK= C.FBUF+2                ; BLOCK # OF BLOCK CURRENTLY IN C.FBUF
                                                                ; -1 INDICATES FILE IS CLOSED
        000030                  C.SNUM= C.FBLK+2                ; UNIT SERIAL NUMBER (TO BE ASSIGNED)
        000040                  C.CNT = C.SNUM+8.               ; COUNT OF UNSUCCESSFUL ATTEMPTS
                                                                ; TO RECEIVE AN ANSWER
        000020                  C.INIT= 20                      ; INIT VALUE FOR HIGH ORDER COUNTER
        000044                  C.SIZE= C.CNT+4                 ;SIZE OF CONTROLLER TABLE
                                                                ;INDEX TO NEXT TABLE
```

```
;USEFUL INSTRUCTION DEFINITIONS

.MACRO  AND ARG,ADR                             ;LOGICAL AND INSTRUCTION
        BIC #^C<ARG>,ADR
.ENDM

.MACRO  OR ARG,ADR                              ;LOGICAL OR INSTRUCTION
        BIS #ARG,ADR
.ENDM

.MACRO  PUSH ARG                                ;PUSH INSTRUCTION
        .IRP X,<ARG>
        MOV X,-(SP)
        .ENDM
.ENDM

.MACRO  POP ARG                                 ;POP INSTRUCTION
        .IRP X,<ARG>
        MOV (SP)+,X
        .ENDM
.ENDM

.MACRO  SOB     ARG,LABEL
        DEC     ARG
        BNE     LABEL
.ENDM

.MACRO  ASSUME  ARG1,FUNCTION,ARG2
        .IF     FUNCTION,<ARG1>-<ARG2>
        .IFF
        .ERROR  ASSUMPTION VIOLATED
        .ENDC
.ENDM
```

```
                                .SBTTL  GLOBAL DATA SECTION

                                ;++
                                ; THE GLOBAL DATA SECTION CONTAINS DATA THAT ARE USED
                                ; IN MORE THAN ONE TEST.
                                ;--

  002160                                ERRTBL
                                .MCALL  M$GNGBL
  002160                        M$GNGBL L$ERRTBL
                                .MCALL  M$GEN
                                .IF NB,L$ERRTBL
                                .IF NB,
                                M$GEN   L$ERRTBL,:,SVCGBL,
                                .ENDC
                                .IF B,
  002160                        M$GEN   L$ERRTBL,:,SVCGBL,< >
                                .IF LE  SVCGBL
  002160                        L$ERRTBL::
                                .MEXIT
                                .ENDC
                                .LIST
                                                                                        L$ERRTBL::
                                        .NLIST
                                .ENDC
                                .ENDC
  002160  000000                ERRTYP::        .WORD   0
  002162  000000                ERRNBR::        .WORD   0
  002164  000000                ERRMSG::        .WORD   0
  002166  000000                ERRBLK::        .WORD   0

  002170                        FFREE:: .BLKW   1               ; FIRST FREE WORD IN MEMORY
  002172                        FSIZE:: .BLKW   1               ; SIZE OF FREE MEMORY IN WORDS
  002174                        FMEM:   .BLKW   1               ; COPY OF FFREE AT END OF INIT SECTION
  002176                        FMEMS:  .BLKW   1               ; COPY OF FSIZE AT END OF INIT SECTION
  002200                        CTRLRS: .BLKW   1               ; COUNT OF UDA CONTROLLERS IN PTABLES
  002202                        TSTTAB: .BLKW   1               ; POINTER TO FIRST CONTROLLER TABLE
  002204                        DMPROG: .BLKW   1               ; ADDR OF DM PROGRAM IN HOST MEMORY
  002206                        DMOVRL: .BLKW   1               ; ADDR OF DM OVERLAYS IN HOST MEMORY
  002210                        DMTRLN: .BLKW   1               ; TRANSFER LENGTH FOR DM MAIN PROGRAM IN BYTES
  002212                        RDLOW:  .BLKW   1               ; LOW BOUND FOR DM PROGRAM READ
  002214                        RDHIGH: .BLKW   1               ; HIGH ...
  002216                        RD.AT:  .BLKW   1               ; HOST ADDR FOR DM PROGRAM READ
  002220                        URNING: .BLKW   1               ; NUMBER OF UNITS STILL RUNNING

  002222                        IFLAGS::.BLKB   1                       ;FLAGS FROM INIT CODE
          000001                                ISTART==BIT0            ; START EVENT FLAG
          000002                                ICONT ==BIT1            ; CONTINUE EVENT FLAG
                                        .EVEN
```

```
                                        .SBTTL  GLOBAL TEXT SECTION

                                        ;++
                                        ; THE GLOBAL TEXT SECTION CONTAINS FORMAT STATEMENTS,
                                        ; MESSAGES, AND ASCII INFORMATION THAT ARE USED IN
                                        ; MORE THAN ONE TEST.
                                        ;--


                                        ;
                                        ; NAMES OF DEVICES SUPPORTED BY PROGRAM
                                        ;
   002224                                       DEVTYP  <UNIBUS DISK ADAPTER (UDA50)>
                                        .MCALL M$DATA,M$GNINS
   002224                               M$DATA L$DVTYP,.ASCIZ,</UNIBUS DISK ADAPTER (UDA50)/>
                                        .MCALL  M$GNGBL,M$GNINS
                                        .IF NB
                                        M$GNGBL L$DVTYP,<>
                                        .ENDC
                                        .IF B
   002224                               M$GNGBL L$DVTYP
                                        .MCALL  M$GEN
                                        .IF NB,L$DVTYP
                                        .IF NB,
                                        M$GEN   L$DVTYP,:,SVCGBL,
                                        .ENDC
                                        .IF B,
   002224                               M$GEN   L$DVTYP,:,SVCGBL,< >
                                        .IF LE  SVCGBL
   002224                               L$DVTYP::
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                                        L$DVTYP::
                                                .NLIST
                                        .ENDC
                                        .ENDC
                                        .ENDC
   002224                               M$GNINS <.ASCIZ /UNIBUS DISK ADAPTER (UDA50)/>
                                        .IF LT SVCINS
                                        .ASCIZ  /UNIBUS DISK ADAPTER (UDA50)/
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
   002224     125     116     111               .ASCIZ  /UNIBUS DISK ADAPTER (UDA50)/
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                             .ASCIZ  /UNIBUS DISK ADAPTER
                                                        .NLIST
                                        .ENDC
   002260                               M$GNINS .EVEN
                                        .IF LT SVCINS
                                        .EVEN
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
```

```
                                        .EVEN
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                .EVEN
                                                .NLIST
                                .ENDC
 13
 14
 15                             ; TEST DESCRIPTION
 16                             ;
 17 002260                              DESCRIPT        <UDA HOST DISK FORMATTER>
                                .MCALL  M$DATA,M$GNINS
    002260                      M$DATA  L$DESC,.ASCIZ,</UDA HOST DISK FORMATTER/>
                                .MCALL  M$GNGBL,M$GNINS
                                .IF NB
                                M$GNGBL L$DESC,<>
                                .ENDC
                                .IF B
    002260                      M$GNGBL L$DESC
                                .MCALL  M$GEN
                                .IF NB,L$DESC
                                .IF NB,
                                M$GEN   L$DESC,:,SVCGBL,
                                .ENDC
                                .IF B,
    002260                      M$GEN   L$DESC,:,SVCGBL,< >
                                .IF LE  SVCGBL
    002260                      L$DESC::
                                .MEXIT
                                .ENDC
                                .LIST
                                                                        L$DESC::
                                        .NLIST
                                .ENDC
                                .ENDC
                                .ENDC
    002260                      M$GNINS <.ASCIZ /UDA HOST DISK FORMATTER/>
                                .IF LT SVCINS
                                .ASCIZ  /UDA HOST DISK FORMATTER/
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
    002260      125     104     101     .ASCIZ  /UDA HOST DISK FORMATTER/
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                .ASCIZ  /UDA HOST DISK FORMA
                                                .NLIST
                                .ENDC
    002310                      M$GNINS .EVEN
                                .IF LT SVCINS
                                .EVEN
                                .MEXIT
                                .ENDC
```

```
                                        .IF EQ SVCINS
                                                .EVEN
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                                .EVEN
                                                        .NLIST
                                        .ENDC
    18                                          .EVEN
    19
```

```
                        ;
                        ; FORMAT STATEMENTS USED IN PRINT CALLS
                        ;

                        ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                        ;       INSERT THE FORMAT STATEMENTS USED IN THE VARIOUS PRINT CALLS.
                        ;       FORMAT STATEMENTS ARE ASCIZ STRINGS USED BY THE RUNTIME
                        ;       SERVICES TO BUILD MESSAGES.  FORMAT STATEMENTS ARE DESCRIBED
                        ;       IN THE SUPERVISOR PROGRAMMER'S MANUAL.
                        ;
                        ;       THE PRINT CALLS (PRINTB AND PRINTX) ARE IN THE NEXT SECTION.
                        ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%


                        ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                        ;     LABELS ATTACHED TO ASCII MESSAGES PLACED IN THIS SECTION MUST BE DEFINED
                        ;     WITH A DOUBLE-COLON (::); THIS WILL MAKE THEM GLOBAL LABELS.  FOR EXAMPLE,
                        ;     A MESSAGE COULD BE DEFINED AS DTAERR:: .ASCIZ 'DATA ERROR OCCURRED'.
                        ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
                                .SBTTL  GLOBAL ERROR REPORT SECTION

                                ;++
                                ; THE GLOBAL ERROR REPORT SECTION CONTAINS MESSAGE PRINTING AREAS
                                ; USED BY MORE THAN TEST TO OUTPUT ADDITIONAL ERROR INFORMATION.  PRINTB
                                ; (BASIC) AND PRINTX (EXTENDED) CALLS ARE USED TO CALL PRINT SERVICES.
                                ;--


   002310                               BGNMSG
                                .MCALL  M$PUSH,M$INCR,M$GNGBL
            000040              I$MSG=F$BGN
   002310                       M$PUSH  T$NS,T$NESTLEV,F$MSG
                                .MCALL  M$INCR,M$SETS
   002310                       M$INCR  T$NESTLEV
            000001              T$NESTLEV=T$NESTLEV+1
   002310                       M$SETS  T$NS,\T$NESTLEV,F$MSG
            000011              T$NS1=F$MSG
            010002              T$$MSG=T$TAGNUM
   002310                       M$INCR T$TAGNUM
            010003              T$TAGNUM=T$TAGNUM+1
   002310                       M$GNGBL
                                .MCALL  M$GEN
                                .IF NB,
                                .IF NB,
                                M$GEN    ,:,SVCGBL,
                                .ENDC
                                .IF B,
                                M$GEN    ,:,SVCGBL,< >
                                .ENDC
                                .ENDC
   002310                       FMERR:  ERRSF   1,FMERRM
                                .MCALL  M$ERRINS
   002310                       M$ERRINS        1,FMERRM,,C$ERSF
                                .MCALL  M$GNINS,M$WORD,M$TSTLAB
   002310                       M$SVC   C$ERSF
                                .MCALL  M$GNINS,M$TSTLAB
   002310                       M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
   002310                       M$GNINS <TRAP   C$ERSF>
                                .IF LT SVCINS
                                TRAP    C$ERSF
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
   002310   104454                      TRAP    C$ERSF
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                TRAP    C$ERSF
                                                .NLIST
```

```
                                .ENDC
        000012                  .RADIX  10
                                .IF NB  1
        000001                  T$ERRNUM=1
                                .IFF
                                .ERROR  ;MISSING ERROR-NR
                                .ENDC
002312                          M$WORD  \T$ERRNUM
                                .MCALL  M$GNINS
                                .IRP    N,<1>
                                M$GNINS <.WORD  N>
                                .ENDM
002312                          M$GNINS <.WORD  1>
                                .IF LT SVCINS
                                .WORD   1
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
002312  000001                          .WORD   1
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   1
                                          .NLIST
                                .ENDC
        000010                  .RADIX  8
                                .IF NB FMERRM
002314                          M$WORD  FMERRM
                                .MCALL  M$GNINS
                                .IRP    N,<FMERRM>
                                M$GNINS <.WORD  N>
                                .ENDM
002314                          M$GNINS <.WORD  FMERRM>
                                .IF LT SVCINS
                                .WORD   FMERRM
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
002314  002330                          .WORD   FMERRM
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   FMERRM
                                          .NLIST
                                .ENDC
                                .IFF
                                M$WORD  0
                                .ENDC
                                .IF NB
                                M$WORD
                                .IFF
002316                          M$WORD  0
                                .MCALL  M$GNINS
                                .IRP    N,<0>
                                M$GNINS <.WORD  N>
```

```
                                .ENDM
     002316                     M$GNINS <.WORD  0>
                                .IF LT SVCINS
                                .WORD   0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     002316  000000                     .WORD   0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   0
                                          .NLIST
                                .ENDC
                                .ENDC
  12 002320                     RDERR:  ERRSF   222,RDERRM
                                .MCALL  M$ERRINS
     002320                     M$ERRINS        222,RDERRM,,C$ERSF
                                .MCALL  M$GNINS,M$WORD,M$TSTLAB
     002320                     M$SVC   C$ERSF
                                .MCALL  M$GNINS,M$TSTLAB
     002320                     M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
     002320                     M$GNINS <TRAP   C$ERSF>
                                .IF LT SVCINS
                                TRAP    C$ERSF
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     002320  104454                     TRAP    C$ERSF
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        TRAP    C$ERSF
                                          .NLIST
                                .ENDC
             000012             .RADIX  10
                                .IF NB  222
             000336             T$ERRNUM=222
                                .IFF
                                .ERROR  ;MISSING ERROR-NR
                                .ENDC
     002322                     M$WORD  \T$ERRNUM
                                .MCALL  M$GNINS
                                .IRP    N,<222>
                                M$GNINS <.WORD  N>
                                .ENDM
     002322                     M$GNINS <.WORD  222>
                                .IF LT SVCINS
                                .WORD   222
```

```
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
002322  000336                        .WORD   222
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                  .WORD   222
                                            .NLIST
                              .ENDC
        000010                .RADIX  8
                              .IF NB RDERRM
002324                        M$WORD  RDERRM
                              .MCALL  M$GNINS
                              .IRP    N,<RDERRM>
                              M$GNINS <.WORD  N>
                              .ENDM
002324                        M$GNINS <.WORD  RDERRM>
                              .IF LT SVCINS
                              .WORD   RDERRM
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
002324  002411                        .WORD   RDERRM
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                  .WORD   RDERRM
                                            .NLIST
                              .ENDC
                              .IFF
                              M$WORD  0
                              .ENDC
                              .IF NB
                              M$WORD
                              .IFF
002326                        M$WORD  0
                              .MCALL  M$GNINS
                              .IRP    N,<0>
                              M$GNINS <.WORD  N>
                              .ENDM
002326                        M$GNINS <.WORD  0>
                              .IF LT SVCINS
                              .WORD   0
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
002326  000000                        .WORD   0
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                  .WORD   0
                                            .NLIST
                              .ENDC
```

```
                                        .ENDC

   002330      116      117      124    FMERRM: .ASCIZ  \NOT ENOUGH MEMORY. SELECT FEWER UNITS TO FORMAT.\
   002411      122      105      101    RDERRM: .ASCIZ  \READ ERROR WHILE ATTEMPTING TO LOAD DM PROGRAM.\

                                                .EVEN
   002472                                       ENDMSG
                                        .MCALL  M$POP,M$GNTAG,M$SVC,M$ENDERR
   002472                               M$POP   T$NS,T$NESTLEV,T$TEMP
                                        .MCALL  M$GETS,M$DECR
                                        .IF LT  T$NESTLEV
                                        .ERROR  T$NESTLEV        ; MACRO T$NS UNDERFLOW
                                        .MEXIT
                                        .ENDC
   002472                               M$GETS  T$NS,\T$NESTLEV,T$TEMP
          000011                        T$TEMP=T$NS1
   002472                               M$DECR  T$NESTLEV
          000000                        T$NESTLEV=T$NESTLEV-1
                                        .IF EQ F$MSG-T$TEMP
   002472                               M$GNTAG L,T$$MSG
                                        .MCALL  M$GEN
   002472                               M$GEN   L,\T$$MSG,SVCTAG
                                        .IF LE  SVCTAG
   002472                               L10002:
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                                          L10002:
                                                .NLIST
          010000                        S$LSYM=T$LSYM
   002472                               M$SVC   C$MSG
                                        .MCALL  M$GNINS,M$TSTLAB
   002472                               M$TSTLAB
                                        .MCALL  M$TLABEL,M$INCR
                                        .IIF LT T$TSTMAC, .MEXIT
                                        .RADIX  10
                                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                        .RADIX  8
                                        M$INCR  T$TSTSEQ
   002472                               M$GNINS <TRAP   C$MSG>
                                        .IF LT SVCINS
                                        TRAP    C$MSG
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
   002472 104423                                TRAP    C$MSG
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                             TRAP    C$MSG
                                                        .NLIST
                                        .ENDC
          000041                        I$MSG=F$END
                                        .IFF
                                        M$ENDERR        ENDMSG,T$TEMP
                                        .ENDC
```

```
                                        .SBTTL  GLOBAL SUBROUTINES SECTION

                                ;ALOCM
                                ;
                                ;ALLOCATE A BLOCK OF FREE MEMORY.  REPORT ERROR IF MEMORY EXHAUSTED.
                                ;
                                ;INPUTS:
                                ;       R1 - NUMBER OF WORDS TO ALLOCATE
                                ;       FFREE - FIRST FREE WORD IN MEMORY
                                ;       FSIZE - SIZE OF FREE MEMORY AVAILABLE IN WORDS
                                ;OUTPUTS:
                                ;       R1 - ADDRESS OF FIRST WORD OF ALLOCATED MEMORY
                                ;       FFREE - NEW FIRST FREE WORD IN MEMORY
                                ;       FSIZE - SIZE OF FREE MEMORY LEFT AFTER ALLOCATION
                                ;SYSTEM FATAL ERROR WILL BE REPORTED IF NOT ENOUGH MEMORY AVAILABLE
                                ;AND ENTIRE PROGRAM WILL BE STOPPED.

002474                          ALOCM:  PUSH    FFREE                   ;SAVE FFREE AT ENTRY
                                        .IRP X,<FFREE>
                                        MOV X,-(SP)
                                        .ENDM
002474  013746  002170                  MOV FFREE,-(SP)
002500  160137  002172                  SUB     R1,FSIZE                ;REDUCE SIZE OF FREE MEMORY
002504  002701                          BLT     FMERR                   ;REPORT ERROR IF NOT ENOUGH MEMORY
002506  060101                          ADD     R1,R1                   ;CHANGE WORDS TO BYTES
002510  060137  002170                  ADD     R1,FFREE                ;CALCULATE NEW START OF FREE MEMORY
002514                                  POP     R1                      ;GET START OF ALLOCATED MEMORY
                                        .IRP X,<R1>
                                        MOV (SP)+,X
                                        .ENDM
002514  012601                          MOV (SP)+,R1
002516  000207                          RETURN
```

```
                                  ;BLDCMD
                                  ;
                                  ;BUILD A COMMAND IN COMMAND PACKET
                                  ;
                                  ;INPUTS:
                                  ;       R5 - CONTROLLER TABLE ADDRESS
                                  ;       R0 - COMMAND CODE
                                  ;OUTPUTS:
                                  ;       R4 - ADDRESS OF HOST COMM AREA
                                  ;       COMMAND PACKET CONTAINING REF NUMBER AND OPCODE. ALL OTHER FIELDS CLEARED.
                                  ;       CMD REFERRENCE NUMBER IN CONTROLLER TABLE INCREMENTED AND RESULT
                                  ;       IN COMMAND PACKET.
                                  ;       R0 - CONTENTS DESTROYED

002520                            BLDCMD: PUSH <R0,R1>
                                          .IRP X,<R0,R1>
                                          MOV X,-(SP)
                                          .ENDM
002520  010046                            MOV R0,-(SP)
002522  010146                            MOV R1,-(SP)
002524  016504  000010                    MOV C.RING(R5),R4                 ;GET ADDRESS OF HOST COMM AREA
002530  010401                            MOV     R4,R1
002532  062701  000014                    ADD     #HC.MPK,R1                ;COMPUTE START OF MESSAGE PACKET
002536  010164  000000                    MOV     R1,HC.MSG(R4)             ;PLACE IN RING
002542  062701  000064                    ADD     #<HC.CPK-HC.MPK>,R1       ;COMPUTE START OF COMMAND PACKET
002546  010164  000004                    MOV     R1,HC.CMD(R4)             ;PLACE IN RING
002552  010400                            MOV R4,R0                         ;COPY TO R0
002554  062700  000100                    ADD #HC.CPK,R0                    ;COMPUTE ADDRESS OF COMMAND PACKET
002560  012701  000030                    MOV #<HC.PSZ>/2,R1                ;GET WORDS TO CLEAR
002564  005020                    BLDC1:  CLR (R0)+                         ;CLEAR PACKET
002566  005301                            DEC R1
002570  001375                            BNE BLDC1
002572  005265  000016                    INC C.REF(R5)                     ;INCREMENT CMD REFERENCE NUMBER
002576  016564  000016  000100            MOV C.REF(R5),HC.CPK+P.CRF(R4)    ;PUT IN PACKET
002604                                    POP R1                            ;RESTORE R1
                                          .IRP X,<R1>
                                          MOV (SP)+,X
                                          .ENDM
002604  012601                            MOV (SP)+,R1
002606                                    POP HC.CPK+P.OPCD(R4)             ;PUT OPCODE IN PACKET
                                          .IRP X,<HC.CPK+P.OPCD(R4)>
                                          MOV (SP)+,X
                                          .ENDM
002606  012664  000110                    MOV (SP)+,HC.CPK+P.OPCD(R4)
002612  000207                            RETURN
```

```
                                        ;CLRBUF
                                        ;
                                        ;CLEAR THE SPECIFIED DATA BUFFER IN THE HOST COMM AREA
                                        ;AND LOAD BUFFER DESCRIPTOR IN COMMAND PACKET TO THE BUFFER
                                        ;
                                        ;INPUTS:
                                        ;       R5 - CONTROLLER TABLE ADDRESS
                                        ;       R4 - ADDRESS OF HOST COMM AREA
                                        ;       R0 - OFFSET INTO HOST COMM AREA TO DATA BUFFER
                                        ;OUTPUTS:
                                        ;       DATA BUFFER CLEARED
                                        ;       COMMAND PACKET POINTING TO BUFFER
                                        ;       COMMAND ENVELOPE HEADER INITIALIZED
                                        ;       BYTE COUNT SET TO SIZE OF BUFFER
                                        ;       R4 - ADDRESS OF DATA BUFFER

   002614                               CLRBUF: PUSH <R0,R1>
                                                .IRP X,<R0,R1>
                                                MOV X,-(SP)
                                                .ENDM
   002614  010046                               MOV R0,-(SP)
   002616  010146                               MOV R1,-(SP)
   002620  060400                               ADD R4,R0                       ;ADD START OF HOST COMM AREA TO OFFSET
   002622  010064  000120                       MOV R0,HC.CPK+P.UADR(R4)        ;PUT BUFFER ADDRESS IN COMMAND PACKET
   002626  012764  000032  000114               MOV #HC.BSZ,HC.CPK+P.BCNT(R4)   ;PUT SIZE OF BUFFER IN COMMAND PACKET
   002634  010004                               MOV R0,R4                       ;PUT BUFFER ADDRESS IN R4
   002636  012701  000015                       MOV #HC.BSZ/2,R1                ;GET SIZE OF BUFFER IN WORDS
   002642  005020                       CLRBFL: CLR (R0)+                       ;CLEAR ALL THE WORDS
   002644  005301                               DEC R1
   002646  001375                               BNE CLRBFL
   002650                                       POP <R1,R0>
                                                .IRP X,<R1,R0>
                                                MOV (SP)+,X
                                                .ENDM
   002650  012601                               MOV (SP)+,R1
   002652  012600                               MOV (SP)+,R0
   002654  000207                               RETURN
```

```
                                        ;       GETBLK - GET FCT BLOCK
                                        ;
                                        ;INPUT
                                        ;       R1 - BLOCK NUMBER REQUESTED
                                        ;       R5 - CONTROLLER TABLE ADDRESS
                                        ;IMPLICIT INPUT
                                        ;       C.FBLK(R5) - CURRENT FCT BLOCK #
                                        ;       C.FBUF(R5) - ADDRESS OF FCT BUFFER
                                        ;OUTPUT
                                        ;       R2 - 1 IF SUCCESSFUL
                                        ;            0 IF EOF
                                        ;           -1 IF ATTEMPT TO READ PAST EOF
                                        ;       C.FBLK(R5) - NEW FCT BLOCK # (-1 IF FILE CLOSED AT EOF)
                                        ;       C.FBUF(R5) - BUFFER CONTAINS NEW DATA
                                        ;
 002656                                 GETBLK: PUSH    <R0,R3>
                                                .IRP X,<R0,R3>
                                                MOV X,-(SP)
                                                .ENDM
 002656  010046                                 MOV R0,-(SP)
 002660  010346                                 MOV R3,-(SP)
 002662  020165  000026                         CMP     R1,C.FBLK(R5)           ; REQ BLK # <= CUR BLK?
 002666  002004                                 BGE     5$                      ; YES
 002670                                         CLOSE                           ; NO - ''REWIND'' THE FILE
                                        .MCALL  M$SVC
 002670                                 M$SVC   C$CLOS
                                        .MCALL  M$GNINS,M$TSTLAB
 002670                                 M$TSTLAB
                                        .MCALL  M$TLABEL,M$INCR
                                        .IIF LT T$TSTMAC, .MEXIT
                                        .RADIX  10
                                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                        .RADIX  8
                                        M$INCR  T$TSTSEQ
 002670                                 M$GNINS <TRAP   C$CLOS>
                                        .IF LT SVCINS
                                        TRAP    C$CLOS
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
 002670  104435                                 TRAP    C$CLOS
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        TRAP    C$CLOS
                                                        .NLIST
                                        .ENDC
 002672  012765  177777  000026                 MOV     #-1,C.FBLK(R5)          ; FLAG FILE AS CLOSED
 002700                                 5$:
 002700  005765  000026                         TST     C.FBLK(R5)              ; FILE OPEN?
 002704  002003                                 BGE     10$                     ; YES
 002706                                         OPEN    #FCTFIL                 ; OPEN FILE
                                        .MCALL  M$LDR0,M$SVC
 002706                                 M$LDR0  #FCTFIL,OPEN
                                        .MCALL  M$GNINS
                                        .IF NB #FCTFIL
```

```
                                  .IF DIF R0,#FCTFIL
    002706                        M$GNINS <MOV    #FCTFIL,R0>
                                  .IF LT SVCINS
                                  MOV     #FCTFIL,R0
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
    002706  012700  014410                MOV     #FCTFIL,R0
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                                  MOV     #FCTFIL,R0
                                                  .NLIST
                                  .ENDC
                                  .ENDC
                                  .IFF
                                  .ERROR  ;MISSING ARG. ON 'OPEN'
                                  .ENDC
    002712                        M$SVC   C$OPEN
                                  .MCALL  M$GNINS,M$TSTLAB
    002712                        M$TSTLAB
                                  .MCALL  M$TLABEL,M$INCR
                                  .IIF LT T$TSTMAC, .MEXIT
                                  .RADIX  10
                                  M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                  .RADIX  8
                                  M$INCR  T$TSTSEQ
    002712                        M$GNINS <TRAP   C$OPEN>
                                  .IF LT SVCINS
                                  TRAP    C$OPEN
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
    002712  104434                        TRAP    C$OPEN
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                                  TRAP    C$OPEN
                                                  .NLIST
                                  .ENDC
    002714                        10$:
    002714  020165  000026                CMP     R1,C.FBLK(R5)           ; IS THE CUR BLK THE RIGHT ONE?
    002720  001414                        BEQ     BLKFND                  ; YES

    002722  005265  000026                INC     C.FBLK(R5)              ; SHOW NEW BLOCK NUMBER
    002726  012703  000400                MOV     #256.,R3                ; GET NEXT 256 WORDS
    002732  016502  000024                MOV     C.FBUF(R5),R2           ; POINT TO THE BUFFER
    002736                        15$:    GETWORD R0                      ; GET NEXT WORD
                                  .MCALL  M$SVC,M$RNR0
    002736                        M$SVC   C$GETW
                                  .MCALL  M$GNINS,M$TSTLAB
    002736                        M$TSTLAB
                                  .MCALL  M$TLABEL,M$INCR
                                  .IIF LT T$TSTMAC, .MEXIT
                                  .RADIX  10
```

```
                                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                        .RADIX  8
                                        M$INCR  T$TSTSEQ
   002736                               M$GNINS <TRAP   C$GETW>
                                        .IF LT SVCINS
                                        TRAP    C$GETW
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
   002736  104427                               TRAP    C$GETW
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        TRAP    C$GETW
                                                        .NLIST
                                        .ENDC
   002740                               M$RNRO  RO,GETWORD
                                        .MCALL  M$GNINS
                                        .IF NB  RO
                                        .IF DIF RO,RO
                                        M$GNINS <MOV    RO,RO>
                                        .ENDC
                                        .IFF
                                        .ERROR  ;MISSING ARG. ON ''GETWORD''
                                        .ENDC
33 002740                                       BNCOMPLETE      GETEOF          ; CHECK FOR END OF FILE
                                        .MCALL  M$GNINS
   002740                               M$GNINS <BCC    GETEOF>
                                        .IF LT SVCINS
                                        BCC     GETEOF
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
   002740  103011                               BCC     GETEOF
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        BCC     GETEOF
                                                        .NLIST
                                        .ENDC
34 002742  010022                               MOV     RO,(R2)+                ; STORE DATA IN BUFFER
35 002744                                       SOB     R3,15$                  ; GET A WHOLE SECTOR
   002744  005303                               DEC     R3
   002746  001373                               BNE     15$
36
37 002750  000761                               BR      10$                     ; SEE IF THE RIGHT BLOCK NOW
38
39 002752  012702  000001               BLKFND: MOV     #1,R2                   ; SHOW SUCCESSFUL RETURN
40 002756                                       POP     <R3,RO>
                                                .IRP X,<R3,RO>
                                                MOV (SP)+,X
                                                .ENDM
   002756  012603                               MOV (SP)+,R3
   002760  012600                               MOV (SP)+,RO
41 002762  000207                               RETURN
```

```

 002764                                 GETEOF:
                                        ::      CMP     R3,#256.                ; MAKE SURE EOF AT FRONT OF BUFFER
                                        ::      BNE     EOFMID                  ; NOT AT FRONT - ERROR
 002764  005002                                 CLR     R2                      ; FLAG END OF FILE
 002766  020165  000026                         CMP     R1,C.FBLK(R5)           ; EOF BLK = REQ BLK?
 002772  001401                                 BEQ     10$                     ; YES - ALL OK
 002774  005302                                 DEC     R2                      ; NO  - FLAG ERROR
 002776                                 10$:
 002776  012765  177777  000026                 MOV     #-1,C.FBLK(R5)          ; FLAG FILE CLOSED
 003004                                         CLOSE                           ; CLOSE FILE
                                        .MCALL  M$SVC
 003004                                 M$SVC   C$CLOS
                                        .MCALL  M$GNINS,M$TSTLAB
 003004                                 M$TSTLAB
                                        .MCALL  M$TLABEL,M$INCR
                                        .IIF LT T$TSTMAC, .MEXIT
                                        .RADIX  10
                                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                        .RADIX  8
                                        M$INCR  T$TSTSEQ
 003004                                 M$GNINS <TRAP   C$CLOS>
                                        .IF LT SVCINS
                                        TRAP    C$CLOS
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
 003004  104435                                 TRAP    C$CLOS
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                                TRAP    C$CLOS
                                                        .NLIST
                                        .ENDC
 003006                                         POP     <R3,R0>
                                                .IRP X,<R3,R0>
                                                MOV (SP)+,X
                                                .ENDM
 003006  012603                                 MOV (SP)+,R3
 003010  012600                                 MOV (SP)+,R0
 003012  000207                                 RETURN

                                        ;;EOFMID:       ERRHRD  6,MIDERR                ; LOG HARD ERROR
                                        ::      POP     <R3,R0>
                                        ::      TST     (SP)+                   ; CLEAR RETURN
                                        ::      JMP     RSPDRP                  ; DROP CURRENT UDA

 003014     105     116     104         MIDERR: .ASCIZ  \END OF FILE ENCOUNTERED IN MIDDLE OF SECTOR ON FCT DLL FILE\
```

```
003110                          GETDMR:
003110  012700  000005                  MOV     #OP.RCV,R0              ;BUILD A RECEIVE DATA COMMAND PACKET
003114  004737  002520                  CALL    BLDCMD
003120  012700  000212                  MOV     #HC.BF2,R0              ;POINT TO BUFFER IN PACKET
003124  004737  002614                  CALL    CLRBUF                  ; AND CLEAR BUFFER
003130  004737  012010                  CALL    SNDCMD
003134  052765  000020  000014          BIS     #CT.REQ,C.FLG(R5)       ;SET RESPONSE FLAG
003142  000207                          RETURN
```

```
                                ;HCOMM
                                ;
                                ;ALLOCATES MEMORY FOR HOST COMM AREA AND PACKET BUFFERS WITH ONE
                                ;DESCRIPTOR IN EACH RING. TO BE CALLED AFTER INITIALIZING
                                ;A CONTROLLER TABLE.
                                ;
                                ;INPUTS:
                                ;       R5 - ADDRESS OF CONTROLLER TABLE
                                ;OUTPUTS:
                                ;       CONTROLLER TABLE POINTING TO HOST COMM AREA
                                ;       RING POINTERS TO PACKETS
                                ;       R4 - ADDRESS OF RING BUFFER

003144  012701  000126          HCOMM:  MOV     #HC.SIZ/2,R1            ;GET SIZE OF AREA TO ALLOCATE
003150  004737  002474                  CALL    ALOCM                   ;ALLOCATE THE MEMORY
003154  010104                          MOV     R1,R4                   ;GET ADDRESS OF HOST COMM AREA
003156  062704  000010                  ADD     #HC.RESZ,R4             ;POINT TO RING BUFFER
003162  010465  000010                  MOV     R4,C.RING(R5)           ;PLACE IN CONTROLLER TABLE
003166  000207                          RETURN
```

```
                                        ;ISCAN
                                        ;
                                        ;TEMPORARY INTERRUPT SERVICE SCANNER.
                                        ;SETS CT.MSG AND CLEARS CT.CMD IF MESSAGE PACKET RECEIVED.
                                        ;
                                        ;INPUTS:
                                        ;       R5 - CONTROLLER TABLE ADDRESS
                                        ;       R4 - HOST COMM AREA ADDRESS

003170  032765  000004  000014  ISCAN:  BIT #CT.CMD,C.FLG(R5)           ;LOOK AT CT.CMD BIT
003176  001412                          BEQ ISCANX                      ;EXIT IF CLEAR
003200  032764  100000  000002          BIT #RG.OWN,HC.MCT(R4)          ;LOOK AT OWN BIT
003206  001006                          BNE ISCANX                      ;EXIT IF STILL SET
003210  042765  000004  000014          BIC #CT.CMD,C.FLG(R5)           ;CLEAR CT.CMD
003216  052765  000010  000014          BIS #CT.MSG,C.FLG(R5)           ;SET CT.MSG
003224  000207                  ISCANX: RETURN
```

```
                                        ;LOAD
                                        ;
                                        ;ISSUE DOWNLINE LOAD AND EXECUTE COMMAND TO UDA. CHECK THAT LOAD
                                        ;HAPPENS WITHOUT ERROR.
                                        ;
                                        ;INPUTS:
                                        ;       R5 - CONTROLLER TABLE ADDRESS
                                        ;OUTPUTS:
                                        ;       Z CLEAR IF NO ERROR
                                        ;       Z SET IF ERROR AND ERROR REPORTED

 003226                                 LOAD:   PUSH <R0,R3,R4>
                                                .IRP X,<R0,R3,R4>
                                                MOV X,-(SP)
                                                .ENDM
    003226  010046                              MOV R0,-(SP)
    003230  010346                              MOV R3,-(SP)
    003232  010446                              MOV R4,-(SP)
 003234  012700  000002                         MOV #OP.DLE,R0                  ;GET DOWNLINE LOAD COMMAND
 003240  004737  002520                         CALL BLDCMD                     ;BUILD COMMAND PACKET
 003244  013764  002210  000114                 MOV     DMTRLN,HC.CPK+P.TRLN(R4); SET TRANSFER LENGTH
 003252  013764  002204  000120                 MOV     DMPROG,HC.CPK+P.MAIN(R4); SET HOST ADDRESS OF MAIN PROGRAM
 003260  013764  002206  000134                 MOV     DMOVRL,HC.CPK+P.OVRL(R4); SET HOST ADDRESS OF OVERLAYS
 003266  004737  012010                         CALL SNDCMD                     ;SEND COMMAND TO UDA
 003272  004737  013644                         CALL WAITMS                     ;WAIT FOR MESSAGE RESPONSE
 003276  032764  000037  000026                 BIT #ST.MSK,HC.MPK+P.STS(R4)    ;LOOK FOR ANY ERROR
 003304  001010                                 BNE LOADE1
 003306  042765  000004  000014                 BIC #CT.CMD,C.FLG(R5)           ;CLEAR COMMAND ISSUED
 003314                                         POP <R4,R3,R0>
                                                .IRP X,<R4,R3,R0>
                                                MOV (SP)+,X
                                                .ENDM
    003314  012604                              MOV (SP)+,R4
    003316  012603                              MOV (SP)+,R3
    003320  012600                              MOV (SP)+,R0
 003322  000244                                 CLZ                             ;CLEAR Z TO INDICATE NO ERROR
 003324  000207                                 RETURN
```

```
     1                                      ;UDA FAILED TO DOWNLINE LOAD DM PROGRAM
     2
     3 003326  016537  000004  002074       LOADE1: MOV C.UNIT(R5),L$LUN              ;TELL DRS WHICH UNIT
     4 003334                                       ERRHRD 7,LOADM1
                                            .MCALL  M$ERRINS
       003334                               M$ERRINS        7,LOADM1,,C$ERHRD
                                            .MCALL  M$GNINS,M$WORD,M$TSTLAB
       003334                               M$SVC   C$ERHRD
                                            .MCALL  M$GNINS,M$TSTLAB
       003334                               M$TSTLAB
                                            .MCALL  M$TLABEL,M$INCR
                                            .IIF LT T$TSTMAC, .MEXIT
                                            .RADIX  10
                                            M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                            .RADIX  8
                                            M$INCR  T$TSTSEQ
       003334                               M$GNINS <TRAP   C$ERHRD>
                                            .IF LT SVCINS
                                            TRAP    C$ERHRD
                                            .MEXIT
                                            .ENDC
                                            .IF EQ SVCINS
       003334  104456                               TRAP    C$ERHRD
                                            .MEXIT
                                            .ENDC
                                            .IF GT SVCINS
                                            .LIST
                                                                                                  TRAP    C$ERHRD
                                                            .NLIST
                                            .ENDC
               000012                       .RADIX  10
                                            .IF NB  7
               000007                       T$ERRNUM=7
                                            .IFF
                                            .ERROR  ;MISSING ERROR-NR
                                            .ENDC
       003336                               M$WORD  \T$ERRNUM
                                            .MCALL  M$GNINS
                                            .IRP    N,<7>
                                            M$GNINS <.WORD  N>
                                            .ENDM
       003336                               M$GNINS <.WORD  7>
                                            .IF LT SVCINS
                                            .WORD   7
                                            .MEXIT
                                            .ENDC
                                            .IF EQ SVCINS
       003336  000007                               .WORD   7
                                            .MEXIT
                                            .ENDC
                                            .IF GT SVCINS
                                            .LIST
                                                                                                  .WORD   7
                                                            .NLIST
                                            .ENDC
               000010                       .RADIX  8
                                            .IF NB LOADM1
```

```
  003340                        M$WORD  LOADM1
                                .MCALL  M$GNINS
                                .IRP    N,<LOADM1>
                                M$GNINS <.WORD  N>
                                .ENDM
  003340                        M$GNINS <.WORD  LOADM1>
                                .IF LT SVCINS
                                .WORD   LOADM1
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
  003340  003356                        .WORD   LOADM1
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                              .WORD   LOADM1
                                                .NLIST
                                .ENDC
                                .IFF
                                M$WORD  0
                                .ENDC
                                .IF NB
                                M$WORD
                                .IFF
  003342                        M$WORD  0
                                .MCALL  M$GNINS
                                .IRP    N,<0>
                                M$GNINS <.WORD  N>
                                .ENDM
  003342                        M$GNINS <.WORD  0>
                                .IF LT SVCINS
                                .WORD   0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
  003342  000000                        .WORD   0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                              .WORD   0
                                                .NLIST
                                .ENDC
                                .ENDC
  003344                                POP     <R4,R3,R0>
                                        .IRP X,<R4,R3,R0>
                                        MOV (SP)+,X
                                        .ENDM
  003344  012604                        MOV (SP)+,R4
  003346  012603                        MOV (SP)+,R3
  003350  012600                        MOV (SP)+,R0
  003352  000264                        SEZ                     ;SET Z TO INDICATE ERROR OCCURRED
  003354  000207                        RETURN

  003356     125     104     101  LOADM1: .ASCIZ\UDA RETURNED ERROR TO DOWNLINE LOAD & EXECUTE COMMAND\
                                        .EVEN
```

```
                                    ;LOADDM
                                    ;
                                    ;LOAD A DM PROGRAM INTO A CONTROLLER
                                    ;
                                    ;INPUTS:
                                    ;       R5 - CONTROLLER TABLE ADDRESS
                                    ;IMPLICIT INPUTS:
                                    ;       DMPROG - POINTER TO START OF DM PROGRAM IN MEMORY
                                    ;
                                    ;OUTPUTS:
                                    ;       IF LOAD SUCCEEDS - Z CLEAR
                                    ;                   CONTROLLER TABLE MARKED LOADED
                                    ;       IF ERROR - Z SET

003444  004737  012110              LOADDM: CALL    UDAINT                  ; RING BUFFER AND INTERRUPTS DISABLED
003450  001406                              BEQ     LOADER                  ;BRANCH IF AN ERROR
003452  004737  003226                      CALL    LOAD                    ;LOAD INTO UDA
003456  001403                              BEQ     LOADER                  ;GET OUT IF LOAD ERROR
003460  052765  000001  000014      LOADEX: BIS     #CT.LD,C.FLG(R5)        ;SET DM LOADED IN CONTROLLER TABLE
003466  000207                      LOADER: RETURN
```

```
     1 003470                          OPENLF: OPEN #FNAME                       ;OPEN FILE TO READ
                                       .MCALL  M$LDRO,M$SVC
       003470                          M$LDRO  #FNAME,OPEN
                                       .MCALL  M$GNINS
                                       .IF NB #FNAME
                                       .IF DIF RO,#FNAME
       003470                          M$GNINS <MOV     #FNAME,RO>
                                       .IF LT SVCINS
                                       MOV      #FNAME,RO
                                       .MEXIT
                                       .ENDC
                                       .IF EQ SVCINS
       003470  012700  004422                   MOV     #FNAME,RO
                                       .MEXIT
                                       .ENDC
                                       .IF GT SVCINS
                                       .LIST
                                                                                          MOV      #FNAME,RO
                                                .NLIST
                                       .ENDC
                                       .ENDC
                                       .IFF
                                       .ERROR  ;MISSING ARG. ON ''OPEN''
                                       .ENDC
       003474                          M$SVC    C$OPEN
                                       .MCALL  M$GNINS,M$TSTLAB
       003474                          M$TSTLAB
                                       .MCALL  M$TLABEL,M$INCR
                                       .IIF LT T$TSTMAC, .MEXIT
                                       .RADIX  10
                                       M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                       .RADIX  8
                                       M$INCR  T$TSTSEQ
       003474                          M$GNINS <TRAP    C$OPEN>
                                       .IF LT SVCINS
                                       TRAP     C$OPEN
                                       .MEXIT
                                       .ENDC
                                       .IF EQ SVCINS
       003474  104434                           TRAP    C$OPEN
                                       .MEXIT
                                       .ENDC
                                       .IF GT SVCINS
                                       .LIST
                                                                                          TRAP     C$OPEN
                                                .NLIST
                                       .ENDC
     2 003476  000207                           RETURN
```

```
    1 003500                       RDREC:  GETBYTE R0                             ;GET A BYTE
                                   .MCALL  M$SVC,M$RBR0
      003500                       M$SVC   C$GETB
                                   .MCALL  M$GNINS,M$TSTLAB
      003500                       M$TSTLAB
                                   .MCALL  M$TLABEL,M$INCR
                                   .IIF LT T$TSTMAC, .MEXIT
                                   .RADIX  10
                                   M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                   .RADIX  8
                                   M$INCR  T$TSTSEQ
      003500                       M$GNINS <TRAP   C$GETB>
                                   .IF LT SVCINS
                                   TRAP    C$GETB
                                   .MEXIT
                                   .ENDC
                                   .IF EQ SVCINS
      003500  104426                       TRAP    C$GETB
                                   .MEXIT
                                   .ENDC
                                   .IF GT SVCINS
                                   .LIST
                                                                                                   TRAP    C$GETB
                                                   .NLIST
                                   .ENDC
      003502                       M$RBR0  R0,GETBYTE
                                   .MCALL  M$GNINS
                                   .IF NB  R0
                                   .IF DIF R0,R0
                                   M$GNINS <MOVB   R0,R0>
                                   .ENDC
                                   .IFF
                                   .ERROR  ;MISSING ARG. ON ''GETBYTE''
                                   .ENDC
    2 003502  005700                       TST     R0                             ;IF ZERO
    3 003504  001775                       BEQ     RDREC                          ; KEEP READING
    4 003506  005300                       DEC     R0                             ;WHEN NOT ZERO
    5 003510  001067                       BNE     RWRDE1                         ; IT BETTER BE A ONE
    6 003512                               GETBYTE R0                             ; AND THE NEXT BYTE
                                   .MCALL  M$SVC,M$RBR0
      003512                       M$SVC   C$GETB
                                   .MCALL  M$GNINS,M$TSTLAB
      003512                       M$TSTLAB
                                   .MCALL  M$TLABEL,M$INCR
                                   .IIF LT T$TSTMAC, .MEXIT
                                   .RADIX  10
                                   M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                   .RADIX  8
                                   M$INCR  T$TSTSEQ
      003512                       M$GNINS <TRAP   C$GETB>
                                   .IF LT SVCINS
                                   TRAP    C$GETB
                                   .MEXIT
                                   .ENDC
                                   .IF EQ SVCINS
      003512  104426                       TRAP    C$GETB
                                   .MEXIT
```

```
                                 .ENDC
                                 .IF GT SVCINS
                                 .LIST
                                                                                  TRAP    C$GETB
                                                      .NLIST
                                 .ENDC
  003514                         M$RBRO  R0,GETBYTE
                                 .MCALL  M$GNINS
                                 .IF NB  R0
                                 .IF DIF R0,R0
                                 M$GNINS <MOVB   R0,R0>
                                 .ENDC
                                 .IFF
                                 .ERROR  ;MISSING ARG. ON ''GETBYTE''
                                 .ENDC
  003514  005700                         TST     R0                    ; SHOULD BE A ZERO
  003516  001064                         BNE     RWRDE1
  003520  012704  000001                 MOV     #1,R4                 ;SET INITIAL CHECKSUM TO INCLUDE THE ONE READ
  003524  004737  003646                 CALL    FWORD                 ;READ BYTE COUNT
  003530  013703  004436                 MOV     FDATA,R3              ;SAVE IN R3
  003534  004737  003646                 CALL    FWORD                 ;READ LOAD ADDRESS
  003540  162703  000006                 SUB     #6,R3                 ;SUBTRACT BYTES ALREADY READ FROM BYTE COUNT
  003544  001431                         BEQ     RWORDT                ;IF RESULT IS ZERO, THIS IS A
                                                                       ;TRANSFER BLOCK
  003546  013705  004436                 MOV     FDATA,R5              ; LOAD ADDRESS
  003552  010502                         MOV     R5,R2
  003554  163702  002212                 SUB     RDLOW,R2              ; COMPUTE OFFSET
  003560  063702  002216                 ADD     RD.AT,R2              ; REAL LOAD ADDRESS

  003564  020537  002212         1$:     CMP     R5,RDLOW              ; CHECK BOUNDS
  003570  103447                         BLO     RDERR1
  003572  020537  002214                 CMP     R5,RDHIGH
  003576  101044                         BHI     RDERR1

  003600                                 GETBYTE R0                    ; GET NEXT DATA BYTE
                                 .MCALL  M$SVC,M$RBRO
  003600                         M$SVC   C$GETB
                                 .MCALL  M$GNINS,M$TSTLAB
  003600                         M$TSTLAB
                                 .MCALL  M$TLABEL,M$INCR
                                 .IIF LT T$TSTMAC, .MEXIT
                                 .RADIX  10
                                 M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                 .RADIX  8
                                 M$INCR  T$TSTSEQ
  003600                         M$GNINS <TRAP   C$GETB>
                                 .IF LT SVCINS
                                 TRAP    C$GETB
                                 .MEXIT
                                 .ENDC
                                 .IF EQ SVCINS
  003600  104426                         TRAP    C$GETB
                                 .MEXIT
                                 .ENDC
                                 .IF GT SVCINS
                                 .LIST
                                                                                  TRAP    C$GETB
```

```
                                                    .NLIST
                                    .ENDC
   003602                           M$RBRO   R0,GETBYTE
                                    .MCALL   M$GNINS
                                    .IF NB   R0
                                    .IF DIF  R0,R0
                                    M$GNINS <MOVB    R0,R0>
                                    .ENDC
                                    .IFF
                                    .ERROR   ;MISSING ARG. ON ''GETBYTE''
                                    .ENDC
   003602  060004                            ADD      R0,R4                         ; UPDATE CHECKSUM
   003604  110022                            MOVB     R0,(R2)+                      ; STORE IN REAL MEMORY
   003606  105725                            TSTB     (R5)+                         ; BUMP FAKE MEM ADDR

   003610                                    SOB      R3,1$                         ; PROCESS REMAINDER OF RECORD
   003610  005303                            DEC      R3
   003612  001364                            BNE      1$

   003614                                    GETBYTE R0                             ;GET CHECKSUM BYTE
                                    .MCALL   M$SVC,M$RBRO
   003614                           M$SVC    C$GETB
                                    .MCALL   M$GNINS,M$TSTLAB
   003614                           M$TSTLAB
                                    .MCALL   M$TLABEL,M$INCR
                                    .IIF LT  T$TSTMAC, .MEXIT
                                    .RADIX   10
                                    M$TLABEL         \T$TESTNUN,\T$TSTSEQ
                                    .RADIX   8
                                    M$INCR   T$TSTSEQ
   003614                           M$GNINS <TRAP    C$GETB>
                                    .IF LT SVCINS
                                    TRAP     C$GETB
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
   003614  104426                            TRAP     C$GETB
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                                         TRAP     C$GETB
                                                    .NLIST
                                    .ENDC
   003616                           M$RBRO   R0,GETBYTE
                                    .MCALL   M$GNINS
                                    .IF NB   R0
                                    .IF DIF  R0,R0
                                    M$GNINS <MOVB    R0,R0>
                                    .ENDC
                                    .IFF
                                    .ERROR   ;MISSING ARG. ON ''GETBYTE''
                                    .ENDC
   003616  060004                            ADD      R0,R4                         ;ADD TO COMPUTED CHECKSUM
   003620  105704                            TSTB     R4                            ;CHECK LOW BYTE OF SUM
   003622  001026                            BNE      RWRDE3                        ;BRANCH IF CHECKSUM ERROR
   003624  000264                            SEZ                                    ;RETURN WITH Z SET TO INDICATE
```

```
   003626  000207                  RETURN                                  ;  RECORD OK

   003630                  RWORDT: GETBYTE R0                              ;READ CHECKSUM BYTE
                           .MCALL  M$SVC,M$RBRO
   003630                  M$SVC   C$GETB
                           .MCALL  M$GNINS,M$TSTLAB
   003630                  M$TSTLAB
                           .MCALL  M$TLABEL,M$INCR
                           .IIF LT T$TSTMAC, .MEXIT
                           .RADIX  10
                           M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                           .RADIX  8
                           M$INCR  T$TSTSEQ
   003630                  M$GNINS <TRAP   C$GETB>
                           .IF LT SVCINS
                           TRAP    C$GETB
                           .MEXIT
                           .ENDC
                           .IF EQ SVCINS
   003630  104426                  TRAP    C$GETB
                           .MEXIT
                           .ENDC
                           .IF GT SVCINS
                           .LIST
                                                                                    TRAP    C$GETB
                                           .NLIST
                           .ENDC
   003632                  M$RBRO  R0,GETBYTE
                           .MCALL  M$GNINS
                           .IF NB  R0
                           .IF DIF R0,R0
                           M$GNINS <MOVB   R0,R0>
                           .ENDC
                           .IFF
                           .ERROR  ;MISSING ARG. ON ''GETBYTE''
                           .ENDC
   003632  060004                  ADD     R0,R4                           ;ADD TO COMPUTED CHECKSUM
   003634  105704                  TSTB    R4                              ;CHECK LOW BYTE OF SUM
   003636  001020                  BNE     RWRDE3                          ;BRANCH IF CHECKSUM ERROR
   003640                          CLOSE                                   ;CLOSE FILE
                           .MCALL  M$SVC
   003640                  M$SVC   C$CLOS
                           .MCALL  M$GNINS,M$TSTLAB
   003640                  M$TSTLAB
                           .MCALL  M$TLABEL,M$INCR
                           .IIF LT T$TSTMAC, .MEXIT
                           .RADIX  10
                           M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                           .RADIX  8
                           M$INCR  T$TSTSEQ
   003640                  M$GNINS <TRAP   C$CLOS>
                           .IF LT SVCINS
                           TRAP    C$CLOS
                           .MEXIT
                           .ENDC
                           .IF EQ SVCINS
   003640  104435                  TRAP    C$CLOS
```

```
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                    TRAP    C$CLOS
                                                .NLIST
                                .ENDC
     45 003642  000244                  CLZ                             ;RETURN WITH Z CLEAR TO INDICATE
     46 003644  000207                  RETURN                          ;  NO MORE WORDS
     47
     48 003646                  FWORD:  GETBYTE R0                      ;READ A BYTE FROM FILE
                                .MCALL  M$SVC,M$RBRO
        003646                  M$SVC   C$GETB
                                .MCALL  M$GNINS,M$TSTLAB
        003646                  M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
        003646                  M$GNINS <TRAP   C$GETB>
                                .IF LT SVCINS
                                TRAP    C$GETB
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
        003646  104426                  TRAP    C$GETB
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                    TRAP    C$GETB
                                                .NLIST
                                .ENDC
        003650                  M$RBRO  R0,GETBYTE
                                .MCALL  M$GNINS
                                .IF NB  R0
                                .IF DIF R0,R0
                                M$GNINS <MOVB   R0,R0>
                                .ENDC
                                .IFF
                                .ERROR  ;MISSING ARG. ON ''GETBYTE''
                                .ENDC
     49 003650  060004                  ADD     R0,R4                   ;UPDATE CHECKSUM ERROR
     50 003652  110037  004436          MOVB    R0,FDATA                ;START TO BUILD WORD
     51 003656                          GETBYTE R0                      ;READ ANOTHER BYTE FROM FILE
                                .MCALL  M$SVC,M$RBRO
        003656                  M$SVC   C$GETB
                                .MCALL  M$GNINS,M$TSTLAB
        003656                  M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
```

```
        003656                              M$GNINS <TRAP     C$GETB>
                                            .IF LT SVCINS
                                            TRAP     C$GETB
                                            .MEXIT
                                            .ENDC
                                            .IF EQ SVCINS
        003656  104426                              TRAP     C$GETB
                                            .MEXIT
                                            .ENDC
                                            .IF GT SVCINS
                                            .LIST
                                                                                         TRAP     C$GETB
                                                             .NLIST
                                            .ENDC
        003660                              M$RBRO  RO,GETBYTE
                                            .MCALL  M$GNINS
                                            .IF NB  RO
                                            .IF DIF RO,RO
                                            M$GNINS <MOVB     RO,RO>
                                            .ENDC
                                            .IFF
                                            .ERROR  ;MISSING ARG. ON ''GETBYTE''
                                            .ENDC
     52 003660  060004                              ADD      RO,R4                     ;UPDATE CHECKSUM
     53 003662  110037  004437                      MOVB     RO,FDATA+1                ;COMPLETE WORD
     54 003666  000207                              RETURN
```

```
      1 003670                     RWRDE1: ERRSF 30001,RWRDEM,RWRDM1        ;START FRAME NOT FOUND
                                   .MCALL  M$ERRINS
        003670                     M$ERRINS        30001,RWRDEM,RWRDM1,C$ERSF
                                   .MCALL  M$GNINS,M$WORD,M$TSTLAB
        003670                     M$SVC   C$ERSF
                                   .MCALL  M$GNINS,M$TSTLAB
        003670                     M$TSTLAB
                                   .MCALL  M$TLABEL,M$INCR
                                   .IIF LT T$TSTMAC, .MEXIT
                                   .RADIX  10
                                   M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                   .RADIX  8
                                   M$INCR  T$TSTSEQ
        003670                     M$GNINS <TRAP    C$ERSF>
                                   .IF LT SVCINS
                                   TRAP    C$ERSF
                                   .MEXIT
                                   .ENDC
                                   .IF EQ SVCINS
        003670  104454                     TRAP    C$ERSF
                                   .MEXIT
                                   .ENDC
                                   .IF GT SVCINS
                                   .LIST
                                                                                  TRAP    C$ERSF
                                           .NLIST
                                   .ENDC
                000012             .RADIX  10
                                   .IF NB  30001
                072461             T$ERRNUM=30001
                                   .IFF
                                   .ERROR  ;MISSING ERROR-NR
                                   .ENDC
        003672                     M$WORD  \T$ERRNUM
                                   .MCALL  M$GNINS
                                   .IRP    N,<30001>
                                   M$GNINS <.WORD  N>
                                   .ENDM
        003672                     M$GNINS <.WORD  30001>
                                   .IF LT SVCINS
                                   .WORD   30001
                                   .MEXIT
                                   .ENDC
                                   .IF EQ SVCINS
        003672  072461                     .WORD   30001
                                   .MEXIT
                                   .ENDC
                                   .IF GT SVCINS
                                   .LIST
                                                                                  .WORD   30001
                                           .NLIST
                                   .ENDC
                000010             .RADIX  8
                                   .IF NB RWRDEM
        003674                     M$WORD  RWRDEM
                                   .MCALL  M$GNINS
                                   .IRP    N,<RWRDEM>
```

```
                                M$GNINS <.WORD  N>
                                .ENDM
   003674                       M$GNINS <.WORD  RWRDEM>
                                .IF LT SVCINS
                                .WORD   RWRDEM
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
   003674  004112                       .WORD   RWRDEM
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                            .WORD   RWRDEM
                                          .NLIST
                                .ENDC
                                .IFF
                                M$WORD  0
                                .ENDC
                                .IF NB RWRDM1
   003676                       M$WORD  RWRDM1
                                .MCALL  M$GNINS
                                .IRP    N,<RWRDM1>
                                M$GNINS <.WORD  N>
                                .ENDM
   003676                       M$GNINS <.WORD  RWRDM1>
                                .IF LT SVCINS
                                .WORD   RWRDM1
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
   003676  003720                       .WORD   RWRDM1
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                            .WORD   RWRDM1
                                          .NLIST
                                .ENDC
                                .IFF
                                M$WORD  0
                                .ENDC
 2 003700                       RWRDE3: ERRSF 30003,RWRDEM,RWRDM3        ;CHECKSUM ERROR
                                .MCALL  M$ERRINS
   003700                       M$ERRINS        30003,RWRDEM,RWRDM3,C$ERSF
                                .MCALL  M$GNINS,M$WORD,M$TSTLAB
   003700                       M$SVC   C$ERSF
                                .MCALL  M$GNINS,M$TSTLAB
   003700                       M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
   003700                       M$GNINS <TRAP   C$ERSF>
                                .IF LT SVCINS
```

```
                                        TRAP    C$ERSF
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      003700  104454                            TRAP    C$ERSF
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                                   TRAP    C$ERSF
                                                        .NLIST
                                        .ENDC
              000012                    .RADIX  10
                                        .IF NB  30003
              072463                    T$ERRNUM=30003
                                        .IFF
                                        .ERROR  ;MISSING ERROR-NR
                                        .ENDC
      003702                            M$WORD  \T$ERRNUM
                                        .MCALL  M$GNINS
                                        .IRP    N,<30003>
                                        M$GNINS <.WORD  N>
                                        .ENDM
      003702                            M$GNINS <.WORD  30003>
                                        .IF LT SVCINS
                                        .WORD   30003
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      003702  072463                            .WORD   30003
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                                   .WORD   30003
                                                        .NLIST
                                        .ENDC
              000010                    .RADIX  8
                                        .IF NB RWRDEM
      003704                            M$WORD  RWRDEM
                                        .MCALL  M$GNINS
                                        .IRP    N,<RWRDEM>
                                        M$GNINS <.WORD  N>
                                        .ENDM
      003704                            M$GNINS <.WORD  RWRDEM>
                                        .IF LT SVCINS
                                        .WORD   RWRDEM
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      003704  004112                            .WORD   RWRDEM
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                                   .WORD   RWRDEM
                                                        .NLIST
```

```
                                  .ENDC
                                  .IFF
                                  M$WORD  0
                                  .ENDC
                                  .IF NB RWRDM3
     003706                       M$WORD  RWRDM3
                                  .MCALL  M$GNINS
                                  .IRP    N,<RWRDM3>
                                  M$GNINS <.WORD  N>
                                  .ENDM
     003706                       M$GNINS <.WORD  RWRDM3>
                                  .IF LT SVCINS
                                  .WORD   RWRDM3
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
     003706  004044                       .WORD   RWRDM3
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                              .WORD   RWRDM3
                                              .NLIST
                                  .ENDC
                                  .IFF
                                  M$WORD  0
                                  .ENDC
   3 003710                       RDERR1: ERRSF 30002,RWRDEM,RWRDM2
                                  .MCALL  M$ERRINS
     003710                       M$ERRINS        30002,RWRDEM,RWRDM2,C$ERSF
                                  .MCALL  M$GNINS,M$WORD,M$TSTLAB
     003710                       M$SVC   C$ERSF
                                  .MCALL  M$GNINS,M$TSTLAB
     003710                       M$TSTLAB
                                  .MCALL  M$TLABEL,M$INCR
                                  .IIF LT T$TSTMAC, .MEXIT
                                  .RADIX  10
                                  M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                  .RADIX  8
                                  M$INCR  T$TSTSEQ
     003710                       M$GNINS <TRAP   C$ERSF>
                                  .IF LT SVCINS
                                  TRAP    C$ERSF
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
     003710  104454                       TRAP    C$ERSF
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                              TRAP    C$ERSF
                                              .NLIST
                                  .ENDC
             000012               .RADIX  10
                                  .IF NB  30002
             072462               T$ERRNUM=30002
```

```
                        .IFF
                        .ERROR  ;MISSING ERROR-NR
                        .ENDC
003712                  M$WORD  \T$ERRNUM
                        .MCALL  M$GNINS
                        .IRP    N,<30002>
                        M$GNINS <.WORD  N>
                        .ENDM
003712                  M$GNINS <.WORD  30002>
                        .IF LT SVCINS
                        .WORD   30002
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
003712  072462                  .WORD   30002
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                        .WORD   30002
                                .NLIST
                        .ENDC
        000010          .RADIX  8
                        .IF NB RWRDEM
003714                  M$WORD  RWRDEM
                        .MCALL  M$GNINS
                        .IRP    N,<RWRDEM>
                        M$GNINS <.WORD  N>
                        .ENDM
003714                  M$GNINS <.WORD  RWRDEM>
                        .IF LT SVCINS
                        .WORD   RWRDEM
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
003714  004112                  .WORD   RWRDEM
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                        .WORD   RWRDEM
                                .NLIST
                        .ENDC
                        .IFF
                        M$WORD  0
                        .ENDC
                        .IF NB RWRDM2
003716                  M$WORD  RWRDM2
                        .MCALL  M$GNINS
                        .IRP    N,<RWRDM2>
                        M$GNINS <.WORD  N>
                        .ENDM
003716                  M$GNINS <.WORD  RWRDM2>
                        .IF LT SVCINS
                        .WORD   RWRDM2
                        .MEXIT
                        .ENDC
```

```
                                .IF EQ SVCINS
     003716  003766                     .WORD   RWRDM2
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                        .WORD   RWRDM2
                                            .NLIST
                                .ENDC
                                .IFF
                                M$WORD  0
                                .ENDC
   4
   5 003720                             BGNMSG RWRDM1
                                .MCALL  M$PUSH,M$INCR,M$GNGBL
             000040             I$MSG=F$BGN
     003720                     M$PUSH  T$NS,T$NESTLEV,F$MSG
                                .MCALL  M$INCR,M$SETS
     003720                     M$INCR  T$NESTLEV
             000001             T$NESTLEV=T$NESTLEV+1
     003720                     M$SETS  T$NS,\T$NESTLEV,F$MSG
             000011             T$NS1=F$MSG
             010003             T$$MSG=T$TAGNUM
     003720                     M$INCR T$TAGNUM
             010004             T$TAGNUM=T$TAGNUM+1
     003720                     M$GNGBL RWRDM1
                                .MCALL  M$GEN
                                .IF NB,RWRDM1
                                .IF NB,
                                M$GEN   RWRDM1,:,SVCGBL,
                                .ENDC
                                .IF B,
     003720                     M$GEN   RWRDM1,:,SVCGBL,< >
                                .IF LE  SVCGBL
     003720                     RWRDM1::
                                .MEXIT
                                .ENDC
                                .LIST
                                                                                   RWRDM1::
                                        .NLIST
                                .ENDC
                                .ENDC
   6 003720                             PRINTB #RWRDF1,#FNAME
                                .MCALL  M$PRINT
                                .IF B   #RWRDF1
                                .ERROR  ;MISSING FORMAT
                                .MEXIT
                                .ENDC
                                .IF B   <#FNAME>
                                M$PRINT C$PNTB,#RWRDF1
                                .MEXIT
                                .ENDC
                                .IF B   <>
     003720                     M$PRINT C$PNTB,#RWRDF1,<#FNAME>
                                .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
             000001             T$ARGCNT=1
     003720                     M$COUNT T$ARGCNT,<#FNAME>,<>,<>,<>,<>,<>,<>,<>
```

```
                                .IF NB <>
                                M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB <#FNAME>
        000002                  T$ARGCNT=T$ARGCNT+1
                                .ENDC
                                .IRP    N,<\T$ARGCNT>
                                M$PUT   #N,#RWRDF1,<#FNAME>,<>,<>,<>,<>,<>,<>,<>
                                .ENDM
  003720                        M$PUT   #2,#RWRDF1,<#FNAME>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <#RWRDF1>
  003720                        M$PUT   <#RWRDF1>,<#FNAME>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <#FNAME>
  003720                        M$PUT   <#FNAME>,<>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <>
                                M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB  <#FNAME>
  003720                        M$PUT1  #FNAME
                                .MCALL  M$GNINS
                                .IF B
  003720                        M$GNINS <MOV    #FNAME,-(SP)>
                                .IF LT SVCINS
                                MOV     #FNAME,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
  003720  012746  004422                MOV     #FNAME,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                  MOV     #FNAME,-(SP)
                                                .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#FNAME>
                                .ERROR  ;ILL. ARG. ''#FNAME'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#RWRDF1>
  003724                        M$PUT1  #RWRDF1
                                .MCALL  M$GNINS
                                .IF B
  003724                        M$GNINS <MOV    #RWRDF1,-(SP)>
                                .IF LT SVCINS
                                MOV     #RWRDF1,-(SP)
                                .MEXIT
                                .ENDC
```

```
                                  .IF EQ SVCINS
003724  012746  004172                    MOV     #RWRDF1,-(SP)
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                                  MOV     #RWRDF1,-(SP)
                                            .NLIST
                                  .ENDC
                                  .IFF
                                  .IF DIF B,<#RWRDF1>
                                  .ERROR  ;ILL. ARG. ''#RWRDF1'' ONLY 'B'' IS ALLOWED.
                                  .MEXIT
                                  .ENDC
                                  M$GNINS <CLR     -(SP)>
                                  M$GNINS <BISB    ,(SP)>
                                  .ENDC
                                  .ENDC
                                  .ENDC
                                  .IF NB  <#2>
003730                            M$PUT1  #2
                                  .MCALL  M$GNINS
                                  .IF B
003730                            M$GNINS <MOV     #2,-(SP)>
                                  .IF LT SVCINS
                                  MOV     #2,-(SP)
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
003730  012746  000002                    MOV     #2,-(SP)
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                                  MOV     #2,-(SP)
                                            .NLIST
                                  .ENDC
                                  .IFF
                                  .IF DIF B,<#2>
                                  .ERROR  ;ILL. ARG. ''#2'' ONLY 'B'' IS ALLOWED.
                                  .MEXIT
                                  .ENDC
                                  M$GNINS <CLR     -(SP)>
                                  M$GNINS <BISB    ,(SP)>
                                  .ENDC
                                  .ENDC
003734                            M$GNINS <MOV     SP,R0>
                                  .IF LT SVCINS
                                  MOV     SP,R0
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
003734  010600                            MOV     SP,R0
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
```

```
                                                                                MOV     SP,R0
                                                    .NLIST
                                        .ENDC
      003736                            M$SVC   C$PNTB
                                        .MCALL  M$GNINS,M$TSTLAB
      003736                            M$TSTLAB
                                        .MCALL  M$TLABEL,M$INCR
                                        .IIF LT T$TSTMAC, .MEXIT
                                        .RADIX  10
                                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                        .RADIX  8
                                        M$INCR  T$TSTSEQ
      003736                            M$GNINS <TRAP   C$PNTB>
                                        .IF LT SVCINS
                                        TRAP    C$PNTB
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      003736  104414                            TRAP    C$PNTB
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                TRAP    C$PNTB
                                                    .NLIST
                                        .ENDC
                                        .IRP    N,<\T$ARGCNT*2+2>
                                        M$GNINS <ADD    #N,SP>
                                        .ENDM
      003740                            M$GNINS <ADD    #6,SP>
                                        .IF LT SVCINS
                                        ADD     #6,SP
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      003740  062706  000006                    ADD     #6,SP
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                ADD     #6,SP
                                                    .NLIST
                                        .ENDC
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
```

```
                                            .IF B    <>
                                            M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>,<>,<>,<>
                                            .MEXIT
                                            .ENDC
                                            .IF B    <>
                                            M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>,<>,<>,<>,<>
                                            .MEXIT
                                            .ENDC
                                            .IF B    <>
                                            M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>,<>,<>,<>,<>,<>
                                            .MEXIT
                                            .ENDC
                                            M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>,<>,<>,<>,<>,<>,<>
  7 003744                                          PRINTB #RWRDF2
                                            .MCALL  M$PRINT
                                            .IF B   #RWRDF2
                                            .ERROR  ;MISSING FORMAT
                                            .MEXIT
                                            .ENDC
                                            .IF B    <>
    003744                                  M$PRINT C$PNTB,#RWRDF2
                                            .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
           000001                           T$ARGCNT=1
    003744                                  M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                            .IF NB <>
                                            M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                            .ENDC
                                            .IF NB <>
                                            T$ARGCNT=T$ARGCNT+1
                                            .ENDC
                                            .IRP    N,<\T$ARGCNT>
                                            M$PUT   #N,#RWRDF2,<>,<>,<>,<>,<>,<>,<>,<>
                                            .ENDM
    003744                                  M$PUT   #1,#RWRDF2,<>,<>,<>,<>,<>,<>,<>,<>
                                            .MCALL  M$PUT1
                                            .IF NB  <#RWRDF2>
    003744                                  M$PUT   <#RWRDF2>,<>,<>,<>,<>,<>,<>,<>,<>
                                            .MCALL  M$PUT1
                                            .IF NB  <>
                                            M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                            .ENDC
                                            .IF NB  <#RWRDF2>
    003744                                  M$PUT1  #RWRDF2
                                            .MCALL  M$GNINS
                                            .IF B
    003744                                  M$GNINS <MOV     #RWRDF2,-(SP)>
                                            .IF LT SVCINS
                                            MOV     #RWRDF2,-(SP)
                                            .MEXIT
                                            .ENDC
                                            .IF EQ SVCINS
    003744  012746  004230                          MOV     #RWRDF2,-(SP)
                                            .MEXIT
                                            .ENDC
                                            .IF GT SVCINS
                                            .LIST
                                                                                    MOV     #RWRDF2,-(SP)
```

```
                                                .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#RWRDF2>
                                .ERROR  ;ILL. ARG. "#RWRDF2" ONLY 'B' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#1>
003750                          M$PUT1  #1
                                .MCALL  M$GNINS
                                .IF B
003750                          M$GNINS <MOV    #1,-(SP)>
                                .IF LT SVCINS
                                MOV     #1,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
003750  012746  000001                  MOV     #1,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                MOV     #1,-(SP)
                                                .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#1>
                                .ERROR  ;ILL. ARG. "#1" ONLY 'B' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
003754                          M$GNINS <MOV    SP,R0>
                                .IF LT SVCINS
                                MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
003754  010600                          MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                MOV     SP,R0
                                                .NLIST
                                .ENDC
003756                          M$SVC   C$PNTB
                                .MCALL  M$GNINS,M$TSTLAB
003756                          M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
```

```
                                        .IIF LT T$TSTMAC, .MEXIT
                                        .RADIX  10
                                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                        .RADIX  8
                                        M$INCR  T$TSTSEQ
      003756                            M$GNINS <TRAP   C$PNTB>
                                        .IF LT SVCINS
                                        TRAP    C$PNTB
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      003756  104414                            TRAP    C$PNTB
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        TRAP    C$PNTB
                                                        .NLIST
                                        .ENDC
                                        .IRP    N,<\T$ARGCNT*2+2>
                                        M$GNINS <ADD    #N,SP>
                                        .ENDM
      003760                            M$GNINS <ADD    #4,SP>
                                        .IF LT SVCINS
                                        ADD     #4,SP
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      003760  062706  000004                    ADD     #4,SP
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        ADD     #4,SP
                                                        .NLIST
                                        .ENDC
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#RWRDF2,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#RWRDF2,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#RWRDF2,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#RWRDF2,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#RWRDF2,<>,<>,<>,<>,<>
                                        .MEXIT
```

```
                          .ENDC
                          .IF B   <>
                          M$PRINT C$PNTB,#RWRDF2,<>,<>,<>,<>,<>,<>
                          .MEXIT
                          .ENDC
                          .IF B   <>
                          M$PRINT C$PNTB,#RWRDF2,<>,<>,<>,<>,<>,<>,<>
                          .MEXIT
                          .ENDC
                          M$PRINT C$PNTB,#RWRDF2,<>,<>,<>,<>,<>,<>,<>,<>
8 003764                          ENDMSG
                          .MCALL  M$POP,M$GNTAG,M$SVC,M$ENDERR
  003764                  M$POP   T$NS,T$NESTLEV,T$TEMP
                          .MCALL  M$GETS,M$DECR
                          .IF LT  T$NESTLEV
                          .ERROR  T$NESTLEV       ; MACRO T$NS UNDERFLOW
                          .MEXIT
                          .ENDC
  003764                  M$GETS  T$NS,\T$NESTLEV,T$TEMP
          000011          T$TEMP=T$NS1
  003764                  M$DECR  T$NESTLEV
          000000          T$NESTLEV=T$NESTLEV-1
                          .IF EQ F$MSG-T$TEMP
  003764                  M$GNTAG L,T$$MSG
                          .MCALL  M$GEN
  003764                  M$GEN   L,\T$$MSG,SVCTAG
                          .IF LE  SVCTAG
  003764                  L10003:
                          .MEXIT
                          .ENDC
                          .LIST
                                                                        L10003:
                                  .NLIST
          010000          S$LSYM=T$LSYM
  003764                  M$SVC   C$MSG
                          .MCALL  M$GNINS,M$TSTLAB
  003764                  M$TSTLAB
                          .MCALL  M$TLABEL,M$INCR
                          .IIF LT T$TSTMAC, .MEXIT
                          .RADIX  10
                          M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                          .RADIX  8
                          M$INCR  T$TSTSEQ
  003764                  M$GNINS <TRAP   C$MSG>
                          .IF LT SVCINS
                          TRAP    C$MSG
                          .MEXIT
                          .ENDC
                          .IF EQ SVCINS
  003764  104423                  TRAP    C$MSG
                          .MEXIT
                          .ENDC
                          .IF GT SVCINS
                          .LIST
                                                                            TRAP    C$MSG
                                          .NLIST
                          .ENDC
```

```
           000041            I$MSG=F$END
                             .IFF
                             M$ENDERR        ENDMSG,T$TEMP
                             .ENDC

   003766                              BGNMSG RWRDM2
                             .MCALL  M$PUSH,M$INCR,M$GNGBL
           000040            I$MSG=F$BGN
   003766                    M$PUSH  T$NS,T$NESTLEV,F$MSG
                             .MCALL  M$INCR,M$SETS
   003766                    M$INCR  T$NESTLEV
           000001            T$NESTLEV=T$NESTLEV+1
   003766                    M$SETS  T$NS,\T$NESTLEV,F$MSG
           000011            T$NS1=F$MSG
           010004            T$$MSG=T$TAGNUM
   003766                    M$INCR T$TAGNUM
           010005            T$TAGNUM=T$TAGNUM+1
   003766                    M$GNGBL RWRDM2
                             .MCALL  M$GEN
                             .IF NB,RWRDM2
                             .IF NB,
                             M$GEN   RWRDM2,:,SVCGBL,
                             .ENDC
                             .IF B,
   003766                    M$GEN   RWRDM2,:,SVCGBL,< >
                             .IF LE  SVCGBL
   003766                    RWRDM2::
                             .MEXIT
                             .ENDC
                             .LIST
                                                                              RWRDM2::
                                       .NLIST
                             .ENDC
                             .ENDC
   003766                              PRINTB #RWRDF1,#FNAME
                             .MCALL  M$PRINT
                             .IF B   #RWRDF1
                             .ERROR  ;MISSING FORMAT
                             .MEXIT
                             .ENDC
                             .IF B   <#FNAME>
                             M$PRINT C$PNTB,#RWRDF1
                             .MEXIT
                             .ENDC
                             .IF B   <>
   003766                    M$PRINT C$PNTB,#RWRDF1,<#FNAME>
                             .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
           000001            T$ARGCNT=1
   003766                    M$COUNT T$ARGCNT,<#FNAME>,<>,<>,<>,<>,<>,<>,<>
                             .IF NB <>
                             M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                             .ENDC
                             .IF NB <#FNAME>
           000002            T$ARGCNT=T$ARGCNT+1
                             .ENDC
                             .IRP    N,<\T$ARGCNT>
                             M$PUT   #N,#RWRDF1,<#FNAME>,<>,<>,<>,<>,<>,<>,<>
```

```
                                        .ENDM
      003766                            M$PUT   #2,#RWRDF1,<#FNAME>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <#RWRDF1>
      003766                            M$PUT   <#RWRDF1>,<#FNAME>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <#FNAME>
      003766                            M$PUT   <#FNAME>,<>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <>
                                        M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDC
                                        .IF NB  <#FNAME>
      003766                            M$PUT1  #FNAME
                                        .MCALL  M$GNINS
                                        .IF B
      003766                            M$GNINS <MOV    #FNAME,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #FNAME,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      003766  012746  004422                    MOV     #FNAME,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                MOV     #FNAME,-(SP)
                                                    .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#FNAME>
                                        .ERROR  ;ILL. ARG. "#FNAME" ONLY 'B' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR    -(SP)>
                                        M$GNINS <BISB   ,(SP)>
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF NB  <#RWRDF1>
      003772                            M$PUT1  #RWRDF1
                                        .MCALL  M$GNINS
                                        .IF B
      003772                            M$GNINS <MOV    #RWRDF1,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #RWRDF1,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      003772  012746  004172                    MOV     #RWRDF1,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                MOV     #RWRDF1,-(SP)
                                                    .NLIST
```

```
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#RWRDF1>
                                        .ERROR  ;ILL. ARG. "#RWRDF1" ONLY 'B' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR     -(SP)>
                                        M$GNINS <BISB    ,(SP)>
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF NB  <#2>
        003776                          M$PUT1  #2
                                        .MCALL  M$GNINS
                                        .IF B
        003776                          M$GNINS <MOV     #2,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #2,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
        003776  012746  000002                  MOV     #2,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        MOV     #2,-(SP)
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#2>
                                        .ERROR  ;ILL. ARG. "#2" ONLY 'B' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR     -(SP)>
                                        M$GNINS <BISB    ,(SP)>
                                        .ENDC
                                        .ENDC
        004002                          M$GNINS <MOV     SP,R0>
                                        .IF LT SVCINS
                                        MOV     SP,R0
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
        004002  010600                          MOV     SP,R0
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        MOV     SP,R0
                                                        .NLIST
                                        .ENDC
        004004                          M$SVC   C$PNTB
                                        .MCALL  M$GNINS,M$TSTLAB
        004004                          M$TSTLAB
                                        .MCALL  M$TLABEL,M$INCR
                                        .IIF LT T$TSTMAC, .MEXIT
```

```
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
      004004                    M$GNINS <TRAP   C$PNTB>
                                .IF LT SVCINS
                                TRAP    C$PNTB
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
      004004  104414                    TRAP    C$PNTB
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                  TRAP    C$PNTB
                                                .NLIST
                                .ENDC
                                .IRP    N,<\T$ARGCNT*2+2>
                                M$GNINS <ADD    #N,SP>
                                .ENDM
      004006                    M$GNINS <ADD    #6,SP>
                                .IF LT SVCINS
                                ADD     #6,SP
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
      004006  062706  000006            ADD     #6,SP
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                  ADD     #6,SP
                                                .NLIST
                                .ENDC
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
```

```
                                        .IF B   <>
                                        M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>,<>,<>,<>,<>,<>,<>
  12 004012                                     PRINTB #RWRDF3,RDLOW,RDHIGH
                                        .MCALL  M$PRINT
                                        .IF B   #RWRDF3
                                        .ERROR  ;MISSING FORMAT
                                        .MEXIT
                                        .ENDC
                                        .IF B   <RDLOW>
                                        M$PRINT C$PNTB,#RWRDF3
                                        .MEXIT
                                        .ENDC
                                        .IF B   <RDHIGH>
                                        M$PRINT C$PNTB,#RWRDF3,<RDLOW>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
     004012                             M$PRINT C$PNTB,#RWRDF3,<RDLOW>,<RDHIGH>
                                        .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
              000001                    T$ARGCNT=1
     004012                             M$COUNT T$ARGCNT,<RDLOW>,<RDHIGH>,<>,<>,<>,<>,<>,<>
                                        .IF NB <RDHIGH>
     004012                             M$COUNT T$ARGCNT,<RDHIGH>,<>,<>,<>,<>,<>,<>,<>
                                        .IF NB <>
                                        M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDC
                                        .IF NB <RDHIGH>
              000002                    T$ARGCNT=T$ARGCNT+1
                                        .ENDC
                                        .ENDC
                                        .IF NB <RDLOW>
              000003                    T$ARGCNT=T$ARGCNT+1
                                        .ENDC
                                        .IRP    N,<\T$ARGCNT>
                                        M$PUT   #N,#RWRDF3,<RDLOW>,<RDHIGH>,<>,<>,<>,<>,<>,<>
                                        .ENDM
     004012                             M$PUT   #3,#RWRDF3,<RDLOW>,<RDHIGH>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <#RWRDF3>
     004012                             M$PUT   <#RWRDF3>,<RDLOW>,<RDHIGH>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <RDLOW>
     004012                             M$PUT   <RDLOW>,<RDHIGH>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <RDHIGH>
     004012                             M$PUT   <RDHIGH>,<>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <>
                                        M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDC
                                        .IF NB  <RDHIGH>
     004012                             M$PUT1  RDHIGH
                                        .MCALL  M$GNINS
                                        .IF B
```

```
004012                          M$GNINS <MOV    RDHIGH,-(SP)>
                                .IF LT SVCINS
                                MOV     RDHIGH,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
004012  013746  002214                  MOV     RDHIGH,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     RDHIGH,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<RDHIGH>
                                .ERROR  ;ILL. ARG. ''RDHIGH'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <RDLOW>
004016                          M$PUT1  RDLOW
                                .MCALL  M$GNINS
                                .IF B
004016                          M$GNINS <MOV    RDLOW,-(SP)>
                                .IF LT SVCINS
                                MOV     RDLOW,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
004016  013746  002212                  MOV     RDLOW,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     RDLOW,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<RDLOW>
                                .ERROR  ;ILL. ARG. ''RDLOW'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#RWRDF3>
004022                          M$PUT1  #RWRDF3
                                .MCALL  M$GNINS
                                .IF B
004022                          M$GNINS <MOV    #RWRDF3,-(SP)>
```

```
                                 .IF LT SVCINS
                                 MOV     #RWRDF3,-(SP)
                                 .MEXIT
                                 .ENDC
                                 .IF EQ SVCINS
     004022  012746  004316              MOV     #RWRDF3,-(SP)
                                 .MEXIT
                                 .ENDC
                                 .IF GT SVCINS
                                 .LIST
                                                                            MOV     #RWRDF3,-(SP)
                                           .NLIST
                                 .ENDC
                                 .IFF
                                 .IF DIF B,<#RWRDF3>
                                 .ERROR  ;ILL. ARG. "#RWRDF3" ONLY 'B' IS ALLOWED.
                                 .MEXIT
                                 .ENDC
                                 M$GNINS <CLR    -(SP)>
                                 M$GNINS <BISB   ,(SP)>
                                 .ENDC
                                 .ENDC
                                 .ENDC
                                 .IF NB  <#3>
     004026                      M$PUT1  #3
                                 .MCALL  M$GNINS
                                 .IF B
     004026                      M$GNINS <MOV    #3,-(SP)>
                                 .IF LT SVCINS
                                 MOV     #3,-(SP)
                                 .MEXIT
                                 .ENDC
                                 .IF EQ SVCINS
     004026  012746  000003              MOV     #3,-(SP)
                                 .MEXIT
                                 .ENDC
                                 .IF GT SVCINS
                                 .LIST
                                                                            MOV     #3,-(SP)
                                           .NLIST
                                 .ENDC
                                 .IFF
                                 .IF DIF B,<#3>
                                 .ERROR  ;ILL. ARG. "#3" ONLY 'B' IS ALLOWED.
                                 .MEXIT
                                 .ENDC
                                 M$GNINS <CLR    -(SP)>
                                 M$GNINS <BISB   ,(SP)>
                                 .ENDC
                                 .ENDC
     004032                      M$GNINS <MOV    SP,R0>
                                 .IF LT SVCINS
                                 MOV     SP,R0
                                 .MEXIT
                                 .ENDC
                                 .IF EQ SVCINS
     004032  010600                      MOV     SP,R0
```

```
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                         MOV     SP,R0
                                                     .NLIST
                                        .ENDC
  004034                                M$SVC    C$PNTB
                                        .MCALL  M$GNINS,M$TSTLAB
  004034                                M$TSTLAB
                                        .MCALL  M$TLABEL,M$INCR
                                        .IIF LT T$TSTMAC, .MEXIT
                                        .RADIX  10
                                        M$TLABEL         \T$TESTNUN,\T$TSTSEQ
                                        .RADIX  8
                                        M$INCR  T$TSTSEQ
  004034                                M$GNINS <TRAP    C$PNTB>
                                        .IF LT SVCINS
                                        TRAP    C$PNTB
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
  004034  104414                                 TRAP     C$PNTB
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                         TRAP    C$PNTB
                                                     .NLIST
                                        .ENDC
                                        .IRP     N,<\T$ARGCNT*2+2>
                                        M$GNINS <ADD     #N,SP>
                                        .ENDM
  004036                                M$GNINS <ADD     #10,SP>
                                        .IF LT SVCINS
                                        ADD     #10,SP
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
  004036  062706  000010                         ADD      #10,SP
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                         ADD     #10,SP
                                                     .NLIST
                                        .ENDC
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#RWRDF3,<RDLOW>,<RDHIGH>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#RWRDF3,<RDLOW>,<RDHIGH>,<>,<>
                                        .MEXIT
                                        .ENDC
```

```
                           .IF B    <>
                           M$PRINT C$PNTB,#RWRDF3,<RDLOW>,<RDHIGH>,<>,<>,<>
                           .MEXIT
                           .ENDC
                           .IF B    <>
                           M$PRINT C$PNTB,#RWRDF3,<RDLOW>,<RDHIGH>,<>,<>,<>,<>
                           .MEXIT
                           .ENDC
                           .IF B    <>
                           M$PRINT C$PNTB,#RWRDF3,<RDLOW>,<RDHIGH>,<>,<>,<>,<>,<>
                           .MEXIT
                           .ENDC
                           M$PRINT C$PNTB,#RWRDF3,<RDLOW>,<RDHIGH>,<>,<>,<>,<>,<>,<>
   13 004042                       ENDMSG
                           .MCALL  M$POP,M$GNTAG,M$SVC,M$ENDERR
      004042               M$POP   T$NS,T$NESTLEV,T$TEMP
                           .MCALL  M$GETS,M$DECR
                           .IF LT  T$NESTLEV
                           .ERROR  T$NESTLEV       ; MACRO T$NS UNDERFLOW
                           .MEXIT
                           .ENDC
      004042               M$GETS  T$NS,\T$NESTLEV,T$TEMP
              000011       T$TEMP=T$NS1
      004042               M$DECR  T$NESTLEV
              000000       T$NESTLEV=T$NESTLEV-1
                           .IF EQ F$MSG-T$TEMP
      004042               M$GNTAG L,T$$MSG
                           .MCALL  M$GEN
      004042               M$GEN   L,\T$$MSG,SVCTAG
                           .IF LE  SVCTAG
      004042               L10004:
                           .MEXIT
                           .ENDC
                           .LIST
                                                                              L10004:
                                   .NLIST
              010000       S$LSYM=T$LSYM
      004042               M$SVC   C$MSG
                           .MCALL  M$GNINS,M$TSTLAB
      004042               M$TSTLAB
                           .MCALL  M$TLABEL,M$INCR
                           .IIF LT T$TSTMAC, .MEXIT
                           .RADIX  10
                           M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                           .RADIX  8
                           M$INCR  T$TSTSEQ
      004042               M$GNINS <TRAP   C$MSG>
                           .IF LT SVCINS
                           TRAP    C$MSG
                           .MEXIT
                           .ENDC
                           .IF EQ SVCINS
      004042  104423               TRAP    C$MSG
                           .MEXIT
                           .ENDC
                           .IF GT SVCINS
                           .LIST
```

```
                                                                                TRAP    C$MSG
                                                .NLIST
                                    .ENDC
          000041                    I$MSG=F$END
                                    .IFF
                                    M$ENDERR        ENDMSG,T$TEMP
                                    .ENDC
14
15 004044                                   BGNMSG RWRDM3
                                    .MCALL  M$PUSH,M$INCR,M$GNGBL
          000040                    I$MSG=F$BGN
   004044                           M$PUSH  T$NS,T$NESTLEV,F$MSG
                                    .MCALL  M$INCR,M$SETS
   004044                           M$INCR  T$NESTLEV
          000001                    T$NESTLEV=T$NESTLEV+1
   004044                           M$SETS  T$NS,\T$NESTLEV,F$MSG
          000011                    T$NS1=F$MSG
          010005                    T$$MSG=T$TAGNUM
   004044                           M$INCR T$TAGNUM
          010006                    T$TAGNUM=T$TAGNUM+1
   004044                           M$GNGBL RWRDM3
                                    .MCALL  M$GEN
                                    .IF NB,RWRDM3
                                    .IF NB,
                                    M$GEN   RWRDM3,:,SVCGBL,
                                    .ENDC
                                    .IF B,
   004044                           M$GEN   RWRDM3,:,SVCGBL,< >
                                    .IF LE  SVCGBL
   004044                           RWRDM3::
                                    .MEXIT
                                    .ENDC
                                    .LIST
                                                                          RWRDM3::
                                            .NLIST
                                    .ENDC
                                    .ENDC
16 004044                                   PRINTB #RWRDF1,#FNAME
                                    .MCALL  M$PRINT
                                    .IF B   #RWRDF1
                                    .ERROR  ;MISSING FORMAT
                                    .MEXIT
                                    .ENDC
                                    .IF B   <#FNAME>
                                    M$PRINT C$PNTB,#RWRDF1
                                    .MEXIT
                                    .ENDC
                                    .IF B   <>
   004044                           M$PRINT C$PNTB,#RWRDF1,<#FNAME>
                                    .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
          000001                    T$ARGCNT=1
   004044                           M$COUNT T$ARGCNT,<#FNAME>,<>,<>,<>,<>,<>,<>,<>
                                    .IF NB <>
                                    M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                    .ENDC
                                    .IF NB <#FNAME>
          000002                    T$ARGCNT=T$ARGCNT+1
```

```
                                .ENDC
                                .IRP    N,<\T$ARGCNT>
                                M$PUT   #N,#RWRDF1,<#FNAME>,<>,<>,<>,<>,<>,<>,<>
                                .ENDM
004044                          M$PUT   #2,#RWRDF1,<#FNAME>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <#RWRDF1>
004044                          M$PUT   <#RWRDF1>,<#FNAME>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <#FNAME>
004044                          M$PUT   <#FNAME>,<>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <>
                                M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB  <#FNAME>
004044                          M$PUT1  #FNAME
                                .MCALL  M$GNINS
                                .IF B
004044                          M$GNINS <MOV    #FNAME,-(SP)>
                                .IF LT SVCINS
                                MOV     #FNAME,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
004044  012746  004422                  MOV     #FNAME,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                MOV     #FNAME,-(SP)
                                                .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#FNAME>
                                .ERROR  ;ILL. ARG. ''#FNAME'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#RWRDF1>
004050                          M$PUT1  #RWRDF1
                                .MCALL  M$GNINS
                                .IF B
004050                          M$GNINS <MOV    #RWRDF1,-(SP)>
                                .IF LT SVCINS
                                MOV     #RWRDF1,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
004050  012746  004172                  MOV     #RWRDF1,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
```

```
                                    .LIST
                                                                                   MOV     #RWRDF1,-(SP)
                                                .NLIST
                                    .ENDC
                                    .IFF
                                    .IF DIF B,<#RWRDF1>
                                    .ERROR  ;ILL. ARG. ''#RWRDF1'' ONLY 'B'' IS ALLOWED.
                                    .MEXIT
                                    .ENDC
                                    M$GNINS <CLR     -(SP)>
                                    M$GNINS <BISB    ,(SP)>
                                    .ENDC
                                    .ENDC
                                    .ENDC
                                    .IF NB  <#2>
          004054                    M$PUT1  #2
                                    .MCALL  M$GNINS
                                    .IF B
          004054                    M$GNINS <MOV     #2,-(SP)>
                                    .IF LT SVCINS
                                    MOV     #2,-(SP)
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
          004054  012746  000002            MOV     #2,-(SP)
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                                   MOV     #2,-(SP)
                                                .NLIST
                                    .ENDC
                                    .IFF
                                    .IF DIF B,<#2>
                                    .ERROR  ;ILL. ARG. ''#2'' ONLY 'B'' IS ALLOWED.
                                    .MEXIT
                                    .ENDC
                                    M$GNINS <CLR     -(SP)>
                                    M$GNINS <BISB    ,(SP)>
                                    .ENDC
                                    .ENDC
          004060                    M$GNINS <MOV     SP,R0>
                                    .IF LT SVCINS
                                    MOV     SP,R0
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
          004060  010600                    MOV     SP,R0
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                                   MOV     SP,R0
                                                .NLIST
                                    .ENDC
          004062                    M$SVC   C$PNTB
                                    .MCALL  M$GNINS,M$TSTLAB
```

```
004062                          M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
004062                          M$GNINS <TRAP   C$PNTB>
                                .IF LT SVCINS
                                TRAP    C$PNTB
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
004062  104414                          TRAP    C$PNTB
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        TRAP    C$PNTB
                                                .NLIST
                                .ENDC
                                .IRP    N,<\T$ARGCNT*2+2>
                                M$GNINS <ADD    #N,SP>
                                .ENDM
004064                          M$GNINS <ADD    #6,SP>
                                .IF LT SVCINS
                                ADD     #6,SP
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
004064  062706  000006                  ADD     #6,SP
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        ADD     #6,SP
                                                .NLIST
                                .ENDC
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
```

```
                                M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>,<>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                M$PRINT C$PNTB,#RWRDF1,<#FNAME>,<>,<>,<>,<>,<>,<>,<>
   17 004070                            PRINTB #RWRDF4
                                .MCALL  M$PRINT
                                .IF B   #RWRDF4
                                .ERROR  ;MISSING FORMAT
                                .MEXIT
                                .ENDC
                                .IF B   <>
      004070                    M$PRINT C$PNTB,#RWRDF4
                                .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
             000001             T$ARGCNT=1
      004070                    M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                .IF NB <>
                                M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB <>
                                T$ARGCNT=T$ARGCNT+1
                                .ENDC
                                .IRP    N,<\T$ARGCNT>
                                M$PUT   #N,#RWRDF4,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDM
      004070                    M$PUT   #1,#RWRDF4,<>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <#RWRDF4>
      004070                    M$PUT   <#RWRDF4>,<>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <>
                                M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB  <#RWRDF4>
      004070                    M$PUT1  #RWRDF4
                                .MCALL  M$GNINS
                                .IF B
      004070                    M$GNINS <MOV    #RWRDF4,-(SP)>
                                .IF LT SVCINS
                                MOV     #RWRDF4,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
      004070 012746 004376              MOV     #RWRDF4,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                MOV     #RWRDF4,-(SP)
                                                .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#RWRDF4>
                                .ERROR  ;ILL. ARG. "#RWRDF4" ONLY 'B' IS ALLOWED.
```

```
                                    .MEXIT
                                    .ENDC
                                    M$GNINS <CLR     -(SP)>
                                    M$GNINS <BISB    ,(SP)>
                                    .ENDC
                                    .ENDC
                                    .ENDC
                                    .IF NB  <#1>
        004074                      M$PUT1  #1
                                    .MCALL  M$GNINS
                                    .IF B
        004074                      M$GNINS <MOV     #1,-(SP)>
                                    .IF LT SVCINS
                                    MOV     #1,-(SP)
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
        004074  012746  000001              MOV     #1,-(SP)
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                              MOV     #1,-(SP)
                                                    .NLIST
                                    .ENDC
                                    .IFF
                                    .IF DIF B,<#1>
                                    .ERROR  ;ILL. ARG. ''#1'' ONLY 'B'' IS ALLOWED.
                                    .MEXIT
                                    .ENDC
                                    M$GNINS <CLR     -(SP)>
                                    M$GNINS <BISB    ,(SP)>
                                    .ENDC
                                    .ENDC
        004100                      M$GNINS <MOV     SP,R0>
                                    .IF LT SVCINS
                                    MOV     SP,R0
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
        004100  010600                      MOV     SP,R0
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                              MOV     SP,R0
                                                    .NLIST
                                    .ENDC
        004102                      M$SVC   C$PNTB
                                    .MCALL  M$GNINS,M$TSTLAB
        004102                      M$TSTLAB
                                    .MCALL  M$TLABEL,M$INCR
                                    .IIF LT T$TSTMAC, .MEXIT
                                    .RADIX  10
                                    M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                    .RADIX  8
                                    M$INCR  T$TSTSEQ
```

```
004102                           M$GNINS <TRAP    C$PNTB>
                                 .IF LT SVCINS
                                 TRAP    C$PNTB
                                 .MEXIT
                                 .ENDC
                                 .IF EQ SVCINS
004102  104414                           TRAP    C$PNTB
                                 .MEXIT
                                 .ENDC
                                 .IF GT SVCINS
                                 .LIST
                                                                         TRAP    C$PNTB
                                         .NLIST
                                 .ENDC
                                 .IRP    N,<\T$ARGCNT*2+2>
                                 M$GNINS <ADD     #N,SP>
                                 .ENDM
004104                           M$GNINS <ADD     #4,SP>
                                 .IF LT SVCINS
                                 ADD     #4,SP
                                 .MEXIT
                                 .ENDC
                                 .IF EQ SVCINS
004104  062706  000004                   ADD     #4,SP
                                 .MEXIT
                                 .ENDC
                                 .IF GT SVCINS
                                 .LIST
                                                                         ADD     #4,SP
                                         .NLIST
                                 .ENDC
                                 .MEXIT
                                 .ENDC
                                 .IF B   <>
                                 M$PRINT C$PNTB,#RWRDF4,<>
                                 .MEXIT
                                 .ENDC
                                 .IF B   <>
                                 M$PRINT C$PNTB,#RWRDF4,<>,<>
                                 .MEXIT
                                 .ENDC
                                 .IF B   <>
                                 M$PRINT C$PNTB,#RWRDF4,<>,<>,<>
                                 .MEXIT
                                 .ENDC
                                 .IF B   <>
                                 M$PRINT C$PNTB,#RWRDF4,<>,<>,<>,<>
                                 .MEXIT
                                 .ENDC
                                 .IF B   <>
                                 M$PRINT C$PNTB,#RWRDF4,<>,<>,<>,<>,<>
                                 .MEXIT
                                 .ENDC
                                 .IF B   <>
                                 M$PRINT C$PNTB,#RWRDF4,<>,<>,<>,<>,<>,<>
                                 .MEXIT
                                 .ENDC
```

```
                            .IF B   <>
                            M$PRINT C$PNTB,#RWRDF4,<>,<>,<>,<>,<>,<>,<>
                            .MEXIT
                            .ENDC
                            M$PRINT C$PNTB,#RWRDF4,<>,<>,<>,<>,<>,<>,<>,<>
   18 004110                        ENDMSG
                            .MCALL  M$POP,M$GNTAG,M$SVC,M$ENDERR
      004110                M$POP   T$NS,T$NESTLEV,T$TEMP
                            .MCALL  M$GETS,M$DECR
                            .IF LT  T$NESTLEV
                            .ERROR  T$NESTLEV        ; MACRO T$NS UNDERFLOW
                            .MEXIT
                            .ENDC
      004110                M$GETS  T$NS,\T$NESTLEV,T$TEMP
             000011         T$TEMP=T$NS1
      004110                M$DECR  T$NESTLEV
             000000         T$NESTLEV=T$NESTLEV-1
                            .IF EQ F$MSG-T$TEMP
      004110                M$GNTAG L,T$$MSG
                            .MCALL  M$GEN
      004110                M$GEN   L,\T$$MSG,SVCTAG
                            .IF LE  SVCTAG
      004110                L10005:
                            .MEXIT
                            .ENDC
                            .LIST
                                                                                      L10005:
                                    .NLIST
             010000         S$LSYM=T$LSYM
      004110                M$SVC   C$MSG
                            .MCALL  M$GNINS,M$TSTLAB
      004110                M$TSTLAB
                            .MCALL  M$TLABEL,M$INCR
                            .IIF LT T$TSTMAC, .MEXIT
                            .RADIX  10
                            M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                            .RADIX  8
                            M$INCR  T$TSTSEQ
      004110                M$GNINS <TRAP   C$MSG>
                            .IF LT SVCINS
                            TRAP    C$MSG
                            .MEXIT
                            .ENDC
                            .IF EQ SVCINS
      004110  104423                TRAP    C$MSG
                            .MEXIT
                            .ENDC
                            .IF GT SVCINS
                            .LIST
                                                                                           TRAP    C$MSG
                                            .NLIST
                            .ENDC
             000041         I$MSG=F$END
                            .IFF
                            M$ENDERR        ENDMSG,T$TEMP
                            .ENDC
   19
```

```
004112     105    122    122  RWRDEM: .ASCIZ  \ERROR READING "DIAGNOSTIC MACHINE" PROGRAM FILE\
004172     045    101    106  RWRDF1: .ASCIZ  \%AFILE BEING READ IS "%T%A"%N\
004230     045    101    104  RWRDF2: .ASCIZ  \%ADID NOT FIND START AND NULL FRAMES WHERE EXPECTED%N\
004316     045    101    104  RWRDF3: .ASCIZ  \%ADATA NOT WITHIN EXPECTED BOUNDS %06%A - %06%N\
004376     045    101    103  RWRDF4: .ASCIZ  \%ACHECKSUM ERROR%N\
                                      .EVEN
004422     132    125    104  FNAME:  .ASCIZ  \ZUDFA0.???\
                                      .EVEN
004436  000000                FDATA:  .WORD 0

004440                                ENDMOD
                              .MCALL  M$POP,M$ENDERR
                              .IF EQ  F$BGN-I$MOD
        000041                I$MOD=F$END
                              .IFF
                              .ERROR  ; MISSING "BGNMOD"
                              .MEXIT
                              .ENDC
004440                        M$POP   T$NS,T$NESTLEV,T$TEMP
                              .MCALL  M$GETS,M$DECR
                              .IF LT  T$NESTLEV
                              .ERROR  T$NESTLEV         ; MACRO T$NS UNDERFLOW
                              .MEXIT
                              .ENDC
004440                        M$GETS  T$NS,\T$NESTLEV,T$TEMP
        000000                T$TEMP=T$NS0
004440                        M$DECR  T$NESTLEV
        177777                T$NESTLEV=T$NESTLEV-1
                              .IF NE F$MOD-T$TEMP
                              M$ENDERR        ENDMOD,T$TEMP
                              .ENDC
```

```
                                   ;READDM
                                   ;
                                   ;READ A DM PROGRAM INTO FREE MEMORY
                                   ;
                                   ;INPUTS:
                                           NONE
                                   ;OUTPUTS:
                                   ;       DMTRLN - TRANSFER LENGTH OF MAIN DM PROGRAM IN BYTES
                                   ;       DMPROG - POINTER TO START OF DM PROGRAM IN MEMORY
                                   ;       DMOVRL - POINTER TO START OF DM OVERLAYS
                                   ;
                                   ;ALL REGISTERS ARE USED AND PREVIOUS CONTENTS DESTROYED
004440                             READDM:
004440 004737 003470                       CALL    OPENLF                  ;OPEN LOAD FILE
004444 012737 001000 002212                MOV     #1000,RDLOW             ; SETUP BOUNDS FOR READ
004452 012737 001100 002214                MOV     #1000+RD.SZ,RDHIGH      ;   THIS SHOULD READ < 56 WORDS
004460 012701 000040                       MOV     #RD.SZ/2,R1             ; INITIAL BUFFER SIZE FOR READ
004464 004737 002474                       CALL    ALOCM                   ; ALLOCATE MEMORY FOR DM PROG
004470 010137 002204                       MOV     R1,DMPROG               ; START OF BUFFER TO HOLD DM PROGRAM
004474 010137 002206                       MOV     R1,DMOVRL               ; START OF BUFFER TO HOLD OVERLAYS...
                                                                           ;... VALUE UPDATED BELOW
004500 010137 002216                       MOV     R1,RD.AT                ; BUFFER ADDRESS FOR RDREC ROUTINE
004504 004737 003500                       CALL    RDREC                   ; READ FIRST RECORD - THIS SHOULD...
                                                                           ;... GET THE DUP HEADER INTO MEMORY
                                                                           ;... FROM WHICH WE NEED THE MAIN AND
                                                                           ;... OVERLAY SIZE
004510 013702 002204                       MOV     DMPROG,R2
004514 016201 000000                       MOV     HDR.MN(R2),R1           ; SIZE OF MAIN CODE
004520 010137 002210                       MOV     R1,DMTRLN               ; SET INITIAL TRANSFER LENGTH
004524 060137 002206                       ADD     R1,DMOVRL               ; SET STARTING ADDRESS OF OVERLAYS
004530 066201 000004                       ADD     HDR.OV(R2),R1           ; CALC TOTAL BUFFER SPACE NEEDED
004534 010137 002214                       MOV     R1,RDHIGH               ; RESET THE UPPER LIMIT
004540 062737 001000 002214                ADD     #1000,RDHIGH            ; ADD BEGINNING PROGRAM OFFSET
004546 000241                              CLC                             ;...CONVERT TO WORD COUNT
004550 006001                              ROR     R1
004552 004737 002474                       CALL    ALOCM
004556 004737 003500               READWD: CALL    RDREC                   ; READ NEXT LOADER RECORD
004562 001775                              BEQ     READWD                  ;GO BACK FOR NEXT
004564 000207                              RETURN
       000100                      RD.SZ   =       100             ; INITIAL (FIRST) BUFFER SIZE TO READ
                                                                   ; THIS VALUE MUST BE LARGER THAN THE
                                                                   ; FIRST LDA FORMATED RECORD IN THE DOWN
                                                                   ; LINE LOADED DM FORMATTER FILE
```

```
                                        ;RESPDM
                                        ;
                                        ;       ASSUMES AT LEAST 1 DM IS RUNNING
                                        ;
                                        ;RESPOND TO DM REQUESTS. RETURN WHEN ALL DM PROGRAMS
                                        ;HAVE TERMINATED.

004566  013705  002202                  RESPDM: MOV     TSTTAB,R5               ;GET CONTROLLER TABLE ADDRESS
004572  016504  000010                  RESPCT: MOV     C.RING(R5),R4           ;GET HOST COMM AREA ADDRESS
004576  032765  000002  000014                  BIT     #CT.RN,C.FLG(R5)        ;CHECK IF PROGRAM RUNNING
004604  001435                                  BEQ     RSPNXT                  ;IF NOT, LOOK AT NEXT
004606  004737  003170                          CALL    ISCAN                   ;SEE IF INTERRUPT WOULD HAVE COME
004612  016537  000004  002074                  MOV     C.UNIT(R5),L$LUN        ;STORE UNIT NUMBER UNDER TEST
004620  032765  000010  000014                  BIT     #CT.MSG,C.FLG(R5)       ;SEE IF INTERRUPT RECEIVED
004626  001051                                  BNE     RSPIN                   ;IF SO, LOOK AT PACKET
004630  005365  000040                          DEC     C.CNT(R5)               ; COUNT ALL 'NO SHOWS'
004634  001020                                  BNE     1$                      ; HAVE WE TRIED 'A LOT'?
004636  005365  000042                          DEC     C.CNT+2(R5)
004642  001015                                  BNE     1$
004644  012765  000020  000042                  MOV     #C.INIT,C.CNT+2(R5)     ; RESET COUNTER
004652                                          PRINTB  #NORESP,L$LUN           ; LOG NO RESPONSE
                                        .MCALL  M$PRINT
                                        .IF B   #NORESP
                                        .ERROR  ;MISSING FORMAT
                                        .MEXIT
                                        .ENDC
                                        .IF B   <L$LUN>
                                        M$PRINT C$PNTB,#NORESP
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
004652                                  M$PRINT C$PNTB,#NORESP,<L$LUN>
                                        .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
        000001                          T$ARGCNT=1
004652                                  M$COUNT T$ARGCNT,<L$LUN>,<>,<>,<>,<>,<>,<>,<>
                                        .IF NB <>
                                        M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDC
                                        .IF NB <L$LUN>
        000002                          T$ARGCNT=T$ARGCNT+1
                                        .ENDC
                                        .IRP    N,<\T$ARGCNT>
                                        M$PUT   #N,#NORESP,<L$LUN>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDM
004652                                  M$PUT   #2,#NORESP,<L$LUN>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <#NORESP>
004652                                  M$PUT   <#NORESP>,<L$LUN>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <L$LUN>
004652                                  M$PUT   <L$LUN>,<>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <>
                                        M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDC
                                        .IF NB  <L$LUN>
004652                                  M$PUT1  L$LUN
```

```
                                        .MCALL  M$GNINS
                                        .IF B
      004652                            M$GNINS <MOV    L$LUN,-(SP)>
                                        .IF LT SVCINS
                                        MOV     L$LUN,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      004652  013746  002074                    MOV     L$LUN,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                MOV     L$LUN,-(SP)
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<L$LUN>
                                        .ERROR  ;ILL. ARG. ''L$LUN'' ONLY 'B'' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR    -(SP)>
                                        M$GNINS <BISB   ,(SP)>
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF NB  <#NORESP>
      004656                            M$PUT1  #NORESP
                                        .MCALL  M$GNINS
                                        .IF B
      004656                            M$GNINS <MOV    #NORESP,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #NORESP,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      004656  012746  006132                    MOV     #NORESP,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                MOV     #NORESP,-(SP)
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#NORESP>
                                        .ERROR  ;ILL. ARG. ''#NORESP'' ONLY 'B'' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR    -(SP)>
                                        M$GNINS <BISB   ,(SP)>
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF NB  <#2>
      004662                            M$PUT1  #2
                                        .MCALL  M$GNINS
```

```
                                  .IF B
004662                            M$GNINS <MOV    #2,-(SP)>
                                  .IF LT SVCINS
                                  MOV     #2,-(SP)
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
004662  012746  000002                    MOV     #2,-(SP)
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                              MOV     #2,-(SP)
                                                  .NLIST
                                  .ENDC
                                  .IFF
                                  .IF DIF B,<#2>
                                  .ERROR  ;ILL. ARG. "#2" ONLY 'B' IS ALLOWED.
                                  .MEXIT
                                  .ENDC
                                  M$GNINS <CLR    -(SP)>
                                  M$GNINS <BISB   ,(SP)>
                                  .ENDC
                                  .ENDC
004666                            M$GNINS <MOV    SP,R0>
                                  .IF LT SVCINS
                                  MOV     SP,R0
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
004666  010600                            MOV     SP,R0
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                              MOV     SP,R0
                                                  .NLIST
                                  .ENDC
004670                            M$SVC   C$PNTB
                                  .MCALL  M$GNINS,M$TSTLAB
004670                            M$TSTLAB
                                  .MCALL  M$TLABEL,M$INCR
                                  .IIF LT T$TSTMAC, .MEXIT
                                  .RADIX  10
                                  M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                  .RADIX  8
                                  M$INCR  T$TSTSEQ
004670                            M$GNINS <TRAP   C$PNTB>
                                  .IF LT SVCINS
                                  TRAP    C$PNTB
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
004670  104414                            TRAP    C$PNTB
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
```

```
                                        .LIST
                                                                                          TRAP    C$PNTB
                                                     .NLIST
                                        .ENDC
                                        .IRP    N,<\T$ARGCNT*2+2>
                                        M$GNINS <ADD     #N,SP>
                                        .ENDM
     004672                             M$GNINS <ADD     #6,SP>
                                        .IF LT SVCINS
                                        ADD      #6,SP
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
     004672  062706  000006                     ADD      #6,SP
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                          ADD     #6,SP
                                                     .NLIST
                                        .ENDC
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#NORESP,<L$LUN>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#NORESP,<L$LUN>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#NORESP,<L$LUN>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#NORESP,<L$LUN>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#NORESP,<L$LUN>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#NORESP,<L$LUN>,<>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        M$PRINT C$PNTB,#NORESP,<L$LUN>,<>,<>,<>,<>,<>,<>,<>
  22 004676                             1$:
  23 004676                                     BREAK                           ;ALLOW DRS TO SEE TERMINAL INPUT
                                        .MCALL  M$SVC
     004676                             M$SVC   C$BRK
                                        .MCALL  M$GNINS,M$TSTLAB
     004676                             M$TSTLAB
                                        .MCALL  M$TLABEL,M$INCR
                                        .IIF LT T$TSTMAC, .MEXIT
                                        .RADIX  10
```

```
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
004676                          M$GNINS <TRAP   C$BRK>
                                .IF LT SVCINS
                                TRAP    C$BRK
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
004676  104422                          TRAP    C$BRK
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                TRAP    C$BRK
                                                .NLIST
                                .ENDC

004700  016505  000000          RSPNXT: MOV     C.NEXT(R5),R5           ;MOVE TO NEXT TABLE
004704  001332                          BNE     RESPCT                  ;LOOK AT NEXT CONTROLLER - IF ANY
004706  000727                          BR      RESPDM                  ;LOOK AT FIRST CONTROLLER AGAIN

                                ;REMOVE A CONTROLLER FROM TESTING

004710                          RSPDRP: PRINTB  #REMMSG,L$LUN           ; LOG REMOVAL
                                .MCALL  M$PRINT
                                .IF B   #REMMSG
                                .ERROR  ;MISSING FORMAT
                                .MEXIT
                                .ENDC
                                .IF B   <L$LUN>
                                M$PRINT C$PNTB,#REMMSG
                                .MEXIT
                                .ENDC
                                .IF B   <>
004710                          M$PRINT C$PNTB,#REMMSG,<L$LUN>
                                .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
        000001                  T$ARGCNT=1
004710                          M$COUNT T$ARGCNT,<L$LUN>,<>,<>,<>,<>,<>,<>,<>
                                .IF NB <>
                                M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB <L$LUN>
        000002                  T$ARGCNT=T$ARGCNT+1
                                .ENDC
                                .IRP    N,<\T$ARGCNT>
                                M$PUT   #N,#REMMSG,<L$LUN>,<>,<>,<>,<>,<>,<>,<>
                                .ENDM
004710                          M$PUT   #2,#REMMSG,<L$LUN>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <#REMMSG>
004710                          M$PUT   <#REMMSG>,<L$LUN>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <L$LUN>
004710                          M$PUT   <L$LUN>,<>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <>
```

```
                                  M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                  .ENDC
                                  .IF NB  <L$LUN>
004710                            M$PUT1  L$LUN
                                  .MCALL  M$GNINS
                                  .IF B
004710                            M$GNINS <MOV    L$LUN,-(SP)>
                                  .IF LT SVCINS
                                  MOV     L$LUN,-(SP)
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
004710  013746  002074                    MOV     L$LUN,-(SP)
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                          MOV     L$LUN,-(SP)
                                                  .NLIST
                                  .ENDC
                                  .IFF
                                  .IF DIF B,<L$LUN>
                                  .ERROR  ;ILL. ARG. ''L$LUN'' ONLY ''B'' IS ALLOWED.
                                  .MEXIT
                                  .ENDC
                                  M$GNINS <CLR    -(SP)>
                                  M$GNINS <BISB   ,(SP)>
                                  .ENDC
                                  .ENDC
                                  .ENDC
                                  .IF NB  <#REMMSG>
004714                            M$PUT1  #REMMSG
                                  .MCALL  M$GNINS
                                  .IF B
004714                            M$GNINS <MOV    #REMMSG,-(SP)>
                                  .IF LT SVCINS
                                  MOV     #REMMSG,-(SP)
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
004714  012746  006202                    MOV     #REMMSG,-(SP)
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                          MOV     #REMMSG,-(SP)
                                                  .NLIST
                                  .ENDC
                                  .IFF
                                  .IF DIF B,<#REMMSG>
                                  .ERROR  ;ILL. ARG. ''#REMMSG'' ONLY ''B'' IS ALLOWED.
                                  .MEXIT
                                  .ENDC
                                  M$GNINS <CLR    -(SP)>
                                  M$GNINS <BISB   ,(SP)>
                                  .ENDC
                                  .ENDC
```

```
                                        .ENDC
                                        .IF NB  <#2>
      004720                            M$PUT1  #2
                                        .MCALL  M$GNINS
                                        .IF B
      004720                            M$GNINS <MOV     #2,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #2,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      004720  012746  000002                    MOV      #2,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                     MOV      #2,-(SP)
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#2>
                                        .ERROR  ;ILL. ARG. '#2' ONLY 'B' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR     -(SP)>
                                        M$GNINS <BISB    ,(SP)>
                                        .ENDC
                                        .ENDC
      004724                            M$GNINS <MOV     SP,R0>
                                        .IF LT SVCINS
                                        MOV     SP,R0
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      004724  010600                            MOV      SP,R0
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                     MOV      SP,R0
                                                        .NLIST
                                        .ENDC
      004726                            M$SVC   C$PNTB
                                        .MCALL  M$GNINS,M$TSTLAB
      004726                            M$TSTLAB
                                        .MCALL  M$TLABEL,M$INCR
                                        .IIF LT T$TSTMAC, .MEXIT
                                        .RADIX  10
                                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                        .RADIX  8
                                        M$INCR  T$TSTSEQ
      004726                            M$GNINS <TRAP    C$PNTB>
                                        .IF LT SVCINS
                                        TRAP    C$PNTB
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
```

```
       004726  104414                          TRAP    C$PNTB
                                       .MEXIT
                                       .ENDC
                                       .IF GT SVCINS
                                       .LIST
                                                                                      TRAP    C$PNTB
                                                       .NLIST
                                       .ENDC
                                       .IRP    N,<\T$ARGCNT*2+2>
                                       M$GNINS <ADD    #N,SP>
                                       .ENDM
       004730                          M$GNINS <ADD    #6,SP>
                                       .IF LT SVCINS
                                       ADD     #6,SP
                                       .MEXIT
                                       .ENDC
                                       .IF EQ SVCINS
       004730  062706  000006                  ADD     #6,SP
                                       .MEXIT
                                       .ENDC
                                       .IF GT SVCINS
                                       .LIST
                                                                                      ADD     #6,SP
                                                       .NLIST
                                       .ENDC
                                       .MEXIT
                                       .ENDC
                                       .IF B   <>
                                       M$PRINT C$PNTB,#REMMSG,<L$LUN>,<>
                                       .MEXIT
                                       .ENDC
                                       .IF B   <>
                                       M$PRINT C$PNTB,#REMMSG,<L$LUN>,<>,<>
                                       .MEXIT
                                       .ENDC
                                       .IF B   <>
                                       M$PRINT C$PNTB,#REMMSG,<L$LUN>,<>,<>,<>
                                       .MEXIT
                                       .ENDC
                                       .IF B   <>
                                       M$PRINT C$PNTB,#REMMSG,<L$LUN>,<>,<>,<>,<>
                                       .MEXIT
                                       .ENDC
                                       .IF B   <>
                                       M$PRINT C$PNTB,#REMMSG,<L$LUN>,<>,<>,<>,<>,<>
                                       .MEXIT
                                       .ENDC
                                       .IF B   <>
                                       M$PRINT C$PNTB,#REMMSG,<L$LUN>,<>,<>,<>,<>,<>,<>
                                       .MEXIT
                                       .ENDC
                                       M$PRINT C$PNTB,#REMMSG,<L$LUN>,<>,<>,<>,<>,<>,<>,<>
    32 004734                          RSPDNE:
    33 004734  042765  000002  000014          BIC     #CT.RN,C.FLG(R5)        ;CLEAR PROGRAM RUNNING
    34 004742  005337  002220                  DEC     URNING                  ;REDUCE RUNNING CONTROLLERS COUNT
    35 004746  001354                          BNE     RSPNXT                  ;IF ANY STILL RUNNING, LOOK AT THEM
    36 004750  000207                          RETURN                          ;ELSE RETURN TO TEST SECTION
```

```
                                        ;CONTROLLER HAS RESPONDED, LOOK AT MESSAGE PACKET

  004752  042765  000010  000014  RSPIN:  BIC  #CT.MSG,C.FLG(R5)        ;CLEAR MESSAGE INTERRUPT RECEIVED
  004760  005065  000040                  CLR     C.CNT(R5)             ; RESET COUNTER
  004764  012765  000020  000042          MOV     #C.INIT,C.CNT+2(R5)

                                  ;CHECK FOR PROPER OPCODE IN END PACKET

  004772  012700  000204                  MOV #OP.END+OP.SND,R0         ;GET SEND DATA END PACKET OPCODE
  004776  032765  000020  000014          BIT #CT.REQ,C.FLG(R5)         ;LOOK IF MAINTENANCE READ OR WRITE SENT
  005004  001402                          BEQ RSPMWR
  005006  012700  000205                  MOV #OP.END+OP.RCV,R0         ;CHANGE TO RECEIVE END PACKET OPCODE
  005012  120064  000024          RSPMWR: CMPB R0,HC.MPK+P.OPCD(R4)     ;COMPARE TO OPCODE IN END PACKET
  005016  001405                          BEQ RSPSTS
  005020                                  ERRHRD 1,RSPPKE               ;REPORT OPCODE ERROR IN RESPONSE PACKET
                                  .MCALL  M$ERRINS
  005020                          M$ERRINS        1,RSPPKE,,C$ERHRD
                                  .MCALL  M$GNINS,M$WORD,M$TSTLAB
  005020                          M$SVC   C$ERHRD
                                  .MCALL  M$GNINS,M$TSTLAB
  005020                          M$TSTLAB
                                  .MCALL  M$TLABEL,M$INCR
                                  .IIF LT T$TSTMAC, .MEXIT
                                  .RADIX  10
                                  M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                  .RADIX  8
                                  M$INCR  T$TSTSEQ
  005020                          M$GNINS <TRAP   C$ERHRD>
                                  .IF LT SVCINS
                                  TRAP    C$ERHRD
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
  005020  104456                          TRAP    C$ERHRD
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                                  TRAP    C$ERHRD
                                                  .NLIST
                                  .ENDC
          000012                  .RADIX  10
                                  .IF NB  1
          000001                  T$ERRNUM=1
                                  .IFF
                                  .ERROR  ;MISSING ERROR-NR
                                  .ENDC
  005022                          M$WORD  \T$ERRNUM
                                  .MCALL  M$GNINS
                                  .IRP    N,<1>
                                  M$GNINS <.WORD  N>
                                  .ENDM
  005022                          M$GNINS <.WORD  1>
                                  .IF LT SVCINS
                                  .WORD   1
                                  .MEXIT
                                  .ENDC
```

```
                              .IF EQ SVCINS
      005022  000001                  .WORD   1
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                                    .WORD   1
                                              .NLIST
                              .ENDC
              000010          .RADIX  8
                              .IF NB RSPPKE
      005024                  M$WORD  RSPPKE
                              .MCALL  M$GNINS
                              .IRP    N,<RSPPKE>
                              M$GNINS <.WORD  N>
                              .ENDM
      005024                  M$GNINS <.WORD  RSPPKE>
                              .IF LT SVCINS
                              .WORD   RSPPKE
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
      005024  006276                  .WORD   RSPPKE
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                                    .WORD   RSPPKE
                                              .NLIST
                              .ENDC
                              .IFF
                              M$WORD  0
                              .ENDC
                              .IF NB
                              M$WORD
                              .IFF
      005026                  M$WORD  0
                              .MCALL  M$GNINS
                              .IRP    N,<0>
                              M$GNINS <.WORD  N>
                              .ENDM
      005026                  M$GNINS <.WORD  0>
                              .IF LT SVCINS
                              .WORD   0
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
      005026  000000                  .WORD   0
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                                    .WORD   0
                                              .NLIST
                              .ENDC
                              .ENDC
   16 005030  000727                  BR RSPDRP                          ;DROP UNIT FROM TESTING
```

```
                                         ;LOOK AT STATUS CODE

   005032  032764  000037  000026  RSPSTS: BIT #ST.MSK,HC.MPK+P.STS(R4)     ;CHECK FOR STATUS CODE ST.SUC (ZERO)
   005040  001405                          BEQ RSPREF
   005042                                  ERRHRD 2,RSPSTE                   ;REPORT ERROR STATUS CODE
                                   .MCALL  M$ERRINS
   005042                          M$ERRINS        2,RSPSTE,,C$ERHRD
                                   .MCALL  M$GNINS,M$WORD,M$TSTLAB
   005042                          M$SVC   C$ERHRD
                                   .MCALL  M$GNINS,M$TSTLAB
   005042                          M$TSTLAB
                                   .MCALL  M$TLABEL,M$INCR
                                   .IIF LT T$TSTMAC, .MEXIT
                                   .RADIX  10
                                   M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                   .RADIX  8
                                   M$INCR  T$TSTSEQ
   005042                          M$GNINS <TRAP    C$ERHRD>
                                   .IF LT SVCINS
                                   TRAP    C$ERHRD
                                   .MEXIT
                                   .ENDC
                                   .IF EQ SVCINS
   005042  104456                          TRAP     C$ERHRD
                                   .MEXIT
                                   .ENDC
                                   .IF GT SVCINS
                                   .LIST
                                                                                  TRAP     C$ERHRD
                                                   .NLIST
                                   .ENDC
           000012                  .RADIX  10
                                   .IF NB  2
           000002                  T$ERRNUM=2
                                   .IFF
                                   .ERROR  ;MISSING ERROR-NR
                                   .ENDC
   005044                          M$WORD  \T$ERRNUM
                                   .MCALL  M$GNINS
                                   .IRP    N,<2>
                                   M$GNINS <.WORD  N>
                                   .ENDM
   005044                          M$GNINS <.WORD  2>
                                   .IF LT SVCINS
                                   .WORD   2
                                   .MEXIT
                                   .ENDC
                                   .IF EQ SVCINS
   005044  000002                          .WORD    2
                                   .MEXIT
                                   .ENDC
                                   .IF GT SVCINS
                                   .LIST
                                                                                  .WORD    2
                                                   .NLIST
                                   .ENDC
```

```
          000010                        .RADIX  8
                                        .IF NB RSPSTE
   005046                               M$WORD  RSPSTE
                                        .MCALL  M$GNINS
                                        .IRP    N,<RSPSTE>
                                        M$GNINS <.WORD  N>
                                        .ENDM
   005046                               M$GNINS <.WORD  RSPSTE>
                                        .IF LT SVCINS
                                        .WORD   RSPSTE
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
   005046 006514                                .WORD   RSPSTE
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        .WORD   RSPSTE
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        M$WORD  0
                                        .ENDC
                                        .IF NB
                                        M$WORD
                                        .IFF
   005050                               M$WORD  0
                                        .MCALL  M$GNINS
                                        .IRP    N,<0>
                                        M$GNINS <.WORD  N>
                                        .ENDM
   005050                               M$GNINS <.WORD  0>
                                        .IF LT SVCINS
                                        .WORD   0
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
   005050 000000                                .WORD   0
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        .WORD   0
                                                        .NLIST
                                        .ENDC
                                        .ENDC
   005052 000716                                BR RSPDRP                       ;DROP UNIT FROM TESTING

                                        ;CHECK FOR EXPECTED REFERENCE NUMBER

   005054 026564  000016  000014        RSPREF: CMP C.REF(R5),HC.MPK+P.CRF(R4)  ;CHECK IF CORRECT REF NUMBER
   005062 001405                                BEQ RSPPTW
   005064                                       ERRHRD 3,RSPPRE
                                        .MCALL  M$ERRINS
   005064                               M$ERRINS        3,RSPPRE,,C$ERHRD
                                        .MCALL  M$GNINS,M$WORD,M$TSTLAB
```

```
005064                  M$SVC   C$ERHRD
                        .MCALL  M$GNINS,M$TSTLAB
005064                  M$TSTLAB
                        .MCALL  M$TLABEL,M$INCR
                        .IIF LT T$TSTMAC, .MEXIT
                        .RADIX  10
                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                        .RADIX  8
                        M$INCR  T$TSTSEQ
005064                  M$GNINS <TRAP   C$ERHRD>
                        .IF LT SVCINS
                        TRAP    C$ERHRD
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
005064  104456                  TRAP    C$ERHRD
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                TRAP    C$ERHRD
                                        .NLIST
                        .ENDC
        000012          .RADIX  10
                        .IF NB  3
        000003          T$ERRNUM=3
                        .IFF
                        .ERROR  ;MISSING ERROR-NR
                        .ENDC
005066                  M$WORD  \T$ERRNUM
                        .MCALL  M$GNINS
                        .IRP    N,<3>
                        M$GNINS <.WORD  N>
                        .ENDM
005066                  M$GNINS <.WORD  3>
                        .IF LT SVCINS
                        .WORD   3
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
005066  000003                  .WORD   3
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                .WORD   3
                                        .NLIST
                        .ENDC
        000010          .RADIX  8
                        .IF NB RSPPRE
005070                  M$WORD  RSPPRE
                        .MCALL  M$GNINS
                        .IRP    N,<RSPPRE>
                        M$GNINS <.WORD  N>
                        .ENDM
005070                  M$GNINS <.WORD  RSPPRE>
                        .IF LT SVCINS
```

```
                                        .WORD   RSPPRE
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
   005070  006346                              .WORD   RSPPRE
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                   .WORD   RSPPRE
                                                      .NLIST
                                        .ENDC
                                        .IFF
                                        M$WORD  0
                                        .ENDC
                                        .IF NB
                                        M$WORD
                                        .IFF
   005072                               M$WORD  0
                                        .MCALL  M$GNINS
                                        .IRP    N,<0>
                                        M$GNINS <.WORD  N>
                                        .ENDM
   005072                               M$GNINS <.WORD  0>
                                        .IF LT SVCINS
                                        .WORD   0
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
   005072  000000                              .WORD   0
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                   .WORD   0
                                                      .NLIST
                                        .ENDC
                                        .ENDC
   005074  000705                              BR RSPDRP                        ;DROP UNIT FROM TESTING

                                        ;CHECK IF RESPONSE FROM MAINTENANCE READ OR WRITE

   005076  032765  000020  000014  RSPPTW: BIT     #CT.REQ,C.FLG(R5)        ; LAST CMD A READ?
   005104  001004                              BNE     RSPPT2                   ; YES - PROCESS IT

                                        ;SEND MAINTENANCE READ COMMAND TO GET NEXT MESSAGE

   005106  004737  003110                      CALL    GETDMR                   ; ISSUE MAINT. READ
   005112  000137  004700                      JMP     RSPNXT                   ;NOW WAIT FOR END PACKET
```

```
                                        ;MAINTENANCE READ END PACKET RECEIVED, LOOK AT REQUEST FROM DM PROGRAM

 005116  042765  000020  000014  RSPPT2: BIC     #CT.REQ,C.FLG(R5)       ; CLEAR REQUEST FLAG
 005124  016401  000214                  MOV     HC.BF2+2(R4),R1         ; GET MESSAGE CODE
 005130  022701  020103                  CMP     #'C ,R1                 ; CYLINDER COMPLETE?
 005134  001423                          BEQ     CYLCMP
 005136  022701  020106                  CMP     #'F ,R1                 ; FCT REQUEST?
 005142  001510                          BEQ     GETFCT
 005144  022701  020104                  CMP     #'D ,R1                 ; FORMAT DONE?
 005150  001533                          BEQ     FMTDNE
 005152  022701  020123                  CMP     #'S ,R1                 ; ASKING FOR START?
 005156  001432                          BEQ     KRANTZ
 005160  022701  020105                  CMP     #'E ,R1                 ; ERROR IN FORMAT?
 005164  001002                          BNE     1$                      ; NO - ERROR
 005166  000137  006062                  JMP     FMTERR                  ; YES

 005172                          1$:     ERRHRD  4,RSPPNE                ; UNKNOWN MESSAGE
                                 .MCALL  M$ERRINS
 005172                          M$ERRINS        4,RSPPNE,,C$ERHRD
                                 .MCALL  M$GNINS,M$WORD,M$TSTLAB
 005172                          M$SVC   C$ERHRD
                                 .MCALL  M$GNINS,M$TSTLAB
 005172                          M$TSTLAB
                                 .MCALL  M$TLABEL,M$INCR
                                 .IIF LT T$TSTMAC, .MEXIT
                                 .RADIX  10
                                 M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                 .RADIX  8
                                 M$INCR  T$TSTSEQ
 005172                          M$GNINS <TRAP   C$ERHRD>
                                 .IF LT SVCINS
                                 TRAP    C$ERHRD
                                 .MEXIT
                                 .ENDC
                                 .IF EQ SVCINS
 005172  104456                          TRAP    C$ERHRD
                                 .MEXIT
                                 .ENDC
                                 .IF GT SVCINS
                                 .LIST
                                                                                         TRAP    C$ERHRD
                                                 .NLIST
                                 .ENDC
         000012                  .RADIX  10
                                 .IF NB  4
         000004                  T$ERRNUM=4
                                 .IFF
                                 .ERROR  ;MISSING ERROR-NR
                                 .ENDC
 005174                          M$WORD  \T$ERRNUM
                                 .MCALL  M$GNINS
                                 .IRP    N,<4>
                                 M$GNINS <.WORD  N>
                                 .ENDM
 005174                          M$GNINS <.WORD  4>
                                 .IF LT SVCINS
                                 .WORD   4
```

```
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     005174  000004                     .WORD   4
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   4
                                          .NLIST
                                .ENDC
             000010             .RADIX  8
                                .IF NB RSPPNE
     005176                     M$WORD  RSPPNE
                                .MCALL  M$GNINS
                                .IRP    N,<RSPPNE>
                                M$GNINS <.WORD  N>
                                .ENDM
     005176                     M$GNINS <.WORD  RSPPNE>
                                .IF LT SVCINS
                                .WORD   RSPPNE
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     005176  006432                     .WORD   RSPPNE
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   RSPPNE
                                          .NLIST
                                .ENDC
                                .IFF
                                M$WORD  0
                                .ENDC
                                .IF NB
                                M$WORD
                                .IFF
     005200                     M$WORD  0
                                .MCALL  M$GNINS
                                .IRP    N,<0>
                                M$GNINS <.WORD  N>
                                .ENDM
     005200                     M$GNINS <.WORD  0>
                                .IF LT SVCINS
                                .WORD   0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     005200  000000                     .WORD   0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   0
                                          .NLIST
                                .ENDC
```

```
                                .ENDC
   005202  000642                        BR      RSPDRP                  ; DROP OFFENDING UDA

   005204                       CYLCMP: PRINTX  #RM.CMP,L$LUN,HC.BF2+6(R4) ; LOG MESSAGE
                                .MCALL  M$PRINT
                                .IF B   #RM.CMP
                                .ERROR  ;MISSING FORMAT
                                .MEXIT
                                .ENDC
                                .IF B   <L$LUN>
                                M$PRINT C$PNTX,#RM.CMP
                                .MEXIT
                                .ENDC
                                .IF B   <HC.BF2+6(R4)>
                                M$PRINT C$PNTX,#RM.CMP,<L$LUN>
                                .MEXIT
                                .ENDC
                                .IF B   <>
   005204                       M$PRINT C$PNTX,#RM.CMP,<L$LUN>,<HC.BF2+6(R4)>
                                .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
           000001               T$ARGCNT=1
   005204                       M$COUNT T$ARGCNT,<L$LUN>,<HC.BF2+6(R4)>,<>,<>,<>,<>,<>,<>
                                .IF NB <HC.BF2+6(R4)>
   005204                       M$COUNT T$ARGCNT,<HC.BF2+6(R4)>,<>,<>,<>,<>,<>,<>,<>
                                .IF NB <>
                                M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB <HC.BF2+6(R4)>
           000002               T$ARGCNT=T$ARGCNT+1
                                .ENDC
                                .ENDC
                                .IF NB <L$LUN>
           000003               T$ARGCNT=T$ARGCNT+1
                                .ENDC
                                .IRP    N,<\T$ARGCNT>
                                M$PUT   #N,#RM.CMP,<L$LUN>,<HC.BF2+6(R4)>,<>,<>,<>,<>,<>,<>
                                .ENDM
   005204                       M$PUT   #3,#RM.CMP,<L$LUN>,<HC.BF2+6(R4)>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <#RM.CMP>
   005204                       M$PUT   <#RM.CMP>,<L$LUN>,<HC.BF2+6(R4)>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <L$LUN>
   005204                       M$PUT   <L$LUN>,<HC.BF2+6(R4)>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <HC.BF2+6(R4)>
   005204                       M$PUT   <HC.BF2+6(R4)>,<>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <>
                                M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB  <HC.BF2+6(R4)>
   005204                       M$PUT1  HC.BF2+6(R4)
                                .MCALL  M$GNINS
                                .IF B
   005204                       M$GNINS <MOV    HC.BF2+6(R4),-(SP)>
                                .IF LT SVCINS
```

```
                                MOV     HC.BF2+6(R4),-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     005204  016446  000220             MOV     HC.BF2+6(R4),-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     HC.BF2+6(R4),-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<HC.BF2+6(R4)>
                                .ERROR  ;ILL. ARG. ''HC.BF2+6(R4)'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <L$LUN>
     005210                     M$PUT1  L$LUN
                                .MCALL  M$GNINS
                                .IF B
     005210                     M$GNINS <MOV    L$LUN,-(SP)>
                                .IF LT SVCINS
                                MOV     L$LUN,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     005210  013746  002074             MOV     L$LUN,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     L$LUN,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<L$LUN>
                                .ERROR  ;ILL. ARG. ''L$LUN'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#RM.CMP>
     005214                     M$PUT1  #RM.CMP
                                .MCALL  M$GNINS
                                .IF B
     005214                     M$GNINS <MOV    #RM.CMP,-(SP)>
                                .IF LT SVCINS
                                MOV     #RM.CMP,-(SP)
```

```
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
005214  012746  006572                 MOV     #RM.CMP,-(SP)
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                       MOV     #RM.CMP,-(SP)
                                        .NLIST
                              .ENDC
                              .IFF
                              .IF DIF B,<#RM.CMP>
                              .ERROR  ;ILL. ARG. '"#RM.CMP"' ONLY 'B' IS ALLOWED.
                              .MEXIT
                              .ENDC
                              M$GNINS <CLR    -(SP)>
                              M$GNINS <BISB   ,(SP)>
                              .ENDC
                              .ENDC
                              .ENDC
                              .IF NB  <#3>
005220                        M$PUT1  #3
                              .MCALL  M$GNINS
                              .IF B
005220                        M$GNINS <MOV    #3,-(SP)>
                              .IF LT SVCINS
                              MOV     #3,-(SP)
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
005220  012746  000003                 MOV     #3,-(SP)
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                       MOV     #3,-(SP)
                                        .NLIST
                              .ENDC
                              .IFF
                              .IF DIF B,<#3>
                              .ERROR  ;ILL. ARG. '"#3"' ONLY 'B' IS ALLOWED.
                              .MEXIT
                              .ENDC
                              M$GNINS <CLR    -(SP)>
                              M$GNINS <BISB   ,(SP)>
                              .ENDC
                              .ENDC
005224                        M$GNINS <MOV    SP,R0>
                              .IF LT SVCINS
                              MOV     SP,R0
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
005224  010600                         MOV     SP,R0
                              .MEXIT
                              .ENDC
```

```
                            .IF GT SVCINS
                            .LIST
                                                                        MOV     SP,R0
                                          .NLIST
                            .ENDC
   005226                   M$SVC    C$PNTX
                            .MCALL  M$CNINS,M$TSTLAB
   005226                   M$TSTLAB
                            .MCALL  M$TLABEL,M$INCR
                            .IIF LT T$TSTMAC, .MEXIT
                            .RADIX  10
                            M$TLABEL          \T$TESTNUN,\T$TSTSEQ
                            .RADIX  8
                            M$INCR  T$TSTSEQ
   005226                   M$GNINS <TRAP    C$PNTX>
                            .IF LT SVCINS
                            TRAP    C$PNTX
                            .MEXIT
                            .ENDC
                            .IF EQ SVCINS
   005226  104415                   TRAP     C$PNTX
                            .MEXIT
                            .ENDC
                            .IF GT SVCINS
                            .LIST
                                                                        TRAP    C$PNTX
                                          .NLIST
                            .ENDC
                            .IRP     N,<\T$ARGCNT*2+2>
                            M$GNINS <ADD     #N,SP>
                            .ENDM
   005230                   M$GNINS <ADD     #10,SP>
                            .IF LT SVCINS
                            ADD     #10,SP
                            .MEXIT
                            .ENDC
                            .IF EQ SVCINS
   005230  062706  000010           ADD      #10,SP
                            .MEXIT
                            .ENDC
                            .IF GT SVCINS
                            .LIST
                                                                        ADD     #10,SP
                                          .NLIST
                            .ENDC
                            .MEXIT
                            .ENDC
                            .IF B   <>
                            M$PRINT C$PNTX,#RM.CMP,<L$LUN>,<HC.BF2+6(R4)>,<>
                            .MEXIT
                            .ENDC
                            .IF B   <>
                            M$PRINT C$PNTX,#RM.CMP,<L$LUN>,<HC.BF2+6(R4)>,<>,<>
                            .MEXIT
                            .ENDC
                            .IF B   <>
                            M$PRINT C$PNTX,#RM.CMP,<L$LUN>,<HC.BF2+6(R4)>,<>,<>,<>
```

```
                                        .MEXIT
                                        .ENDC
                                        .IF B    <>
                                        M$PRINT C$PNTX,#RM.CMP,<L$LUN>,<HC.BF2+6(R4)>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B    <>
                                        M$PRINT C$PNTX,#RM.CMP,<L$LUN>,<HC.BF2+6(R4)>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        M$PRINT C$PNTX,#RM.CMP,<L$LUN>,<HC.BF2+6(R4)>,<>,<>,<>,<>,<>,<>
    21 005234   004737  003110                  CALL    GETDMR                  ; ISSUE ANOTHER MAINT. READ TO THIS DM
    22 005240   000137  004700                  JMP     RSPNXT                  ; GET NEXT MESSAGE
```

```
005244                          KRANTZ:
005244  012700  000004                  MOV     #OP.SND,R0              ;BUILD A SEND DATTA COMMAND PACKET
005250  004737  002520                  CALL    BLDCMD
005254  012700  000160                  MOV     #HC.BF1,R0              ;POINT TO BUFFER IN PACKET
005260  004737  002614                  CALL    CLRBUF                  ; AND CLEAR BUFER

005264  012724  020123                  MOV     #'S ,(R4)+              ; SET START MESSAGE FLAG
005270  013700  002204                  MOV     DMPROG,R0               ; START OF DM PROG IN HOST MEM
005274  063700  002210                  ADD     DMTRLN,R0               ; COMPUTE START OF DM OVERLAYS
005300  010024                          MOV     R0,(R4)+                ; PUT IN BUFF FOR DM
005302  005024                          CLR     (R4)+                   ; HI ORDER BITS OF ADDRESS ARE ZEROS
005304  016524  000020                  MOV     C.UNUM(R5),(R4)+        ; UNIT NUMBER TO TEST
005310  016524  000022                  MOV     C.DFLG(R5),(R4)+        ; STARTUP FLAGS
005314  016524  000030                  MOV     C.SNUM(R5),(R4)+        ; MOVE 4 WORD SERIAL NUMBER
005320  016524  000032                  MOV     C.SNUM+2(R5),(R4)+
005324  016524  000034                  MOV     C.SNUM+4(R5),(R4)+
005330  016524  000036                  MOV     C.SNUM+6(R5),(R4)+
005334  013724  002150                  MOV     DATE,(R4)+              ; DATE
005340  013724  002152                  MOV     DATE+2,(R4)+
005344  013724  002154                  MOV     DATE+4,(R4)+
005350  013724  002156                  MOV     DATE+6,(R4)+

005354  004737  012010                  CALL    SNDCMD
005360  000137  004700                  JMP     RSPNXT
005364                          GETFCT:
005364  016401  000216                  MOV     HC.BF2+4(R4),R1         ; GET DESIRED FCT BLOCK NUMBER
005370  004737  002656                  CALL    GETBLK                  ; READ DESIRED BLOCK

005374  012700  000004                  MOV     #OP.SND,R0              ; REQUEST A SEND DATA PACKET
005400  004737  002520                  CALL    BLDCMD                  ; BUILD THE COMMAND
005404  012700  000160                  MOV     #HC.BF1,R0              ; PLACE DATA IN BUFFER 1
005410  004737  002614                  CALL    CLRBUF                  ; CLEAR MESSAGE BUFFER
                                                                        ; PUT MESSAGE IN BUFFER
005414  012724  020106                  MOV     #'F ,(R4)+              ; SET MESSAGE CODE
005420  010124                          MOV     R1,(R4)+                ; SET FCT BLOCK NUMBER
005422  010224                          MOV     R2,(R4)+                ; SET SUCCESS/FAILURE (0=SUCCESS,-1=...)
005424  016524  000024                  MOV     C.FBUF(R5),(R4)+        ; SET POINTER TO BUFFER

005430  004737  012010                  CALL    SNDCMD                  ; SEND THE MESSAGE

005434  000137  004700                  JMP     RSPNXT                  ; CHECK NEXT CONTROLLER
```

```
   1 005440                     FMTDNE: PRINTF   #RM.DNE,L$LUN              ; LOG UNIT SUCCESSFULLY COMPLETED
                                .MCALL  M$PRINT
                                .IF B   #RM.DNE
                                .ERROR  ;MISSING FORMAT
                                .MEXIT
                                .ENDC
                                .IF B   <L$LUN>
                                M$PRINT C$PNTF,#RM.DNE
                                .MEXIT
                                .ENDC
                                .IF B   <>
     005440                     M$PRINT C$PNTF,#RM.DNE,<L$LUN>
                                .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
            000001              T$ARGCNT=1
     005440                     M$COUNT T$ARGCNT,<L$LUN>,<>,<>,<>,<>,<>,<>,<>
                                .IF NB <>
                                M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB <L$LUN>
            000002              T$ARGCNT=T$ARGCNT+1
                                .ENDC
                                .IRP    N,<\T$ARGCNT>
                                M$PUT   #N,#RM.DNE,<L$LUN>,<>,<>,<>,<>,<>,<>,<>
                                .ENDM
     005440                     M$PUT   #2,#RM.DNE,<L$LUN>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <#RM.DNE>
     005440                     M$PUT   <#RM.DNE>,<L$LUN>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <L$LUN>
     005440                     M$PUT   <L$LUN>,<>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <>
                                M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB  <L$LUN>
     005440                     M$PUT1  L$LUN
                                .MCALL  M$GNINS
                                .IF B
     005440                     M$GNINS <MOV      L$LUN,-(SP)>
                                .IF LT SVCINS
                                MOV     L$LUN,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     005440 013746  002074              MOV      L$LUN,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                MOV      L$LUN,-(SP)
                                                .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<L$LUN>
                                .ERROR  ;ILL. ARG. ''L$LUN'' ONLY ''B'' IS ALLOWED.
                                .MEXIT
```

```
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#RM.DNE>
     005444                     M$PUT1  #RM.DNE
                                .MCALL  M$GNINS
                                .IF B
     005444                     M$GNINS <MOV    #RM.DNE,-(SP)>
                                .IF LT SVCINS
                                MOV     #RM.DNE,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     005444  012746  006644             MOV     #RM.DNE,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                MOV     #RM.DNE,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#RM.DNE>
                                .ERROR  ;ILL. ARG. ''#RM.DNE'' ONLY ''B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#2>
     005450                     M$PUT1  #2
                                .MCALL  M$GNINS
                                .IF B
     005450                     M$GNINS <MOV    #2,-(SP)>
                                .IF LT SVCINS
                                MOV     #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     005450  012746  000002             MOV     #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                MOV     #2,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#2>
                                .ERROR  ;ILL. ARG. ''#2'' ONLY ''B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
```

```
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
     005454                     M$GNINS <MOV    SP,R0>
                                .IF LT SVCINS
                                MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     005454  010600                     MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     SP,R0
                                        .NLIST
                                .ENDC
     005456                     M$SVC   C$PNTF
                                .MCALL  M$GNINS,M$TSTLAB
     005456                     M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
     005456                     M$GNINS <TRAP   C$PNTF>
                                .IF LT SVCINS
                                TRAP    C$PNTF
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     005456  104417                     TRAP    C$PNTF
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        TRAP    C$PNTF
                                        .NLIST
                                .ENDC
                                .IRP    N,<\T$ARGCNT*2+2>
                                M$GNINS <ADD    #N,SP>
                                .ENDM
     005460                     M$GNINS <ADD    #6,SP>
                                .IF LT SVCINS
                                ADD     #6,SP
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     005460  062706  000006             ADD     #6,SP
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        ADD     #6,SP
                                        .NLIST
```

```
                                    .ENDC
                                    .MEXIT
                                    .ENDC
                                    .IF B    <>
                                    M$PRINT C$PNTF,#RM.DNE,<L$LUN>,<>
                                    .MEXIT
                                    .ENDC
                                    .IF B    <>
                                    M$PRINT C$PNTF,#RM.DNE,<L$LUN>,<>,<>
                                    .MEXIT
                                    .ENDC
                                    .IF B    <>
                                    M$PRINT C$PNTF,#RM.DNE,<L$LUN>,<>,<>,<>
                                    .MEXIT
                                    .ENDC
                                    .IF B    <>
                                    M$PRINT C$PNTF,#RM.DNE,<L$LUN>,<>,<>,<>,<>
                                    .MEXIT
                                    .ENDC
                                    .IF B    <>
                                    M$PRINT C$PNTF,#RM.DNE,<L$LUN>,<>,<>,<>,<>,<>
                                    .MEXIT
                                    .ENDC
                                    .IF B    <>
                                    M$PRINT C$PNTF,#RM.DNE,<L$LUN>,<>,<>,<>,<>,<>,<>
                                    .MEXIT
                                    .ENDC
                                    M$PRINT C$PNTF,#RM.DNE,<L$LUN>,<>,<>,<>,<>,<>,<>,<>

 005464  062704  000216                      ADD     #HC.BF2+4,R4             ; POINT TO FIRST DATA WORD
 005470  011402                              MOV     (R4),R2                  ; TOTAL # REVECTORED LBNS
 005472  166402  000002                      SUB     2(R4),R2                 ; - SECONDARY REVECS = PRIMARY REVECS

 005476                                      PRINTS  #RM.D1T,(R4)+            ; LBN MESSAGES
                                    .MCALL  M$PRINT
                                    .IF B   #RM.D1T
                                    .ERROR  ;MISSING FORMAT
                                    .MEXIT
                                    .ENDC
                                    .IF B   <(R4)+>
                                    M$PRINT C$PNTS,#RM.D1T
                                    .MEXIT
                                    .ENDC
                                    .IF B   <>
 005476                             M$PRINT C$PNTS,#RM.D1T,<(R4)+>
                                    .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
         000001                     T$ARGCNT=1
 005476                             M$COUNT T$ARGCNT,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                    .IF NB <>
                                    M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                    .ENDC
                                    .IF NB <(R4)+>
         000002                     T$ARGCNT=T$ARGCNT+1
                                    .ENDC
                                    .IRP    N,<\T$ARGCNT>
                                    M$PUT   #N,#RM.D1T,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                    .ENDM
```

```
	005476				M$PUT	#2,#RM.D1T,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
					.MCALL	M$PUT1
					.IF NB	<#RM.D1T>
	005476				M$PUT	<#RM.D1T>,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
					.MCALL	M$PUT1
					.IF NB	<(R4)+>
	005476				M$PUT	<(R4)+>,<>,<>,<>,<>,<>,<>,<>,<>
					.MCALL	M$PUT1
					.IF NB	<>
					M$PUT	<>,<>,<>,<>,<>,<>,<>,<>,<>
					.ENDC
					.IF NB	<(R4)+>
	005476				M$PUT1	(R4)+
					.MCALL	M$GNINS
					.IF B
	005476				M$GNINS <MOV	(R4)+,-(SP)>
					.IF LT SVCINS
					MOV	(R4)+,-(SP)
					.MEXIT
					.ENDC
					.IF EQ SVCINS
	005476	012446				MOV	(R4)+,-(SP)
					.MEXIT
					.ENDC
					.IF GT SVCINS
					.LIST
										MOV	(R4)+,-(SP)
						.NLIST
					.ENDC
					.IFF
					.IF DIF B,<(R4)+>
					.ERROR	;ILL. ARG. "(R4)+" ONLY 'B' IS ALLOWED.
					.MEXIT
					.ENDC
					M$GNINS <CLR	-(SP)>
					M$GNINS <BISB	,(SP)>
					.ENDC
					.ENDC
					.ENDC
					.IF NB	<#RM.D1T>
	005500				M$PUT1	#RM.D1T
					.MCALL	M$GNINS
					.IF B
	005500				M$GNINS <MOV	#RM.D1T,-(SP)>
					.IF LT SVCINS
					MOV	#RM.D1T,-(SP)
					.MEXIT
					.ENDC
					.IF EQ SVCINS
	005500	012746	006723			MOV	#RM.D1T,-(SP)
					.MEXIT
					.ENDC
					.IF GT SVCINS
					.LIST
										MOV	#RM.D1T,-(SP)
						.NLIST
					.ENDC
```

```
                                .IFF
                                .IF DIF B,<#RM.D1T>
                                .ERROR  ;ILL. ARG. ''#RM.D1T'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#2>
        005504                  M$PUT1  #2
                                .MCALL  M$GNINS
                                .IF B
        005504                  M$GNINS <MOV    #2,-(SP)>
                                .IF LT SVCINS
                                MOV     #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
        005504  012746  000002          MOV     #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     #2,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#2>
                                .ERROR  ;ILL. ARG. ''#2'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
        005510                  M$GNINS <MOV    SP,R0>
                                .IF LT SVCINS
                                MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
        005510  010600                  MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     SP,R0
                                          .NLIST
                                .ENDC
        005512                  M$SVC   C$PNTS
                                .MCALL  M$GNINS,M$TSTLAB
        005512                  M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
```

```
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
005512                          M$GNINS <TRAP   C$PNTS>
                                .IF LT SVCINS
                                TRAP    C$PNTS
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
005512  104416                          TRAP    C$PNTS
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                TRAP    C$PNTS
                                                .NLIST
                                .ENDC
                                .IRP    N,<\T$ARGCNT*2+2>
                                M$GNINS <ADD    #N,SP>
                                .ENDM
005514                          M$GNINS <ADD    #6,SP>
                                .IF LT SVCINS
                                ADD     #6,SP
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
005514  062706  000006                  ADD     #6,SP
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                ADD     #6,SP
                                                .NLIST
                                .ENDC
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTS,#RM.D1T,<(R4)+>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTS,#RM.D1T,<(R4)+>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTS,#RM.D1T,<(R4)+>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTS,#RM.D1T,<(R4)+>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTS,#RM.D1T,<(R4)+>,<>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
```

```
                        M$PRINT C$PNTS,#RM.D1T,<(R4)+>,<>,<>,<>,<>,<>,<>
                        .MEXIT
                        .ENDC
                        M$PRINT C$PNTS,#RM.D1T,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
  8 005520                      PRINTS  #RM.D1P,R2
                        .MCALL  M$PRINT
                        .IF B   #RM.D1P
                        .ERROR  ;MISSING FORMAT
                        .MEXIT
                        .ENDC
                        .IF B   <R2>
                        M$PRINT C$PNTS,#RM.D1P
                        .MEXIT
                        .ENDC
                        .IF B   <>
    005520              M$PRINT C$PNTS,#RM.D1P,<R2>
                        .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
            000001      T$ARGCNT=1
    005520              M$COUNT T$ARGCNT,<R2>,<>,<>,<>,<>,<>,<>,<>
                        .IF NB <>
                        M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                        .ENDC
                        .IF NB <R2>
            000002      T$ARGCNT=T$ARGCNT+1
                        .ENDC
                        .IRP    N,<\T$ARGCNT>
                        M$PUT   #N,#RM.D1P,<R2>,<>,<>,<>,<>,<>,<>,<>
                        .ENDM
    005520              M$PUT   #2,#RM.D1P,<R2>,<>,<>,<>,<>,<>,<>,<>
                        .MCALL  M$PUT1
                        .IF NB  <#RM.D1P>
    005520              M$PUT   <#RM.D1P>,<R2>,<>,<>,<>,<>,<>,<>,<>
                        .MCALL  M$PUT1
                        .IF NB  <R2>
    005520              M$PUT   <R2>,<>,<>,<>,<>,<>,<>,<>,<>
                        .MCALL  M$PUT1
                        .IF NB  <>
                        M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                        .ENDC
                        .IF NB  <R2>
    005520              M$PUT1  R2
                        .MCALL  M$GNINS
                        .IF B
    005520              M$GNINS <MOV    R2,-(SP)>
                        .IF LT SVCINS
                        MOV     R2,-(SP)
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
    005520  010246              MOV     R2,-(SP)
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                MOV     R2,-(SP)
                                        .NLIST
                        .ENDC
```

```
                                .IFF
                                .IF DIF B,<R2>
                                .ERROR  ;ILL. ARG. ''R2'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR     -(SP)>
                                M$GNINS <BISB    ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB   <#RM.D1P>
005522                          M$PUT1   #RM.D1P
                                .MCALL   M$GNINS
                                .IF B
005522                          M$GNINS <MOV     #RM.D1P,-(SP)>
                                .IF LT SVCINS
                                MOV      #RM.D1P,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
005522  012746  007005                   MOV      #RM.D1P,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                             MOV      #RM.D1P,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#RM.D1P>
                                .ERROR  ;ILL. ARG. ''#RM.D1P'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR     -(SP)>
                                M$GNINS <BISB    ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB   <#2>
005526                          M$PUT1   #2
                                .MCALL   M$GNINS
                                .IF B
005526                          M$GNINS <MOV     #2,-(SP)>
                                .IF LT SVCINS
                                MOV      #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
005526  012746  000002                   MOV      #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                             MOV      #2,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
```

```
                                        .IF DIF B,<#2>
                                        .ERROR  ;ILL. ARG. ''#2'' ONLY 'B'' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR    -(SP)>
                                        M$GNINS <BISB   ,(SP)>
                                        .ENDC
                                        .ENDC
      005532                            M$GNINS <MOV    SP,R0>
                                        .IF LT SVCINS
                                        MOV     SP,R0
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      005532  010600                           MOV      SP,R0
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        MOV     SP,R0
                                                     .NLIST
                                        .ENDC
      005534                            M$SVC   C$PNTS
                                        .MCALL  M$GNINS,M$TSTLAB
      005534                            M$TSTLAB
                                        .MCALL  M$TLABEL,M$INCR
                                        .IIF LT T$TSTMAC, .MEXIT
                                        .RADIX  10
                                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                        .RADIX  8
                                        M$INCR  T$TSTSEQ
      005534                            M$GNINS <TRAP   C$PNTS>
                                        .IF LT SVCINS
                                        TRAP    C$PNTS
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      005534  104416                           TRAP     C$PNTS
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        TRAP    C$PNTS
                                                     .NLIST
                                        .ENDC
                                        .IRP    N,<\T$ARGCNT*2+2>
                                        M$GNINS <ADD    #N,SP>
                                        .ENDM
      005536                            M$GNINS <ADD    #6,SP>
                                        .IF LT SVCINS
                                        ADD     #6,SP
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      005536  062706  000006                   ADD      #6,SP
                                        .MEXIT
                                        .ENDC
```

```
                                .IF GT SVCINS
                                .LIST
                                                                        ADD     #6,SP
                                           .NLIST
                                .ENDC
                                .MEXIT
                                .ENDC
                                .IF B    <>
                                M$PRINT C$PNTS,#RM.D1P,<R2>,<>
                                .MEXIT
                                .ENDC
                                .IF B    <>
                                M$PRINT C$PNTS,#RM.D1P,<R2>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B    <>
                                M$PRINT C$PNTS,#RM.D1P,<R2>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B    <>
                                M$PRINT C$PNTS,#RM.D1P,<R2>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B    <>
                                M$PRINT C$PNTS,#RM.D1P,<R2>,<>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B    <>
                                M$PRINT C$PNTS,#RM.D1P,<R2>,<>,<>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                M$PRINT C$PNTS,#RM.D1P,<R2>,<>,<>,<>,<>,<>,<>,<>
   9 005542                             PRINTS  #RM.D1S,(R4)+
                                .MCALL  M$PRINT
                                .IF B    #RM.D1S
                                .ERROR  ;MISSING FORMAT
                                .MEXIT
                                .ENDC
                                .IF B    <(R4)+>
                                M$PRINT C$PNTS,#RM.D1S
                                .MEXIT
                                .ENDC
                                .IF B    <>
     005542                     M$PRINT C$PNTS,#RM.D1S,<(R4)+>
                                .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
             000001             T$ARGCNT=1
     005542                     M$COUNT T$ARGCNT,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                .IF NB <>
                                M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB <(R4)+>
             000002             T$ARGCNT=T$ARGCNT+1
                                .ENDC
                                .IRP    N,<\T$ARGCNT>
                                M$PUT   #N,#RM.D1S,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                .ENDM
     005542                     M$PUT   #2,#RM.D1S,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
```

```
                                   .MCALL   M$PUT1
                                   .IF NB   <#RM.D1S>
 005542                            M$PUT    <#RM.D1S>,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                   .MCALL   M$PUT1
                                   .IF NB   <(R4)+>
 005542                            M$PUT    <(R4)+>,<>,<>,<>,<>,<>,<>,<>,<>
                                   .MCALL   M$PUT1
                                   .IF NB   <>
                                   M$PUT    <>,<>,<>,<>,<>,<>,<>,<>,<>
                                   .ENDC
                                   .IF NB   <(R4)+>
 005542                            M$PUT1   (R4)+
                                   .MCALL   M$GNINS
                                   .IF B
 005542                            M$GNINS <MOV     (R4)+,-(SP)>
                                   .IF LT SVCINS
                                   MOV      (R4)+,-(SP)
                                   .MEXIT
                                   .ENDC
                                   .IF EQ SVCINS
 005542  012446                             MOV      (R4)+,-(SP)
                                   .MEXIT
                                   .ENDC
                                   .IF GT SVCINS
                                   .LIST
                                                                                 MOV      (R4)+,-(SP)
                                                 .NLIST
                                   .ENDC
                                   .IFF
                                   .IF DIF B,<(R4)+>
                                   .ERROR   ;ILL. ARG. ''(R4)+'' ONLY 'B'' IS ALLOWED.
                                   .MEXIT
                                   .ENDC
                                   M$GNINS <CLR     -(SP)>
                                   M$GNINS <BISB    ,(SP)>
                                   .ENDC
                                   .ENDC
                                   .ENDC
                                   .IF NB   <#RM.D1S>
 005544                            M$PUT1   #RM.D1S
                                   .MCALL   M$GNINS
                                   .IF B
 005544                            M$GNINS <MOV     #RM.D1S,-(SP)>
                                   .IF LT SVCINS
                                   MOV      #RM.D1S,-(SP)
                                   .MEXIT
                                   .ENDC
                                   .IF EQ SVCINS
 005544  012746  007067                     MOV      #RM.D1S,-(SP)
                                   .MEXIT
                                   .ENDC
                                   .IF GT SVCINS
                                   .LIST
                                                                                 MOV      #RM.D1S,-(SP)
                                                 .NLIST
                                   .ENDC
                                   .IFF
```

```
                                .IF DIF B,<#RM.D1S>
                                .ERROR  ;ILL. ARG. "#RM.D1S" ONLY 'B' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#2>
005550                          M$PUT1  #2
                                .MCALL  M$GNINS
                                .IF B
005550                          M$GNINS <MOV    #2,-(SP)>
                                .IF LT SVCINS
                                MOV     #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
005550  012746  000002                  MOV     #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     #2,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#2>
                                .ERROR  ;ILL. ARG. "#2" ONLY 'B' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
005554                          M$GNINS <MOV    SP,R0>
                                .IF LT SVCINS
                                MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
005554  010600                          MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     SP,R0
                                          .NLIST
                                .ENDC
005556                          M$SVC   C$PNTS
                                .MCALL  M$GNINS,M$TSTLAB
005556                          M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
```

```
                                        .RADIX  8
                                        M$INCR  T$TSTSEQ
     005556                             M$GNINS <TRAP    C$PNTS>
                                        .IF LT SVCINS
                                        TRAP    C$PNTS
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
     005556  104416                             TRAP    C$PNTS
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                    TRAP    C$PNTS
                                                        .NLIST
                                        .ENDC
                                        .IRP    N,<\T$ARGCNT*2+2>
                                        M$GNINS <ADD     #N,SP>
                                        .ENDM
     005560                             M$GNINS <ADD     #6,SP>
                                        .IF LT SVCINS
                                        ADD     #6,SP
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
     005560  062706  000006                     ADD     #6,SP
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                    ADD     #6,SP
                                                        .NLIST
                                        .ENDC
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D1S,<(R4)+>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D1S,<(R4)+>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D1S,<(R4)+>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D1S,<(R4)+>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D1S,<(R4)+>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D1S,<(R4)+>,<>,<>,<>,<>,<>,<>
```

```
                                .MEXIT
                                .ENDC
                                M$PRINT C$PNTS,#RM.D1S,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
   10 005564                            PRINTS  #RM.D2D,(R4)+           ; RCT MESSAGES
                                .MCALL  M$PRINT
                                .IF B   #RM.D2D
                                .ERROR  ;MISSING FORMAT
                                .MEXIT
                                .ENDC
                                .IF B   <(R4)+>
                                M$PRINT C$PNTS,#RM.D2D
                                .MEXIT
                                .ENDC
                                .IF B   <>
      005564                    M$PRINT C$PNTS,#RM.D2D,<(R4)+>
                                .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
             000001             T$ARGCNT=1
      005564                    M$COUNT T$ARGCNT,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                .IF NB <>
                                M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB <(R4)+>
             000002             T$ARGCNT=T$ARGCNT+1
                                .ENDC
                                .IRP    N,<\T$ARGCNT>
                                M$PUT   #N,#RM.D2D,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                .ENDM
      005564                    M$PUT   #2,#RM.D2D,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <#RM.D2D>
      005564                    M$PUT   <#RM.D2D>,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <(R4)+>
      005564                    M$PUT   <(R4)+>,<>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <>
                                M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB  <(R4)+>
      005564                    M$PUT1  (R4)+
                                .MCALL  M$GNINS
                                .IF B
      005564                    M$GNINS <MOV    (R4)+,-(SP)>
                                .IF LT SVCINS
                                MOV     (R4)+,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
      005564  012446                    MOV     (R4)+,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                MOV     (R4)+,-(SP)
                                                .NLIST
                                .ENDC
                                .IFF
```

```
                                        .IF DIF B,<(R4)+>
                                        .ERROR  ;ILL. ARG. ''(R4)+'' ONLY 'B'' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR    -(SP)>
                                        M$GNINS <BISB   ,(SP)>
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF NB  <#RM.D2D>
       005566                           M$PUT1  #RM.D2D
                                        .MCALL  M$GNINS
                                        .IF B
       005566                           M$GNINS <MOV    #RM.D2D,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #RM.D2D,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
       005566  012746  007151                   MOV     #RM.D2D,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        MOV     #RM.D2D,-(SP)
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#RM.D2D>
                                        .ERROR  ;ILL. ARG. ''#RM.D2D'' ONLY 'B'' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR    -(SP)>
                                        M$GNINS <BISB   ,(SP)>
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF NB  <#2>
       005572                           M$PUT1  #2
                                        .MCALL  M$GNINS
                                        .IF B
       005572                           M$GNINS <MOV    #2,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #2,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
       005572  012746  000002                   MOV     #2,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        MOV     #2,-(SP)
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#2>
```

```
                            .ERROR  ;ILL. ARG. ''#2'' ONLY 'B'' IS ALLOWED.
                            .MEXIT
                            .ENDC
                            M$GNINS <CLR    -(SP)>
                            M$GNINS <BISB   ,(SP)>
                            .ENDC
                            .ENDC
005576                      M$GNINS <MOV    SP,R0>
                            .IF LT SVCINS
                            MOV     SP,R0
                            .MEXIT
                            .ENDC
                            .IF EQ SVCINS
005576  010600                      MOV     SP,R0
                            .MEXIT
                            .ENDC
                            .IF GT SVCINS
                            .LIST
                                                                                MOV     SP,R0
                                            .NLIST
                            .ENDC
005600                      M$SVC   C$PNTS
                            .MCALL  M$GNINS,M$TSTLAB
005600                      M$TSTLAB
                            .MCALL  M$TLABEL,M$INCR
                            .IIF LT T$TSTMAC, .MEXIT
                            .RADIX  10
                            M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                            .RADIX  8
                            M$INCR  T$TSTSEQ
005600                      M$GNINS <TRAP   C$PNTS>
                            .IF LT SVCINS
                            TRAP    C$PNTS
                            .MEXIT
                            .ENDC
                            .IF EQ SVCINS
005600  104416                      TRAP    C$PNTS
                            .MEXIT
                            .ENDC
                            .IF GT SVCINS
                            .LIST
                                                                                TRAP    C$PNTS
                                            .NLIST
                            .ENDC
                            .IRP    N,<\T$ARGCNT*2+2>
                            M$GNINS <ADD    #N,SP>
                            .ENDM
005602                      M$GNINS <ADD    #6,SP>
                            .IF LT SVCINS
                            ADD     #6,SP
                            .MEXIT
                            .ENDC
                            .IF EQ SVCINS
005602  062706  000006              ADD     #6,SP
                            .MEXIT
                            .ENDC
                            .IF GT SVCINS
```

```
                        .LIST
                                                                        ADD     #6,SP
                                        .NLIST
                        .ENDC
                        .MEXIT
                        .ENDC
                        .IF B    <>
                        M$PRINT C$PNTS,#RM.D2D,<(R4)+>,<>
                        .MEXIT
                        .ENDC
                        .IF B    <>
                        M$PRINT C$PNTS,#RM.D2D,<(R4)+>,<>,<>
                        .MEXIT
                        .ENDC
                        .IF B    <>
                        M$PRINT C$PNTS,#RM.D2D,<(R4)+>,<>,<>,<>
                        .MEXIT
                        .ENDC
                        .IF B    <>
                        M$PRINT C$PNTS,#RM.D2D,<(R4)+>,<>,<>,<>,<>
                        .MEXIT
                        .ENDC
                        .IF B    <>
                        M$PRINT C$PNTS,#RM.D2D,<(R4)+>,<>,<>,<>,<>,<>
                        .MEXIT
                        .ENDC
                        .IF B    <>
                        M$PRINT C$PNTS,#RM.D2D,<(R4)+>,<>,<>,<>,<>,<>,<>
                        .MEXIT
                        .ENDC
                        M$PRINT C$PNTS,#RM.D2D,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
  11 005606                     PRINTS  #RM.D2H,(R4)+
                        .MCALL  M$PRINT
                        .IF B   #RM.D2H
                        .ERROR  ;MISSING FORMAT
                        .MEXIT
                        .ENDC
                        .IF B   <(R4)+>
                        M$PRINT C$PNTS,#RM.D2H
                        .MEXIT
                        .ENDC
                        .IF B   <>
     005606             M$PRINT C$PNTS,#RM.D2H,<(R4)+>
                        .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
            000001      T$ARGCNT=1
     005606             M$COUNT T$ARGCNT,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                        .IF NB <>
                        M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                        .ENDC
                        .IF NB <(R4)+>
            000002      T$ARGCNT=T$ARGCNT+1
                        .ENDC
                        .IRP    N,<\T$ARGCNT>
                        M$PUT   #N,#RM.D2H,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                        .ENDM
     005606             M$PUT   #2,#RM.D2H,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                        .MCALL  M$PUT1
```

```
                                .IF NB   <#RM.D2H>
   005606                       M$PUT    <#RM.D2H>,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL   M$PUT1
                                .IF NB   <(R4)+>
   005606                       M$PUT    <(R4)+>,<>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL   M$PUT1
                                .IF NB   <>
                                M$PUT    <>,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB   <(R4)+>
   005606                       M$PUT1   (R4)+
                                .MCALL   M$GNINS
                                .IF B
   005606                       M$GNINS <MOV    (R4)+,-(SP)>
                                .IF LT SVCINS
                                MOV      (R4)+,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
   005606  012446                        MOV    (R4)+,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                  MOV      (R4)+,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<(R4)+>
                                .ERROR   ;ILL. ARG. ''(R4)+'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB   <#RM.D2H>
   005610                       M$PUT1   #RM.D2H
                                .MCALL   M$GNINS
                                .IF B
   005610                       M$GNINS <MOV    #RM.D2H,-(SP)>
                                .IF LT SVCINS
                                MOV      #RM.D2H,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
   005610  012746  007233                MOV    #RM.D2H,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                  MOV      #RM.D2H,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#RM.D2H>
```

```
                                .ERROR  ;ILL. ARG. ''#RM.D2H'' ONLY ''B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#2>
     005614                     M$PUT1  #2
                                .MCALL  M$GNINS
                                .IF B
     005614                     M$GNINS <MOV    #2,-(SP)>
                                .IF LT SVCINS
                                MOV     #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     005614  012746  000002             MOV     #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     #2,-(SP)
                                        .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#2>
                                .ERROR  ;ILL. ARG. ''#2'' ONLY ''B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
     005620                     M$GNINS <MOV    SP,R0>
                                .IF LT SVCINS
                                MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     005620  010600                     MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     SP,R0
                                        .NLIST
                                .ENDC
     005622                     M$SVC   C$PNTS
                                .MCALL  M$GNINS,M$TSTLAB
     005622                     M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
```

```
                                        M$INCR  T$TSTSEQ
      005622                            M$GNINS <TRAP   C$PNTS>
                                        .IF LT SVCINS
                                        TRAP    C$PNTS
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      005622  104416                            TRAP    C$PNTS
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                          TRAP    C$PNTS
                                                        .NLIST
                                        .ENDC
                                        .IRP    N,<\T$ARGCNT*2+2>
                                        M$GNINS <ADD    #N,SP>
                                        .ENDM
      005624                            M$GNINS <ADD    #6,SP>
                                        .IF LT SVCINS
                                        ADD     #6,SP
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      005624  062706  000006                    ADD     #6,SP
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                          ADD     #6,SP
                                                        .NLIST
                                        .ENDC
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D2H,<(R4)+>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D2H,<(R4)+>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D2H,<(R4)+>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D2H,<(R4)+>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D2H,<(R4)+>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D2H,<(R4)+>,<>,<>,<>,<>,<>,<>
                                        .MEXIT
```

```
                                        .ENDC
                                        M$PRINT C$PNTS,#RM.D2H,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
     12 005630                                  PRINTS  #RM.D3D,(R4)+           ; DBN MESSAGES
                                        .MCALL  M$PRINT
                                        .IF B   #RM.D3D
                                        .ERROR  ;MISSING FORMAT
                                        .MEXIT
                                        .ENDC
                                        .IF B   <(R4)+>
                                        M$PRINT C$PNTS,#RM.D3D
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
        005630                          M$PRINT C$PNTS,#RM.D3D,<(R4)+>
                                        .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
               000001                   T$ARGCNT=1
        005630                          M$COUNT T$ARGCNT,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                        .IF NB <>
                                        M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDC
                                        .IF NB <(R4)+>
               000002                   T$ARGCNT=T$ARGCNT+1
                                        .ENDC
                                        .IRP    N,<\T$ARGCNT>
                                        M$PUT   #N,#RM.D3D,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDM
        005630                          M$PUT   #2,#RM.D3D,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <#RM.D3D>
        005630                          M$PUT   <#RM.D3D>,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <(R4)+>
        005630                          M$PUT   <(R4)+>,<>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <>
                                        M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDC
                                        .IF NB  <(R4)+>
        005630                          M$PUT1  (R4)+
                                        .MCALL  M$GNINS
                                        .IF B
        005630                          M$GNINS <MOV    (R4)+,-(SP)>
                                        .IF LT SVCINS
                                        MOV     (R4)+,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
        005630  012446                          MOV     (R4)+,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                MOV     (R4)+,-(SP)
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<(R4)+>
```

```
                                        .ERROR  ;ILL. ARG. ''(R4)+'' ONLY 'B'' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR    -(SP)>
                                        M$GNINS <BISB   ,(SP)>
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF NB  <#RM.D3D>
      005632                            M$PUT1  #RM.D3D
                                        .MCALL  M$GNINS
                                        .IF B
      005632                            M$GNINS <MOV    #RM.D3D,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #RM.D3D,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      005632  012746  007315                    MOV     #RM.D3D,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                MOV     #RM.D3D,-(SP)
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#RM.D3D>
                                        .ERROR  ;ILL. ARG. ''#RM.D3D'' ONLY 'B'' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR    -(SP)>
                                        M$GNINS <BISB   ,(SP)>
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF NB  <#2>
      005636                            M$PUT1  #2
                                        .MCALL  M$GNINS
                                        .IF B
      005636                            M$GNINS <MOV    #2,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #2,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      005636  012746  000002                    MOV     #2,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                MOV     #2,-(SP)
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#2>
                                        .ERROR  ;ILL. ARG. ''#2'' ONLY 'B'' IS ALLOWED.
```

```
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR     -(SP)>
                                M$GNINS <BISB    ,(SP)>
                                .ENDC
                                .ENDC
005642                          M$GNINS <MOV     SP,R0>
                                .IF LT SVCINS
                                MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
005642  010600                          MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                MOV     SP,R0
                                        .NLIST
                                .ENDC
005644                          M$SVC   C$PNTS
                                .MCALL  M$GNINS,M$TSTLAB
005644                          M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
005644                          M$GNINS <TRAP    C$PNTS>
                                .IF LT SVCINS
                                TRAP    C$PNTS
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
005644  104416                          TRAP    C$PNTS
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                TRAP    C$PNTS
                                        .NLIST
                                .ENDC
                                .IRP    N,<\T$ARGCNT*2+2>
                                M$GNINS <ADD     #N,SP>
                                .ENDM
005646                          M$GNINS <ADD     #6,SP>
                                .IF LT SVCINS
                                ADD     #6,SP
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
005646  062706  000006                  ADD     #6,SP
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
```

```
                                                                        ADD     #6,SP
                                                        .NLIST
                                        .ENDC
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D3D,<(R4)+>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D3D,<(R4)+>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D3D,<(R4)+>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D3D,<(R4)+>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D3D,<(R4)+>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D3D,<(R4)+>,<>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        M$PRINT C$PNTS,#RM.D3D,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
    13 005652                                   PRINTS  #RM.D3H,(R4)+
                                        .MCALL  M$PRINT
                                        .IF B   #RM.D3H
                                        .ERROR  ;MISSING FORMAT
                                        .MEXIT
                                        .ENDC
                                        .IF B   <(R4)+>
                                        M$PRINT C$PNTS,#RM.D3H
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
       005652                           M$PRINT C$PNTS,#RM.D3H,<(R4)+>
                                        .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
              000001                    T$ARGCNT=1
       005652                           M$COUNT T$ARGCNT,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                        .IF NB <>
                                        M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDC
                                        .IF NB <(R4)+>
              000002                    T$ARGCNT=T$ARGCNT+1
                                        .ENDC
                                        .IRP    N,<\T$ARGCNT>
                                        M$PUT   #N,#RM.D3H,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDM
       005652                           M$PUT   #2,#RM.D3H,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <#RM.D3H>
```

```
        005652                          M$PUT   <#RM.D3H>,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <(R4)+>
        005652                          M$PUT   <(R4)+>,<>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <>
                                        M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDC
                                        .IF NB  <(R4)+>
        005652                          M$PUT1  (R4)+
                                        .MCALL  M$GNINS
                                        .IF B
        005652                          M$GNINS <MOV     (R4)+,-(SP)>
                                        .IF LT SVCINS
                                        MOV     (R4)+,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
        005652  012446                          MOV     (R4)+,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        MOV     (R4)+,-(SP)
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<(R4)+>
                                        .ERROR  ;ILL. ARG. ''(R4)+'' ONLY 'B'' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR     -(SP)>
                                        M$GNINS <BISB    ,(SP)>
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF NB  <#RM.D3H>
        005654                          M$PUT1  #RM.D3H
                                        .MCALL  M$GNINS
                                        .IF B
        005654                          M$GNINS <MOV     #RM.D3H,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #RM.D3H,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
        005654  012746  007377                  MOV     #RM.D3H,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        MOV     #RM.D3H,-(SP)
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#RM.D3H>
                                        .ERROR  ;ILL. ARG. ''#RM.D3H'' ONLY 'B'' IS ALLOWED.
```

```
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#2>
     005660                     M$PUT1  #2
                                .MCALL  M$GNINS
                                .IF B
     005660                     M$GNINS <MOV    #2,-(SP)>
                                .IF LT SVCINS
                                MOV     #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     005660  012746  000002             MOV     #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                              MOV     #2,-(SP)
                                                .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#2>
                                .ERROR  ;ILL. ARG. '"#2"' ONLY '"B"' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
     005664                     M$GNINS <MOV    SP,R0>
                                .IF LT SVCINS
                                MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     005664  010600                     MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                              MOV     SP,R0
                                                .NLIST
                                .ENDC
     005666                     M$SVC   C$PNTS
                                .MCALL  M$GNINS,M$TSTLAB
     005666                     M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
```

```
	005666                                  M$GNINS <TRAP   C$PNTS>
	                                        .IF LT SVCINS
	                                        TRAP    C$PNTS
	                                        .MEXIT
	                                        .ENDC
	                                        .IF EQ SVCINS
	005666  104416                                  TRAP    C$PNTS
	                                        .MEXIT
	                                        .ENDC
	                                        .IF GT SVCINS
	                                        .LIST
	                                                                                        TRAP    C$PNTS
	                                                        .NLIST
	                                        .ENDC
	                                        .IRP    N,<\T$ARGCNT*2+2>
	                                        M$GNINS <ADD    #N,SP>
	                                        .ENDM
	005670                                  M$GNINS <ADD    #6,SP>
	                                        .IF LT SVCINS
	                                        ADD     #6,SP
	                                        .MEXIT
	                                        .ENDC
	                                        .IF EQ SVCINS
	005670  062706  000006                          ADD     #6,SP
	                                        .MEXIT
	                                        .ENDC
	                                        .IF GT SVCINS
	                                        .LIST
	                                                                                        ADD     #6,SP
	                                                        .NLIST
	                                        .ENDC
	                                        .MEXIT
	                                        .ENDC
	                                        .IF B   <>
	                                        M$PRINT C$PNTS,#RM.D3H,<(R4)+>,<>
	                                        .MEXIT
	                                        .ENDC
	                                        .IF B   <>
	                                        M$PRINT C$PNTS,#RM.D3H,<(R4)+>,<>,<>
	                                        .MEXIT
	                                        .ENDC
	                                        .IF B   <>
	                                        M$PRINT C$PNTS,#RM.D3H,<(R4)+>,<>,<>,<>
	                                        .MEXIT
	                                        .ENDC
	                                        .IF B   <>
	                                        M$PRINT C$PNTS,#RM.D3H,<(R4)+>,<>,<>,<>,<>
	                                        .MEXIT
	                                        .ENDC
	                                        .IF B   <>
	                                        M$PRINT C$PNTS,#RM.D3H,<(R4)+>,<>,<>,<>,<>,<>
	                                        .MEXIT
	                                        .ENDC
	                                        .IF B   <>
	                                        M$PRINT C$PNTS,#RM.D3H,<(R4)+>,<>,<>,<>,<>,<>,<>
	                                        .MEXIT
	                                        .ENDC
```

```
                              M$PRINT C$PNTS,#RM.D3H,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
  14 005674                           PRINTS  #RM.D4D,(R4)+              ; XBN MESSAGES
                              .MCALL  M$PRINT
                              .IF B   #RM.D4D
                              .ERROR  ;MISSING FORMAT
                              .MEXIT
                              .ENDC
                              .IF B   <(R4)+>
                              M$PRINT C$PNTS,#RM.D4D
                              .MEXIT
                              .ENDC
                              .IF B   <>
     005674                   M$PRINT C$PNTS,#RM.D4D,<(R4)+>
                              .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
             000001           T$ARGCNT=1
     005674                   M$COUNT T$ARGCNT,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                              .IF NB <>
                              M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                              .ENDC
                              .IF NB <(R4)+>
             000002           T$ARGCNT=T$ARGCNT+1
                              .ENDC
                              .IRP    N,<\T$ARGCNT>
                              M$PUT   #N,#RM.D4D,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                              .ENDM
     005674                   M$PUT   #2,#RM.D4D,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                              .MCALL  M$PUT1
                              .IF NB  <#RM.D4D>
     005674                   M$PUT   <#RM.D4D>,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                              .MCALL  M$PUT1
                              .IF NB  <(R4)+>
     005674                   M$PUT   <(R4)+>,<>,<>,<>,<>,<>,<>,<>,<>
                              .MCALL  M$PUT1
                              .IF NB  <>
                              M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                              .ENDC
                              .IF NB  <(R4)+>
     005674                   M$PUT1  (R4)+
                              .MCALL  M$GNINS
                              .IF B
     005674                   M$GNINS <MOV    (R4)+,-(SP)>
                              .IF LT SVCINS
                              MOV     (R4)+,-(SP)
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
     005674  012446                   MOV     (R4)+,-(SP)
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                          MOV     (R4)+,-(SP)
                                            .NLIST
                              .ENDC
                              .IFF
                              .IF DIF B,<(R4)+>
                              .ERROR  ;ILL. ARG. "(R4)+" ONLY 'B" IS ALLOWED.
```

```
                                    .MEXIT
                                    .ENDC
                                    M$GNINS <CLR    -(SP)>
                                    M$GNINS <BISB   ,(SP)>
                                    .ENDC
                                    .ENDC
                                    .ENDC
                                    .IF NB  <#RM.D4D>
        005676                      M$PUT1  #RM.D4D
                                    .MCALL  M$GNINS
                                    .IF B
        005676                      M$GNINS <MOV    #RM.D4D,-(SP)>
                                    .IF LT SVCINS
                                    MOV     #RM.D4D,-(SP)
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
        005676  012746  007461              MOV     #RM.D4D,-(SP)
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                        MOV     #RM.D4D,-(SP)
                                                .NLIST
                                    .ENDC
                                    .IFF
                                    .IF DIF B,<#RM.D4D>
                                    .ERROR  ;ILL. ARG. "#RM.D4D" ONLY 'B' IS ALLOWED.
                                    .MEXIT
                                    .ENDC
                                    M$GNINS <CLR    -(SP)>
                                    M$GNINS <BISB   ,(SP)>
                                    .ENDC
                                    .ENDC
                                    .ENDC
                                    .IF NB  <#2>
        005702                      M$PUT1  #2
                                    .MCALL  M$GNINS
                                    .IF B
        005702                      M$GNINS <MOV    #2,-(SP)>
                                    .IF LT SVCINS
                                    MOV     #2,-(SP)
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
        005702  012746  000002              MOV     #2,-(SP)
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                        MOV     #2,-(SP)
                                                .NLIST
                                    .ENDC
                                    .IFF
                                    .IF DIF B,<#2>
                                    .ERROR  ;ILL. ARG. "#2" ONLY 'B' IS ALLOWED.
                                    .MEXIT
```

```
                                        .ENDC
                                        M$GNINS <CLR    -(SP)>
                                        M$GNINS <BISB   ,(SP)>
                                        .ENDC
                                        .ENDC
      005706                            M$GNINS <MOV    SP,R0>
                                        .IF LT SVCINS
                                        MOV     SP,R0
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      005706  010600                            MOV     SP,R0
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                    MOV     SP,R0
                                                .NLIST
                                        .ENDC
      005710                            M$SVC   C$PNTS
                                        .MCALL  M$GNINS,M$TSTLAB
      005710                            M$TSTLAB
                                        .MCALL  M$TLABEL,M$INCR
                                        .IIF LT T$TSTMAC, .MEXIT
                                        .RADIX  10
                                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                        .RADIX  8
                                        M$INCR  T$TSTSEQ
      005710                            M$GNINS <TRAP   C$PNTS>
                                        .IF LT SVCINS
                                        TRAP    C$PNTS
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      005710  104416                            TRAP    C$PNTS
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                    TRAP    C$PNTS
                                                .NLIST
                                        .ENDC
                                        .IRP    N,<\T$ARGCNT*2+2>
                                        M$GNINS <ADD    #N,SP>
                                        .ENDM
      005712                            M$GNINS <ADD    #6,SP>
                                        .IF LT SVCINS
                                        ADD     #6,SP
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      005712  062706  000006                    ADD     #6,SP
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                    ADD     #6,SP
```

```
                                                  .NLIST
                                        .ENDC
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D4D,<(R4)+>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D4D,<(R4)+>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D4D,<(R4)+>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D4D,<(R4)+>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D4D,<(R4)+>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.D4D,<(R4)+>,<>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        M$PRINT C$PNTS,#RM.D4D,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
    15 005716                                   PRINTS  #RM.D4H,(R4)+
                                        .MCALL  M$PRINT
                                        .IF B   #RM.D4H
                                        .ERROR  ;MISSING FORMAT
                                        .MEXIT
                                        .ENDC
                                        .IF B   <(R4)+>
                                        M$PRINT C$PNTS,#RM.D4H
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
       005716                           M$PRINT C$PNTS,#RM.D4H,<(R4)+>
                                        .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
              000001                    T$ARGCNT=1
       005716                           M$COUNT T$ARGCNT,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                        .IF NB <>
                                        M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDC
                                        .IF NB <(R4)+>
              000002                    T$ARGCNT=T$ARGCNT+1
                                        .ENDC
                                        .IRP    N,<\T$ARGCNT>
                                        M$PUT   #N,#RM.D4H,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDM
       005716                           M$PUT   #2,#RM.D4H,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <#RM.D4H>
       005716                           M$PUT   <#RM.D4H>,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
```

```
                                        .MCALL  M$PUT1
                                        .IF NB  <(R4)+>
      005716                            M$PUT   <(R4)+>,<>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <>
                                        M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDC
                                        .IF NB  <(R4)+>
      005716                            M$PUT1  (R4)+
                                        .MCALL  M$GNINS
                                        .IF B
      005716                            M$GNINS <MOV    (R4)+,-(SP)>
                                        .IF LT SVCINS
                                        MOV     (R4)+,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      005716  012446                            MOV     (R4)+,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        MOV     (R4)+,-(SP)
                                                     .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<(R4)+>
                                        .ERROR  ;ILL. ARG. ''(R4)+'' ONLY 'B'' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR    -(SP)>
                                        M$GNINS <BISB   ,(SP)>
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF NB  <#RM.D4H>
      005720                            M$PUT1  #RM.D4H
                                        .MCALL  M$GNINS
                                        .IF B
      005720                            M$GNINS <MOV    #RM.D4H,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #RM.D4H,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      005720  012746  007543                    MOV     #RM.D4H,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        MOV     #RM.D4H,-(SP)
                                                     .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#RM.D4H>
                                        .ERROR  ;ILL. ARG. ''#RM.D4H'' ONLY 'B'' IS ALLOWED.
                                        .MEXIT
```

```
                              .ENDC
                              M$GNINS <CLR    -(SP)>
                              M$GNINS <BISB   ,(SP)>
                              .ENDC
                              .ENDC
                              .ENDC
                              .IF NB  <#2>
      005724                  M$PUT1  #2
                              .MCALL  M$GNINS
                              .IF B
      005724                  M$GNINS <MOV    #2,-(SP)>
                              .IF LT SVCINS
                              MOV     #2,-(SP)
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
      005724  012746  000002          MOV     #2,-(SP)
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                  MOV     #2,-(SP)
                                          .NLIST
                              .ENDC
                              .IFF
                              .IF DIF B,<#2>
                              .ERROR  ;ILL. ARG. ''#2'' ONLY ''B'' IS ALLOWED.
                              .MEXIT
                              .ENDC
                              M$GNINS <CLR    -(SP)>
                              M$GNINS <BISB   ,(SP)>
                              .ENDC
                              .ENDC
      005730                  M$GNINS <MOV    SP,R0>
                              .IF LT SVCINS
                              MOV     SP,R0
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
      005730  010600                  MOV     SP,R0
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                  MOV     SP,R0
                                          .NLIST
                              .ENDC
      005732                  M$SVC   C$PNTS
                              .MCALL  M$GNINS,M$TSTLAB
      005732                  M$TSTLAB
                              .MCALL  M$TLABEL,M$INCR
                              .IIF LT T$TSTMAC, .MEXIT
                              .RADIX  10
                              M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                              .RADIX  8
                              M$INCR  T$TSTSEQ
      005732                  M$GNINS <TRAP   C$PNTS>
```

```
                                         .IF LT SVCINS
                                         TRAP    C$PNTS
                                         .MEXIT
                                         .ENDC
                                         .IF EQ SVCINS
      005732  104416                             TRAP    C$PNTS
                                         .MEXIT
                                         .ENDC
                                         .IF GT SVCINS
                                         .LIST
                                                                                       TRAP    C$PNTS
                                                         .NLIST
                                         .ENDC
                                         .IRP    N,<\T$ARGCNT*2+2>
                                         M$GNINS <ADD    #N,SP>
                                         .ENDM
      005734                             M$GNINS <ADD    #6,SP>
                                         .IF LT SVCINS
                                         ADD     #6,SP
                                         .MEXIT
                                         .ENDC
                                         .IF EQ SVCINS
      005734  062706  000006                     ADD     #6,SP
                                         .MEXIT
                                         .ENDC
                                         .IF GT SVCINS
                                         .LIST
                                                                                       ADD     #6,SP
                                                         .NLIST
                                         .ENDC
                                         .MEXIT
                                         .ENDC
                                         .IF B   <>
                                         M$PRINT C$PNTS,#RM.D4H,<(R4)+>,<>
                                         .MEXIT
                                         .ENDC
                                         .IF B   <>
                                         M$PRINT C$PNTS,#RM.D4H,<(R4)+>,<>,<>
                                         .MEXIT
                                         .ENDC
                                         .IF B   <>
                                         M$PRINT C$PNTS,#RM.D4H,<(R4)+>,<>,<>,<>
                                         .MEXIT
                                         .ENDC
                                         .IF B   <>
                                         M$PRINT C$PNTS,#RM.D4H,<(R4)+>,<>,<>,<>,<>
                                         .MEXIT
                                         .ENDC
                                         .IF B   <>
                                         M$PRINT C$PNTS,#RM.D4H,<(R4)+>,<>,<>,<>,<>,<>
                                         .MEXIT
                                         .ENDC
                                         .IF B   <>
                                         M$PRINT C$PNTS,#RM.D4H,<(R4)+>,<>,<>,<>,<>,<>,<>
                                         .MEXIT
                                         .ENDC
                                         M$PRINT C$PNTS,#RM.D4H,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
```

```
     16 005740                          PRINTS  #RM.RET,(R4)+           ; RETRIES MESSAGE
                                .MCALL  M$PRINT
                                .IF B   #RM.RET
                                .ERROR  ;MISSING FORMAT
                                .MEXIT
                                .ENDC
                                .IF B   <(R4)+>
                                M$PRINT C$PNTS,#RM.RET
                                .MEXIT
                                .ENDC
                                .IF B   <>
        005740                  M$PRINT C$PNTS,#RM.RET,<(R4)+>
                                .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
               000001           T$ARGCNT=1
        005740                  M$COUNT T$ARGCNT,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                .IF NB <>
                                M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB <(R4)+>
               000002           T$ARGCNT=T$ARGCNT+1
                                .ENDC
                                .IRP    N,<\T$ARGCNT>
                                M$PUT   #N,#RM.RET,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                .ENDM
        005740                  M$PUT   #2,#RM.RET,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <#RM.RET>
        005740                  M$PUT   <#RM.RET>,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <(R4)+>
        005740                  M$PUT   <(R4)+>,<>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <>
                                M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB  <(R4)+>
        005740                  M$PUT1  (R4)+
                                .MCALL  M$GNINS
                                .IF B
        005740                  M$GNINS <MOV    (R4)+,-(SP)>
                                .IF LT SVCINS
                                MOV     (R4)+,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
        005740 012446                   MOV     (R4)+,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                              MOV     (R4)+,-(SP)
                                                .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<(R4)+>
                                .ERROR  ;ILL. ARG. ''(R4)+'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
```

```
                                        .ENDC
                                        M$GNINS <CLR     -(SP)>
                                        M$GNINS <BISB    ,(SP)>
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF NB  <#RM.RET>
005742                                  M$PUT1  #RM.RET
                                        .MCALL  M$GNINS
                                        .IF B
005742                                  M$GNINS <MOV     #RM.RET,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #RM.RET,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
005742  012746  007625                          MOV      #RM.RET,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                    MOV      #RM.RET,-(SP)
                                                    .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#RM.RET>
                                        .ERROR  ;ILL. ARG. ''#RM.RET'' ONLY 'B'' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR     -(SP)>
                                        M$GNINS <BISB    ,(SP)>
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF NB  <#2>
005746                                  M$PUT1  #2
                                        .MCALL  M$GNINS
                                        .IF B
005746                                  M$GNINS <MOV     #2,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #2,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
005746  012746  000002                          MOV      #2,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                    MOV      #2,-(SP)
                                                    .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#2>
                                        .ERROR  ;ILL. ARG. ''#2'' ONLY 'B'' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
```

```
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
        005752                  M$GNINS <MOV    SP,R0>
                                .IF LT SVCINS
                                MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
        005752  010600                  MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                MOV     SP,R0
                                                .NLIST
                                .ENDC
        005754                  M$SVC   C$PNTS
                                .MCALL  M$GNINS,M$TSTLAB
        005754                  M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
        005754                  M$GNINS <TRAP   C$PNTS>
                                .IF LT SVCINS
                                TRAP    C$PNTS
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
        005754  104416                  TRAP    C$PNTS
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                TRAP    C$PNTS
                                                .NLIST
                                .ENDC
                                .IRP    N,<\T$ARGCNT*2+2>
                                M$GNINS <ADD    #N,SP>
                                .ENDM
        005756                  M$GNINS <ADD    #6,SP>
                                .IF LT SVCINS
                                ADD     #6,SP
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
        005756  062706  000006          ADD     #6,SP
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                ADD     #6,SP
                                                .NLIST
```

```
                                .ENDC
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTS,#RM.RET,<(R4)+>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTS,#RM.RET,<(R4)+>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTS,#RM.RET,<(R4)+>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTS,#RM.RET,<(R4)+>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTS,#RM.RET,<(R4)+>,<>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTS,#RM.RET,<(R4)+>,<>,<>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                M$PRINT C$PNTS,#RM.RET,<(R4)+>,<>,<>,<>,<>,<>,<>,<>
 17
 18 005762                              SOB     (R4),2$                 ; WAS COMPLETION CODE 1?
    005762  005314                      DEC     (R4)
    005764  001011                      BNE     2$
 19 005766                              PRINTS  #RM.DC1                 ; YES
                                .MCALL  M$PRINT
                                .IF B   #RM.DC1
                                .ERROR  ;MISSING FORMAT
                                .MEXIT
                                .ENDC
                                .IF B   <>
    005766                      M$PRINT C$PNTS,#RM.DC1
                                .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
            000001              T$ARGCNT=1
    005766                      M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                .IF NB <>
                                M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB <>
                                T$ARGCNT=T$ARGCNT+1
                                .ENDC
                                .IRP    N,<\T$ARGCNT>
                                M$PUT   #N,#RM.DC1,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDM
    005766                      M$PUT   #1,#RM.DC1,<>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <#RM.DC1>
    005766                      M$PUT   <#RM.DC1>,<>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
```

```
                                .IF NB  <>
                                M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB  <#RM.DC1>
     005766                     M$PUT1  #RM.DC1
                                .MCALL  M$GNINS
                                .IF B
     005766                     M$GNINS <MOV    #RM.DC1,-(SP)>
                                .IF LT SVCINS
                                MOV     #RM.DC1,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     005766  012746  007707             MOV     #RM.DC1,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                            MOV     #RM.DC1,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#RM.DC1>
                                .ERROR  ;ILL. ARG. ''#RM.DC1'' ONLY ''B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#1>
     005772                     M$PUT1  #1
                                .MCALL  M$GNINS
                                .IF B
     005772                     M$GNINS <MOV    #1,-(SP)>
                                .IF LT SVCINS
                                MOV     #1,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     005772  012746  000001             MOV     #1,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                            MOV     #1,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#1>
                                .ERROR  ;ILL. ARG. ''#1'' ONLY ''B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
```

```
                                .ENDC
   005776                       M$GNINS <MOV    SP,R0>
                                .IF LT SVCINS
                                MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
   005776  010600                       MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                MOV     SP,R0
                                                .NLIST
                                .ENDC
   006000                       M$SVC   C$PNTS
                                .MCALL  M$GNINS,M$TSTLAB
   006000                       M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
   006000                       M$GNINS <TRAP   C$PNTS>
                                .IF LT SVCINS
                                TRAP    C$PNTS
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
   006000  104416                       TRAP    C$PNTS
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                TRAP    C$PNTS
                                                .NLIST
                                .ENDC
                                .IRP    N,<\T$ARGCNT*2+2>
                                M$GNINS <ADD    #N,SP>
                                .ENDM
   006002                       M$GNINS <ADD    #4,SP>
                                .IF LT SVCINS
                                ADD     #4,SP
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
   006002  062706  000004               ADD     #4,SP
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                ADD     #4,SP
                                                .NLIST
                                .ENDC
                                .MEXIT
                                .ENDC
```

```
                        .IF B    <>
                        M$PRINT C$PNTS,#RM.DC1,<>
                        .MEXIT
                        .ENDC
                        .IF B    <>
                        M$PRINT C$PNTS,#RM.DC1,<>,<>
                        .MEXIT
                        .ENDC
                        .IF B    <>
                        M$PRINT C$PNTS,#RM.DC1,<>,<>,<>
                        .MEXIT
                        .ENDC
                        .IF B    <>
                        M$PRINT C$PNTS,#RM.DC1,<>,<>,<>,<>
                        .MEXIT
                        .ENDC
                        .IF B    <>
                        M$PRINT C$PNTS,#RM.DC1,<>,<>,<>,<>,<>
                        .MEXIT
                        .ENDC
                        .IF B    <>
                        M$PRINT C$PNTS,#RM.DC1,<>,<>,<>,<>,<>,<>
                        .MEXIT
                        .ENDC
                        .IF B    <>
                        M$PRINT C$PNTS,#RM.DC1,<>,<>,<>,<>,<>,<>,<>
                        .MEXIT
                        .ENDC
                        M$PRINT C$PNTS,#RM.DC1,<>,<>,<>,<>,<>,<>,<>,<>
 006006  000423                 BR      10$

 006010                 2$:     SOB     (R4),3$                 ; WAS COMPLETION CODE 2?
 006010  005314                 DEC     (R4)
 006012  001011                 BNE     3$
 006014                         PRINTS  #RM.DC2                 ; YES
                        .MCALL  M$PRINT
                        .IF B   #RM.DC2
                        .ERROR  ;MISSING FORMAT
                        .MEXIT
                        .ENDC
                        .IF B   <>
 006014                 M$PRINT C$PNTS,#RM.DC2
                        .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
         000001         T$ARGCNT=1
 006014                 M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                        .IF NB <>
                        M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>
                        .ENDC
                        .IF NB <>
                        T$ARGCNT=T$ARGCNT+1
                        .ENDC
                        .IRP    N,<\T$ARGCNT>
                        M$PUT   #N,#RM.DC2,<>,<>,<>,<>,<>,<>,<>,<>
                        .ENDM
 006014                 M$PUT   #1,#RM.DC2,<>,<>,<>,<>,<>,<>,<>,<>
                        .MCALL  M$PUT1
                        .IF NB  <#RM.DC2>
```

```
     006014                            M$PUT    <#RM.DC2>,<>,<>,<>,<>,<>,<>,<>,<>
                                       .MCALL   M$PUT1
                                       .IF NB   <>
                                       M$PUT    <>,<>,<>,<>,<>,<>,<>,<>,<>
                                       .ENDC
                                       .IF NB   <#RM.DC2>
     006014                            M$PUT1   #RM.DC2
                                       .MCALL   M$GNINS
                                       .IF B
     006014                            M$GNINS <MOV     #RM.DC2,-(SP)>
                                       .IF LT SVCINS
                                       MOV      #RM.DC2,-(SP)
                                       .MEXIT
                                       .ENDC
                                       .IF EQ SVCINS
     006014  012746  007755                     MOV     #RM.DC2,-(SP)
                                       .MEXIT
                                       .ENDC
                                       .IF GT SVCINS
                                       .LIST
                                                                                    MOV     #RM.DC2,-(SP)
                                                    .NLIST
                                       .ENDC
                                       .IFF
                                       .IF DIF B,<#RM.DC2>
                                       .ERROR   ;ILL. ARG. ''#RM.DC2'' ONLY 'B'' IS ALLOWED.
                                       .MEXIT
                                       .ENDC
                                       M$GNINS <CLR     -(SP)>
                                       M$GNINS <BISB    ,(SP)>
                                       .ENDC
                                       .ENDC
                                       .ENDC
                                       .IF NB   <#1>
     006020                            M$PUT1   #1
                                       .MCALL   M$GNINS
                                       .IF B
     006020                            M$GNINS <MOV     #1,-(SP)>
                                       .IF LT SVCINS
                                       MOV      #1,-(SP)
                                       .MEXIT
                                       .ENDC
                                       .IF EQ SVCINS
     006020  012746  000001                     MOV     #1,-(SP)
                                       .MEXIT
                                       .ENDC
                                       .IF GT SVCINS
                                       .LIST
                                                                                    MOV     #1,-(SP)
                                                    .NLIST
                                       .ENDC
                                       .IFF
                                       .IF DIF B,<#1>
                                       .ERROR   ;ILL. ARG. ''#1'' ONLY 'B'' IS ALLOWED.
                                       .MEXIT
                                       .ENDC
                                       M$GNINS <CLR     -(SP)>
```

```
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
006024                          M$GNINS <MOV    SP,R0>
                                .IF LT SVCINS
                                MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
006024  010600                          MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     SP,R0
                                        .NLIST
                                .ENDC
006026                          M$SVC   C$PNTS
                                .MCALL  M$GNINS,M$TSTLAB
006026                          M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
006026                          M$GNINS <TRAP   C$PNTS>
                                .IF LT SVCINS
                                TRAP    C$PNTS
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
006026  104416                          TRAP    C$PNTS
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        TRAP    C$PNTS
                                        .NLIST
                                .ENDC
                                .IRP    N,<\T$ARGCNT*2+2>
                                M$GNINS <ADD    #N,SP>
                                .ENDM
006030                          M$GNINS <ADD    #4,SP>
                                .IF LT SVCINS
                                ADD     #4,SP
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
006030  062706  000004                  ADD     #4,SP
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        ADD     #4,SP
                                        .NLIST
                                .ENDC
```

```
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.DC2,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.DC2,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.DC2,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.DC2,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.DC2,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.DC2,<>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTS,#RM.DC2,<>,<>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        M$PRINT C$PNTS,#RM.DC2,<>,<>,<>,<>,<>,<>,<>,<>
   006034   000410                              BR      10$

   006036                               3$:     PRINTB  #RM.DCX                 ; UNKNOWN COMPLETION CODE
                                        .MCALL  M$PRINT
                                        .IF B   #RM.DCX
                                        .ERROR  ;MISSING FORMAT
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
   006036                               M$PRINT C$PNTB,#RM.DCX
                                        .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
            000001                      T$ARGCNT=1
   006036                               M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                        .IF NB <>
                                        M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDC
                                        .IF NB <>
                                        T$ARGCNT=T$ARGCNT+1
                                        .ENDC
                                        .IRP    N,<\T$ARGCNT>
                                        M$PUT   #N,#RM.DCX,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDM
   006036                               M$PUT   #1,#RM.DCX,<>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <#RM.DCX>
   006036                               M$PUT   <#RM.DCX>,<>,<>,<>,<>,<>,<>,<>,<>
```

```
                                .MCALL  M$PUT1
                                .IF NB  <>
                                M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB  <#RM.DCX>
     006036                     M$PUT1  #RM.DCX
                                .MCALL  M$GNINS
                                .IF B
     006036                     M$GNINS <MOV    #RM.DCX,-(SP)>
                                .IF LT SVCINS
                                MOV     #RM.DCX,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     006036 012746 010027               MOV     #RM.DCX,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     #RM.DCX,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#RM.DCX>
                                .ERROR  ;ILL. ARG. ''#RM.DCX'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#1>
     006042                     M$PUT1  #1
                                .MCALL  M$GNINS
                                .IF B
     006042                     M$GNINS <MOV    #1,-(SP)>
                                .IF LT SVCINS
                                MOV     #1,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     006042 012746 000001               MOV     #1,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     #1,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#1>
                                .ERROR  ;ILL. ARG. ''#1'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
```

```
                                        .ENDC
                                        .ENDC
     006046                             M$GNINS <MOV     SP,R0>
                                        .IF LT SVCINS
                                        MOV      SP,R0
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
     006046  010600                             MOV      SP,R0
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                              MOV      SP,R0
                                                      .NLIST
                                        .ENDC
     006050                             M$SVC    C$PNTB
                                        .MCALL   M$GNINS,M$TSTLAB
     006050                             M$TSTLAB
                                        .MCALL   M$TLABEL,M$INCR
                                        .IIF LT T$TSTMAC, .MEXIT
                                        .RADIX   10
                                        M$TLABEL          \T$TESTNUN,\T$TSTSEQ
                                        .RADIX   8
                                        M$INCR   T$TSTSEQ
     006050                             M$GNINS <TRAP    C$PNTB>
                                        .IF LT SVCINS
                                        TRAP     C$PNTB
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
     006050  104414                             TRAP     C$PNTB
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                              TRAP     C$PNTB
                                                      .NLIST
                                        .ENDC
                                        .IRP     N,<\T$ARGCNT*2+2>
                                        M$GNINS <ADD     #N,SP>
                                        .ENDM
     006052                             M$GNINS <ADD     #4,SP>
                                        .IF LT SVCINS
                                        ADD      #4,SP
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
     006052  062706  000004                     ADD      #4,SP
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                              ADD      #4,SP
                                                      .NLIST
                                        .ENDC
                                        .MEXIT
```

```
                                        .ENDC
                                        .IF B    <>
                                        M$PRINT C$PNTB,#RM.DCX,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B    <>
                                        M$PRINT C$PNTB,#RM.DCX,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B    <>
                                        M$PRINT C$PNTB,#RM.DCX,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B    <>
                                        M$PRINT C$PNTB,#RM.DCX,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B    <>
                                        M$PRINT C$PNTB,#RM.DCX,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B    <>
                                        M$PRINT C$PNTB,#RM.DCX,<>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B    <>
                                        M$PRINT C$PNTB,#RM.DCX,<>,<>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        M$PRINT C$PNTB,#RM.DCX,<>,<>,<>,<>,<>,<>,<>,<>

   006056  000137  004734               10$:    JMP     RSPDNE                  ; REMOVE UNIT FROM TESTING
```

```
  006062  016403  000216          FMTERR: MOV     HC.BF2+4(R4),R3                 ; GET ERROR #

  006066  012702  010627                  MOV     #M.ER0,R2                       ; POINTER TO DEFAULT ERR MSG
  006072  005703                          TST     R3                              ; CHECK ERROR # FOR RANGE
  006074  003410                          BLE     1$                              ; BAD VALUE
  006076  020327  000026                  CMP     R3,#MAXERR                      ; CHECK HIGH VALUE
  006102  003005                          BGT     1$                              ; BAD VALUE
  006104  060303                          ADD     R3,R3                           ; MAKE BYTE OFFSET
  006106  016303  011572                  MOV     TBLERR(R3),R3                   ; GET POINTER TO ERROR MESSAGE
  006112  001401                          BEQ     1$                              ; IF NULL ENTRY - USE DEFAULT
  006114  010302                          MOV     R3,R2                           ; POINT TO ACTUAL ERROR MESSAGE
  006116                          1$:
  006116                                  ERRHRD  5,RM.ER1,RM.ER2                 ; LOG ERR MESS
                                  .MCALL  M$ERRINS
  006116                          M$ERRINS        5,RM.ER1,RM.ER2,C$ERHRD
                                  .MCALL  M$GNINS,M$WORD,M$TSTLAB
  006116                          M$SVC   C$ERHRD
                                  .MCALL  M$GNINS,M$TSTLAB
  006116                          M$TSTLAB
                                  .MCALL  M$TLABEL,M$INCR
                                  .IIF LT T$TSTMAC, .MEXIT
                                  .RADIX  10
                                  M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                  .RADIX  8
                                  M$INCR  T$TSTSEQ
  006116                          M$GNINS <TRAP   C$ERHRD>
                                  .IF LT SVCINS
                                  TRAP    C$ERHRD
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
  006116  104456                          TRAP    C$ERHRD
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                                                  TRAP    C$ERHRD
                                                  .NLIST
                                  .ENDC
          000012                  .RADIX  10
                                  .IF NB  5
          000005                  T$ERRNUM=5
                                  .IFF
                                  .ERROR  ;MISSING ERROR-NR
                                  .ENDC
  006120                          M$WORD  \T$ERRNUM
                                  .MCALL  M$GNINS
                                  .IRP    N,<5>
                                  M$GNINS <.WORD  N>
                                  .ENDM
  006120                          M$GNINS <.WORD  5>
                                  .IF LT SVCINS
                                  .WORD   5
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
  006120  000005                          .WORD   5
```

```
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                .WORD   5
                                                .NLIST
                                .ENDC
           000010               .RADIX  8
                                .IF NB RM.ER1
   006122                       M$WORD  RM.ER1
                                .MCALL  M$GNINS
                                .IRP    N,<RM.ER1>
                                M$GNINS <.WORD  N>
                                .ENDM
   006122                       M$GNINS <.WORD  RM.ER1>
                                .IF LT SVCINS
                                .WORD   RM.ER1
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
   006122  010270                       .WORD   RM.ER1
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                .WORD   RM.ER1
                                                .NLIST
                                .ENDC
                                .IFF
                                M$WORD  0
                                .ENDC
                                .IF NB RM.ER2
   006124                       M$WORD  RM.ER2
                                .MCALL  M$GNINS
                                .IRP    N,<RM.ER2>
                                M$GNINS <.WORD  N>
                                .ENDM
   006124                       M$GNINS <.WORD  RM.ER2>
                                .IF LT SVCINS
                                .WORD   RM.ER2
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
   006124  010324                       .WORD   RM.ER2
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                .WORD   RM.ER2
                                                .NLIST
                                .ENDC
                                .IFF
                                M$WORD  0
                                .ENDC
14
15 006126  000137  004710               JMP     RSPDRP                  ; REMOVE UNIT FROM TESTING
16
```

```
                                        ;RESPONSE ERROR MESSAGES

 006132    045    116    045   NORESP: .ASCIZ  \%N%AUNIT %D2%A HAS NOT RESPONDED LATELY\
 006202    045    116    045   REMMSG: .ASCIZ  \%N%AUNIT %D2%A - REMOVED FROM TESTING FOR REMAINDER OF PASS\
 006276    127    122    117   RSPPKE: .ASCIZ  \WRONG OPCODE RECEIVED IN MESSAGE PACKET\
 006346    115    105    123   RSPPRE: .ASCIZ  \MESSAGE PACKET RECEIVED WITH WRONG REFERENCE NUMBER\
 006432    115    105    123   RSPPNE: .ASCIZ  \MESSAGE PACKET RECEIVED WITH UNKNOWN MESSAGE CODE\
 006514    105    122    122   RSPSTE: .ASCIZ  \ERROR STATUS CODE REPORTED IN MESSAGE COMMAND\

 006572    045    116    045   RM.CMP: .ASCIZ  \%N%AUNIT %D2%A - CYLINDER %D4%A COMPLETED\

 006644    045    116    045   RM.DNE: .ASCIZ  \%N%AUNIT %D2%A - FORMAT SUCCESSFULLY COMPLETED\
 006723    045    116    045   RM.D1T: .ASCIZ  \%N%A      TOTAL REVECTORED BLOCKS                  %D4\
 007005    045    116    045   RM.D1P: .ASCIZ  \%N%A      PRIMARY REVECTORS                        %D4\
 007067    045    116    045   RM.D1S: .ASCIZ  \%N%A      SECONDARY REVECTORS                      %D4\
 007151    045    116    045   RM.D2D: .ASCIZ  \%N%A      RCT BLOCKS WITH DATA ERRORS              %D4\
 007233    045    116    045   RM.D2H: .ASCIZ  \%N%A      RCT BLOCKS WITH HEADER/TIMING ERRORS     %D4\
 007315    045    116    045   RM.D3D: .ASCIZ  \%N%A      DBN BLOCKS WITH DATA ERRORS              %D4\
 007377    045    116    045   RM.D3H: .ASCIZ  \%N%A      DBN BLOCKS WITH HEADER/TIMING ERRORS     %D4\
 007461    045    116    045   RM.D4D: .ASCIZ  \%N%A      XBN BLOCKS WITH DATA ERRORS              %D4\
 007543    045    116    045   RM.D4H: .ASCIZ  \%N%A      XBN BLOCKS WITH HEADER/TIMING ERRORS     %D4\
 007625    045    116    045   RM.RET: .ASCIZ  \%N%A      BLOCKS RETRIED ON CHECK PASS             %D4\

 007707    045    116    045   RM.DC1: .ASCIZ  \%N%A      FCT WAS USED TO FORMAT DRIVE\
 007755    045    116    045   RM.DC2: .ASCIZ  \%N%A      FCT WAS NOT USED TO FORMAT DRIVE\
 010027    045    116    045   RM.DCX: .ASCIZ  \%N%A**** UNKNOWN COMPLETION CODE RETURNED ****\

 010106    045    116    045   RM.FM0: .ASCIZ  \%N%A      UNKNOWN FORMAT COMPLETION MODE\
 010156    045    116    045   RM.FM1: .ASCIZ  \%N%A      FORMAT COMPLETED USING FCT\
 010222    045    116    045   RM.FM2: .ASCIZ  \%N%A      FORMAT COMPLETED WITHOUT FCT\

 010270    125    104    101   RM.ER1: .ASCIZ  \UDA FORMATTER ERROR OCCURED\

                                       .EVEN

 010324                                BGNMSG  RM.ER2            ; FORMATTER RETURNED ERROR
                               .MCALL  M$PUSH,M$INCR,M$GNGBL
          000040               I$MSG=F$BGN
 010324                        M$PUSH  T$NS,T$NESTLEV,F$MSG
                               .MCALL  M$INCR,M$SETS
 010324                        M$INCR  T$NESTLEV
          000000               T$NESTLEV=T$NESTLEV+1
 010324                        M$SETS  T$NS,\T$NESTLEV,F$MSG
          000011               T$NS0=F$MSG
          010006               T$$MSG=T$TAGNUM
 010324                        M$INCR T$TAGNUM
          010007               T$TAGNUM=T$TAGNUM+1
 010324                        M$GNGBL RM.ER2
                               .MCALL  M$GEN
                               .IF NB,RM.ER2
                               .IF NB,
                               M$GEN   RM.ER2,:,SVCGBL,
                               .ENDC
                               .IF B,
 010324                        M$GEN   RM.ER2,:,SVCGBL,< >
                               .IF LE  SVCGBL
 010324                        RM.ER2::
```

```
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                                RM.ER2::
                                                .NLIST
                                        .ENDC
                                        .ENDC
    37 010324                                   PRINTB  #RM.ER3,HC.BF2+4(R4)
                                        .MCALL  M$PRINT
                                        .IF B   #RM.ER3
                                        .ERROR  ;MISSING FORMAT
                                        .MEXIT
                                        .ENDC
                                        .IF B   <HC.BF2+4(R4)>
                                        M$PRINT C$PNTB,#RM.ER3
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
       010324                           M$PRINT C$PNTB,#RM.ER3,<HC.BF2+4(R4)>
                                        .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
              000001                    T$ARGCNT=1
       010324                           M$COUNT T$ARGCNT,<HC.BF2+4(R4)>,<>,<>,<>,<>,<>,<>,<>
                                        .IF NB <>
                                        M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDC
                                        .IF NB <HC.BF2+4(R4)>
              000002                    T$ARGCNT=T$ARGCNT+1
                                        .ENDC
                                        .IRP    N,<\T$ARGCNT>
                                        M$PUT   #N,#RM.ER3,<HC.BF2+4(R4)>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDM
       010324                           M$PUT   #2,#RM.ER3,<HC.BF2+4(R4)>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <#RM.ER3>
       010324                           M$PUT   <#RM.ER3>,<HC.BF2+4(R4)>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <HC.BF2+4(R4)>
       010324                           M$PUT   <HC.BF2+4(R4)>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <>
                                        M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDC
                                        .IF NB  <HC.BF2+4(R4)>
       010324                           M$PUT1  HC.BF2+4(R4)
                                        .MCALL  M$GNINS
                                        .IF B
       010324                           M$GNINS <MOV    HC.BF2+4(R4),-(SP)>
                                        .IF LT SVCINS
                                        MOV     HC.BF2+4(R4),-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
       010324 016446  000216                    MOV     HC.BF2+4(R4),-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
```

```
                                                                                MOV     HC.BF2+4(R4),-(SP)
                                          .NLIST
                              .ENDC
                              .IFF
                              .IF DIF B,<HC.BF2+4(R4)>
                              .ERROR  ;ILL. ARG. ''HC.BF2+4(R4)'' ONLY ''B'' IS ALLOWED.
                              .MEXIT
                              .ENDC
                              M$GNINS <CLR    -(SP)>
                              M$GNINS <BISB   ,(SP)>
                              .ENDC
                              .ENDC
                              .ENDC
                              .IF NB  <#RM.ER3>
010330                        M$PUT1  #RM.ER3
                              .MCALL  M$GNINS
                              .IF B
010330                        M$GNINS <MOV    #RM.ER3,-(SP)>
                              .IF LT SVCINS
                              MOV     #RM.ER3,-(SP)
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
010330  012746  010420                MOV     #RM.ER3,-(SP)
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                                MOV     #RM.ER3,-(SP)
                                          .NLIST
                              .ENDC
                              .IFF
                              .IF DIF B,<#RM.ER3>
                              .ERROR  ;ILL. ARG. ''#RM.ER3'' ONLY ''B'' IS ALLOWED.
                              .MEXIT
                              .ENDC
                              M$GNINS <CLR    -(SP)>
                              M$GNINS <BISB   ,(SP)>
                              .ENDC
                              .ENDC
                              .ENDC
                              .IF NB  <#2>
010334                        M$PUT1  #2
                              .MCALL  M$GNINS
                              .IF B
010334                        M$GNINS <MOV    #2,-(SP)>
                              .IF LT SVCINS
                              MOV     #2,-(SP)
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
010334  012746  000002                MOV     #2,-(SP)
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                                MOV     #2,-(SP)
```

```
                                                    .NLIST
                                      .ENDC
                                      .IFF
                                      .IF DIF B,<#2>
                                      .ERROR  ;ILL. ARG. ''#2'' ONLY 'B'' IS ALLOWED.
                                      .MEXIT
                                      .ENDC
                                      M$GNINS <CLR      -(SP)>
                                      M$GNINS <BISB     ,(SP)>
                                      .ENDC
                                      .ENDC
      010340                          M$GNINS <MOV      SP,R0>
                                      .IF LT SVCINS
                                      MOV     SP,R0
                                      .MEXIT
                                      .ENDC
                                      .IF EQ SVCINS
      010340  010600                          MOV       SP,R0
                                      .MEXIT
                                      .ENDC
                                      .IF GT SVCINS
                                      .LIST
                                                                                          MOV     SP,R0
                                                    .NLIST
                                      .ENDC
      010342                          M$SVC   C$PNTB
                                      .MCALL  M$GNINS,M$TSTLAB
      010342                          M$TSTLAB
                                      .MCALL  M$TLABEL,M$INCR
                                      .IIF LT T$TSTMAC, .MEXIT
                                      .RADIX  10
                                      M$TLABEL          \T$TESTNUN,\T$TSTSEQ
                                      .RADIX  8
                                      M$INCR  T$TSTSEQ
      010342                          M$GNINS <TRAP     C$PNTB>
                                      .IF LT SVCINS
                                      TRAP    C$PNTB
                                      .MEXIT
                                      .ENDC
                                      .IF EQ SVCINS
      010342  104414                          TRAP      C$PNTB
                                      .MEXIT
                                      .ENDC
                                      .IF GT SVCINS
                                      .LIST
                                                                                          TRAP    C$PNTB
                                                    .NLIST
                                      .ENDC
                                      .IRP    N,<\T$ARGCNT*2+2>
                                      M$GNINS <ADD      #N,SP>
                                      .ENDM
      010344                          M$GNINS <ADD      #6,SP>
                                      .IF LT SVCINS
                                      ADD     #6,SP
                                      .MEXIT
                                      .ENDC
                                      .IF EQ SVCINS
```

```
      010344  062706  000006                ADD     #6,SP
                                      .MEXIT
                                      .ENDC
                                      .IF GT SVCINS
                                      .LIST
                                                                                             ADD     #6,SP
                                                  .NLIST
                                      .ENDC
                                      .MEXIT
                                      .ENDC
                                      .IF B    <>
                                      M$PRINT C$PNTB,#RM.ER3,<HC.BF2+4(R4)>,<>
                                      .MEXIT
                                      .ENDC
                                      .IF B    <>
                                      M$PRINT C$PNTB,#RM.ER3,<HC.BF2+4(R4)>,<>,<>
                                      .MFXIT
                                      .ENDC
                                      .IF B    <>
                                      M$PRINT C$PNTB,#RM.ER3,<HC.BF2+4(R4)>,<>,<>,<>
                                      .MEXIT
                                      .ENDC
                                      .IF B    <>
                                      M$PRINT C$PNTB,#RM.ER3,<HC.BF2+4(R4)>,<>,<>,<>,<>
                                      .MEXIT
                                      .ENDC
                                      .IF B    <>
                                      M$PRINT C$PNTB,#RM.ER3,<HC.BF2+4(R4)>,<>,<>,<>,<>,<>
                                      .MEXIT
                                      .ENDC
                                      .IF B    <>
                                      M$PRINT C$PNTB,#RM.ER3,<HC.BF2+4(R4)>,<>,<>,<>,<>,<>,<>
                                      .MEXIT
                                      .ENDC
                                      M$PRINT C$PNTB,#RM.ER3,<HC.BF2+4(R4)>,<>,<>,<>,<>,<>,<>,<>
    38 010350                                   PRINTB  #RM.ER4,HC.BF2+6(R4)
                                      .MCALL  M$PRINT
                                      .IF B   #RM.ER4
                                      .ERROR  ;MISSING FORMAT
                                      .MEXIT
                                      .ENDC
                                      .IF B   <HC.BF2+6(R4)>
                                      M$PRINT C$PNTB,#RM.ER4
                                      .MEXIT
                                      .ENDC
                                      .IF B   <>
      010350                          M$PRINT C$PNTB,#RM.ER4,<HC.BF2+6(R4)>
                                      .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
              000001                  T$ARGCNT=1
      010350                          M$COUNT T$ARGCNT,<HC.BF2+6(R4)>,<>,<>,<>,<>,<>,<>,<>
                                      .IF NB <>
                                      M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                      .ENDC
                                      .IF NB <HC.BF2+6(R4)>
              000002                  T$ARGCNT=T$ARGCNT+1
                                      .ENDC
                                      .IRP    N,<\T$ARGCNT>
```

```
                                  M$PUT    #N,#RM.ER4,<HC.BF2+6(R4)>,<>,<>,<>,<>,<>,<>,<>
                                  .ENDM
      010350                      M$PUT    #2,#RM.ER4,<HC.BF2+6(R4)>,<>,<>,<>,<>,<>,<>,<>
                                  .MCALL   M$PUT1
                                  .IF NB   <#RM.ER4>
      010350                      M$PUT    <#RM.ER4>,<HC.BF2+6(R4)>,<>,<>,<>,<>,<>,<>,<>
                                  .MCALL   M$PUT1
                                  .IF NB   <HC.BF2+6(R4)>
      010350                      M$PUT    <HC.BF2+6(R4)>,<>,<>,<>,<>,<>,<>,<>,<>
                                  .MCALL   M$PUT1
                                  .IF NB   <>
                                  M$PUT    <>,<>,<>,<>,<>,<>,<>,<>,<>
                                  .ENDC
                                  .IF NB   <HC.BF2+6(R4)>
      010350                      M$PUT1   HC.BF2+6(R4)
                                  .MCALL   M$GNINS
                                  .IF B
      010350                      M$GNINS <MOV     HC.BF2+6(R4),-(SP)>
                                  .IF LT SVCINS
                                  MOV      HC.BF2+6(R4),-(SP)
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
      010350 016446 000220                 MOV     HC.BF2+6(R4),-(SP)
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                      MOV      HC.BF2+6(R4),-(SP)
                                           .NLIST
                                  .ENDC
                                  .IFF
                                  .IF DIF B,<HC.BF2+6(R4)>
                                  .ERROR   ;ILL. ARG. "HC.BF2+6(R4)" ONLY "B" IS ALLOWED.
                                  .MEXIT
                                  .ENDC
                                  M$GNINS <CLR     -(SP)>
                                  M$GNINS <BISB    ,(SP)>
                                  .ENDC
                                  .ENDC
                                  .ENDC
                                  .IF NB   <#RM.ER4>
      010354                      M$PUT1   #RM.ER4
                                  .MCALL   M$GNINS
                                  .IF B
      010354                      M$GNINS <MOV     #RM.ER4,-(SP)>
                                  .IF LT SVCINS
                                  MOV      #RM.ER4,-(SP)
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
      010354 012746 010472                 MOV     #RM.ER4,-(SP)
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                      MOV      #RM.ER4,-(SP)
```

```
                                                   .NLIST
                                    .ENDC
                                    .IFF
                                    .IF DIF B,<#RM.ER4>
                                    .ERROR  ;ILL. ARG. ''#RM.ER4'' ONLY 'B'' IS ALLOWED.
                                    .MEXIT
                                    .ENDC
                                    M$GNINS <CLR    -(SP)>
                                    M$GNINS <BISB   ,(SP)>
                                    .ENDC
                                    .ENDC
                                    .ENDC
                                    .IF NB  <#2>
      010360                        M$PUT1  #2
                                    .MCALL  M$GNINS
                                    .IF B
      010360                        M$GNINS <MOV    #2,-(SP)>
                                    .IF LT SVCINS
                                    MOV     #2,-(SP)
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
      010360  012746  000002              MOV     #2,-(SP)
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                                MOV     #2,-(SP)
                                                   .NLIST
                                    .ENDC
                                    .IFF
                                    .IF DIF B,<#2>
                                    .ERROR  ;ILL. ARG. ''#2'' ONLY 'B'' IS ALLOWED.
                                    .MEXIT
                                    .ENDC
                                    M$GNINS <CLR    -(SP)>
                                    M$GNINS <BISB   ,(SP)>
                                    .ENDC
                                    .ENDC
      010364                        M$GNINS <MOV    SP,R0>
                                    .IF LT SVCINS
                                    MOV     SP,R0
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
      010364  010600                      MOV     SP,R0
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                                MOV     SP,R0
                                                   .NLIST
                                    .ENDC
      010366                        M$SVC   C$PNTB
                                    .MCALL  M$GNINS,M$TSTLAB
      010366                        M$TSTLAB
                                    .MCALL  M$TLABEL,M$INCR
```

```
                                 .IIF LT T$TSTMAC, .MEXIT
                                 .RADIX  10
                                 M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                 .RADIX  8
                                 M$INCR  T$TSTSEQ
     010366                      M$GNINS <TRAP    C$PNTB>
                                 .IF LT SVCINS
                                 TRAP    C$PNTB
                                 .MEXIT
                                 .ENDC
                                 .IF EQ SVCINS
     010366  104414                      TRAP    C$PNTB
                                 .MEXIT
                                 .ENDC
                                 .IF GT SVCINS
                                 .LIST
                                                                                    TRAP    C$PNTB
                                            .NLIST
                                 .ENDC
                                 .IRP    N,<\T$ARGCNT*2+2>
                                 M$GNINS <ADD     #N,SP>
                                 .ENDM
     010370                      M$GNINS <ADD     #6,SP>
                                 .IF LT SVCINS
                                 ADD     #6,SP
                                 .MEXIT
                                 .ENDC
                                 .IF EQ SVCINS
     010370  062706  000006              ADD     #6,SP
                                 .MEXIT
                                 .ENDC
                                 .IF GT SVCINS
                                 .LIST
                                                                                    ADD     #6,SP
                                            .NLIST
                                 .ENDC
                                 .MEXIT
                                 .ENDC
                                 .IF B   <>
                                 M$PRINT C$PNTB,#RM.ER4,<HC.BF2+6(R4)>,<>
                                 .MEXIT
                                 .ENDC
                                 .IF B   <>
                                 M$PRINT C$PNTB,#RM.ER4,<HC.BF2+6(R4)>,<>,<>
                                 .MEXIT
                                 .ENDC
                                 .IF B   <>
                                 M$PRINT C$PNTB,#RM.ER4,<HC.BF2+6(R4)>,<>,<>,<>
                                 .MEXIT
                                 .ENDC
                                 .IF B   <>
                                 M$PRINT C$PNTB,#RM.ER4,<HC.BF2+6(R4)>,<>,<>,<>,<>
                                 .MEXIT
                                 .ENDC
                                 .IF B   <>
                                 M$PRINT C$PNTB,#RM.ER4,<HC.BF2+6(R4)>,<>,<>,<>,<>,<>
                                 .MEXIT
```

```
                                .ENDC
                                .IF B    <>
                                M$PRINT C$PNTB,#RM.ER4,<HC.BF2+6(R4)>,<>,<>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                M$PRINT C$PNTB,#RM.ER4,<HC.BF2+6(R4)>,<>,<>,<>,<>,<>,<>,<>
   39 010374                            PRINTB  #RM.ER5,R2
                                .MCALL  M$PRINT
                                .IF B    #RM.ER5
                                .ERROR  ;MISSING FORMAT
                                .MEXIT
                                .ENDC
                                .IF B    <R2>
                                M$PRINT C$PNTB,#RM.ER5
                                .MEXIT
                                .ENDC
                                .IF B    <>
      010374                    M$PRINT C$PNTB,#RM.ER5,<R2>
                                .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
              000001            T$ARGCNT=1
      010374                    M$COUNT T$ARGCNT,<R2>,<>,<>,<>,<>,<>,<>,<>
                                .IF NB <>
                                M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB <R2>
              000002            T$ARGCNT=T$ARGCNT+1
                                .ENDC
                                .IRP     N,<\T$ARGCNT>
                                M$PUT    #N,#RM.ER5,<R2>,<>,<>,<>,<>,<>,<>,<>
                                .ENDM
      010374                    M$PUT    #2,#RM.ER5,<R2>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB   <#RM.ER5>
      010374                    M$PUT    <#RM.ER5>,<R2>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB   <R2>
      010374                    M$PUT    <R2>,<>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB   <>
                                M$PUT    <>,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB   <R2>
      010374                    M$PUT1   R2
                                .MCALL  M$GNINS
                                .IF B
      010374                    M$GNINS <MOV     R2,-(SP)>
                                .IF LT SVCINS
                                MOV      R2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
      010374  010246                    MOV      R2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                  MOV     R2,-(SP)
```

```
                                                .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<R2>
                                .ERROR  ;ILL. ARG. 'R2'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR     -(SP)>
                                M$GNINS <BISB    ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#RM.ER5>
010376                          M$PUT1  #RM.ER5
                                .MCALL  M$GNINS
                                .IF B
010376                          M$GNINS <MOV     #RM.ER5,-(SP)>
                                .IF LT SVCINS
                                MOV     #RM.ER5,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
010376  012746  010545                  MOV     #RM.ER5,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     #RM.ER5,-(SP)
                                                .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#RM.ER5>
                                .ERROR  ;ILL. ARG. '#RM.ER5'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR     -(SP)>
                                M$GNINS <BISB    ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#2>
010402                          M$PUT1  #2
                                .MCALL  M$GNINS
                                .IF B
010402                          M$GNINS <MOV     #2,-(SP)>
                                .IF LT SVCINS
                                MOV     #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
010402  012746  000002                  MOV     #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     #2,-(SP)
                                                .NLIST
```

```
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#2>
                                        .ERROR  ;ILL. ARG. ''#2'' ONLY 'B'' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR     -(SP)>
                                        M$GNINS <BISB    ,(SP)>
                                        .ENDC
                                        .ENDC
      010406                            M$GNINS <MOV     SP,R0>
                                        .IF LT SVCINS
                                        MOV     SP,R0
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      010406  010600                            MOV     SP,R0
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        MOV     SP,R0
                                                      .NLIST
                                        .ENDC
      010410                            M$SVC   C$PNTB
                                        .MCALL  M$GNINS,M$TSTLAB
      010410                            M$TSTLAB
                                        .MCALL  M$TLABEL,M$INCR
                                        .IIF LT T$TSTMAC, .MEXIT
                                        .RADIX  10
                                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                        .RADIX  8
                                        M$INCR  T$TSTSEQ
      010410                            M$GNINS <TRAP    C$PNTB>
                                        .IF LT SVCINS
                                        TRAP    C$PNTB
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      010410  104414                            TRAP    C$PNTB
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        TRAP    C$PNTB
                                                      .NLIST
                                        .ENDC
                                        .IRP    N,<\T$ARGCNT*2+2>
                                        M$GNINS <ADD     #N,SP>
                                        .ENDM
      010412                            M$GNINS <ADD     #6,SP>
                                        .IF LT SVCINS
                                        ADD     #6,SP
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      010412  062706  000006                    ADD     #6,SP
```

```
                                   .MEXIT
                                   .ENDC
                                   .IF GT SVCINS
                                   .LIST
                                                                           ADD     #6,SP
                                              .NLIST
                                   .ENDC
                                   .MEXIT
                                   .ENDC
                                   .IF B   <>
                                   M$PRINT C$PNTB,#RM.ER5,<R2>,<>
                                   .MEXIT
                                   .ENDC
                                   .IF B   <>
                                   M$PRINT C$PNTB,#RM.ER5,<R2>,<>,<>
                                   .MEXIT
                                   .ENDC
                                   .IF B   <>
                                   M$PRINT C$PNTB,#RM.ER5,<R2>,<>,<>,<>
                                   .MEXIT
                                   .ENDC
                                   .IF B   <>
                                   M$PRINT C$PNTB,#RM.ER5,<R2>,<>,<>,<>,<>
                                   .MEXIT
                                   .ENDC
                                   .IF B   <>
                                   M$PRINT C$PNTB,#RM.ER5,<R2>,<>,<>,<>,<>,<>
                                   .MEXIT
                                   .ENDC
                                   .IF B   <>
                                   M$PRINT C$PNTB,#RM.ER5,<R2>,<>,<>,<>,<>,<>,<>
                                   .MEXIT
                                   .ENDC
                                   M$PRINT C$PNTB,#RM.ER5,<R2>,<>,<>,<>,<>,<>,<>,<>
  40 010416                                ENDMSG
                                   .MCALL  M$POP,M$GNTAG,M$SVC,M$ENDERR
     010416                        M$POP   T$NS,T$NESTLEV,T$TEMP
                                   .MCALL  M$GETS,M$DECR
                                   .IF LT  T$NESTLEV
                                   .ERROR  T$NESTLEV        ; MACRO T$NS UNDERFLOW
                                   .MEXIT
                                   .ENDC
     010416                        M$GETS  T$NS,\T$NESTLEV,T$TEMP
             000011                T$TEMP=T$NS0
     010416                        M$DECR  T$NESTLEV
             177777                T$NESTLEV=T$NESTLEV-1
                                   .IF EQ F$MSG-T$TEMP
     010416                        M$GNTAG L,T$$MSG
                                   .MCALL  M$GEN
     010416                        M$GEN   L,\T$$MSG,SVCTAG
                                   .IF LE  SVCTAG
     010416                        L10006:
                                   .MEXIT
                                   .ENDC
                                   .LIST
                                                                    L10006:
                                           .NLIST
```

```
        010000                          S$LSYM=T$LSYM
010416                                  M$SVC   C$MSG
                                        .MCALL  M$GNINS,M$TSTLAB
010416                                  M$TSTLAB
                                        .MCALL  M$TLABEL,M$INCR
                                        .IIF LT T$TSTMAC, .MEXIT
                                        .RADIX  10
                                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                        .RADIX  8
                                        M$INCR  T$TSTSEQ
010416                                  M$GNINS <TRAP   C$MSG>
                                        .IF LT SVCINS
                                        TRAP    C$MSG
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
010416  104423                                  TRAP    C$MSG
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                TRAP    C$MSG
                                                .NLIST
                                        .ENDC
        000041                          I$MSG=F$END
                                        .IFF
                                        M$ENDERR        ENDMSG,T$TEMP
                                        .ENDC

010420     045     101     040  RM.ER3: .ASCIZ    \%A           ERROR NUMBER REPORTED WAS %D2\
010472     045     116     045  RM.ER4: .ASCIZ  \%N%A           ERROR CODE WAS %D6%A DECIMAL\
010545     045     116     045  RM.ER5: .ASCII  \%N%A           ERROR NUMBER MEANS:\
010606     045     116     045          .ASCIZ  \%N%A           %T\

010627     105     122     122  M.ER0:  .ASCIZ  "ERROR NUMBER NOT IN CURRENT TABLES"
010672     107     105     124  M.ER1:  .ASCIZ  "GET STATUS FAILURE"
010715     123     104     111  M.ER2:  .ASCIZ  "SDI SEND ERROR"
010734     125     116     123  M.ER3:  .ASCIZ  "UNSUCCESSFUL SDI COMMAND"
010765     123     104     111  M.ER4:  .ASCIZ  "SDI RECEIVE ERROR"
011007     125     116     111  M.ER5:  .ASCIZ  "UNIBUS READ ERROR"
011031     106     117     122  M.ER6:  .ASCIZ  "FORMATTER INITIALIZATION ERROR"
011070     116     117     116  M.ER7:  .ASCIZ  "NON-EXISTANT UNIT NUMBER"
011121     104     102     116  M.ER8:  .ASCIZ  "DBN/XBN FORMAT ERROR (FORMAT XFC FAILED)"
011172     106     103     124  M.ER9:  .ASCIZ  "FCT CHECK ERROR"
011212     123     105     105  M.ER10: .ASCIZ  "SEEK ERROR"
011225     122     103     124  M.ER11: .ASCIZ  "RCT CHECK ERROR"
011245     114     102     116  M.ER12: .ASCIZ  "LBN FORMAT ERROR (FORMAT XFC FAILED)"
011312     106     103     124  M.ER13: .ASCIZ  "FCT WRITE ERROR"
011332     122     103     124  M.ER14: .ASCIZ  "RCT READ ERROR"
011351     122     103     124  M.ER15: .ASCIZ  "RCT WRITE ERROR"
011371     122     103     124  M.ER16: .ASCIZ  "RCT FULL"
011402     106     103     124  M.ER17: .ASCIZ  "FCT READ ERROR"
011421     106     103     124  M.ER18: .ASCIZ  "FCT NON-EXISTANT"
011442     106     103     124  M.ER19: .ASCIZ  "FCT DOWN LINE LOAD ERROR (FCT BLOCK NOT AVBL.)"
011521     104     122     111  M.ER20: .ASCIZ  "DRIVE INIT TIMEOUT"
        000000                  M.ER21  =       0
011544     123     105     114  M.ER22: .ASCIZ  "SELECT GROUP FAILURE"
```

```

                                            .EVEN

   011572  010627                   TBLERR: .WORD   M.ER0                           ; POINTERS TO ERROR MESSAGES
   011574  010672  010715  010734           .WORD   M.ER1 ,M.ER2 ,M.ER3 ,M.ER4 ,M.ER5 ,M.ER6 ,M.ER7 ,M.ER8
   011614  011172  011212  011225           .WORD   M.ER9 ,M.ER10,M.ER11,M.ER12,M.ER13,M.ER14,M.ER15,M.ER16
   011634  011402  011421  011442           .WORD   M.ER17,M.ER18,M.ER19,M.ER20,M.ER21,M.ER22

           000026                   MAXERR  =       <.-TBLERR-2>/2
```

```
                                        ;RUNDM
                                        ;
                                        ;LOAD AND RUN A DM PROGRAM IN THE CONTROLLERS.
                                        ;
                                        ;INPUTS:
                                        ;       TSTTAB - POINTER TO FIRST CONTROLLER TABLE
                                        ;
                                        ;IMPLICIT INPUTS:
                                        ;       DMPROG - POINTER TO START OF DM PROGRAM IN MEMORY
                                        ;       DMTRAD - DM TRANSFER ADDRESS
                                        ;       DMTRLN - TRANSFER LENGTH OF MAIN DM PROGRAM
                                        ;
                                        ;OUTPUTS:
                                        ;       NONE
                                        ;
                                        ;ALL REGISTERS ARE USED AND PREVIOUS CONTENTS DESTROYED.
                                        ;

011650  005037  002220                  RUNDM:  CLR     URNING                  ; COUNT # RUNNING UNITS

                                        ;LOAD DM PROGRAM INTO EACH CONTROLLER

011654  012705  002202                          MOV     #TSTTAB,R5              ; POINTER TO FIRST CONTROLLER TABLE
011660                                          ASSUME  C.NEXT,EQ,0
                                                .IF     EQ,<C.NEXT>-<0>
                                                .IFF
                                                .ERROR  ASSUMPTION VIOLATED
                                                .ENDC
011660  016505  000000                  LDDM:   MOV     C.NEXT(R5),R5           ; GET NEXT CONTROLLER TABLE ADDR
011664  001424                                  BEQ     RUNDMX                  ; EXIT IF NO MORE
011666  016537  000004  002074                  MOV     C.UNIT(R5),L$LUN        ; RECORD WHICH LOGICAL UNIT IN USE
011674  005065  000014                          CLR     C.FLG(R5)               ;CLEAR ALL FLAGS
011700  032765  100000  000004                  BIT     #CT.AVL,C.UNIT(R5)      ;SEE IF UNIT TO BE TESTED
011706  001014                                  BNE     LDERR                   ;IF NOT, DON'T LOAD THIS UNIT
011710  004737  003444                          CALL    LOADDM                  ;LOAD THE DM PROGRAM
011714  001411                                  BEQ     LDERR                   ;IF AN ERROR, GO TO NEXT CONTROLLER
011716  052765  000002  000014                  BIS     #CT.RN,C.FLG(R5)        ; SET PROGRAM RUNNING BIT
011724  004737  003110                          CALL    GETDMR                  ; SEND THE 'RECEIVE' COMMAND
011730  005237  002220                          INC     URNING                  ; COUNT # UNITS RUNNING
011734                                  LDNEXT:
011734  000751                                  BR      LDDM                    ; DO NEXT CONTROLLER
011736  000207                          RUNDMX: RETURN

011740                                  LDERR:  ERRDF   203,LDERRM              ; LOG ERROR
                                        .MCALL  M$ERRINS
011740                                  M$ERRINS        203,LDERRM,,C$ERDF
                                        .MCALL  M$GNINS,M$WORD,M$TSTLAB
011740                                  M$SVC   C$ERDF
                                        .MCALL  M$GNINS,M$TSTLAB
011740                                  M$TSTLAB
                                        .MCALL  M$TLABEL,M$INCR
                                        .IIF LT T$TSTMAC, .MEXIT
                                        .RADIX  10
                                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                        .RADIX  8
                                        M$INCR  T$TSTSEQ
011740                                  M$GNINS <TRAP   C$ERDF>
```

```
                                .IF LT SVCINS
                                TRAP    C$ERDF
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
    011740  104455                      TRAP    C$ERDF
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        TRAP    C$ERDF
                                        .NLIST
                                .ENDC
            000012              .RADIX  10
                                .IF NB  203
            000313              T$ERRNUM=203
                                .IFF
                                .ERROR  ;MISSING ERROR-NR
                                .ENDC
    011742                      M$WORD  \T$ERRNUM
                                .MCALL  M$GNINS
                                .IRP    N,<203>
                                M$GNINS <.WORD  N>
                                .ENDM
    011742                      M$GNINS <.WORD  203>
                                .IF LT SVCINS
                                .WORD   203
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
    011742  000313                      .WORD   203
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   203
                                        .NLIST
                                .ENDC
            000010              .RADIX  8
                                .IF NB LDERRM
    011744                      M$WORD  LDERRM
                                .MCALL  M$GNINS
                                .IRP    N,<LDERRM>
                                M$GNINS <.WORD  N>
                                .ENDM
    011744                      M$GNINS <.WORD  LDERRM>
                                .IF LT SVCINS
                                .WORD   LDERRM
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
    011744  011752                      .WORD   LDERRM
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   LDERRM
```

```
                                                        .NLIST
                                     .ENDC
                                     .IFF
                                     M$WORD  0
                                     .ENDC
                                     .IF NB
                                     M$WORD
                                     .IFF
 011746                              M$WORD  0
                                     .MCALL  M$GNINS
                                     .IRP    N,<0>
                                     M$GNINS <.WORD  N>
                                     .ENDM
 011746                              M$GNINS <.WORD  0>
                                     .IF LT SVCINS
                                     .WORD   0
                                     .MEXIT
                                     .ENDC
                                     .IF EQ SVCINS
 011746  000000                              .WORD   0
                                     .MEXIT
                                     .ENDC
                                     .IF GT SVCINS
                                     .LIST
                                                                                      .WORD   0
                                                        .NLIST
                                     .ENDC
                                     .ENDC
 011750  000771                              BR      LDNEXT                  ; DO NEXT CONTROLLER

 011752     125     116     101      LDERRM: .ASCIZ  \UNABLE TO DOWN LINE LOAD UDA\

                                             .EVEN
```

```
                                        ;SNDCMD
                                        ;
                                        ;SEND A COMMAND TO THE UDA.
                                        ;CLEAR THE RESPONSE PACKET. MARK BOTH PACKETS AVAILABLE TO THE
                                        ;UDA. SET COMMAND ISSUED BIT IN CONTROLLER TABLE AND INITIALIZE
                                        ;TIMEOUT COUNTER.
                                        ;
                                        ;INPUTS:
                                        ;       R5 - CONTROLLER TABLE ADDRESS
                                        ;OUTPUTS:
                                        ;       R4 - ADDRESS OF HOST COMM AREA


012010                                  SNDCMD: PUSH <R0,R1>
                                                .IRP X,<R0,R1>
                                                MOV X,-(SP)
                                                .ENDM
 012010  010046                                 MOV R0,-(SP)
 012012  010146                                 MOV R1,-(SP)
012014   016504  000010                         MOV C.RING(R5),R4                   ;LOAD R4 WITH HOST COMM AREA ADDRESS
012020   012700  000014                         MOV #HC.MPK,R0                      ;POINT TO MESSAGE PACKET
012024   060400                                 ADD R4,R0
012026   012701  000030                         MOV #HC.PSZ/2,R1                    ;SIZE OF MESSAGE PACKET
012032   005020                         SNDC1:  CLR (R0)+                           ;CLEAR ENTIRE MESSAGE PACKET
012034   005301                                 DEC R1
012036   001375                                 BNE SNDC1
012040   012764  000060  000074                 MOV     #HC.PSZ,HC.CEV(R4)          ; PUT PACKET SIZE IN ENVELOPE
012046   012764  001001  000076                 MOV     #DUP.VC,HC.CEV+2(R4)        ; MARK PACKET AS SPECIAL UDA FUNCTION
012054   012764  140000  000002                 MOV #RG.OWN+RG.FLG,HC.MCT(R4)       ;MARK MESSAGE PACKET AVAILABLE
012062   012764  100000  000006                 MOV #RG.OWN,HC.CCT(R4)              ;MARK COMMAND TO UDA
012070   005775  000002                         TST @C.UADR(R5)                     ;TELL UDA COMMAND IS THERE
012074   052765  000004  000014                 BIS #CT.CMD,C.FLG(R5)               ;MARK COMMAND ISSUED
                                        ;;;INITIALIZE TIMEOUT COUNTER
012102                                          POP     <R1,R0>
                                                .IRP X,<R1,R0>
                                                MOV (SP)+,X
                                                .ENDM
 012102  012601                                 MOV (SP)+,R1
 012104  012600                                 MOV (SP)+,R0
012106   000207                                 RETURN
```

```
                                ;UDAINT
                                ;
                                ;FUNCTIONAL DESCRIPTION:
                                ;       SUBROUTINE TO INITIALIZE A UDA AND BRING IT ON-LINE.
                                ;       ALL STEPS ARE CHECKED. AN ERROR MESSAGE IS REPORTED IF ANY ERROR
                                ;       DETECTED.
                                ;
                                ;       THE COMMAND/RING BUFFERS ARE 1 ENTRY EACH
                                ;
                                ;INPUTS:
                                ;       R5 - ADDRESS OF CONTROLLER TABLE.
                                ;
                                ;OUTPUTS:
                                ;       CONDITION Z - SET IF ANY ERROR REPORTED. CLEAR IF NO ERROR.
                                ;       R4 - ADDRESS OF UDAIP REGISTER IN UDA
                                ;       R5 - UNCHANGED.

                                ;CHECK IF ENOUGH FREE MEMORY FOR RING BUFFER

012110                          UDAINT:

                                ;FILL HOST COMMUNICATION AREA WITH ALL ONES

012110  016502  000010                  MOV     C.RING(R5),R2           ;GET FIRST ADDRESS OF RING BUFFER
012114  012703  000004                  MOV     #RNGLEN,R3              ;GET SIZE OF RING BUFFER
012120  012722  177777          5$:     MOV     #-1,(R2)+               ;WRITE ONES TO BUFFER
012124                                  SOB     R3,5$
012124  005303                          DEC     R3
012126  001374                          BNE     5$

                                ;       DO THE INITIALIZATION

012130  004737  012204                  CALL    UDAIST                  ;DO FIRST THREE STEPS
012134  103421                          BCS     UDAIEX                  ;GET OUT IF UDA MICROCODE REPORTED FAILURE

                                ;       CHECK HOST COMMUNICATION AREA FOR ALL ZEROS

012136  016502  000010                  MOV     C.RING(R5),R2           ;GET FIRST ADDRESS OF RING BUFFER
012142  012703  000004                  MOV     #RNGLEN,R3              ;GET SIZE OF RING BUFFER
012146  005722                  10$:    TST     (R2)+                   ;CHECK WORD IN BUFFER
012150  001007                          BNE     UDAI2E                  ;GO TO ERROR REPORTER IF NOT ZERO
012152                                  SOB     R3,10$
012152  005303                          DEC     R3
012154  001374                          BNE     10$

                                ;       SEND GO BIT TO UDASA REGISTER TO END INITIALIZATION

012156  012764  000001  000002          MOV     #SA.GO,2(R4)            ;SEND GO BIT
012164  000244                          CLZ                             ;CLEAR Z AS NO ERROR INDICATION
012166  000207                          RETURN

012170                          UDAI2E: ERRDF 15,INTHD,INTBF            ;REPORT BUFFER NOT CLEARED
                                .MCALL  M$ERRINS
012170                          M$ERRINS        15,INTHD,INTBF,C$ERDF
                                .MCALL  M$GNINS,M$WORD,M$TSTLAB
012170                          M$SVC   C$ERDF
                                .MCALL  M$GNINS,M$TSTLAB
```

```
012170                        M$TSTLAB
                              .MCALL  M$TLABEL,M$INCR
                              .IIF LT T$TSTMAC, .MEXIT
                              .RADIX  10
                              M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                              .RADIX  8
                              M$INCR  T$TSTSEQ
012170                        M$GNINS <TRAP   C$ERDF>
                              .IF LT SVCINS
                              TRAP    C$ERDF
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
012170  104455                        TRAP    C$ERDF
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                      TRAP    C$ERDF
                                              .NLIST
                              .ENDC
        000012                .RADIX  10
                              .IF NB  15
        000017                T$ERRNUM=15
                              .IFF
                              .ERROR  ;MISSING ERROR-NR
                              .ENDC
012172                        M$WORD  \T$ERRNUM
                              .MCALL  M$GNINS
                              .IRP    N,<15>
                              M$GNINS <.WORD  N>
                              .ENDM
012172                        M$GNINS <.WORD  15>
                              .IF LT SVCINS
                              .WORD   15
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
012172  000017                        .WORD   15
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                      .WORD   15
                                              .NLIST
                              .ENDC
        000010                .RADIX  8
                              .IF NB INTHD
012174                        M$WORD  INTHD
                              .MCALL  M$GNINS
                              .IRP    N,<INTHD>
                              M$GNINS <.WORD  N>
                              .ENDM
012174                        M$GNINS <.WORD  INTHD>
                              .IF LT SVCINS
                              .WORD   INTHD
                              .MEXIT
```

```
                                .ENDC
                                .IF EQ SVCINS
   012174  013074                       .WORD   INTHD
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                        .WORD   INTHD
                                                .NLIST
                                .ENDC
                                .IFF
                                M$WORD  0
                                .ENDC
                                .IF NB INTBF
   012176                       M$WORD  INTBF
                                .MCALL  M$GNINS
                                .IRP    N,<INTBF>
                                M$GNINS <.WORD  N>
                                .ENDM
   012176                       M$GNINS <.WORD  INTBF>
                                .IF LT SVCINS
                                .WORD   INTBF
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
   012176  012750                       .WORD   INTBF
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                        .WORD   INTBF
                                                .NLIST
                                .ENDC
                                .IFF
                                M$WORD  0
                                .ENDC

                                ;       ERROR RETURN

   012200  000264               UDAIEX: SEZ                             ;SET Z TO INDICATE ERROR OCCURRED
   012202  000207                       RETURN
```

```
                                          ;UDAIST
                                          ;
                                          ;START THE INITIALIZATION PROCESS ON THE SELECTED UDA.
                                          ;STOP BEFORE WRITING THE THIRD WORD SO UDA DOES NOT
                                          ;ATTEMPT ANY UNIBUS TRANSFERS.
                                          ;
                                          ;INPUTS:
                                          ;       R5 - ADDRESS OF CONTROLLER TABLE

012204                                    UDAIST: BREAK
                                          .MCALL  M$SVC
012204                                    M$SVC   C$BRK
                                          .MCALL  M$GNINS,M$TSTLAB
012204                                    M$TSTLAB
                                          .MCALL  M$TLABEL,M$INCR
                                          .IIF LT T$TSTMAC, .MEXIT
                                          .RADIX  10
                                          M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                          .RADIX  8
                                          M$INCR  T$TSTSEQ
012204                                    M$GNINS <TRAP   C$BRK>
                                          .IF LT SVCINS
                                          TRAP    C$BRK
                                          .MEXIT
                                          .ENDC
                                          .IF EQ SVCINS
012204  104422                                    TRAP    C$BRK
                                          .MEXIT
                                          .ENDC
                                          .IF GT SVCINS
                                          .LIST
                                                                                          TRAP    C$BRK
                                                          .NLIST
                                          .ENDC

                                          ;       START THE INITIALIZATION BY WRITING TO UDAIP REGISTER

012206  016504  000002                            MOV C.UADR(R5),R4               ;GET ADDRESS OF UDAIP REGISTER
012212  005014                                    CLR (R4)                        ;WRITE TO UDAIP

012214  012737  004000  012550                    MOV     #SA.S1,UDARSD           ; STEP 1 MASK
012222  004737  012426                            CALL    UDARSP                  ; GET STEP 1 READ RESPONSE
012226  103475                                    BCS     UDAIXY                  ; EXIT ON FAILURE
012230  010200                                    MOV     R2,R0                   ; COPY RESPONSE
012232  042700  003777                            BIC     #IN.MS1,R0              ; CLEAR DON'T CARES
012236  012703  004000                            MOV     #IN.RS1,R3
012242  020300                                    CMP     R3,R0                   ; CHECK FOR CORRECT RESPONSE
012244  001062                                    BNE     UDAIXX                  ; ERROR
012246  012764  100000  000002                    MOV     #IN.WT1,2(R4)           ; DO STEP 1 WRITE


012254  012737  010000  012550                    MOV     #SA.S2,UDARSD           ; STEP 2 MASK
012262  004737  012426                            CALL    UDARSP                  ; GET STEP 2 READ RESPONSE
012266  103455                                    BCS     UDAIXY                  ; EXIT ON FAILURE
012270  010200                                    MOV     R2,R0                   ; COPY RESPONSE
012272  042700  003500                            BIC     #IN.MS2,R0              ; CLEAR DON'T CARES
012276  012703  010200                            MOV     #IN.RS2,R3
```

```
   012302  020300                          CMP     R3,R0                  ; CHECK FOR CORRECT RESPONSE
   012304  001042                          BNE     UDAIXX                 ; ERROR
   012306  016564  000010  000002          MOV     C.RING(R5),2(R4)       ; DO STEP 2 WRITE

   012314  012737  020000  012550          MOV     #SA.S3,UDARSD          ; STEP 3 MASK
   012322  004737  012426                  CALL    UDARSP                 ; GET STEP 3 READ RESPONSE
   012326  103435                          BCS     UDAIXY                 ; EXIT ON FAILURE
   012330  010200                          MOV     R2,R0                  ; COPY RESPONSE
   012332  042700  002000                  BIC     #IN.MS3,R0             ; CLEAR DON'T CARES
   012336  012703  020000                  MOV     #IN.RS3,R3
   012342  020300                          CMP     R3,R0                  ; CHECK FOR CORRECT RESPONSE
   012344  001022                          BNE     UDAIXX                 ; ERROR
   012346  012764  000000  000002          MOV     #IN.WT3,2(R4)          ; DO STEP 3 WRITE

   012354  012737  040000  012550          MOV     #SA.S4,UDARSD          ; STEP 4 MASK
   012362  004737  012426                  CALL    UDARSP                 ; GET STEP 4 READ RESPONSE
   012366  103415                          BCS     UDAIXY                 ; EXIT ON FAILURE
   012370  010200                          MOV     R2,R0                  ; COPY RESPONSE
   012372  042700  003777                  BIC     #IN.MS4,R0             ; CLEAR DON'T CARES
   012376  012703  040000                  MOV     #IN.RS4,R3
   012402  020300                          CMP     R3,R0                  ; CHECK FOR CORRECT RESPONSE
   012404  001002                          BNE     UDAIXX                 ; ERROR
                                                                          ; ALLOW CALLER TO DO STEP 4 WRITE

   012406  000241                          CLC                            ;CLEAR CARRY FOR NO ERROR INDICATION
   012410  000207                          RETURN

   012412                          UDAIXX: ERRDF 6,INTHD,INTR3            ;REPORT ERROR
                                   .MCALL  M$ERRINS
   012412                          M$ERRINS        6,INTHD,INTR3,C$ERDF
                                   .MCALL  M$GNINS,M$WORD,M$TSTLAB
   012412                          M$SVC   C$ERDF
                                   .MCALL  M$GNINS,M$TSTLAB
   012412                          M$TSTLAB
                                   .MCALL  M$TLABEL,M$INCR
                                   .IIF LT T$TSTMAC, .MEXIT
                                   .RADIX  10
                                   M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                   .RADIX  8
                                   M$INCR  T$TSTSEQ
   012412                          M$GNINS <TRAP   C$ERDF>
                                   .IF LT SVCINS
                                   TRAP    C$ERDF
                                   .MEXIT
                                   .ENDC
                                   .IF EQ SVCINS
   012412  104455                          TRAP    C$ERDF
                                   .MEXIT
                                   .ENDC
                                   .IF GT SVCINS
                                   .LIST
                                                                                      TRAP    C$ERDF
                                           .NLIST
                                   .ENDC
           000012                  .RADIX  10
                                   .IF NB  6
           000006                  T$ERRNUM=6
```

```
                                 .IFF
                                 .ERROR  ;MISSING ERROR-NR
                                 .ENDC
      012414                     M$WORD  \T$ERRNUM
                                 .MCALL  M$GNINS
                                 .IRP    N,<6>
                                 M$GNINS <.WORD  N>
                                 .ENDM
      012414                     M$GNINS <.WORD  6>
                                 .IF LT SVCINS
                                 .WORD   6
                                 .MEXIT
                                 .ENDC
                                 .IF EQ SVCINS
      012414  000006                     .WORD   6
                                 .MEXIT
                                 .ENDC
                                 .IF GT SVCINS
                                 .LIST
                                                                                     .WORD   6
                                                 .NLIST
                                 .ENDC
              000010             .RADIX  8
                                 .IF NB INTHD
      012416                     M$WORD  INTHD
                                 .MCALL  M$GNINS
                                 .IRP    N,<INTHD>
                                 M$GNINS <.WORD  N>
                                 .ENDM
      012416                     M$GNINS <.WORD  INTHD>
                                 .IF LT SVCINS
                                 .WORD   INTHD
                                 .MEXIT
                                 .ENDC
                                 .IF EQ SVCINS
      012416  013074                     .WORD   INTHD
                                 .MEXIT
                                 .ENDC
                                 .IF GT SVCINS
                                 .LIST
                                                                                     .WORD   INTHD
                                                 .NLIST
                                 .ENDC
                                 .IFF
                                 M$WORD  0
                                 .ENDC
                                 .IF NB INTR3
      012420                     M$WORD  INTR3
                                 .MCALL  M$GNINS
                                 .IRP    N,<INTR3>
                                 M$GNINS <.WORD  N>
                                 .ENDM
      012420                     M$GNINS <.WORD  INTR3>
                                 .IF LT SVCINS
                                 .WORD   INTR3
                                 .MEXIT
                                 .ENDC
```

```
                                  .IF EQ SVCINS
     012420  012662                       .WORD   INTR3
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                                      .WORD   INTR3
                                              .NLIST
                                  .ENDC
                                  .IFF
                                  M$WORD  0
                                  .ENDC
  62 012422  000261               UDAIXY: SEC                           ; FLAG ERROR TO CALLER
  63 012424  000207                       RETURN
```

```
                                  ;UDARSP
                                  ;
                                  ;WAIT FOR UDA TO RESPOND WITH DATA IN UDASA REGISTER.
                                  ;EITHER STEP BIT FROM MASK IN LOCATION UDARSD OR ERROR BIT
                                  ;WILL CAUSE A TERMINATION.
                                  ;AN ERROR MESSAGE WILL BE PRINTED IF THE UDA DOES NOT RESPOND
                                  ;IN 30 SECONDS OR IF ERROR SETS. (30 SECONDS BASED ON 11/44 PROCESSOR
                                  ;EXECUTION TIME)
                                  ;
                                  ;INPUTS:
                                  ;        UDASRD - MASK OF STEP BIT TO LOOK FOR
                                  ;        R4 - ADDRESS OF UDAIP REGISTER
                                  ;
                                  ;OUTPUTS:
                                  ;        ERROR MESSAGE IF TIME OUT ON RESPONSE OR ERROR BIT SETS
                                  ;        R2 - DATA FROM UDASA REGISTER
                                  ;        CARRY SET IF ERROR BIT SETS

012426  052737  100000  012550    UDARSP: BIS #SA.ERR,UDARSD          ;SET ERROR BIT IN MASK WORD
012434  012702  006400                    MOV #6400,R2                ;SET UP DELAY COUNT FOR 30 SECONDS
012440                            UDARS1: DELAY 5.                    ;DELAY 0.0005 SECOND
                                  .MCALL M$GNINS
                                  .IF LT G$DELM-5.
                                  .ERROR ;ARGUMENT TO "DELAY" MUST NOT BE GREATER THAN 250
                                  .MEXIT
                                  .ENDC
                                  .IF B 5.
                                  M$GNINS <MOV    #1,(PC)+>
                                  .IFF
012440                            M$GNINS <MOV    #5.,(PC)+>
                                  .IF LT SVCINS
                                  MOV     #5.,(PC)+
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
012440  012727  000005                    MOV     #5.,(PC)+
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                                MOV     #5.,(PC)+
                                            .NLIST
                                  .ENDC
                                  .ENDC
012444                            M$GNINS <.WORD  0>
                                  .IF LT SVCINS
                                  .WORD   0
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
012444  000000                            .WORD   0
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                                .WORD   0
                                            .NLIST
```

```
                                   .ENDC
012446                             M$GNINS <MOV     L$DLY,(PC)+>
                                   .IF LT SVCINS
                                   MOV     L$DLY,(PC)+
                                   .MEXIT
                                   .ENDC
                                   .IF EQ SVCINS
012446  013727  002116                     MOV     L$DLY,(PC)+
                                   .MEXIT
                                   .ENDC
                                   .IF GT SVCINS
                                   .LIST
                                                                  MOV     L$DLY,(PC)+
                                           .NLIST
                                   .ENDC
012452                             M$GNINS <.WORD   0>
                                   .IF LT SVCINS
                                   .WORD   0
                                   .MEXIT
                                   .ENDC
                                   .IF EQ SVCINS
012452  000000                             .WORD   0
                                   .MEXIT
                                   .ENDC
                                   .IF GT SVCINS
                                   .LIST
                                                                  .WORD   0
                                           .NLIST
                                   .ENDC
012454                             M$GNINS <DEC     -6(PC)>
                                   .IF LT SVCINS
                                   DEC     -6(PC)
                                   .MEXIT
                                   .ENDC
                                   .IF EQ SVCINS
012454  005367  177772                     DEC     -6(PC)
                                   .MEXIT
                                   .ENDC
                                   .IF GT SVCINS
                                   .LIST
                                                                  DEC     -6(PC)
                                           .NLIST
                                   .ENDC
012460                             M$GNINS <BNE     .-4>
                                   .IF LT SVCINS
                                   BNE     .-4
                                   .MEXIT
                                   .ENDC
                                   .IF EQ SVCINS
012460  001375                             BNE     .-4
                                   .MEXIT
                                   .ENDC
                                   .IF GT SVCINS
                                   .LIST
                                                                  BNE     .-4
                                           .NLIST
                                   .ENDC
```

```
   012462                              M$GNINS <DEC    -22(PC)>
                                       .IF LT SVCINS
                                       DEC     -22(PC)
                                       .MEXIT
                                       .ENDC
                                       .IF EQ SVCINS
   012462  005367  177756                      DEC     -22(PC)
                                       .MEXIT
                                       .ENDC
                                       .IF GT SVCINS
                                       .LIST
                                                                                                DEC      -22(PC)
                                                       .NLIST
                                       .ENDC
   012466                              M$GNINS <BNE    .-20>
                                       .IF LT SVCINS
                                       BNE     .-20
                                       .MEXIT
                                       .ENDC
                                       .IF EQ SVCINS
   012466  001367                              BNE     .-20
                                       .MEXIT
                                       .ENDC
                                       .IF GT SVCINS
                                       .LIST
                                                                                                BNE      .-20
                                                       .NLIST
                                       .ENDC
   012470  033764  012550  000002              BIT UDARSD,2(R4)               ;LOOK AT ERROR AND STEP BIT
   012476  001011                              BNE UDARS2                     ;BRANCH IF EITHER SET
   012500  005302                              DEC R2                         ;LOOK AT TIME OUT COUNTER
   012502  001356                              BNE UDARS1                     ;LOOP UNLESS TIME OUT
   012504  016402  000002                      MOV 2(R4),R2                   ;GET REGISTER CONTENTS
   012510                                      ERRDF 4,INTHD,INTR1            ;REPORT TIME OUT ERROR
                                       .MCALL  M$ERRINS
   012510                              M$ERRINS        4,INTHD,INTR1,C$ERDF
                                       .MCALL  M$GNINS,M$WORD,M$TSTLAB
   012510                              M$SVC   C$ERDF
                                       .MCALL  M$GNINS,M$TSTLAB
   012510                              M$TSTLAB
                                       .MCALL  M$TLABEL,M$INCR
                                       .IIF LT T$TSTMAC, .MEXIT
                                       .RADIX  10
                                       M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                       .RADIX  8
                                       M$INCR  T$TSTSEQ
   012510                              M$GNINS <TRAP   C$ERDF>
                                       .IF LT SVCINS
                                       TRAP    C$ERDF
                                       .MEXIT
                                       .ENDC
                                       .IF EQ SVCINS
   012510  104455                              TRAP    C$ERDF
                                       .MEXIT
                                       .ENDC
                                       .IF GT SVCINS
                                       .LIST
```

```
                                                                                      TRAP    C$ERDF
                                                  .NLIST
                                  .ENDC
          000012                  .RADIX  10
                                  .IF NB  4
          000004                  T$ERRNUM=4
                                  .IFF
                                  .ERROR  ;MISSING ERROR-NR
                                  .ENDC
    012512                        M$WORD  \T$ERRNUM
                                  .MCALL  M$GNINS
                                  .IRP    N,<4>
                                  M$GNINS <.WORD  N>
                                  .ENDM
    012512                        M$GNINS <.WORD  4>
                                  .IF LT SVCINS
                                  .WORD   4
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
    012512  000004                        .WORD   4
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                                      .WORD   4
                                                  .NLIST
                                  .ENDC
          000010                  .RADIX  8
                                  .IF NB INTHD
    012514                        M$WORD  INTHD
                                  .MCALL  M$GNINS
                                  .IRP    N,<INTHD>
                                  M$GNINS <.WORD  N>
                                  .ENDM
    012514                        M$GNINS <.WORD  INTHD>
                                  .IF LT SVCINS
                                  .WORD   INTHD
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
    012514  013074                        .WORD   INTHD
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                                      .WORD   INTHD
                                                  .NLIST
                                  .ENDC
                                  .IFF
                                  M$WORD  0
                                  .ENDC
                                  .IF NB INTR1
    012516                        M$WORD  INTR1
                                  .MCALL  M$GNINS
                                  .IRP    N,<INTR1>
                                  M$GNINS <.WORD  N>
```

```
                                .ENDM
     012516                     M$GNINS <.WORD  INTR1>
                                .IF LT SVCINS
                                .WORD   INTR1
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     012516  012552                     .WORD   INTR1
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   INTR1
                                          .NLIST
                                .ENDC
                                .IFF
                                M$WORD  0
                                .ENDC
  28 012520  000407                     BR UDAXXX
```

```
                                ;CHECK IF ERROR BIT SET

 012522  016402  000002         UDARS2: MOV 2(R4),R2                    ;GET REGISTER CONTENTS
 012526  100006                         BPL UDARSX                      ;EXIT IF ERROR NOT SET
 012530                                 ERRDF 5,INTHD,INTR2             ;REPORT ERROR INFO
                                .MCALL  M$ERRINS
 012530                         M$ERRINS        5,INTHD,INTR2,C$ERDF
                                .MCALL  M$GNINS,M$WORD,M$TSTLAB
 012530                         M$SVC   C$ERDF
                                .MCALL  M$GNINS,M$TSTLAB
 012530                         M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
 012530                         M$GNINS <TRAP   C$ERDF>
                                .IF LT SVCINS
                                TRAP    C$ERDF
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
 012530  104455                         TRAP    C$ERDF
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                TRAP    C$ERDF
                                          .NLIST
                                .ENDC
         000012                 .RADIX  10
                                .IF NB  5
         000005                 T$ERRNUM=5
                                .IFF
                                .ERROR  ;MISSING ERROR-NR
                                .ENDC
 012532                         M$WORD  \T$ERRNUM
                                .MCALL  M$GNINS
                                .IRP    N,<5>
                                M$GNINS <.WORD  N>
                                .ENDM
 012532                         M$GNINS <.WORD  5>
                                .IF LT SVCINS
                                .WORD   5
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
 012532  000005                         .WORD   5
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                .WORD   5
                                          .NLIST
                                .ENDC
         000010                 .RADIX  8
```

```
                          .IF NB INTHD
  012534                  M$WORD  INTHD
                          .MCALL  M$GNINS
                          .IRP    N,<INTHD>
                          M$GNINS <.WORD  N>
                          .ENDM
  012534                  M$GNINS <.WORD  INTHD>
                          .IF LT SVCINS
                          .WORD   INTHD
                          .MEXIT
                          .ENDC
                          .IF EQ SVCINS
  012534  013074                  .WORD   INTHD
                          .MEXIT
                          .ENDC
                          .IF GT SVCINS
                          .LIST
                                                                        .WORD   INTHD
                                          .NLIST
                          .ENDC
                          .IFF
                          M$WORD  0
                          .ENDC
                          .IF NB INTR2
  012536                  M$WORD  INTR2
                          .MCALL  M$GNINS
                          .IRP    N,<INTR2>
                          M$GNINS <.WORD  N>
                          .ENDM
  012536                  M$GNINS <.WORD  INTR2>
                          .IF LT SVCINS
                          .WORD   INTR2
                          .MEXIT
                          .ENDC
                          .IF EQ SVCINS
  012536  012616                  .WORD   INTR2
                          .MEXIT
                          .ENDC
                          .IF GT SVCINS
                          .LIST
                                                                        .WORD   INTR2
                                          .NLIST
                          .ENDC
                          .IFF
                          M$WORD  0
                          .ENDC
  012540  000261          UDAXXX: SEC
  012542  000207                  RETURN

                          ;NORMAL EXIT

  012544  000241          UDARSX: CLC                           ;CLEAR CARRY AS NO ERROR INDICATION
  012546  000207                  RETURN

                          ;LOCATION FOR STEP BIT MASK

  012550  000000          UDARSD: .WORD 0                       ;LOAD BY CALLING ROUTINE
```

```
      1                                         ;UDAINT ROUTINE ERROR MESSAGES
      2
      3 012552                                          BGNMSG INTR1                            ;TIME OUT ERROR
                                                .MCALL  M$PUSH,M$INCR,M$GNGBL
                        000040                  I$MSG=F$BGN
        012552                                  M$PUSH  T$NS,T$NESTLEV,F$MSG
                                                .MCALL  M$INCR,M$SETS
        012552                                  M$INCR  T$NESTLEV
                        000000                  T$NESTLEV=T$NESTLEV+1
        012552                                  M$SETS  T$NS,\T$NESTLEV,F$MSG
                        000011                  T$NS0=F$MSG
                        010007                  T$$MSG=T$TAGNUM
        012552                                  M$INCR T$TAGNUM
                        010010                  T$TAGNUM=T$TAGNUM+1
        012552                                  M$GNGBL INTR1
                                                .MCALL  M$GEN
                                                .IF NB,INTR1
                                                .IF NB,
                                                M$GEN    INTR1,:,SVCGBL,
                                                .ENDC
                                                .IF B,
        012552                                  M$GEN    INTR1,:,SVCGBL,< >
                                                .IF LE  SVCGBL
        012552                                  INTR1::
                                                .MEXIT
                                                .ENDC
                                                .LIST
                                                                                                INTR1::
                                                        .NLIST
                                                .ENDC
                                                .ENDC
      4 012552                                          PRINTB #INTM1
                                                .MCALL  M$PRINT
                                                .IF B   #INTM1
                                                .ERROR  ;MISSING FORMAT
                                                .MEXIT
                                                .ENDC
                                                .IF B   <>
        012552                                  M$PRINT C$PNTB,#INTM1
                                                .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
                        000001                  T$ARGCNT=1
        012552                                  M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                                .IF NB <>
                                                M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                                .ENDC
                                                .IF NB <>
                                                T$ARGCNT=T$ARGCNT+1
                                                .ENDC
                                                .IRP    N,<\T$ARGCNT>
                                                M$PUT   #N,#INTM1,<>,<>,<>,<>,<>,<>,<>,<>
                                                .ENDM
        012552                                  M$PUT   #1,#INTM1,<>,<>,<>,<>,<>,<>,<>,<>
                                                .MCALL  M$PUT1
                                                .IF NB  <#INTM1>
        012552                                  M$PUT   <#INTM1>,<>,<>,<>,<>,<>,<>,<>,<>
                                                .MCALL  M$PUT1
                                                .IF NB  <>
```

```
                                M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB  <#INTM1>
     012552                     M$PUT1  #INTM1
                                .MCALL  M$GNINS
                                .IF B
     012552                     M$GNINS <MOV     #INTM1,-(SP)>
                                .IF LT SVCINS
                                MOV     #INTM1,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     012552  012746  013121             MOV     #INTM1,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     #INTM1,-(SP)
                                                .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#INTM1>
                                .ERROR  ;ILL. ARG. ''#INTM1'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR     -(SP)>
                                M$GNINS <BISB    ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#1>
     012556                     M$PUT1  #1
                                .MCALL  M$GNINS
                                .IF B
     012556                     M$GNINS <MOV     #1,-(SP)>
                                .IF LT SVCINS
                                MOV     #1,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     012556  012746  000001             MOV     #1,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     #1,-(SP)
                                                .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#1>
                                .ERROR  ;ILL. ARG. ''#1'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR     -(SP)>
                                M$GNINS <BISB    ,(SP)>
                                .ENDC
                                .ENDC
```

```
012562                          M$GNINS <MOV     SP,R0>
                                .IF LT SVCINS
                                MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
012562  010600                          MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     SP,R0
                                                .NLIST
                                .ENDC
012564                          M$SVC   C$PNTB
                                .MCALL  M$GNINS,M$TSTLAB
012564                          M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
012564                          M$GNINS <TRAP    C$PNTB>
                                .IF LT SVCINS
                                TRAP    C$PNTB
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
012564  104414                          TRAP    C$PNTB
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        TRAP    C$PNTB
                                                .NLIST
                                .ENDC
                                .IRP    N,<\T$ARGCNT*2+2>
                                M$GNINS <ADD     #N,SP>
                                .ENDM
012566                          M$GNINS <ADD     #4,SP>
                                .IF LT SVCINS
                                ADD     #4,SP
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
012566  062706  000004                  ADD     #4,SP
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        ADD     #4,SP
                                                .NLIST
                                .ENDC
                                .MEXIT
                                .ENDC
                                .IF B   <>
```

```
                              M$PRINT C$PNTB,#INTM1,<>
                              .MEXIT
                              .ENDC
                              .IF B   <>
                              M$PRINT C$PNTB,#INTM1,<>,<>
                              .MEXIT
                              .ENDC
                              .IF B   <>
                              M$PRINT C$PNTB,#INTM1,<>,<>,<>
                              .MEXIT
                              .ENDC
                              .IF B   <>
                              M$PRINT C$PNTB,#INTM1,<>,<>,<>,<>
                              .MEXIT
                              .ENDC
                              .IF B   <>
                              M$PRINT C$PNTB,#INTM1,<>,<>,<>,<>,<>
                              .MEXIT
                              .ENDC
                              .IF B   <>
                              M$PRINT C$PNTB,#INTM1,<>,<>,<>,<>,<>,<>
                              .MEXIT
                              .ENDC
                              .IF B   <>
                              M$PRINT C$PNTB,#INTM1,<>,<>,<>,<>,<>,<>,<>
                              .MEXIT
                              .ENDC
                              M$PRINT C$PNTB,#INTM1,<>,<>,<>,<>,<>,<>,<>,<>
    5 012572                          PRINTB #INTM2,R2
                              .MCALL  M$PRINT
                              .IF B   #INTM2
                              .ERROR  ;MISSING FORMAT
                              .MEXIT
                              .ENDC
                              .IF B   <R2>
                              M$PRINT C$PNTB,#INTM2
                              .MEXIT
                              .ENDC
                              .IF B   <>
      012572                  M$PRINT C$PNTB,#INTM2,<R2>
                              .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
              000001          T$ARGCNT=1
      012572                  M$COUNT T$ARGCNT,<R2>,<>,<>,<>,<>,<>,<>,<>
                              .IF NB <>
                              M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                              .ENDC
                              .IF NB <R2>
              000002          T$ARGCNT=T$ARGCNT+1
                              .ENDC
                              .IRP    N,<\T$ARGCNT>
                              M$PUT   #N,#INTM2,<R2>,<>,<>,<>,<>,<>,<>,<>
                              .ENDM
      012572                  M$PUT   #2,#INTM2,<R2>,<>,<>,<>,<>,<>,<>,<>
                              .MCALL  M$PUT1
                              .IF NB  <#INTM2>
      012572                  M$PUT   <#INTM2>,<R2>,<>,<>,<>,<>,<>,<>,<>
                              .MCALL  M$PUT1
```

```
                                .IF NB  <R2>
012572                          M$PUT   <R2>,<>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <>
                                M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB  <R2>
012572                          M$PUT1  R2
                                .MCALL  M$GNINS
                                .IF B
012572                          M$GNINS <MOV    R2,-(SP)>
                                .IF LT SVCINS
                                MOV     R2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
012572  010246                          MOV     R2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     R2,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<R2>
                                .ERROR  ;ILL. ARG. ''R2'' ONLY ''B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#INTM2>
012574                          M$PUT1  #INTM2
                                .MCALL  M$GNINS
                                .IF B
012574                          M$GNINS <MOV    #INTM2,-(SP)>
                                .IF LT SVCINS
                                MOV     #INTM2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
012574  012746  013221                  MOV     #INTM2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     #INTM2,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#INTM2>
                                .ERROR  ;ILL. ARG. ''#INTM2'' ONLY ''B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
```

```
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#2>
012600                          M$PUT1  #2
                                .MCALL  M$GNINS
                                .IF B
012600                          M$GNINS <MOV    #2,-(SP)>
                                .IF LT SVCINS
                                MOV     #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
012600  012746  000002                  MOV     #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                        MOV     #2,-(SP)
                                                .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#2>
                                .ERROR  ;ILL. ARG. ''#2'' ONLY ''B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
012604                          M$GNINS <MOV    SP,R0>
                                .IF LT SVCINS
                                MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
012604  010600                          MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                        MOV     SP,R0
                                                .NLIST
                                .ENDC
012606                          M$SVC   C$PNTB
                                .MCALL  M$GNINS,M$TSTLAB
012606                          M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
012606                          M$GNINS <TRAP   C$PNTB>
                                .IF LT SVCINS
```

```
                                        TRAP    C$PNTB
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
     012606  104414                             TRAP    C$PNTB
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        TRAP    C$PNTB
                                                        .NLIST
                                        .ENDC
                                        .IRP    N,<\T$ARGCNT*2+2>
                                        M$GNINS <ADD    #N,SP>
                                        .ENDM
     012610                             M$GNINS <ADD    #6,SP>
                                        .IF LT SVCINS
                                        ADD     #6,SP
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
     012610  062706  000006                     ADD     #6,SP
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        ADD     #6,SP
                                                        .NLIST
                                        .ENDC
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#INTM2,<R2>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#INTM2,<R2>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#INTM2,<R2>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#INTM2,<R2>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#INTM2,<R2>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#INTM2,<R2>,<>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        M$PRINT C$PNTB,#INTM2,<R2>,<>,<>,<>,<>,<>,<>,<>
    6 012614                                    ENDMSG
```

```
                                    .MCALL  M$POP,M$GNTAG,M$SVC,M$ENDERR
     012614                         M$POP   T$NS,T$NESTLEV,T$TEMP
                                    .MCALL  M$GETS,M$DECR
                                    .IF LT  T$NESTLEV
                                    .ERROR  T$NESTLEV       ; MACRO T$NS UNDERFLOW
                                    .MEXIT
                                    .ENDC
     012614                         M$GETS  T$NS,\T$NESTLEV,T$TEMP
            000011                  T$TEMP=T$NS0
     012614                         M$DECR  T$NESTLEV
            177777                  T$NESTLEV=T$NESTLEV-1
                                    .IF EQ F$MSG-T$TEMP
     012614                         M$GNTAG L,T$$MSG
                                    .MCALL  M$GEN
     012614                         M$GEN   L,\T$$MSG,SVCTAG
                                    .IF LE  SVCTAG
     012614                         L10007:
                                    .MEXIT
                                    .ENDC
                                    .LIST
                                                                                  L10007:
                                            .NLIST
            010000                  S$LSYM=T$LSYM
     012614                         M$SVC   C$MSG
                                    .MCALL  M$GNINS,M$TSTLAB
     012614                         M$TSTLAB
                                    .MCALL  M$TLABEL,M$INCR
                                    .IIF LT T$TSTMAC, .MEXIT
                                    .RADIX  10
                                    M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                    .RADIX  8
                                    M$INCR  T$TSTSEQ
     012614                         M$GNINS <TRAP   C$MSG>
                                    .IF LT SVCINS
                                    TRAP    C$MSG
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
     012614 104423                          TRAP    C$MSG
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                              TRAP    C$MSG
                                                    .NLIST
                                    .ENDC
            000041                  I$MSG=F$END
                                    .IFF
                                    M$ENDERR        ENDMSG,T$TEMP
                                    .ENDC
   7
   8 012616                                 BGNMSG INTR2                 ;UDA DIAGS FAILED
                                    .MCALL  M$PUSH,M$INCR,M$GNGBL
            000040                  I$MSG=F$BGN
     012616                         M$PUSH  T$NS,T$NESTLEV,F$MSG
                                    .MCALL  M$INCR,M$SETS
     012616                         M$INCR  T$NESTLEV
```

```
             00000C          T$NESTLEV=T$NESTLEV+1
    012616                   M$SETS  T$NS,\T$NESTLEV,F$MSG
             000011          T$NS0=F$MSG
             010010          T$$MSG=T$TAGNUM
    012616                   M$INCR T$TAGNUM
             010011          T$TAGNUM=T$TAGNUM+1
    012616                   M$GNGBL INTR2
                             .MCALL  M$GEN
                             .IF NB,INTR2
                             .IF NB,
                             M$GEN   INTR2,:,SVCGBL,
                             .ENDC
                             .IF B,
    012616                   M$GEN   INTR2,:,SVCGBL,< >
                             .IF LE  SVCGBL
    012616                   INTR2::
                             .MEXIT
                             .ENDC
                             .LIST
                                                                              INTR2::
                                     .NLIST
                             .ENDC
                             .ENDC
  9 012616                           PRINTB #INTM3
                             .MCALL  M$PRINT
                             .IF B   #INTM3
                             .ERROR  ;MISSING FORMAT
                             .MEXIT
                             .ENDC
                             .IF B   <>
    012616                   M$PRINT C$PNTB,#INTM3
                             .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
             000001          T$ARGCNT=1
    012616                   M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                             .IF NB <>
                             M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>
                             .ENDC
                             .IF NB <>
                             T$ARGCNT=T$ARGCNT+1
                             .ENDC
                             .IRP    N,<\T$ARGCNT>
                             M$PUT   #N,#INTM3,<>,<>,<>,<>,<>,<>,<>,<>
                             .ENDM
    012616                   M$PUT   #1,#INTM3,<>,<>,<>,<>,<>,<>,<>,<>
                             .MCALL  M$PUT1
                             .IF NB  <#INTM3>
    012616                   M$PUT   <#INTM3>,<>,<>,<>,<>,<>,<>,<>,<>
                             .MCALL  M$PUT1
                             .IF NB  <>
                             M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                             .ENDC
                             .IF NB  <#INTM3>
    012616                   M$PUT1  #INTM3
                             .MCALL  M$GNINS
                             .IF B
    012616                   M$GNINS <MOV    #INTM3,-(SP)>
                             .IF LT SVCINS
```

```
                                        MOV     #INTM3,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      012616  012746  013253                    MOV     #INTM3,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                MOV     #INTM3,-(SP)
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#INTM3>
                                        .ERROR  ;ILL. ARG. '"#INTM3"' ONLY '"B"' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR    -(SP)>
                                        M$GNINS <BISB   ,(SP)>
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF NB  <#1>
      012622                            M$PUT1  #1
                                        .MCALL  M$GNINS
                                        .IF B
      012622                            M$GNINS <MOV    #1,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #1,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      012622  012746  000001                    MOV     #1,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                MOV     #1,-(SP)
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#1>
                                        .ERROR  ;ILL. ARG. '"#1"' ONLY '"B"' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR    -(SP)>
                                        M$GNINS <BISB   ,(SP)>
                                        .ENDC
                                        .ENDC
      012626                            M$GNINS <MOV    SP,R0>
                                        .IF LT SVCINS
                                        MOV     SP,R0
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      012626  010600                            MOV     SP,R0
                                        .MEXIT
```

```
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                                MOV     SP,R0
                                        .NLIST
                              .ENDC
     012630                   M$SVC    C$PNTB
                              .MCALL  M$GNINS,M$TSTLAB
     012630                   M$TSTLAB
                              .MCALL  M$TLABEL,M$INCR
                              .IIF LT T$TSTMAC, .MEXIT
                              .RADIX  10
                              M$TLABEL         \T$TESTNUN,\T$TSTSEQ
                              .RADIX  8
                              M$INCR  T$TSTSEQ
     012630                   M$GNINS <TRAP    C$PNTB>
                              .IF LT SVCINS
                              TRAP    C$PNTB
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
     012630  104414                   TRAP     C$PNTB
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                                TRAP    C$PNTB
                                        .NLIST
                              .ENDC
                              .IRP     N,<\T$ARGCNT*2+2>
                              M$GNINS <ADD     #N,SP>
                              .ENDM
     012632                   M$GNINS <ADD     #4,SP>
                              .IF LT SVCINS
                              ADD     #4,SP
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
     012632  062706  000004           ADD      #4,SP
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                                ADD     #4,SP
                                        .NLIST
                              .ENDC
                              .MEXIT
                              .ENDC
                              .IF B   <>
                              M$PRINT C$PNTB,#INTM3,<>
                              .MEXIT
                              .ENDC
                              .IF B   <>
                              M$PRINT C$PNTB,#INTM3,<>,<>
                              .MEXIT
                              .ENDC
                              .IF B   <>
```

```
                                        M$PRINT C$PNTB,#INTM3,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#INTM3,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#INTM3,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#INTM3,<>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTB,#INTM3,<>,<>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        M$PRINT C$PNTB,#INTM3,<>,<>,<>,<>,<>,<>,<>,<>
  10 012636                                     PRINTB #INTM2,R2
                                        .MCALL  M$PRINT
                                        .IF B   #INTM2
                                        .ERROR  ;MISSING FORMAT
                                        .MEXIT
                                        .ENDC
                                        .IF B   <R2>
                                        M$PRINT C$PNTB,#INTM2
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
     012636                             M$PRINT C$PNTB,#INTM2,<R2>
                                        .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
            000001                      T$ARGCNT=1
     012636                             M$COUNT T$ARGCNT,<R2>,<>,<>,<>,<>,<>,<>,<>
                                        .IF NB <>
                                        M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDC
                                        .IF NB <R2>
            000002                      T$ARGCNT=T$ARGCNT+1
                                        .ENDC
                                        .IRP    N,<\T$ARGCNT>
                                        M$PUT   #N,#INTM2,<R2>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDM
     012636                             M$PUT   #2,#INTM2,<R2>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <#INTM2>
     012636                             M$PUT   <#INTM2>,<R2>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <R2>
     012636                             M$PUT   <R2>,<>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <>
                                        M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDC
                                        .IF NB  <R2>
     012636                             M$PUT1  R2
```

```
                                .MCALL  M$GNINS
                                .IF B
     012636                     M$GNINS <MOV    R2,-(SP)>
                                .IF LT SVCINS
                                MOV     R2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     012636  010246                     MOV     R2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     R2,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<R2>
                                .ERROR  ;ILL. ARG. ''R2'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#INTM2>
     012640                     M$PUT1  #INTM2
                                .MCALL  M$GNINS
                                .IF B
     012640                     M$GNINS <MOV    #INTM2,-(SP)>
                                .IF LT SVCINS
                                MOV     #INTM2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     012640  012746  013221             MOV     #INTM2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     #INTM2,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#INTM2>
                                .ERROR  ;ILL. ARG. ''#INTM2'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#2>
     012644                     M$PUT1  #2
                                .MCALL  M$GNINS
```

```
                                .IF B
   012644                       M$GNINS <MOV    #2,-(SP)>
                                .IF LT SVCINS
                                MOV     #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
   012644  012746  000002               MOV     #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                    MOV     #2,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#2>
                                .ERROR  ;ILL. ARG. "#2" ONLY "B" IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
   012650                       M$GNINS <MOV    SP,R0>
                                .IF LT SVCINS
                                MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
   012650  010600                       MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                    MOV     SP,R0
                                          .NLIST
                                .ENDC
   012652                       M$SVC   C$PNTB
                                .MCALL  M$GNINS,M$TSTLAB
   012652                       M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
   012652                       M$GNINS <TRAP   C$PNTB>
                                .IF LT SVCINS
                                TRAP    C$PNTB
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
   012652  104414                       TRAP    C$PNTB
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
```

```
                               .LIST
                                                                             TRAP     C$PNTB
                                          .NLIST
                               .ENDC
                               .IRP     N,<\T$ARGCNT*2+2>
                               M$GNINS <ADD     #N,SP>
                               .ENDM
      012654                   M$GNINS <ADD     #6,SP>
                               .IF LT SVCINS
                               ADD      #6,SP
                               .MEXIT
                               .ENDC
                               .IF EQ SVCINS
      012654  062706  000006            ADD      #6,SP
                               .MEXIT
                               .ENDC
                               .IF GT SVCINS
                               .LIST
                                                                             ADD      #6,SP
                                          .NLIST
                               .ENDC
                               .MEXIT
                               .ENDC
                               .IF B    <>
                               M$PRINT C$PNTB,#INTM2,<R2>,<>
                               .MEXIT
                               .ENDC
                               .IF B    <>
                               M$PRINT C$PNTB,#INTM2,<R2>,<>,<>
                               .MEXIT
                               .ENDC
                               .IF B    <>
                               M$PRINT C$PNTB,#INTM2,<R2>,<>,<>,<>
                               .MEXIT
                               .ENDC
                               .IF B    <>
                               M$PRINT C$PNTB,#INTM2,<R2>,<>,<>,<>,<>
                               .MEXIT
                               .ENDC
                               .IF B    <>
                               M$PRINT C$PNTB,#INTM2,<R2>,<>,<>,<>,<>,<>
                               .MEXIT
                               .ENDC
                               .IF B    <>
                               M$PRINT C$PNTB,#INTM2,<R2>,<>,<>,<>,<>,<>,<>
                               .MEXIT
                               .ENDC
                               M$PRINT C$PNTB,#INTM2,<R2>,<>,<>,<>,<>,<>,<>,<>
   11 012660                            ENDMSG
                               .MCALL   M$POP,M$GNTAG,M$SVC,M$ENDERR
      012660                   M$POP    T$NS,T$NESTLEV,T$TEMP
                               .MCALL   M$GETS,M$DECR
                               .IF LT   T$NESTLEV
                               .ERROR   T$NESTLEV        ; MACRO T$NS UNDERFLOW
                               .MEXIT
                               .ENDC
      012660                   M$GETS   T$NS,\T$NESTLEV,T$TEMP
```

```
        000011              T$TEMP=T$NSO
012660                      M$DECR  T$NESTLEV
        177777              T$NESTLEV=T$NESTLEV-1
                            .IF EQ F$MSG-T$TEMP
012660                      M$GNTAG L,T$$MSG
                            .MCALL  M$GEN
012660                      M$GEN   L,\T$$MSG,SVCTAG
                            .IF LE  SVCTAG
012660                      L10010:
                            .MEXIT
                            .ENDC
                            .LIST
                                                                                L10010:
                                      .NLIST
        010000              S$LSYM=T$LSYM
012660                      M$SVC   C$MSG
                            .MCALL  M$GNINS,M$TSTLAB
012660                      M$TSTLAB
                            .MCALL  M$TLABEL,M$INCR
                            .IIF LT T$TSTMAC, .MEXIT
                            .RADIX  10
                            M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                            .RADIX  8
                            M$INCR  T$TSTSEQ
012660                      M$GNINS <TRAP   C$MSG>
                            .IF LT SVCINS
                            TRAP    C$MSG
                            .MEXIT
                            .ENDC
                            .IF EQ SVCINS
012660  104423                      TRAP    C$MSG
                            .MEXIT
                            .ENDC
                            .IF GT SVCINS
                            .LIST
                                                                                   TRAP    C$MSG
                                            .NLIST
                            .ENDC
        000041              I$MSG=F$END
                            .IFF
                            M$ENDERR        ENDMSG,T$TEMP
                            .ENDC

012662                              BGNMSG INTR3                    ;INPROPER RESPONSE
                            .MCALL  M$PUSH,M$INCR,M$GNGBL
        000040              I$MSG=F$BGN
012662                      M$PUSH  T$NS,T$NESTLEV,F$MSG
                            .MCALL  M$INCR,M$SETS
012662                      M$INCR  T$NESTLEV
        000000              T$NESTLEV=T$NESTLEV+1
012662                      M$SETS  T$NS,\T$NESTLEV,F$MSG
        000011              T$NSO=F$MSG
        010011              T$$MSG=T$TAGNUM
012662                      M$INCR T$TAGNUM
        010012              T$TAGNUM=T$TAGNUM+1
012662                      M$GNGBL INTR3
                            .MCALL  M$GEN
```

```
                              .IF NB,INTR3
                              .IF NB,
                              M$GEN    INTR3,:,SVCGBL,
                              .ENDC
                              .IF B,
      012662                  M$GEN    INTR3,:,SVCGBL,< >
                              .IF LE   SVCGBL
      012662                  INTR3::
                              .MEXIT
                              .ENDC
                              .LIST
                                                                      INTR3::
                                       .NLIST
                              .ENDC
                              .ENDC
   14 012662                           PRINTB #INTM4
                              .MCALL   M$PRINT
                              .IF B    #INTM4
                              .ERROR   ;MISSING FORMAT
                              .MEXIT
                              .ENDC
                              .IF B    <>
      012662                  M$PRINT C$PNTB,#INTM4
                              .MCALL   M$COUNT,M$PUT,M$GNINS,M$SVC
             000001           T$ARGCNT=1
      012662                  M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                              .IF NB <>
                              M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                              .ENDC
                              .IF NB <>
                              T$ARGCNT=T$ARGCNT+1
                              .ENDC
                              .IRP     N,<\T$ARGCNT>
                              M$PUT    #N,#INTM4,<>,<>,<>,<>,<>,<>,<>,<>
                              .ENDM
      012662                  M$PUT    #1,#INTM4,<>,<>,<>,<>,<>,<>,<>,<>
                              .MCALL   M$PUT1
                              .IF NB   <#INTM4>
      012662                  M$PUT    <#INTM4>,<>,<>,<>,<>,<>,<>,<>,<>
                              .MCALL   M$PUT1
                              .IF NB   <>
                              M$PUT    <>,<>,<>,<>,<>,<>,<>,<>,<>
                              .ENDC
                              .IF NB   <#INTM4>
      012662                  M$PUT1   #INTM4
                              .MCALL   M$GNINS
                              .IF B
      012662                  M$GNINS <MOV      #INTM4,-(SP)>
                              .IF LT SVCINS
                              MOV      #INTM4,-(SP)
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
      012662  012746  013331           MOV      #INTM4,-(SP)
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
```

```
                                .LIST
                                                                                MOV     #INTM4,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#INTM4>
                                .ERROR  ;ILL. ARG. "#INTM4" ONLY "B" IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR     -(SP)>
                                M$GNINS <BISB    ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#1>
   012666                       M$PUT1  #1
                                .MCALL  M$GNINS
                                .IF B
   012666                       M$GNINS <MOV     #1,-(SP)>
                                .IF LT SVCINS
                                MOV     #1,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
   012666  012746  000001               MOV     #1,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                MOV     #1,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#1>
                                .ERROR  ;ILL. ARG. "#1" ONLY "B" IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR     -(SP)>
                                M$GNINS <BISB    ,(SP)>
                                .ENDC
                                .ENDC
   012672                       M$GNINS <MOV     SP,R0>
                                .IF LT SVCINS
                                MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
   012672  010600                       MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                MOV     SP,R0
                                          .NLIST
                                .ENDC
   012674                       M$SVC   C$PNTB
                                .MCALL  M$GNINS,M$TSTLAB
```

```
012674                      M$TSTLAB
                            .MCALL  M$TLABEL,M$INCR
                            .IIF LT T$TSTMAC, .MEXIT
                            .RADIX  10
                            M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                            .RADIX  8
                            M$INCR  T$TSTSEQ
012674                      M$GNINS <TRAP    C$PNTB>
                            .IF LT SVCINS
                            TRAP    C$PNTB
                            .MEXIT
                            .ENDC
                            .IF EQ SVCINS
012674  104414                      TRAP    C$PNTB
                            .MEXIT
                            .ENDC
                            .IF GT SVCINS
                            .LIST
                                                                TRAP    C$PNTB
                                            .NLIST
                            .ENDC
                            .IRP    N,<\T$ARGCNT*2+2>
                            M$GNINS <ADD    #N,SP>
                            .ENDM
012676                      M$GNINS <ADD    #4,SP>
                            .IF LT SVCINS
                            ADD     #4,SP
                            .MEXIT
                            .ENDC
                            .IF EQ SVCINS
012676  062706  000004              ADD     #4,SP
                            .MEXIT
                            .ENDC
                            .IF GT SVCINS
                            .LIST
                                                                ADD     #4,SP
                                            .NLIST
                            .ENDC
                            .MEXIT
                            .ENDC
                            .IF B   <>
                            M$PRINT C$PNTB,#INTM4,<>
                            .MEXIT
                            .ENDC
                            .IF B   <>
                            M$PRINT C$PNTB,#INTM4,<>,<>
                            .MEXIT
                            .ENDC
                            .IF B   <>
                            M$PRINT C$PNTB,#INTM4,<>,<>,<>
                            .MEXIT
                            .ENDC
                            .IF B   <>
                            M$PRINT C$PNTB,#INTM4,<>,<>,<>,<>
                            .MEXIT
                            .ENDC
                            .IF B   <>
```

```
                                  M$PRINT C$PNTB,#INTM4,<>,<>,<>,<>,<>
                                  .MEXIT
                                  .ENDC
                                  .IF B   <>
                                  M$PRINT C$PNTB,#INTM4,<>,<>,<>,<>,<>,<>
                                  .MEXIT
                                  .ENDC
                                  .IF B   <>
                                  M$PRINT C$PNTB,#INTM4,<>,<>,<>,<>,<>,<>,<>
                                  .MEXIT
                                  .ENDC
                                  M$PRINT C$PNTB,#INTM4,<>,<>,<>,<>,<>,<>,<>,<>
   15 012702                              PRINTB #INTM5,R2
                                  .MCALL  M$PRINT
                                  .IF B   #INTM5
                                  .ERROR  ;MISSING FORMAT
                                  .MEXIT
                                  .ENDC
                                  .IF B   <R2>
                                  M$PRINT C$PNTB,#INTM5
                                  .MEXIT
                                  .ENDC
                                  .IF B   <>
      012702                      M$PRINT C$PNTB,#INTM5,<R2>
                                  .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
              000001              T$ARGCNT=1
      012702                      M$COUNT T$ARGCNT,<R2>,<>,<>,<>,<>,<>,<>,<>
                                  .IF NB <>
                                  M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                  .ENDC
                                  .IF NB <R2>
              000002              T$ARGCNT=T$ARGCNT+1
                                  .ENDC
                                  .IRP    N,<\T$ARGCNT>
                                  M$PUT   #N,#INTM5,<R2>,<>,<>,<>,<>,<>,<>,<>
                                  .ENDM
      012702                      M$PUT   #2,#INTM5,<R2>,<>,<>,<>,<>,<>,<>,<>
                                  .MCALL  M$PUT1
                                  .IF NB  <#INTM5>
      012702                      M$PUT   <#INTM5>,<R2>,<>,<>,<>,<>,<>,<>,<>
                                  .MCALL  M$PUT1
                                  .IF NB  <R2>
      012702                      M$PUT   <R2>,<>,<>,<>,<>,<>,<>,<>,<>
                                  .MCALL  M$PUT1
                                  .IF NB  <>
                                  M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                  .ENDC
                                  .IF NB  <R2>
      012702                      M$PUT1  R2
                                  .MCALL  M$GNINS
                                  .IF B
      012702                      M$GNINS <MOV    R2,-(SP)>
                                  .IF LT SVCINS
                                  MOV     R2,-(SP)
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
```

```
	012702	010246				MOV	R2,-(SP)
					.MEXIT
					.ENDC
					.IF GT SVCINS
					.LIST
													MOV	R2,-(SP)
								.NLIST
					.ENDC
					.IFF
					.IF DIF B,<R2>
					.ERROR	;ILL. ARG. ''R2'' ONLY 'B'' IS ALLOWED.
					.MEXIT
					.ENDC
					M$GNINS <CLR	-(SP)>
					M$GNINS <BISB	,(SP)>
					.ENDC
					.ENDC
					.ENDC
					.IF NB	<#INTM5>
	012704				M$PUT1	#INTM5
					.MCALL	M$GNINS
					.IF B
	012704				M$GNINS <MOV	#INTM5,-(SP)>
					.IF LT SVCINS
					MOV	#INTM5,-(SP)
					.MEXIT
					.ENDC
					.IF EQ SVCINS
	012704	012746	013411			MOV	#INTM5,-(SP)
					.MEXIT
					.ENDC
					.IF GT SVCINS
					.LIST
													MOV	#INTM5,-(SP)
								.NLIST
					.ENDC
					.IFF
					.IF DIF B,<#INTM5>
					.ERROR	;ILL. ARG. ''#INTM5'' ONLY 'B'' IS ALLOWED.
					.MEXIT
					.ENDC
					M$GNINS <CLR	-(SP)>
					M$GNINS <BISB	,(SP)>
					.ENDC
					.ENDC
					.ENDC
					.IF NB	<#2>
	012710				M$PUT1	#2
					.MCALL	M$GNINS
					.IF B
	012710				M$GNINS <MOV	#2,-(SP)>
					.IF LT SVCINS
					MOV	#2,-(SP)
					.MEXIT
					.ENDC
					.IF EQ SVCINS
	012710	012746	000002			MOV	#2,-(SP)
```

```
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                          MOV     #2,-(SP)
                                              .NLIST
                                  .ENDC
                                  .IFF
                                  .IF DIF B,<#2>
                                  .ERROR  ;ILL. ARG. ''#2'' ONLY 'B'' IS ALLOWED.
                                  .MEXIT
                                  .ENDC
                                  M$GNINS <CLR    -(SP)>
                                  M$GNINS <BISB   ,(SP)>
                                  .ENDC
                                  .ENDC
      012714                      M$GNINS <MOV    SP,R0>
                                  .IF LT SVCINS
                                  MOV     SP,R0
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
      012714  010600                      MOV     SP,R0
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                          MOV     SP,R0
                                              .NLIST
                                  .ENDC
      012716                      M$SVC   C$PNTB
                                  .MCALL  M$GNINS,M$TSTLAB
      012716                      M$TSTLAB
                                  .MCALL  M$TLABEL,M$INCR
                                  .IIF LT T$TSTMAC, .MEXIT
                                  .RADIX  10
                                  M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                  .RADIX  8
                                  M$INCR  T$TSTSEQ
      012716                      M$GNINS <TRAP   C$PNTB>
                                  .IF LT SVCINS
                                  TRAP    C$PNTB
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
      012716  104414                      TRAP    C$PNTB
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                          TRAP    C$PNTB
                                              .NLIST
                                  .ENDC
                                  .IRP    N,<\T$ARGCNT*2+2>
                                  M$GNINS <ADD    #N,SP>
                                  .ENDM
      012720                      M$GNINS <ADD    #6,SP>
```

```
                                .IF LT SVCINS
                                ADD     #6,SP
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     012720  062706  000006             ADD     #6,SP
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        ADD     #6,SP
                                          .NLIST
                                .ENDC
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#INTM5,<R2>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#INTM5,<R2>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#INTM5,<R2>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#INTM5,<R2>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#INTM5,<R2>,<>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#INTM5,<R2>,<>,<>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                M$PRINT C$PNTB,#INTM5,<R2>,<>,<>,<>,<>,<>,<>,<>
  16 012724                             PRINTB #INTM6,R3
                                .MCALL  M$PRINT
                                .IF B   #INTM6
                                .ERROR  ;MISSING FORMAT
                                .MEXIT
                                .ENDC
                                .IF B   <R3>
                                M$PRINT C$PNTB,#INTM6
                                .MEXIT
                                .ENDC
                                .IF B   <>
     012724                     M$PRINT C$PNTB,#INTM6,<R3>
                                .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
             000001             T$ARGCNT=1
     012724                     M$COUNT T$ARGCNT,<R3>,<>,<>,<>,<>,<>,<>,<>
                                .IF NB <>
                                M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
```

```
                          .ENDC
                          .IF NB <R3>
       000002             T$ARGCNT=T$ARGCNT+1
                          .ENDC
                          .IRP     N,<\T$ARGCNT>
                          M$PUT    #N,#INTM6,<R3>,<>,<>,<>,<>,<>,<>,<>
                          .ENDM
012724                    M$PUT    #2,#INTM6,<R3>,<>,<>,<>,<>,<>,<>,<>
                          .MCALL   M$PUT1
                          .IF NB   <#INTM6>
012724                    M$PUT    <#INTM6>,<R3>,<>,<>,<>,<>,<>,<>,<>
                          .MCALL   M$PUT1
                          .IF NB   <R3>
012724                    M$PUT    <R3>,<>,<>,<>,<>,<>,<>,<>,<>
                          .MCALL   M$PUT1
                          .IF NB   <>
                          M$PUT    <>,<>,<>,<>,<>,<>,<>,<>,<>
                          .ENDC
                          .IF NB   <R3>
012724                    M$PUT1   R3
                          .MCALL   M$GNINS
                          .IF B
012724                    M$GNINS <MOV     R3,-(SP)>
                          .IF LT SVCINS
                          MOV      R3,-(SP)
                          .MEXIT
                          .ENDC
                          .IF EQ SVCINS
012724  010346                     MOV     R3,-(SP)
                          .MEXIT
                          .ENDC
                          .IF GT SVCINS
                          .LIST
                                                                         MOV     R3,-(SP)
                                           .NLIST
                          .ENDC
                          .IFF
                          .IF DIF B,<R3>
                          .ERROR  ;ILL. ARG. 'R3'' ONLY 'B'' IS ALLOWED.
                          .MEXIT
                          .ENDC
                          M$GNINS <CLR     -(SP)>
                          M$GNINS <BISB    ,(SP)>
                          .ENDC
                          .ENDC
                          .ENDC
                          .IF NB   <#INTM6>
012726                    M$PUT1   #INTM6
                          .MCALL   M$GNINS
                          .IF B
012726                    M$GNINS <MOV     #INTM6,-(SP)>
                          .IF LT SVCINS
                          MOV      #INTM6,-(SP)
                          .MEXIT
                          .ENDC
                          .IF EQ SVCINS
012726  012746  013435             MOV     #INTM6,-(SP)
```

```
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                             MOV     #INTM6,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#INTM6>
                                .ERROR  ;ILL. ARG. "#INTM6" ONLY 'B' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#2>
     012732                     M$PUT1  #2
                                .MCALL  M$GNINS
                                .IF B
     012732                     M$GNINS <MOV    #2,-(SP)>
                                .IF LT SVCINS
                                MOV     #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     012732  012746  000002           MOV       #2,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                             MOV     #2,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#2>
                                .ERROR  ;ILL. ARG. "#2" ONLY 'B' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
     012736                     M$GNINS <MOV    SP,R0>
                                .IF LT SVCINS
                                MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     012736  010600                   MOV       SP,R0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                             MOV     SP,R0
                                          .NLIST
```

```
                                .ENDC
012740                          M$SVC   C$PNTB
                                .MCALL  M$GNINS,M$TSTLAB
012740                          M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
012740                          M$GNINS <TRAP   C$PNTB>
                                .IF LT SVCINS
                                TRAP    C$PNTB
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
012740  104414                          TRAP    C$PNTB
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        TRAP    C$PNTB
                                                .NLIST
                                .ENDC
                                .IRP    N,<\T$ARGCNT*2+2>
                                M$GNINS <ADD    #N,SP>
                                .ENDM
012742                          M$GNINS <ADD    #6,SP>
                                .IF LT SVCINS
                                ADD     #6,SP
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
012742  062706  000006                  ADD     #6,SP
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        ADD     #6,SP
                                                .NLIST
                                .ENDC
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#INTM6,<R3>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#INTM6,<R3>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#INTM6,<R3>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#INTM6,<R3>,<>,<>,<>,<>
```

```
                        .MEXIT
                        .ENDC
                        .IF B    <>
                        M$PRINT C$PNTB,#INTM6,<R3>,<>,<>,<>,<>,<>
                        .MEXIT
                        .ENDC
                        .IF B    <>
                        M$PRINT C$PNTB,#INTM6,<R3>,<>,<>,<>,<>,<>,<>
                        .MEXIT
                        .ENDC
                        M$PRINT C$PNTB,#INTM6,<R3>,<>,<>,<>,<>,<>,<>,<>
 17 012746                      ENDMSG
                        .MCALL  M$POP,M$GNTAG,M$SVC,M$ENDERR
    012746              M$POP   T$NS,T$NESTLEV,T$TEMP
                        .MCALL  M$GETS,M$DECR
                        .IF LT  T$NESTLEV
                        .ERROR  T$NESTLEV        ; MACRO T$NS UNDERFLOW
                        .MEXIT
                        .ENDC
    012746              M$GETS  T$NS,\T$NESTLEV,T$TEMP
            000011      T$TEMP=T$NS0
    012746              M$DECR  T$NESTLEV
            177777      T$NESTLEV=T$NESTLEV-1
                        .IF EQ F$MSG-T$TEMP
    012746              M$GNTAG L,T$$MSG
                        .MCALL  M$GEN
    012746              M$GEN   L,\T$$MSG,SVCTAG
                        .IF LE  SVCTAG
    012746              L10011:
                        .MEXIT
                        .ENDC
                        .LIST
                                                                    L10011:
                                .NLIST
            010000      S$LSYM=T$LSYM
    012746              M$SVC   C$MSG
                        .MCALL  M$GNINS,M$TSTLAB
    012746              M$TSTLAB
                        .MCALL  M$TLABEL,M$INCR
                        .IIF LT T$TSTMAC, .MEXIT
                        .RADIX  10
                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                        .RADIX  8
                        M$INCR  T$TSTSEQ
    012746              M$GNINS <TRAP   C$MSG>
                        .IF LT SVCINS
                        TRAP    C$MSG
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
    012746  104423              TRAP    C$MSG
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                    TRAP    C$MSG
                                     .NLIST
```

```
                                .ENDC
            000041              I$MSG=F$END
                                .IFF
                                M$ENDERR        ENDMSG,T$TEMP
                                .ENDC
   18
   19 012750                            BGNMSG INTBF                    ;RING BUFFER NOT CLEARED
                                .MCALL  M$PUSH,M$INCR,M$GNGBL
            000040              I$MSG=F$BGN
      012750                    M$PUSH  T$NS,T$NESTLEV,F$MSG
                                .MCALL  M$INCR,M$SETS
      012750                    M$INCR  T$NESTLEV
            000000              T$NESTLEV=T$NESTLEV+1
      012750                    M$SETS  T$NS,\T$NESTLEV,F$MSG
            000011              T$NS0=F$MSG
            010012              T$$MSG=T$TAGNUM
      012750                    M$INCR T$TAGNUM
            010013              T$TAGNUM=T$TAGNUM+1
      012750                    M$GNGBL INTBF
                                .MCALL  M$GEN
                                .IF NB,INTBF
                                .IF NB,
                                M$GEN   INTBF,:,SVCGBL,
                                .ENDC
                                .IF B,
      012750                    M$GEN   INTBF,:,SVCGBL,< >
                                .IF LE  SVCGBL
      012750                    INTBF::
                                .MEXIT
                                .ENDC
                                .LIST
                                                                        INTBF::
                                        .NLIST
                                .ENDC
                                .ENDC
   20 012750                            PRINTB #INTB1M
                                .MCALL  M$PRINT
                                .IF B   #INTB1M
                                .ERROR  ;MISSING FORMAT
                                .MEXIT
                                .ENDC
                                .IF B   <>
      012750                    M$PRINT C$PNTB,#INTB1M
                                .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
            000001              T$ARGCNT=1
      012750                    M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                .IF NB <>
                                M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB <>
                                T$ARGCNT=T$ARGCNT+1
                                .ENDC
                                .IRP    N,<\T$ARGCNT>
                                M$PUT   #N,#INTB1M,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDM
      012750                    M$PUT   #1,#INTB1M,<>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
```

```
                                        .IF NB  <#INTB1M>
012750                                  M$PUT   <#INTB1M>,<>,<>,<>,<>,<>,<>,<>,<>
                                        .MCALL  M$PUT1
                                        .IF NB  <>
                                        M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDC
                                        .IF NB  <#INTB1M>
012750                                  M$PUT1  #INTB1M
                                        .MCALL  M$GNINS
                                        .IF B
012750                                  M$GNINS <MOV    #INTB1M,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #INTB1M,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
012750  012746  013461                          MOV     #INTB1M,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        MOV     #INTB1M,-(SP)
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#INTB1M>
                                        .ERROR  ;ILL. ARG. ''#INTB1M'' ONLY 'B'' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR    -(SP)>
                                        M$GNINS <BISB   ,(SP)>
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF NB  <#1>
012754                                  M$PUT1  #1
                                        .MCALL  M$GNINS
                                        .IF B
012754                                  M$GNINS <MOV    #1,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #1,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
012754  012746  000001                          MOV     #1,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        MOV     #1,-(SP)
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#1>
                                        .ERROR  ;ILL. ARG. ''#1'' ONLY 'B'' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
```

```
                                M$GNINS <CLR     -(SP)>
                                M$GNINS <BISB    ,(SP)>
                                .ENDC
                                .ENDC
      012760                    M$GNINS <MOV     SP,R0>
                                .IF LT SVCINS
                                MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
      012760  010600                    MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        MOV     SP,R0
                                          .NLIST
                                .ENDC
      012762                    M$SVC   C$PNTB
                                .MCALL  M$GNINS,M$TSTLAB
      012762                    M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
      012762                    M$GNINS <TRAP    C$PNTB>
                                .IF LT SVCINS
                                TRAP    C$PNTB
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
      012762  104414                    TRAP    C$PNTB
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        TRAP    C$PNTB
                                          .NLIST
                                .ENDC
                                .IRP    N,<\T$ARGCNT*2+2>
                                M$GNINS <ADD     #N,SP>
                                .ENDM
      012764                    M$GNINS <ADD     #4,SP>
                                .IF LT SVCINS
                                ADD     #4,SP
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
      012764  062706  000004            ADD     #4,SP
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        ADD     #4,SP
                                          .NLIST
```

```
                                .ENDC
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#INTB1M,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#INTB1M,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#INTB1M,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#INTB1M,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#INTB1M,<>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#INTB1M,<>,<>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTB,#INTB1M,<>,<>,<>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                M$PRINT C$PNTB,#INTB1M,<>,<>,<>,<>,<>,<>,<>,<>
    21 012770                           PRINTX #INTB2M
                                .MCALL  M$PRINT
                                .IF B   #INTB2M
                                .ERROR  ;MISSING FORMAT
                                .MEXIT
                                .ENDC
                                .IF B   <>
       012770                   M$PRINT C$PNTX,#INTB2M
                                .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
              000001            T$ARGCNT=1
       012770                   M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                .IF NB <>
                                M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB <>
                                T$ARGCNT=T$ARGCNT+1
                                .ENDC
                                .IRP    N,<\T$ARGCNT>
                                M$PUT   #N,#INTB2M,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDM
       012770                   M$PUT   #1,#INTB2M,<>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <#INTB2M>
       012770                   M$PUT   <#INTB2M>,<>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
```

```
                                        .IF NB  <>
                                        M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDC
                                        .IF NB  <#INTB2M>
      012770                            M$PUT1  #INTB2M
                                        .MCALL  M$GNINS
                                        .IF B
      012770                            M$GNINS <MOV    #INTB2M,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #INTB2M,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      012770  012746  013530                    MOV     #INTB2M,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                MOV     #INTB2M,-(SP)
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#INTB2M>
                                        .ERROR  ;ILL. ARG. ''#INTB2M'' ONLY ''B'' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR    -(SP)>
                                        M$GNINS <BISB   ,(SP)>
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF NB  <#1>
      012774                            M$PUT1  #1
                                        .MCALL  M$GNINS
                                        .IF B
      012774                            M$GNINS <MOV    #1,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #1,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      012774  012746  000001                    MOV     #1,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                MOV     #1,-(SP)
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#1>
                                        .ERROR  ;ILL. ARG. ''#1'' ONLY ''B'' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR    -(SP)>
                                        M$GNINS <BISB   ,(SP)>
                                        .ENDC
```

```
                                        .ENDC
        013000                          M$GNINS <MOV    SP,R0>
                                        .IF LT SVCINS
                                        MOV     SP,R0
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
        013000  010600                          MOV     SP,R0
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                        MOV     SP,R0
                                                        .NLIST
                                        .ENDC
        013002                          M$SVC   C$PNTX
                                        .MCALL  M$GNINS,M$TSTLAB
        013002                          M$TSTLAB
                                        .MCALL  M$TLABEL,M$INCR
                                        .IIF LT T$TSTMAC, .MEXIT
                                        .RADIX  10
                                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                        .RADIX  8
                                        M$INCR  T$TSTSEQ
        013002                          M$GNINS <TRAP   C$PNTX>
                                        .IF LT SVCINS
                                        TRAP    C$PNTX
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
        013002  104415                          TRAP    C$PNTX
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                        TRAP    C$PNTX
                                                        .NLIST
                                        .ENDC
                                        .IRP    N,<\T$ARGCNT*2+2>
                                        M$GNINS <ADD    #N,SP>
                                        .ENDM
        013004                          M$GNINS <ADD    #4,SP>
                                        .IF LT SVCINS
                                        ADD     #4,SP
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
        013004  062706  000004                  ADD     #4,SP
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                        ADD     #4,SP
                                                        .NLIST
                                        .ENDC
                                        .MEXIT
                                        .ENDC
```

```
                                  .IF B    <>
                                  M$PRINT C$PNTX,#INTB2M,<>
                                  .MEXIT
                                  .ENDC
                                  .IF B    <>
                                  M$PRINT C$PNTX,#INTB2M,<>,<>
                                  .MEXIT
                                  .ENDC
                                  .IF B    <>
                                  M$PRINT C$PNTX,#INTB2M,<>,<>,<>
                                  .MEXIT
                                  .ENDC
                                  .IF B    <>
                                  M$PRINT C$PNTX,#INTB2M,<>,<>,<>,<>
                                  .MEXIT
                                  .ENDC
                                  .IF B    <>
                                  M$PRINT C$PNTX,#INTB2M,<>,<>,<>,<>,<>
                                  .MEXIT
                                  .ENDC
                                  .IF B    <>
                                  M$PRINT C$PNTX,#INTB2M,<>,<>,<>,<>,<>,<>
                                  .MEXIT
                                  .ENDC
                                  .IF B    <>
                                  M$PRINT C$PNTX,#INTB2M,<>,<>,<>,<>,<>,<>,<>
                                  .MEXIT
                                  .ENDC
                                  M$PRINT C$PNTX,#INTB2M,<>,<>,<>,<>,<>,<>,<>,<>
   22 013010                              PRINTX #INTB3M
                                  .MCALL  M$PRINT
                                  .IF B    #INTB3M
                                  .ERROR   ;MISSING FORMAT
                                  .MEXIT
                                  .ENDC
                                  .IF B    <>
      013010                      M$PRINT C$PNTX,#INTB3M
                                  .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
              000001              T$ARGCNT=1
      013010                      M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                  .IF NB <>
                                  M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                  .ENDC
                                  .IF NB <>
                                  T$ARGCNT=T$ARGCNT+1
                                  .ENDC
                                  .IRP     N,<\T$ARGCNT>
                                  M$PUT    #N,#INTB3M,<>,<>,<>,<>,<>,<>,<>,<>
                                  .ENDM
      013010                      M$PUT    #1,#INTB3M,<>,<>,<>,<>,<>,<>,<>,<>
                                  .MCALL   M$PUT1
                                  .IF NB   <#INTB3M>
      013010                      M$PUT    <#INTB3M>,<>,<>,<>,<>,<>,<>,<>,<>
                                  .MCALL   M$PUT1
                                  .IF NB   <>
                                  M$PUT    <>,<>,<>,<>,<>,<>,<>,<>,<>
                                  .ENDC
```

```
                                .IF NB  <#INTB3M>
   013010                       M$PUT1  #INTB3M
                                .MCALL  M$GNINS
                                .IF B
   013010                       M$GNINS <MOV    #INTB3M,-(SP)>
                                .IF LT SVCINS
                                MOV     #INTB3M,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
   013010  012746  013575               MOV     #INTB3M,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                MOV     #INTB3M,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#INTB3M>
                                .ERROR  ;ILL. ARG. ''#INTB3M'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
                                .ENDC
                                .IF NB  <#1>
   013014                       M$PUT1  #1
                                .MCALL  M$GNINS
                                .IF B
   013014                       M$GNINS <MOV    #1,-(SP)>
                                .IF LT SVCINS
                                MOV     #1,-(SP)
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
   013014  012746  000001               MOV     #1,-(SP)
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                MOV     #1,-(SP)
                                          .NLIST
                                .ENDC
                                .IFF
                                .IF DIF B,<#1>
                                .ERROR  ;ILL. ARG. ''#1'' ONLY 'B'' IS ALLOWED.
                                .MEXIT
                                .ENDC
                                M$GNINS <CLR    -(SP)>
                                M$GNINS <BISB   ,(SP)>
                                .ENDC
                                .ENDC
   013020                       M$GNINS <MOV    SP,R0>
                                .IF LT SVCINS
```

```
                                MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     013020  010600                     MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                        MOV     SP,R0
                                                .NLIST
                                .ENDC
     013022                     M$SVC   C$PNTX
                                .MCALL  M$GNINS,M$TSTLAB
     013022                     M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
     013022                     M$GNINS <TRAP   C$PNTX>
                                .IF LT SVCINS
                                TRAP    C$PNTX
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     013022  104415                     TRAP    C$PNTX
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                        TRAP    C$PNTX
                                                .NLIST
                                .ENDC
                                .IRP    N,<\T$ARGCNT*2+2>
                                M$GNINS <ADD    #N,SP>
                                .ENDM
     013024                     M$GNINS <ADD    #4,SP>
                                .IF LT SVCINS
                                ADD     #4,SP
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     013024  062706  000004             ADD     #4,SP
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                        ADD     #4,SP
                                                .NLIST
                                .ENDC
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTX,#INTB3M,<>
                                .MEXIT
```

```
                                        .ENDC
                                        .IF B    <>
                                        M$PRINT C$PNTX,#INTB3M,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B    <>
                                        M$PRINT C$PNTX,#INTB3M,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B    <>
                                        M$PRINT C$PNTX,#INTB3M,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B    <>
                                        M$PRINT C$PNTX,#INTB3M,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B    <>
                                        M$PRINT C$PNTX,#INTB3M,<>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B    <>
                                        M$PRINT C$PNTX,#INTB3M,<>,<>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        M$PRINT C$PNTX,#INTB3M,<>,<>,<>,<>,<>,<>,<>,<>
    23 013030   016502  000010                  MOV C.RING(R5),R2
    24 013034   012703  000004                  MOV #RNGLEN,R3
    25 013040                           INTBFL: PRINTX #INTB4M,R2,(R2)
                                        .MCALL  M$PRINT
                                        .IF B   #INTB4M
                                        .ERROR  ;MISSING FORMAT
                                        .MEXIT
                                        .ENDC
                                        .IF B    <R2>
                                        M$PRINT C$PNTX,#INTB4M
                                        .MEXIT
                                        .ENDC
                                        .IF B    <(R2)>
                                        M$PRINT C$PNTX,#INTB4M,<R2>
                                        .MEXIT
                                        .ENDC
                                        .IF B    <>
       013040                           M$PRINT C$PNTX,#INTB4M,<R2>,<(R2)>
                                        .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
                000001                  T$ARGCNT=1
       013040                           M$COUNT T$ARGCNT,<R2>,<(R2)>,<>,<>,<>,<>,<>,<>
                                        .IF NB <(R2)>
       013040                           M$COUNT T$ARGCNT,<(R2)>,<>,<>,<>,<>,<>,<>,<>
                                        .IF NB <>
                                        M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                        .ENDC
                                        .IF NB <(R2)>
                000002                  T$ARGCNT=T$ARGCNT+1
                                        .ENDC
                                        .ENDC
                                        .IF NB <R2>
```

```
          000003          T$ARGCNT=T$ARGCNT+1
                          .ENDC
                          .IRP    N,<\T$ARGCNT>
                          M$PUT   #N,#INTB4M,<R2>,<(R2)>,<>,<>,<>,<>,<`,<>
                          .ENDM
   013040                 M$PUT   #3,#INTB4M,<R2>,<(R2)>,<>,<>,<>,<>,<>,<>
                          .MCALL  M$PUT1
                          .IF NB  <#INTB4M>
   013040                 M$PUT   <#INTB4M>,<R2>,<(R2)>,<>,<>,<>,<>,<>,<>
                          .MCALL  M$PUT1
                          .IF NB  <R2>
   013040                 M$PUT   <R2>,<(R2)>,<>,<>,<>,<>,<>,<>,<>
                          .MCALL  M$PUT1
                          .IF NB  <(R2)>
   013040                 M$PUT   <(R2)>,<>,<>,<>,<>,<>,<>,<>,<>
                          .MCALL  M$PUT1
                          .IF NB  <>
                          M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                          .ENDC
                          .IF NB  <(R2)>
   013040                 M$PUT1  (R2)
                          .MCALL  M$GNINS
                          .IF B
   013040                 M$GNINS <MOV     (R2),-(SP)>
                          .IF LT SVCINS
                          MOV     (R2),-(SP)
                          .MEXIT
                          .ENDC
                          .IF EQ SVCINS
   013040  011246                 MOV      (R2),-(SP)
                          .MEXIT
                          .ENDC
                          .IF GT SVCINS
                          .LIST
                                                                          MOV      (R2),-(SP)
                                          .NLIST
                          .ENDC
                          .IFF
                          .IF DIF B,<(R2)>
                          .ERROR  ;ILL. ARG. "(R2)" ONLY 'B' IS ALLOWED.
                          .MEXIT
                          .ENDC
                          M$GNINS <CLR     -(SP)>
                          M$GNINS <BISB    ,(SP)>
                          .ENDC
                          .ENDC
                          .ENDC
                          .IF NB  <R2>
   013042                 M$PUT1  R2
                          .MCALL  M$GNINS
                          .IF B
   013042                 M$GNINS <MOV     R2,-(SP)>
                          .IF LT SVCINS
                          MOV     R2,-(SP)
                          .MEXIT
                          .ENDC
                          .IF EQ SVCINS
```

```
013042 010246                  MOV     R2,-(SP)
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                MOV     R2,-(SP)
                                        .NLIST
                        .ENDC
                        .IFF
                        .IF DIF B,<R2>
                        .ERROR  ;ILL. ARG. "R2" ONLY "B" IS ALLOWED.
                        .MEXIT
                        .ENDC
                        M$GNINS <CLR    -(SP)>
                        M$GNINS <BISB   ,(SP)>
                        .ENDC
                        .ENDC
                        .ENDC
                        .IF NB  <#INTB4M>
013044                  M$PUT1  #INTB4M
                        .MCALL  M$GNINS
                        .IF B
013044                  M$GNINS <MOV    #INTB4M,-(SP)>
                        .IF LT SVCINS
                        MOV     #INTB4M,-(SP)
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
013044 012746 013631           MOV     #INTB4M,-(SP)
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                MOV     #INTB4M,-(SP)
                                        .NLIST
                        .ENDC
                        .IFF
                        .IF DIF B,<#INTB4M>
                        .ERROR  ;ILL. ARG. "#INTB4M" ONLY "B" IS ALLOWED.
                        .MEXIT
                        .ENDC
                        M$GNINS <CLR    -(SP)>
                        M$GNINS <BISB   ,(SP)>
                        .ENDC
                        .ENDC
                        .ENDC
                        .IF NB  <#3>
013050                  M$PUT1  #3
                        .MCALL  M$GNINS
                        .IF B
013050                  M$GNINS <MOV    #3,-(SP)>
                        .IF LT SVCINS
                        MOV     #3,-(SP)
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
013050 012746 000003           MOV     #3,-(SP)
```

```
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                MOV     #3,-(SP)
                                      .NLIST
                        .ENDC
                        .IFF
                        .IF DIF B,<#3>
                        .ERROR  ;ILL. ARG. ''#3'' ONLY 'B'' IS ALLOWED.
                        .MEXIT
                        .ENDC
                        M$GNINS <CLR      -(SP)>
                        M$GNINS <BISB     ,(SP)>
                        .ENDC
                        .ENDC
013054                  M$GNINS <MOV      SP,R0>
                        .IF LT SVCINS
                        MOV     SP,R0
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
013054  010600                  MOV       SP,R0
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                MOV     SP,R0
                                      .NLIST
                        .ENDC
013056                  M$SVC   C$PNTX
                        .MCALL  M$GNINS,M$TSTLAB
013056                  M$TSTLAB
                        .MCALL  M$TLABEL,M$INCR
                        .IIF LT T$TSTMAC, .MEXIT
                        .RADIX  10
                        M$TLABEL          \T$TESTNUN,\T$TSTSEQ
                        .RADIX  8
                        M$INCR  T$TSTSEQ
013056                  M$GNINS <TRAP     C$PNTX>
                        .IF LT SVCINS
                        TRAP    C$PNTX
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
013056  104415                  TRAP      C$PNTX
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                TRAP    C$PNTX
                                      .NLIST
                        .ENDC
                        .IRP    N,<\T$ARGCNT*2+2>
                        M$GNINS <ADD      #N,SP>
                        .ENDM
013060                  M$GNINS <ADD      #10,SP>
```

```
                                        .IF LT SVCINS
                                        ADD     #10,SP
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      013060  062706  000010                    ADD     #10,SP
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        ADD     #10,SP
                                                        .NLIST
                                        .ENDC
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTX,#INTB4M,<R2>,<(R2)>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTX,#INTB4M,<R2>,<(R2)>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTX,#INTB4M,<R2>,<(R2)>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTX,#INTB4M,<R2>,<(R2)>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTX,#INTB4M,<R2>,<(R2)>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        M$PRINT C$PNTX,#INTB4M,<R2>,<(R2)>,<>,<>,<>,<>,<>,<>
   26 013064  005722                            TST     (R2)+                   ; POINT TO NEXT LOCATION
   27 013066                                    SOB     R3,INTBFL
      013066  005303                            DEC     R3
      013070  001363                            BNE     INTBFL
   28 013072                                    ENDMSG
                                        .MCALL  M$POP,M$GNTAG,M$SVC,M$ENDERR
      013072                            M$POP   T$NS,T$NESTLEV,T$TEMP
                                        .MCALL  M$GETS,M$DECR
                                        .IF LT  T$NESTLEV
                                        .ERROR  T$NESTLEV       ; MACRO T$NS UNDERFLOW
                                        .MEXIT
                                        .ENDC
      013072                            M$GETS  T$NS,\T$NESTLEV,T$TEMP
              000011                    T$TEMP=T$NS0
      013072                            M$DECR  T$NESTLEV
              177777                    T$NESTLEV=T$NESTLEV-1
                                        .IF EQ F$MSG-T$TEMP
      013072                            M$GNTAG L,T$$MSG
                                        .MCALL  M$GEN
      013072                            M$GEN   L,\T$$MSG,SVCTAG
                                        .IF LE  SVCTAG
```

```
   013072                            L10012:
                                     .MEXIT
                                     .ENDC
                                     .LIST
                                                                               L10012:
                                               .NLIST
           010000                    S$LSYM=T$LSYM
   013072                            M$SVC    C$MSG
                                     .MCALL  M$GNINS,M$TSTLAB
   013072                            M$TSTLAB
                                     .MCALL  M$TLABEL,M$INCR
                                     .IIF LT T$TSTMAC, .MEXIT
                                     .RADIX  10
                                     M$TLABEL         \T$TESTNUN,\T$TSTSEQ
                                     .RADIX  8
                                     M$INCR  T$TSTSEQ
   013072                            M$GNINS <TRAP    C$MSG>
                                     .IF LT SVCINS
                                     TRAP     C$MSG
                                     .MEXIT
                                     .ENDC
                                     .IF EQ SVCINS
   013072  104423                              TRAP     C$MSG
                                     .MEXIT
                                     .ENDC
                                     .IF GT SVCINS
                                     .LIST
                                                                                    TRAP     C$MSG
                                                        .NLIST
                                     .ENDC
           000041                    I$MSG=F$END
                                     .IFF
                                     M$ENDERR         ENDMSG,T$TEMP
                                     .ENDC

   013074     125     104     101    INTHD:   .ASCIZ\UDA INITIALIZE ERROR\
   013121     045     101     124    INTM1:   .ASCIZ\%ATIME-OUT ERROR WHILE WAITING FOR RESPONSE IN UDASA REGISTER%N\
   013221     045     101     011    INTM2:   .ASCIZ\%A        UDASA REGISTER = %06%N\
   013253     045     101     125    INTM3:   .ASCIZ\%AUDA RESIDENT DIAGNOSTICS DETECTED FAILURE%N\
   013331     045     101     125    INTM4:   .ASCIZ\%AUDASA REGISTER DID NOT RETURN CORRECT VALUE%N\
   013411     045     101     011    INTM5:   .ASCIZ\%A        EXPECTED = %06%N\
   013435     045     101     011    INTM6:   .ASCIZ\%A          ACTUAL   = %06%N\
   013461     045     101     122    INTB1M:  .ASCIZ\%ARING BUFFER WAS NOT CLEARED BY UDA%N\
   013530     045     101     103    INTB2M:  .ASCIZ\%ACURRENT CONTENTS OF RING BUFFER:%N\
   013575     045     123     066    INTB3M:  .ASCIZ\%S6%AADDRESS%S4%ACONTENTS%N\
   013631     045     117     061    INTB4M:  .ASCIZ\%013%011%N\
                                              .EVEN
```

```
                                     ;WAITMS
                                     ;
                                     ;WAIT FOR UDA TO RESPOND WITH A MESSAGE PACKET
                                     ;
                                     ;INPUTS:
                                     ;        R4 - ADDRESS OF HOST COMM AREA
                                     ;
013644  032764  100000  000002  WAITMS: BIT #RG.OWN,HC.MCT(R4)          ;LOOK AT OWN BIT
013652  001374                          BNE WAITMS                      ;WAIT FOR IT TO CLEAR
013654  000207                          RETURN
```

```
                          ;       .TITLE MISCELLANEOUS SECTIONS
                                  .SBTTL  REPORT CODING SECTION
013656                            BGNMOD
                          .MCALL  M$GNGBL,M$PUSH
                          .IF NE  F$END-I$MOD
                          .ERROR  ;'BGNMOD'' IN MOD
                          .MEXIT
                          .IFF
        000040            I$MOD=F$BGN
                          .ENDC
                          .IF NB
                          M$GNGBL
                          .ENDC
013656                    M$PUSH  T$NS,T$NESTLEV,F$MOD
                          .MCALL  M$INCR,M$SETS
013656                    M$INCR  T$NESTLEV
        000000            T$NESTLEV=T$NESTLEV+1
013656                    M$SETS  T$NS,\T$NESTLEV,F$MOD
        000000            T$NS0=F$MOD

                          ;++
                          ; THE REPORT CODING SECTION CONTAINS THE
                          ; 'PRINTS'' CALLS THAT GENERATE STATISTICAL REPORTS.
                          ;--

013656                            BGNRPT
                          .MCALL  M$PUSH,M$INCR,M$GNGBL
        000040            I$RPT=F$BGN
013656                    M$PUSH  T$NS,T$NESTLEV,F$RPT
                          .MCALL  M$INCR,M$SETS
013656                    M$INCR  T$NESTLEV
        000001            T$NESTLEV=T$NESTLEV+1
013656                    M$SETS  T$NS,\T$NESTLEV,F$RPT
        000012            T$NS1=F$RPT
        010013            T$$RPT=T$TAGNUM
013656                    M$INCR T$TAGNUM
        010014            T$TAGNUM=T$TAGNUM+1
013656                    M$GNGBL L$RPT
                          .MCALL  M$GEN
                          .IF NB,L$RPT
                          .IF NB,
                          M$GEN   L$RPT,:,SVCGBL,
                          .ENDC
                          .IF B,
013656                    M$GEN   L$RPT,:,SVCGBL,< >
                          .IF LE  SVCGBL
013656                    L$RPT::
                          .MEXIT
                          .ENDC
                          .LIST
                                                                  L$RPT::

                                  .NLIST
                          .ENDC
                          .ENDC

                          ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                          ;       THIS SECTION, WHICH IS OPTIONAL, CONTAINS THE CODE FOR PRINTING
```

```
                          ;       STATISTICAL INFORMATION GATHERED BY THE DIAGNOSTIC.  IT IS
                          ;       EXECUTED BY THE OPERATOR COMMAND ''PRINT'' OR BY THE MACRO CALL
                          ;       ''DORPT''.  USE THE PRINTS MACRO TO PRINT THE INFORMATION.
                          ;       USE FORMAT STATEMENTS AS IN THE PRINTB/PRINTX MACROS.  IT IS
                          ;       THE PROGRAMMER'S RESPONSIBILTY TO DEVISE AND IMPLEMENT THE
                          ;       FORM AND CONTENT OF THE STATISTICS.
                          ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

 013656                           EXIT    RPT
                          .MCALL  M$SVC,M$EXIT,M$EXSEG,M$EXTJ,M$GETTOP,M$CHECK,M$WORD,XFER
         000041           T$FLAG=F$END
 013656                   M$CHECK RPT,T$TEMP,T$FLAG
                          .IF IDN <TST>,<RPT>
                          T$TEMP=T$$TEST
                          T$FLAG=I$TST
                          .MEXIT
                          .ENDC
                          .IF IDN <SUB>,<RPT>
                          T$TEMP=T$$SUB
                          T$FLAG=I$SUB
                          .MEXIT
                          .ENDC
                          .IF IDN <SEG>,<RPT>
                          T$TEMP=T$$SEG
                          T$FLAG=I$SEG
                          .MEXIT
                          .ENDC
                          .IF IDN <INIT>,<RPT>
                          T$TEMP=T$$INIT
                          T$FLAG=I$INIT
                          .MEXIT
                          .ENDC
                          .IF IDN <CLN>,<RPT>
                          T$TEMP=T$$CLEAN
                          T$FLAG=I$CLN
                          .MEXIT
                          .ENDC
                          .IF IDN <SRV>,<RPT>
                          T$TEMP=T$$SRV
                          T$FLAG=I$SRV
                          .MEXIT
                          .ENDC
                          .IF IDN <MSG>,<RPT>
                          T$TEMP=T$$MSG
                          T$FLAG=F$JMP
                          .MEXIT
                          .ENDC
                          .IF IDN <RPT>,<RPT>
         010013           T$TEMP=T$$RPT
         000050           T$FLAG=F$JMP
                          .MEXIT
                          .ENDC
                          .IF IDN <DU>,<RPT>
                          T$TEMP=T$$DU
                          T$FLAG=F$JMP
                          .MEXIT
                          .ENDC
```

```
                        .IF IDN <AU>,<RPT>
                        T$TEMP=T$$AU
                        T$FLAG=F$JMP
                        .MEXIT
                        .ENDC
                        .IF EQ T$FLAG-F$JMP
    013656              M$WORD  J$JMP
                        .MCALL  M$GNINS
                        .IRP    N,<J$JMP>
                        M$GNINS <.WORD  N>
                        .ENDM
    013656              M$GNINS <.WORD  J$JMP>
                        .IF LT SVCINS
                        .WORD   J$JMP
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
    013656  000167              .WORD   J$JMP
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                        .WORD   J$JMP
                                        .NLIST
                        .ENDC
    013660              M$EXTJ  \T$TEMP
                        .MCALL  M$GNINS
    013660              M$GNINS <.WORD  L10013-2-.>
                        .IF LT SVCINS
                        .WORD   L10013-2-.
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
    013660  000000              .WORD   L10013-2-.
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                        .WORD   L10013-2-.
                                        .NLIST
                        .ENDC
                        .MEXIT
                        .ENDC
                        .IF EQ  T$FLAG-F$BGN
                        M$SVC   C$EXIT
                        .IF IDN <SEG>,<RPT>
                        M$GETTOP T$SEK,T$SEGLEV,T$TEMP
                        M$EXSEG \T$TEMP
                        .IFF
                        M$EXIT  \T$TEMP
                        .ENDC
                        .MEXIT
                        .ENDC
                        .IF IDN <HRD>,<RPT>
                        M$GETTOP        T$NS,T$NESTLEV,T$TEMP
                        .IF EQ  F$HARD-T$TEMP
                        .IRP    N,<\T$$HARD>
```

```
                        XFER    L'N
                        .ENDM
                        .MEXIT
                        .ENDC
                        .ENDC
                        .IF IDN <SFT>,<RPT>
                        M$GETTOP        T$NS,T$NESTLEV,T$TEMP
                        .IF EQ  F$SOFT-T$TEMP
                        .IRP    N,<\T$$SOFT>
                        XFER    L'N
                        .ENDM
                        .MEXIT
                        .ENDC
                        .ENDC
                        .ERROR  ;ILL. "EXIT RPT" STMT.

                        ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                        ;       INSERT LOCAL STORAGE THAT IS USED ONLY
                        ;       DURING THE REPORT SECTION.
                        ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

                        ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                        ;       INSERT MESSAGES THAT ARE USED ONLY
                        ;       DURING THE REPORT SECTION.
                        ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

                                .EVEN

   013662                       ENDRPT
                        .MCALL  M$POP,M$GNTAG,M$SVC,M$ENDERR
   013662               M$POP   T$NS,T$NESTLEV,T$TEMP
                        .MCALL  M$GETS,M$DECR
                        .IF LT  T$NESTLEV
                        .ERROR  T$NESTLEV       ; MACRO T$NS UNDERFLOW
                        .MEXIT
                        .ENDC
   013662               M$GETS  T$NS,\T$NESTLEV,T$TEMP
           000012       T$TEMP=T$NS1
   013662               M$DECR  T$NESTLEV
           000000       T$NESTLEV=T$NESTLEV-1
                        .IF EQ F$RPT-T$TEMP
   013662               M$GNTAG L,T$$RPT
                        .MCALL  M$GEN
   013662               M$GEN   L,\T$$RPT,SVCTAG
                        .IF LE  SVCTAG
   013662               L10013:
                        .MEXIT
                        .ENDC
                        .LIST
                                                                              L10013:
                                .NLIST
           010000       S$LSYM=T$LSYM
   013662               M$SVC   C$RPT
                        .MCALL  M$GNINS,M$TSTLAB
   013662               M$TSTLAB
                        .MCALL  M$TLABEL,M$INCR
                        .IIF LT T$TSTMAC, .MEXIT
```

```
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
     013662                     M$GNINS <TRAP   C$RPT>
                                .IF LT SVCINS
                                TRAP    C$RPT
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     013662  104425                     TRAP    C$RPT
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                TRAP    C$RPT
                                                .NLIST
                                .ENDC
             000041             I$RPT=F$END
                                .IFF
                                M$ENDERR        ENDRPT,T$TEMP
                                .ENDC
```

```
                                        .SBTTL  PROTECTION TABLE

                                ;++
                                ; THIS TABLE IS USED BY THE RUNTIME SERVICES
                                ; TO PROTECT THE LOAD MEDIA.
                                ;--

  013664                                BGNPROT
                                .MCALL M$PUSH,M$INCR,M$GNGBL
          000040                I$PROT=F$BGN
  013664                        M$PUSH T$NS,T$NESTLEV,F$PROT
                                .MCALL  M$INCR,M$SETS
  013664                        M$INCR  T$NESTLEV
          000001                T$NESTLEV=T$NESTLEV+1
  013664                        M$SETS  T$NS,\T$NESTLEV,F$PROT
          000021                T$NS1=F$PROT
          010014                T$$PROT=T$TAGNUM
  013664                        M$INCR T$TAGNUM
          010015                T$TAGNUM=T$TAGNUM+1
  013664                        M$GNGBL L$PROT
                                .MCALL  M$GEN
                                .IF NB,L$PROT
                                .IF NB,
                                M$GEN   L$PROT,:,SVCGBL,
                                .ENDC
                                .IF B,
  013664                        M$GEN   L$PROT,:,SVCGBL,< >
                                .IF LE  SVCGBL
  013664                        L$PROT::
                                .MEXIT
                                .ENDC
                                .LIST
                                                                            L$PROT::
                                        .NLIST
                                .ENDC
                                .ENDC

  013664  177777                        -1              ;OFFSET INTO P-TABLE FOR CSR ADDRESS
  013666  177777                        -1              ;OFFSET INTO P-TABLE FOR MASSBUS ADDRESS
  013670  177777                        -1              ;OFFSET INTO P-TABLE FOR DRIVE NUMBER

  013672                                ENDPROT
                                .MCALL M$POP
  013672                        M$POP T$NS,T$NESTLEV,T$TEMP
                                .MCALL  M$GETS,M$DECR
                                .IF LT  T$NESTLEV
                                .ERROR  T$NESTLEV       ; MACRO T$NS UNDERFLOW
                                .MEXIT
                                .ENDC
  013672                        M$GETS  T$NS,\T$NESTLEV,T$TEMP
          000021                T$TEMP=T$NS1
  013672                        M$DECR  T$NESTLEV
          000000                T$NESTLEV=T$NESTLEV-1
                                .IF NE F$PROT-T$TEMP
                                .ERROR  ;MISSING BGNPROT
                                .MEXIT
                                .ENDC
```

```

;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
;	INSERT BYTE OFFSET FOR DATA ;   REFERS TO THE NUMBER OF BYTES FROM THE BEGINNING OF
;	ENTRY TO THE ITEM IN QUESTION.)  IF THE PARTICULAR
;	ITEM DOES NOT APPLY, LEAVE ENTRY AS -1.  WHEN THE RUNTIME
;	SERVICES EXECUTES A GPHARD, IT USES THESE OFFSETS (IF NOT
;	SET TO -1) TO GET THE ITEMS AND COMPARE WITH THOSE SAVED
;	IN THE XXDP+ MONITOR.  IF THE UNIT BEING REQUESTED MATCHES THE
;	LOAD DEVICE, THE RUNTIME SERVICES RETURN AN INCOMPLETE FLAG ON
;	THE GPHARD.
;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
                                  .SBTTL  INITIALIZE SECTION

                          ;++
                          ; THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
                          ; AT THE BEGINNING OF EACH PASS.
                          ;--

013672                            BGNINIT
                          .MCALL  M$PUSH,M$INCR,M$GNGBL
           000040         I$INIT=F$BGN
013672                    M$PUSH  T$NS,T$NESTLEV,F$INIT
                          .MCALL  M$INCR,M$SETS
013672                    M$INCR  T$NESTLEV
           000001         T$NESTLEV=T$NESTLEV+1
013672                    M$SETS  T$NS,\T$NESTLEV,F$INIT
           000006         T$NS1=F$INIT
           010015         T$$INIT=T$TAGNUM
013672                    M$INCR T$TAGNUM
           010016         T$TAGNUM=T$TAGNUM+1
013672                    M$GNGBL L$INIT
                          .MCALL  M$GEN
                          .IF NB,L$INIT
                          .IF NB,
                          M$GEN   L$INIT,:,SVCGBL,
                          .ENDC
                          .IF B,
013672                    M$GEN   L$INIT,:,SVCGBL,< >
                          .IF LE  SVCGBL
013672                    L$INIT::
                          .MEXIT
                          .ENDC
                          .LIST
                                                                        L$INIT::
                                  .NLIST
                          .ENDC
                          .ENDC

                          ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                          ;       THE INITIALIZE CODE IS EXECUTED UNDER FIVE CONDITIONS.  THERE
                          ;       ARE SUPERVISOR EVENT FLAGS THAT ARE USED TO LET THE
                          ;       DIAGNOSTIC KNOW UNDER WHICH CONDITION THE EXECUTION IS TAKING
                          ;       PLACE.  THE EVENT FLAGS ARE READ USING THE ''READEF'' MACRO.
                          ;       THE CONDITIONS UNDER WHICH THE INIT CODE IS EXECUTED AND THE
                          ;       CORRRESPONDING EVENT FLAGS ARE:
                          ;               START COMMAND           EF.START
                          ;               RESTART COMMAND         EF.RESTART
                          ;               CONTINUE COMMAND        EF.CONTINUE
                          ;               POWERDOWN/POWERUP       EF.PWR
                          ;               NEW PASS                EF.NEW
                          ;       EXAMPLE OF EVENT FLAG USE:
                          ;               READEF  #EF.START
                          ;               BCOMPLETE       STARTCODE
                          ;       DURING THE INIT CODE, USE THE ''GPHARD'' MACRO TO OBTAIN P-TABLE
                          ;       INFORMATION FOR DEVICE TESTING.  GET ONE UNIT'S INFORMATION IF
                          ;       THIS IS A SEQUENTIAL DIAGNOSTIC.  GET INFORMATION ON ALL
                          ;       UNITS AVAILABLE FOR TESTING IF THIS IS AN EXERCISER.  THE NUMBER
                          ;       OF UNITS AVAILABLE IS IN A HEADER LOCATION: ''L$UNIT''.
```

```
     30                                  ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
     31
     32 013672  005037  002222                   CLR     IFLAGS                          ;INITIALIZE EVENT FLAG RECORD
     33 013676                                   READEF  #EF.START                       ;CHECK START FLAG
                                         .MCALL  M$LDRO,M$SVC
        013676                           M$LDRO  #EF.START,READEF
                                         .MCALL  M$GNINS
                                         .IF NB #EF.START
                                         .IF DIF RO,#EF.START
        013676                           M$GNINS <MOV    #EF.START,RO>
                                         .IF LT SVCINS
                                         MOV     #EF.START,RO
                                         .MEXIT
                                         .ENDC
                                         .IF EQ SVCINS
        013676  012700  000040                   MOV     #EF.START,RO
                                         .MEXIT
                                         .ENDC
                                         .IF GT SVCINS
                                         .LIST
                                                                                                 MOV     #EF.START,RO
                                                         .NLIST
                                         .ENDC
                                         .ENDC
                                         .IFF
                                         .ERROR  ;MISSING ARG. ON ''READEF''
                                         .ENDC
        013702                           M$SVC   C$REFG
                                         .MCALL  M$GNINS,M$TSTLAB
        013702                           M$TSTLAB
                                         .MCALL  M$TLABEL,M$INCR
                                         .IIF LT T$TSTMAC, .MEXIT
                                         .RADIX  10
                                         M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                         .RADIX  8
                                         M$INCR  T$TSTSEQ
        013702                           M$GNINS <TRAP   C$REFG>
                                         .IF LT SVCINS
                                         TRAP    C$REFG
                                         .MEXIT
                                         .ENDC
                                         .IF EQ SVCINS
        013702  104447                           TRAP    C$REFG
                                         .MEXIT
                                         .ENDC
                                         .IF GT SVCINS
                                         .LIST
                                                                                                 TRAP    C$REFG
                                                         .NLIST
                                         .ENDC
     34 013704                                   BNCOMPLETE INIT1                        ;JUMP IF NOT SET
                                         .MCALL  M$GNINS
        013704                           M$GNINS <BCC    INIT1>
                                         .IF LT SVCINS
                                         BCC     INIT1
                                         .MEXIT
                                         .ENDC
```

```
                                         .IF EQ SVCINS
      013704  103003                            BCC     INIT1
                                         .MEXIT
                                         .ENDC
                                         .IF GT SVCINS
                                         .LIST
                                                                                       BCC      INIT1
                                                       .NLIST
                                         .ENDC
   35 013706  152737  000001  002222            BISB    #ISTART,IFLAGS           ;SET START BIT IN FLAG RECORD
   36 013714                             INIT1:  READEF  #EF.CONTINUE             ;CHECK CONTINUE FLAG
                                         .MCALL  M$LDRO,M$SVC
      013714                             M$LDRO  #EF.CONTINUE,READEF
                                         .MCALL  M$GNINS
                                         .IF NB #EF.CONTINUE
                                         .IF DIF RO,#EF.CONTINUE
      013714                             M$GNINS <MOV    #EF.CONTINUE,RO>
                                         .IF LT SVCINS
                                         MOV     #EF.CONTINUE,RO
                                         .MEXIT
                                         .ENDC
                                         .IF EQ SVCINS
      013714  012700  000036                    MOV     #EF.CONTINUE,RO
                                         .MEXIT
                                         .ENDC
                                         .IF GT SVCINS
                                         .LIST
                                                                                       MOV      #EF.CONTINUE,RO
                                                       .NLIST
                                         .ENDC
                                         .ENDC
                                         .IFF
                                         .ERROR  ;MISSING ARG. ON ''READEF''
                                         .ENDC
      013720                             M$SVC   C$REFG
                                         .MCALL  M$GNINS,M$TSTLAB
      013720                             M$TSTLAB
                                         .MCALL  M$TLABEL,M$INCR
                                         .IIF LT T$TSTMAC, .MEXIT
                                         .RADIX  10
                                         M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                         .RADIX  8
                                         M$INCR  T$TSTSEQ
      013720                             M$GNINS <TRAP   C$REFG>
                                         .IF LT SVCINS
                                         TRAP    C$REFG
                                         .MEXIT
                                         .ENDC
                                         .IF EQ SVCINS
      013720  104447                            TRAP    C$REFG
                                         .MEXIT
                                         .ENDC
                                         .IF GT SVCINS
                                         .LIST
                                                                                       TRAP     C$REFG
                                                       .NLIST
                                         .ENDC
```

```
     37 013722                             BNCOMPLETE INIT2                      ;JUMP IF NOT SET
                                    .MCALL  M$GNINS
        013722                      M$GNINS <BCC      INIT2>
                                    .IF LT SVCINS
                                    BCC     INIT2
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
        013722  103005                     BCC      INIT2
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                                             BCC      INIT2
                                                   .NLIST
                                    .ENDC
     38 013724  152737  000002  002222     BISB     #ICONT,IFLAGS                ;SET CONTINUE BIT IN FLAG RECORD
     39 013732                             EXIT     INIT                         ;EXIT THE INIT CODE
                                    .MCALL  M$SVC,M$EXIT,M$EXSEG,M$EXTJ,M$GETTOP,M$CHECK,M$WORD,XFER
                000041              T$FLAG=F$END
        013732                      M$CHECK INIT,T$TEMP,T$FLAG
                                    .IF IDN <TST>,<INIT>
                                    T$TEMP=T$$TEST
                                    T$FLAG=I$TST
                                    .MEXIT
                                    .ENDC
                                    .IF IDN <SUB>,<INIT>
                                    T$TEMP=T$$SUB
                                    T$FLAG=I$SUB
                                    .MEXIT
                                    .ENDC
                                    .IF IDN <SEG>,<INIT>
                                    T$TEMP=T$$SEG
                                    T$FLAG=I$SEG
                                    .MEXIT
                                    .ENDC
                                    .IF IDN <INIT>,<INIT>
                010015              T$TEMP=T$$INIT
                000040              T$FLAG=I$INIT
                                    .MEXIT
                                    .ENDC
                                    .IF IDN <CLN>,<INIT>
                                    T$TEMP=T$$CLEAN
                                    T$FLAG=I$CLN
                                    .MEXIT
                                    .ENDC
                                    .IF IDN <SRV>,<INIT>
                                    T$TEMP=T$$SRV
                                    T$FLAG=I$SRV
                                    .MEXIT
                                    .ENDC
                                    .IF IDN <MSG>,<INIT>
                                    T$TEMP=T$$MSG
                                    T$FLAG=F$JMP
                                    .MEXIT
                                    .ENDC
                                    .IF IDN <RPT>,<INIT>
```

```
                                T$TEMP=T$$RPT
                                T$FLAG=F$JMP
                                .MEXIT
                                .ENDC
                                .IF IDN <DU>,<INIT>
                                T$TEMP=T$$DU
                                T$FLAG=F$JMP
                                .MEXIT
                                .ENDC
                                .IF IDN <AU>,<INIT>
                                T$TEMP=T$$AU
                                T$FLAG=F$JMP
                                .MEXIT
                                .ENDC
                                .IF EQ T$FLAG-F$JMP
                                M$WORD  J$JMP
                                M$EXTJ  \T$TEMP
                                .MEXIT
                                .ENDC
                                .IF EQ  T$FLAG-F$BGN
     013732                     M$SVC   C$EXIT
                                .MCALL  M$GNINS,M$TSTLAB
     013732                     M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
     013732                     M$GNINS <TRAP   C$EXIT>
                                .IF LT SVCINS
                                TRAP    C$EXIT
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     013732  104432                     TRAP    C$EXIT
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                              TRAP    C$EXIT
                                          .NLIST
                                .ENDC
                                .IF IDN <SEG>,<INIT>
                                M$GETTOP T$SEK,T$SEGLEV,T$TEMP
                                M$EXSEG \T$TEMP
                                .IFF
     013734                     M$EXIT  \T$TEMP
                                .MCALL  M$GNINS
     013734                     M$GNINS <.WORD  L10015-.>
                                .IF LT SVCINS
                                .WORD   L10015-.
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     013734  000566                     .WORD   L10015-.
                                .MEXIT
```

```
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                                  .WORD   L10015-.
                                          .NLIST
                              .ENDC
                              .ENDC
                              .MEXIT
                              .ENDC
                              .IF IDN <HRD>,<INIT>
                              M$GETTOP          T$NS,T$NESTLEV,T$TEMP
                              .IF EQ  F$HARD-T$TEMP
                              .IRP    N,<\T$$HARD>
                              XFER    L'N
                              .ENDM
                              .MEXIT
                              .ENDC
                              .ENDC
                              .IF IDN <SFT>,<INIT>
                              M$GETTOP          T$NS,T$NESTLEV,T$TEMP
                              .IF EQ  F$SOFT-T$TEMP
                              .IRP    N,<\T$$SOFT>
                              XFER    L'N
                              .ENDM
                              .MEXIT
                              .ENDC
                              .ENDC
                              .ERROR  ;ILL. "EXIT INIT" STMT.
40
41 013736                     INIT2:  READEF  #EF.PWR                  ;CHECK POWER FAIL FLAG
                              .MCALL  M$LDRO,M$SVC
   013736                     M$LDRO  #EF.PWR,READEF
                              .MCALL  M$GNINS
                              .IF NB #EF.PWR
                              .IF DIF RO,#EF.PWR
   013736                     M$GNINS <MOV     #EF.PWR,RO>
                              .IF LT SVCINS
                              MOV     #EF.PWR,RO
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
   013736  012700  000034             MOV     #EF.PWR,RO
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                                  MOV     #EF.PWR,RO
                                          .NLIST
                              .ENDC
                              .ENDC
                              .IFF
                              .ERROR  ;MISSING ARG. ON "READEF"
                              .ENDC
   013742                     M$SVC   C$REFG
                              .MCALL  M$GNINS,M$TSTLAB
   013742                     M$TSTLAB
                              .MCALL  M$TLABEL,M$INCR
```

```
                                        .IIF LT T$TSTMAC, .MEXIT
                                        .RADIX  10
                                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                        .RADIX  8
                                        M$INCR  T$TSTSEQ
      013742                            M$GNINS <TRAP   C$REFG>
                                        .IF LT SVCINS
                                        TRAP    C$REFG
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      013742  104447                            TRAP    C$REFG
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                              TRAP    C$REFG
                                                        .NLIST
                                        .ENDC
   42 013744                                    BNCOMPLETE INIT3                ;JUMP IF NOT SET
                                        .MCALL  M$GNINS
      013744                            M$GNINS <BCC    INIT3>
                                        .IF LT SVCINS
                                        BCC     INIT3
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      013744  103020                            BCC     INIT3
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                              BCC     INIT3
                                                        .NLIST
                                        .ENDC
   43                                   ;;;     DORPT                           ;PRINT A STATISTICAL REPORT
   44 013746  012701  004540            POWDLY: MOV     #2400.,R1               ;DELAY ONE MINUTE FOR DISK
   45 013752                                    DELAY   250.                    ; UNITS POWER UP
                                        .MCALL M$GNINS
                                        .IF LT G$DELM-250.
                                        .ERROR ;ARGUMENT TO ''DELAY'' MUST NOT BE GREATER THAN 250
                                        .MEXIT
                                        .ENDC
                                        .IF B 250.
                                        M$GNINS <MOV    #1,(PC)+>
                                        .IFF
      013752                            M$GNINS <MOV    #250.,(PC)+>
                                        .IF LT SVCINS
                                        MOV     #250.,(PC)+
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      013752  012727  000372                    MOV     #250.,(PC)+
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
```

```
                                                                    MOV     #250.,(PC)+
                                        .NLIST
                              .ENDC
                              .ENDC
   013756                     M$GNINS <.WORD  0>
                              .IF LT SVCINS
                              .WORD   0
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
   013756  000000                  .WORD  0
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                    .WORD   0
                                        .NLIST
                              .ENDC
   013760                     M$GNINS <MOV    L$DLY,(PC)+>
                              .IF LT SVCINS
                              MOV     L$DLY,(PC)+
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
   013760  013727  002116          MOV    L$DLY,(PC)+
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                    MOV     L$DLY,(PC)+
                                        .NLIST
                              .ENDC
   013764                     M$GNINS <.WORD  0>
                              .IF LT SVCINS
                              .WORD   0
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
   013764  000000                  .WORD  0
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                    .WORD   0
                                        .NLIST
                              .ENDC
   013766                     M$GNINS <DEC    -6(PC)>
                              .IF LT SVCINS
                              DEC     -6(PC)
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
   013766  005367  177772          DEC    -6(PC)
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
```

```
                                                                        DEC     -6(PC)
                                        .NLIST
                         .ENDC
   013772                M$GNINS <BNE   .-4>
                         .IF LT SVCINS
                         BNE     .-4
                         .MEXIT
                         .ENDC
                         .IF EQ SVCINS
   013772  001375                BNE    .-4
                         .MEXIT
                         .ENDC
                         .IF GT SVCINS
                         .LIST
                                                                        BNE     .-4
                                        .NLIST
                         .ENDC
   013774                M$GNINS <DEC   -22(PC)>
                         .IF LT SVCINS
                         DEC     -22(PC)
                         .MEXIT
                         .ENDC
                         .IF EQ SVCINS
   013774  005367 177756         DEC    -22(PC)
                         .MEXIT
                         .ENDC
                         .IF GT SVCINS
                         .LIST
                                                                        DEC     -22(PC)
                                        .NLIST
                         .ENDC
   014000                M$GNINS <BNE   .-20>
                         .IF LT SVCINS
                         BNE     .-20
                         .MEXIT
                         .ENDC
                         .IF EQ SVCINS
   014000  001367                BNE    .-20
                         .MEXIT
                         .ENDC
                         .IF GT SVCINS
                         .LIST
                                                                        BNE     .-20
                                        .NLIST
                         .ENDC
46 014002  005301                DEC    R1                ; WHILE RESPONDING TO ^C
47 014004  003360                BGT    POWDLY            ; EVERY 0.025 SECOND
```

```
     1 014006                    INIT3:  BRESET                                  ;RESET ALL UNITS
                                 .MCALL  M$SVC
       014006                    M$SVC   C$RESET
                                 .MCALL  M$GNINS,M$TSTLAB
       014006                    M$TSTLAB
                                 .MCALL  M$TLABEL,M$INCR
                                 .IIF LT T$TSTMAC, .MEXIT
                                 .RADIX  10
                                 M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                 .RADIX  8
                                 M$INCR  T$TSTSEQ
       014006                    M$GNINS <TRAP   C$RESET>
                                 .IF LT SVCINS
                                 TRAP    C$RESET
                                 .MEXIT
                                 .ENDC
                                 .IF EQ SVCINS
       014006  104433                    TRAP    C$RESET
                                 .MEXIT
                                 .ENDC
                                 .IF GT SVCINS
                                 .LIST
                                                                                         TRAP    C$RESET
                                                 .NLIST
                                 .ENDC
     2 014010                            MEMORY  FFREE                           ;RESET START OF FREE MEMORY
                                 .MCALL  M$SVC,M$RNRO
       014010                    M$SVC   C$MEM
                                 .MCALL  M$GNINS,M$TSTLAB
       014010                    M$TSTLAB
                                 .MCALL  M$TLABEL,M$INCR
                                 .IIF LT T$TSTMAC, .MEXIT
                                 .RADIX  10
                                 M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                 .RADIX  8
                                 M$INCR  T$TSTSEQ
       014010                    M$GNINS <TRAP   C$MEM>
                                 .IF LT SVCINS
                                 TRAP    C$MEM
                                 .MEXIT
                                 .ENDC
                                 .IF EQ SVCINS
       014010  104431                    TRAP    C$MEM
                                 .MEXIT
                                 .ENDC
                                 .IF GT SVCINS
                                 .LIST
                                                                                         TRAP    C$MEM
                                                 .NLIST
                                 .ENDC
       014012                    M$RNRO  FFREE,MEMORY
                                 .MCALL  M$GNINS
                                 .IF NB  FFREE
                                 .IF DIF R0,FFREE
       014012                    M$GNINS <MOV    R0,FFREE>
                                 .IF LT SVCINS
                                 MOV     R0,FFREE
```

```
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
  014012  010037  002170                        MOV     R0,FFREE
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        MOV     R0,FFREE
                                                        .NLIST
                                        .ENDC
                                        .ENDC
                                        .IFF
                                        .ERROR  ;MISSING ARG. ON 'MEMORY'
                                        .ENDC
3 014016  017737  166146  002172                MOV     @FFREE,FSIZE            ;RESET SIZE OF FREE MEMORY
4                                       ;;; TEMPORARY UNTIL SUPERVISOR MEMORY CALL FIXED WITH SETUP
5 014024  162737  000100  002172                SUB     #100,FSIZE
6                                       ;;;
```

```
                                ;INITIALIZE CONTROLLER TABLE STORAGE WITH A WORD OF ZEROS

  014032  005037  002202                CLR     TSTTAB                          ;ZEROS MARKS END CONTROLLER TABLES
  014036  005037  002200                CLR     CTRLRS                          ;CLEAR CONTROLLER COUNT

                                ;GET A P-TABLE FROM DRS

  014042  005002                        CLR     R2                              ;LOGICAL UNIT NUMBER IN R2
  014044                        INIT4:  GPHARD  R2,R0                           ;GET POINTER TO A P-TABLE
                                .MCALL  M$LDR0,M$SVC,M$RNR0
  014044                        M$LDR0  R2,GPHARD
                                .MCALL  M$GNINS
                                .IF NB R2
                                .IF DIF R0,R2
  014044                        M$GNINS <MOV    R2,R0>
                                .IF LT SVCINS
                                MOV     R2,R0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
  014044  010200                        MOV     R2,R0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                                MOV     R2,R0
                                                .NLIST
                                .ENDC
                                .ENDC
                                .IFF
                                .ERROR  ;MISSING ARG. ON "GPHARD"
                                .ENDC
  014046                        M$SVC   C$GPHRD
                                .MCALL  M$GNINS,M$TSTLAB
  014046                        M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
  014046                        M$GNINS <TRAP   C$GPHRD>
                                .IF LT SVCINS
                                TRAP    C$GPHRD
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
  014046  104442                        TRAP    C$GPHRD
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                                TRAP    C$GPHRD
                                                .NLIST
                                .ENDC
  014050                        M$RNR0  R0,GPHARD
                                .MCALL  M$GNINS
```

```
                                 .IF NB  R0
                                 .IF DIF R0,R0
                                 M$GNINS <MOV    R0,R0>
                                 .ENDC
                                 .IFF
                                 .ERROR  ;MISSING ARG. ON ''GPHARD''
                                 .ENDC

                                 ;SEE IF A CONTROLLER TABLE ALREADY EXISTS FOR CONTROLLER IN P-TABLE

 014050  012703  002202                  MOV     #TSTTAB,R3              ;GET ADDRESS OF CONTROLLER TABLES
 014054  005737  002200                  TST     CTRLRS                  ; MAKE SURE ATLEAST 1 TABLE EXISTS
 014060  001410                          BEQ     NEWTAB                  ; NO TABLES - SKIP CHECK
 014062  021063  000002          INIT5:  CMP     (R0),C.UADR(R3)         ;CHECK IF SAME UNIBUS ADDRESS
 014066  001500                          BEQ     DUPERR                  ; FATAL ERROR
 014070  005713                          TST     (R3)                    ; ANY MORE TABLES?
 014072  001403                          BEQ     NEWTAB                  ; NO - INSERT THIS ONE
 014074  016303  000000                  MOV     C.NEXT(R3),R3           ; YES - POINT TO NEXT TABLE
 014100  000770                          BR      INIT5
```

```
     1                                  ;BUILD A CONTROLLER TABLE
     2
     3 014102                                   ASSUME  C.NEXT,EQ,0
                                                .IF     EQ,<C.NEXT>-<0>
                                                .IFF
                                                .ERROR  ASSUMPTION VIOLATED
                                                .ENDC
     4 014102                                   ASSUME  C.UADR,EQ,C.NEXT+2
                                                .IF     EQ,<C.UADR>-<C.NEXT+2>
                                                .IFF
                                                .ERROR  ASSUMPTION VIOLATED
                                                .ENDC
     5 014102                                   ASSUME  C.UNIT,EQ,C.UADR+2
                                                .IF     EQ,<C.UNIT>-<C.UADR+2>
                                                .IFF
                                                .ERROR  ASSUMPTION VIOLATED
                                                .ENDC
     6 014102                                   ASSUME  C.VEC ,EQ,C.UNIT+2
                                                .IF     EQ,<C.VEC>-<C.UNIT+2>
                                                .IFF
                                                .ERROR  ASSUMPTION VIOLATED
                                                .ENDC
     7 014102                                   ASSUME  C.RING,EQ,C.VEC+2
                                                .IF     EQ,<C.RING>-<C.VEC+2>
                                                .IFF
                                                .ERROR  ASSUMPTION VIOLATED
                                                .ENDC
     8 014102                                   ASSUME  C.TO  ,EQ,C.RING+2
                                                .IF     EQ,<C.TO>-<C.RING+2>
                                                .IFF
                                                .ERROR  ASSUMPTION VIOLATED
                                                .ENDC
     9 014102                                   ASSUME  C.FLG ,EQ,C.TO+2
                                                .IF     EQ,<C.FLG>-<C.TO+2>
                                                .IFF
                                                .ERROR  ASSUMPTION VIOLATED
                                                .ENDC
    10 014102                                   ASSUME  C.REF ,EQ,C.FLG+2
                                                .IF     EQ,<C.REF>-<C.FLG+2>
                                                .IFF
                                                .ERROR  ASSUMPTION VIOLATED
                                                .ENDC
    11 014102                                   ASSUME  C.UNUM,EQ,C.REF+2
                                                .IF     EQ,<C.UNUM>-<C.REF+2>
                                                .IFF
                                                .ERROR  ASSUMPTION VIOLATED
                                                .ENDC
    12
    13 014102                                   ASSUME  PT.UBA,EQ,0
                                                .IF     EQ,<PT.UBA>-<0>
                                                .IFF
                                                .ERROR  ASSUMPTION VIOLATED
                                                .ENDC
    14 014102                                   ASSUME  PT.UNIT,EQ,PT.UBA+2
                                                .IF     EQ,<PT.UNIT>-<PT.UBA+2>
                                                .IFF
                                                .ERROR  ASSUMPTION VIOLATED
```

```
                                            .ENDC
   014102                                   ASSUME  PT.FLAG,EQ,PT.UNIT+2
                                            .IF     EQ,<PT.FLAG>-<PT.UNIT+2>
                                            .IFF
                                            .ERROR  ASSUMPTION VIOLATED
                                            .ENDC

   014102  012701  000022           NEWTAB: MOV     #C.SIZE/2,R1            ;GET WORDS IN CONTROLLER TABLE
   014106  004737  002474                   CALL    ALOCM                   ;ALLOCATE SPACE FOR IT
   014112  010113                           MOV     R1,(R3)                 ; SET POINTER TO THIS TABLE
   014114  010105                           MOV     R1,R5                   ; SAVE C TABLE ADDRESS
   014116  005021                           CLR     (R1)+                   ; FLAG END OF TABLE
   014120  012021                           MOV     (R0)+,(R1)+             ;STORE UNIBUS ADDRESS
   014122  010221                           MOV     R2,(R1)+                ;UNIT NUMBER
   014124  005021                           CLR     (R1)+                   ; CLEAR VECTOR ADDRESS
   014126  005021                           CLR     (R1)+                   ;CLEAR RING BUFFER ADDRESS
   014130  005021                           CLR     (R1)+                   ; CLEAR TIME OUT
   014132  005021                           CLR     (R1)+                   ; CLEAR FLAGS
   014134  005021                           CLR     (R1)+                   ; CLEAR REFERENCE NUMBER
   014136  012021                           MOV     (R0)+,(R1)+             ; DRIVE UNIT #
   014140  012011                           MOV     (R0)+,(R1)              ; STARTUP FLAGS FOR DM
   014142  005065  000040                   CLR     C.CNT(R5)               ; SET ACCESS COUNT TO 0
   014146  012765  000020  000042           MOV     #C.INIT,C.CNT+2(R5)
   014154  032721  000004                   BIT     #DLLFCT,(R1)+           ; DLL FCT
   014160  001421                           BEQ     NODLL                   ; NO
                                                                            ; YES - ALLOCATE BUFFER AND GET FILE NAME
   014162  012701  000256                   MOV     #256,R1                 ; BUFFER SIZE
   014166  004737  002474                   CALL    ALOCM                   ; GET BUFFER
   014172  010165  000024                   MOV     R1,C.FBUF(R5)           ; SET POINTER IN C TABLE
   014176  012765  177777  000026           MOV     #-1,C.FBLK(R5)          ; SET EXISTING BLOCK TO EOF

   014204                                   GMANID  ASKFIL,FCTFIL,A,0,0,-1,NO       ; GET FILE NAME
                                    .MCALL  M$SVC,M$GENBR,M$WORD,M$GNLS,M$INCR,GPRMD
           000001                   T$GMANID=1
   014204                           M$SVC   C$GMAN
                                    .MCALL  M$GNINS,M$TSTLAB
   014204                           M$TSTLAB
                                    .MCALL  M$TLABEL,M$INCR
                                    .IIF LT T$TSTMAC, .MEXIT
                                    .RADIX  10
                                    M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                    .RADIX  8
                                    M$INCR  T$TSTSEQ
   014204                           M$GNINS <TRAP   C$GMAN>
                                    .IF LT SVCINS
                                    TRAP    C$GMAN
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
   014204  104443                           TRAP    C$GMAN
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                                TRAP    C$GMAN
                                            .NLIST
                                    .ENDC
```

```
      014206                 M$GENBR BR,\S$LSYM,$
                             .MCALL  M$GNINS
      014206                 M$GNINS <BR      10000$>
                             .IF LT SVCINS
                             BR      10000$
                             .MEXIT
                             .ENDC
                             .IF EQ SVCINS
      014206  000406                 BR      10000$
                             .MEXIT
                             .ENDC
                             .IF GT SVCINS
                             .LIST
                                                                         BR      10000$
                                             .NLIST
                             .ENDC
      014210                 M$WORD  FCTFIL
                             .MCALL  M$GNINS
                             .IRP    N,<FCTFIL>
                             M$GNINS <.WORD  N>
                             .ENDM
      014210                 M$GNINS <.WORD  FCTFIL>
                             .IF LT SVCINS
                             .WORD   FCTFIL
                             .MEXIT
                             .ENDC
                             .IF EQ SVCINS
      014210  014410                 .WORD   FCTFIL
                             .MEXIT
                             .ENDC
                             .IF GT SVCINS
                             .LIST
                                                                         .WORD   FCTFIL
                                             .NLIST
                             .ENDC
      014212                 GPRMD   ASKFIL,0,A,0,<0>,<-1>,NO
                             .MCALL  M$RADIX,M$DEFAULT,M$EXCP,M$WORD,M$CNTOP
                             .IF IDN A,A
                             .IF EQ T$GMANID
                             .ERROR  ;ASCII RADIX VALID ONLY ON ''GMANID''
                             .ENDC
                             .ENDC
              000000         T$TEMP=0&1
                             .IF NE  T$TEMP & 1
                             .ERROR  ;ODD OFFSET
                             .ENDC
                             .IF LT  G$OFSIZE-0
                             .ERROR  ;OFFSET TOO BIG
                             .ENDC
              000002         T$CODE=G$PRMD + <0 * G$OFFSET>
      014212                 M$RADIX A,T$TEMP
                             .IF IDN B,A
                             T$TEMP=G$RADB
                             .MEXIT
                             .ENDC
                             .IF IDN O,A
                             T$TEMP=G$RADO
```

```
                              .MEXIT
                              .ENDC
                              .IF IDN D,A
                              T$TEMP=G$RADD
                              .MEXIT
                              .ENDC
                              .IF IDN L,A
                              T$TEMP=G$RADL
                              .MEXIT
                              .ENDC
                              .IF IDN A,A
          000140              T$TEMP=G$RADA
                              .MEXIT
                              .ENDC
                              T$TEMP=-1
                              .ERROR  ;ILL. RADIX "A"
          000142              T$CODE=T$CODE ! T$TEMP
014212                        M$DEFAULT       NO,T$TEMP
                              .IF IDN YES,NO
                              T$TEMP=G$YES
                              .MEXIT
                              .ENDC
                              .IF IDN NO,NO
          000000              T$TEMP=G$NO
                              .MEXIT
                              .ENDC
                              T$TEMP=-1
                              .ERROR  ;DEFAULT "NO" MUST BE "YES" OR "NO"
          000142              T$CODE=T$CODE ! T$TEMP
          000000              T$EXCP=0
014212                        M$EXCP  T$CODE,T$EXCP,G$LOLIM,T$LOLIM,0
                              .IF IDN <@>,<0>
                              .IF LT G$OFSIZE-
                              .ERROR  ;INDIRECT PAR. TOO BIG
                              .MEXIT
                              .ENDC
                              T$LOLIM=/2
                              T$CODE=T$CODE ! G$EXCP
                              T$EXCP=T$EXCP ! G$LOLIM
                              .IFF
                              .IF B,
          000000              T$LOLIM=0
                              .IFF
                              .ERROR  ;ILL. DEFERRED MODE
                              .ENDC
                              .ENDC
014212                        M$EXCP  T$CODE,T$EXCP,G$HILIM,T$HILIM,-1
                              .IF IDN <@>,<-1>
                              .IF LT G$OFSIZE-
                              .ERROR  ;INDIRECT PAR. TOO BIG
                              .MEXIT
                              .ENDC
                              T$HILIM=/2
                              T$CODE=T$CODE ! G$EXCP
                              T$EXCP=T$EXCP ! G$HILIM
                              .IFF
                              .IF B,
```

```
        177777                  T$HILIM=-1
                                .IFF
                                .ERROR  ;ILL. DEFERRED MODE
                                .ENDC
                                .ENDC
     014212                     M$CNTOP <>,<T$CODE>
                                .IF NB
                                .IF NE  I$SFT - F$BGN
                                .ERROR  ; ''COUNT'' OPTION VALID ONLY IN S.W. QUES.
                                .MEXIT
                                .ENDC
                                T$CODE=T$CODE ! G$CNTOP
                                .ENDC
     014212                     M$WORD  <T$CODE,ASKFIL,0,T$LOLIM,T$HILIM>
                                .MCALL  M$GNINS
                                .IRP    N,<T$CODE,ASKFIL,0,T$LOLIM,T$HILIM>
                                M$GNINS <.WORD  N>
                                .ENDM
     014212                     M$GNINS <.WORD  T$CODE>
                                .IF LT SVCINS
                                .WORD   T$CODE
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     014212  000142                     .WORD   T$CODE
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   T$CODE
                                                .NLIST
                                .ENDC
     014214                     M$GNINS <.WORD  ASKFIL>
                                .IF LT SVCINS
                                .WORD   ASKFIL
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     014214  014345                     .WORD   ASKFIL
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   ASKFIL
                                                .NLIST
                                .ENDC
     014216                     M$GNINS <.WORD  0>
                                .IF LT SVCINS
                                .WORD   0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     014216  000000                     .WORD   0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
```

```
                                                                                    .WORD   0
                                                 .NLIST
                                .ENDC
    014220                      M$GNINS <.WORD  T$LOLIM>
                                .IF LT SVCINS
                                .WORD   T$LOLIM
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
    014220  000000                      .WORD   T$LOLIM
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                    .WORD   T$LOLIM
                                                 .NLIST
                                .ENDC
    014222                      M$GNINS <.WORD  T$HILIM>
                                .IF LT SVCINS
                                .WORD   T$HILIM
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
    014222  177777                      .WORD   T$HILIM
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                    .WORD   T$HILIM
                                                 .NLIST
                                .ENDC
                                .IF NE  T$EXCP
                                M$WORD  T$EXCP
                                .ENDC
                                .IF NB
                                M$WORD </2>
                                .ENDC
    014224                      M$GNLS
                                .MCALL  M$GEN
                                .IF NB
                                M$GEN   \,$,SVCTAG
                                .IFF
    014224                      M$GEN   \S$LSYM,$,SVCTAG
                                .IF LE  SVCTAG
    014224                      10000$:
                                .MEXIT
                                .ENDC
                                .LIST
                                                                            10000$:
                                        .NLIST
                                .ENDC
    014224                      M$INCR  S$LSYM
            010001              S$LSYM=S$LSYM+1
            000000              T$GMANID=0
 42
 43 014224  004737  003144      NODLL:  CALL    HCOMM                   ; ALLOCATE HOST COMM AREA
 44 014230  005237  002200              INC     CTRLRS                  ;COUNT THE CONTROLLER
```

```
  45
  46                                              ;GET NEXT P-TABLE
  47
  48 014234  005202                               NXTTAB: INC     R2                      ;INCREMENT LOGICAL UNIT NUMBER
  49 014236  023702  002012                               CMP     L$UNIT,R2               ;CHECK IF GOT ALL TABLES
  50 014242  003300                                       BGT     INIT4                   ;IF NOT, GO BACK FOR NEXT
  51
  52 014244  004737  004440                               CALL    READDM                  ; LOAD DM FORMATTER INTO HOST MEMORY
  53
  54                                              ;SAVE CURRENT PARAMETERS FOR HISTORY
  55
  56 014250  013737  002170  002174                       MOV     FFREE,FMEM              ;SAVE START ADDRESS
  57 014256  013737  002172  002176                       MOV     FSIZE,FMEMS             ;SAVE SIZE
  58
  59 014264                                               EXIT    INIT
                                                  .MCALL  M$SVC,M$EXIT,M$EXSEG,M$EXTJ,M$GETTOP,M$CHECK,M$WORD,XFER
             000041                               T$FLAG=F$END
     014264                                       M$CHECK INIT,T$TEMP,T$FLAG
                                                  .IF IDN <TST>,<INIT>
                                                  T$TEMP=T$$TEST
                                                  T$FLAG=I$TST
                                                  .MEXIT
                                                  .ENDC
                                                  .IF IDN <SUB>,<INIT>
                                                  T$TEMP=T$$SUB
                                                  T$FLAG=I$SUB
                                                  .MEXIT
                                                  .ENDC
                                                  .IF IDN <SEG>,<INIT>
                                                  T$TEMP=T$$SEG
                                                  T$FLAG=I$SEG
                                                  .MEXIT
                                                  .ENDC
                                                  .IF IDN <INIT>,<INIT>
             010015                               T$TEMP=T$$INIT
             000040                               T$FLAG=I$INIT
                                                  .MEXIT
                                                  .ENDC
                                                  .IF IDN <CLN>,<INIT>
                                                  T$TEMP=T$$CLEAN
                                                  T$FLAG=I$CLN
                                                  .MEXIT
                                                  .ENDC
                                                  .IF IDN <SRV>,<INIT>
                                                  T$TEMP=T$$SRV
                                                  T$FLAG=I$SRV
                                                  .MEXIT
                                                  .ENDC
                                                  .IF IDN <MSG>,<INIT>
                                                  T$TEMP=T$$MSG
                                                  T$FLAG=F$JMP
                                                  .MEXIT
                                                  .ENDC
                                                  .IF IDN <RPT>,<INIT>
                                                  T$TEMP=T$$RPT
                                                  T$FLAG=F$JMP
                                                  .MEXIT
```

```
                        .ENDC
                        .IF IDN <DU>,<INIT>
                        T$TEMP=T$$DU
                        T$FLAG=F$JMP
                        .MEXIT
                        .ENDC
                        .IF IDN <AU>,<INIT>
                        T$TEMP=T$$AU
                        T$FLAG=F$JMP
                        .MEXIT
                        .ENDC
                        .IF EQ T$FLAG-F$JMP
                        M$WORD  J$JMP
                        M$EXTJ  \T$TEMP
                        .MEXIT
                        .ENDC
                        .IF EQ  T$FLAG-F$BGN
    014264              M$SVC   C$EXIT
                        .MCALL  M$GNINS,M$TSTLAB
    014264              M$TSTLAB
                        .MCALL  M$TLABEL,M$INCR
                        .IIF LT T$TSTMAC, .MEXIT
                        .RADIX  10
                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                        .RADIX  8
                        M$INCR  T$TSTSEQ
    014264              M$GNINS <TRAP   C$EXIT>
                        .IF LT SVCINS
                        TRAP    C$EXIT
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
    014264  104432              TRAP    C$EXIT
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                    TRAP    C$EXIT
                                        .NLIST
                        .ENDC
                        .IF IDN <SEG>,<INIT>
                        M$GETTOP T$SEK,T$SEGLEV,T$TEMP
                        M$EXSEG \T$TEMP
                        .IFF
    014266              M$EXIT  \T$TEMP
                        .MCALL  M$GNINS
    014266              M$GNINS <.WORD  L10015-.>
                        .IF LT SVCINS
                        .WORD   L10015-.
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
    014266  000234              .WORD   L10015-.
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
```

```
                                                                        .WORD   L10015-.
                            .NLIST
        .ENDC
        .ENDC
        .MEXIT
        .ENDC
        .IF IDN <HRD>,<INIT>
        M$GETTOP        T$NS,T$NESTLEV,T$TEMP
        .IF EQ  F$HARD-T$TEMP
        .IRP    N,<\T$$HARD>
        XFER    L'N
        .ENDM
        .MEXIT
        .ENDC
        .ENDC
        .IF IDN <SFT>,<INIT>
        M$GETTOP        T$NS,T$NESTLEV,T$TEMP
        .IF EQ  F$SOFT-T$TEMP
        .IRP    N,<\T$$SOFT>
        XFER    L'N
        .ENDM
        .MEXIT
        .ENDC
        .ENDC
        .ERROR  ;ILL. "EXIT INIT" STMT.
```

```
   1 014270                    DUPERR: ERRSF 1,DUPERM
                               .MCALL  M$ERRINS
     014270                    M$ERRINS        1,DUPERM,,C$ERSF
                               .MCALL  M$GNINS,M$WORD,M$TSTLAB
     014270                    M$SVC   C$ERSF
                               .MCALL  M$GNINS,M$TSTLAB
     014270                    M$TSTLAB
                               .MCALL  M$TLABEL,M$INCR
                               .IIF LT T$TSTMAC, .MEXIT
                               .RADIX  10
                               M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                               .RADIX  8
                               M$INCR  T$TSTSEQ
     014270                    M$GNINS <TRAP   C$ERSF>
                               .IF LT SVCINS
                               TRAP    C$ERSF
                               .MEXIT
                               .ENDC
                               .IF EQ SVCINS
     014270  104454                    TRAP    C$ERSF
                               .MEXIT
                               .ENDC
                               .IF GT SVCINS
                               .LIST
                                                                       TRAP    C$ERSF
                                               .NLIST
                               .ENDC
             000012            .RADIX  10
                               .IF NB  1
             000001            T$ERRNUM=1
                               .IFF
                               .ERROR  ;MISSING ERROR-NR
                               .ENDC
     014272                    M$WORD  \T$ERRNUM
                               .MCALL  M$GNINS
                               .IRP    N,<1>
                               M$GNINS <.WORD  N>
                               .ENDM
     014272                    M$GNINS <.WORD  1>
                               .IF LT SVCINS
                               .WORD   1
                               .MEXIT
                               .ENDC
                               .IF EQ SVCINS
     014272  000001                    .WORD   1
                               .MEXIT
                               .ENDC
                               .IF GT SVCINS
                               .LIST
                                                                       .WORD   1
                                               .NLIST
                               .ENDC
             000010            .RADIX  8
                               .IF NB DUPERM
     014274                    M$WORD  DUPERM
                               .MCALL  M$GNINS
                               .IRP    N,<DUPERM>
```

```
                                        M$GNINS <.WORD  N>
                                        .ENDM
 014274                                 M$GNINS <.WORD  DUPERM>
                                        .IF LT SVCINS
                                        .WORD   DUPERM
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
 014274  014300                                 .WORD   DUPERM
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                         .WORD   DUPERM
                                                     .NLIST
                                        .ENDC
                                        .IFF
                                        M$WORD  0
                                        .ENDC
                                        .IF NB
                                        M$WORD
                                        .IFF
 014276                                 M$WORD  0
                                        .MCALL  M$GNINS
                                        .IRP    N,<0>
                                        M$GNINS <.WORD  N>
                                        .ENDM
 014276                                 M$GNINS <.WORD  0>
                                        .IF LT SVCINS
                                        .WORD   0
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
 014276  000000                                 .WORD   0
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                         .WORD   0
                                                     .NLIST
                                        .ENDC
                                        .ENDC

 014300     124      127      117       DUPERM: .ASCIZ  \TWO CONTROLLERS WITH THE SAME UDAISP\
 014345     105      116      124       ASKFIL: .ASCIZ  \ENTER FILE NAME FOR DOWN LINE LOAD\
 014410                                 FCTFIL: .BLKB   72.                     ; INPUT FILE NAME FOR DLL
 014520     000                                 .BYTE   0
                                                .EVEN

 014522                                         ENDINIT
                                        .MCALL  M$POP,M$GNTAG,M$SVC,M$ENDERR
 014522                                 M$POP   T$NS,T$NESTLEV,T$TEMP
                                        .MCALL  M$GETS,M$DECR
                                        .IF LT  T$NESTLEV
                                        .ERROR  T$NESTLEV       ; MACRO T$NS UNDERFLOW
                                        .MEXIT
                                        .ENDC
```

```
    014522                      M$GETS  T$NS,\T$NESTLEV,T$TEMP
            000006              T$TEMP=T$NS1
    014522                      M$DECR  T$NESTLEV
            000000              T$NESTLEV=T$NESTLEV-1
                                .IF EQ F$INIT-T$TEMP
    014522                      M$GNTAG L,T$$INIT
                                .MCALL  M$GEN
    014522                      M$GEN   L,\T$$INIT,SVCTAG
                                .IF LE  SVCTAG
    014522                      L10015:
                                .MEXIT
                                .ENDC
                                .LIST
                                                                        L10015:
                                        .NLIST
            010000              S$LSYM=T$LSYM
    014522                      M$SVC   C$INIT
                                .MCALL  M$GNINS,M$TSTLAB
    014522                      M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
    014522                      M$GNINS <TRAP   C$INIT>
                                .IF LT SVCINS
                                TRAP    C$INIT
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
    014522  104411                      TRAP    C$INIT
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                            TRAP    C$INIT
                                                .NLIST
                                .ENDC
            000041              I$INIT=F$END
                                .IFF
                                M$ENDERR        ENDINIT,T$TEMP
                                .ENDC
  10
```

```
                                 .SBTTL  AUTODROP SECTION

                        ;++
                        ; THIS CODE IS EXECUTED IMMEDIATELY AFTER THE INITIALIZE CODE IF
                        ; THE ''ADR'' FLAG WAS SET.  THE UNIT(S) UNDER TEST ARE CHECKED TO
                        ; SEE IF THEY WILL RESPOND.  THOSE THAT DON'T ARE IMMEDIATELY
                        ; DROPPED FROM TESTING.
                        ;--

014524                           BGNAUTO
                        .MCALL  M$PUSH,M$INCR,M$GNGBL
          000040        I$AUTO=F$BGN
014524                  M$PUSH T$NS,T$NESTLEV,F$AUTO
                        .MCALL  M$INCR,M$SETS
014524                  M$INCR  T$NESTLEV
          000001        T$NESTLEV=T$NESTLEV+1
014524                  M$SETS  T$NS,\T$NESTLEV,F$AUTO
          000020        T$NS1=F$AUTO
          010016        T$$AUTO=T$TAGNUM
014524                  M$INCR T$TAGNUM
          010017        T$TAGNUM=T$TAGNUM+1
014524                  M$GNGBL L$AUTO
                        .MCALL  M$GEN
                        .IF NB,L$AUTO
                        .IF NB,
                        M$GEN    L$AUTO,:,SVCGBL,
                        .ENDC
                        .IF B,
014524                  M$GEN    L$AUTO,:,SVCGBL,< >
                        .IF LE  SVCGBL
014524                  L$AUTO::
                        .MEXIT
                        .ENDC
                        .LIST
                                                                            L$AUTO::
                                 .NLIST
                        .ENDC
                        .ENDC

                        ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                        ;        INSERT CODE HERE TO CHECK DEVICE(S) TO SEE IF THEY RESPOND.
                        ;        ISSUE A ''DODU'' FOR THOSE THAT DON'T.
                        ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

014524                           ENDAUTO
                        .MCALL M$POP,M$GNTAG,M$SVC,M$ENDERR
014524                  M$POP T$NS,T$NESTLEV,T$TEMP
                        .MCALL  M$GETS,M$DECR
                        .IF LT  T$NESTLEV
                        .ERROR  T$NESTLEV         ; MACRO T$NS UNDERFLOW
                        .MEXIT
                        .ENDC
014524                  M$GETS  T$NS,\T$NESTLEV,T$TEMP
          000020        T$TEMP=T$NS1
014524                  M$DECR  T$NESTLEV
          000000        T$NESTLEV=T$NESTLEV-1
                        .IF EQ F$AUTO-T$TEMP
```

```
        014524                          M$GNTAG L,T$$AUTO
                                        .MCALL  M$GEN
        014524                          M$GEN   L,\T$$AUTO,SVCTAG
                                        .IF LE  SVCTAG
        014524                          L10016:
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                                L10016:
                                                .NLIST
                010000                  S$LSYM=T$LSYM
        014524                          M$SVC C$AUTO
                                        .MCALL  M$GNINS,M$TSTLAB
        014524                          M$TSTLAB
                                        .MCALL  M$TLABEL,M$INCR
                                        .IIF LT T$TSTMAC, .MEXIT
                                        .RADIX  10
                                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                        .RADIX  8
                                        M$INCR  T$TSTSEQ
        014524                          M$GNINS <TRAP   C$AUTO>
                                        .IF LT SVCINS
                                        TRAP    C$AUTO
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
        014524  104461                          TRAP    C$AUTO
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        TRAP    C$AUTO
                                                        .NLIST
                                        .ENDC
                000041                  I$AUTO=F$END
                                        .IFF
                                        M$ENDERR        ENDAUTO,T$TEMP
                                        .ENDC
```

```
                                 .SBTTL  CLEANUP CODING SECTION

                         ;++
                         ; THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED
                         ; AFTER THE HARDWARE TESTS HAVE BEEN PERFORMED.
                         ;--

 014526                          BGNCLN
                         .MCALL  M$PUSH,M$INCR,M$GNGBL
         000040          I$CLN=F$BGN
 014526                  M$PUSH  T$NS,T$NESTLEV,F$CLEAN
                         .MCALL  M$INCR,M$SETS
 014526                  M$INCR  T$NESTLEV
         000001          T$NESTLEV=T$NESTLEV+1
 014526                  M$SETS  T$NS,\T$NESTLEV,F$CLEAN
         000007          T$NS1=F$CLEAN
         010017          T$$CLEAN=T$TAGNUM
 014526                  M$INCR T$TAGNUM
         010020          T$TAGNUM=T$TAGNUM+1
 014526                  M$GNGBL L$CLEAN
                         .MCALL  M$GEN
                         .IF NB,L$CLEAN
                         .IF NB,
                         M$GEN   L$CLEAN,:,SVCGBL,
                         .ENDC
                         .IF B,
 014526                  M$GEN   L$CLEAN,:,SVCGBL,< >
                         .IF LE  SVCGBL
 014526                  L$CLEAN::
                         .MEXIT
                         .ENDC
                         .LIST
                                                                              L$CLEAN::
                                 .NLIST
                         .ENDC
                         .ENDC

                         ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                         ;       INSERT YOUR CLEANUP CODING.  THIS CODING SHOULD
                         ;       RESTORE YOUR TEST-DEVICE TO A NEUTRAL STATE.
                         ;       THIS CODE WILL BE EXECUTED AFTER EACH PASS AND AFTER THE
                         ;       PROGRAM IS INTERRUPTED BY ''^C''.
                         ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

 014526                          EXIT    CLN
                         .MCALL  M$SVC,M$EXIT,M$EXSEG,M$EXTJ,M$GETTOP,M$CHECK,M$WORD,XFER
         000041          T$FLAG=F$END
 014526                  M$CHECK CLN,T$TEMP,T$FLAG
                         .IF IDN <TST>,<CLN>
                         T$TEMP=T$$TEST
                         T$FLAG=I$TST
                         .MEXIT
                         .ENDC
                         .IF IDN <SUB>,<CLN>
                         T$TEMP=T$$SUB
                         T$FLAG=I$SUB
                         .MEXIT
```

```
                                .ENDC
                                .IF IDN <SEG>,<CLN>
                                T$TEMP=T$$SEG
                                T$FLAG=I$SEG
                                .MEXIT
                                .ENDC
                                .IF IDN <INIT>,<CLN>
                                T$TEMP=T$$INIT
                                T$FLAG=I$INIT
                                .MEXIT
                                .ENDC
                                .IF IDN <CLN>,<CLN>
             010017             T$TEMP=T$$CLEAN
             000040             T$FLAG=I$CLN
                                .MEXIT
                                .ENDC
                                .IF IDN <SRV>,<CLN>
                                T$TEMP=T$$SRV
                                T$FLAG=I$SRV
                                .MEXIT
                                .ENDC
                                .IF IDN <MSG>,<CLN>
                                T$TEMP=T$$MSG
                                T$FLAG=F$JMP
                                .MEXIT
                                .ENDC
                                .IF IDN <RPT>,<CLN>
                                T$TEMP=T$$RPT
                                T$FLAG=F$JMP
                                .MEXIT
                                .ENDC
                                .IF IDN <DU>,<CLN>
                                T$TEMP=T$$DU
                                T$FLAG=F$JMP
                                .MEXIT
                                .ENDC
                                .IF IDN <AU>,<CLN>
                                T$TEMP=T$$AU
                                T$FLAG=F$JMP
                                .MEXIT
                                .ENDC
                                .IF EQ T$FLAG-F$JMP
                                M$WORD  J$JMP
                                M$EXTJ  \T$TEMP
                                .MEXIT
                                .ENDC
                                .IF EQ  T$FLAG-F$BGN
  014526                        M$SVC   C$EXIT
                                .MCALL  M$GNINS,M$TSTLAB
  014526                        M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
  014526                        M$GNINS <TRAP   C$EXIT>
```

```
                                .IF LT SVCINS
                                TRAP    C$EXIT
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
      014526  104432                    TRAP    C$EXIT
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        TRAP    C$EXIT
                                          .NLIST
                                .ENDC
                                .IF IDN <SEG>,<CLN>
                                M$GETTOP T$SEK,T$SEGLEV,T$TEMP
                                M$EXSEG \T$TEMP
                                .IFF
      014530                    M$EXIT  \T$TEMP
                                .MCALL  M$GNINS
      014530                    M$GNINS <.WORD  L10017-.>
                                .IF LT SVCINS
                                .WORD   L10017-.
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
      014530  000002                    .WORD   L10017-.
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   L10017-.
                                          .NLIST
                                .ENDC
                                .ENDC
                                .MEXIT
                                .ENDC
                                .IF IDN <HRD>,<CLN>
                                M$GETTOP        T$NS,T$NESTLEV,T$TEMP
                                .IF EQ  F$HARD-T$TEMP
                                .IRP    N,<\T$$HARD>
                                XFER    L'N
                                .ENDM
                                .MEXIT
                                .ENDC
                                .ENDC
                                .IF IDN <SFT>,<CLN>
                                M$GETTOP        T$NS,T$NESTLEV,T$TEMP
                                .IF EQ  F$SOFT-T$TEMP
                                .IRP    N,<\T$$SOFT>
                                XFER    L'N
                                .ENDM
                                .MEXIT
                                .ENDC
                                .ENDC
                                .ERROR  ;ILL. "EXIT CLN" STMT.
 18
 19                             ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
                        ;       INSERT LOCAL STORAGE THAT IS USED ONLY
                        ;       DURING THE CLEANUP SECTION.
                        ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

                        ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                        ;       INSERT MESSAGES THAT ARE USED ONLY
                        ;       DURING THE CLEANUP SECTION.
                        ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

014532                          ENDCLN
                        .MCALL  M$POP,M$GNTAG,M$SVC,M$ENDERR
014532                  M$POP   T$NS,T$NESTLEV,T$TEMP
                        .MCALL  M$GETS,M$DECR
                        .IF LT  T$NESTLEV
                        .ERROR  T$NESTLEV       ; MACRO T$NS UNDERFLOW
                        .MEXIT
                        .ENDC
014532                  M$GETS  T$NS,\T$NESTLEV,T$TEMP
        000007          T$TEMP=T$NS1
014532                  M$DECR  T$NESTLEV
        000000          T$NESTLEV=T$NESTLEV-1
                        .IF EQ F$CLEAN-T$TEMP
014532                  M$GNTAG L,T$$CLEAN
                        .MCALL  M$GEN
014532                  M$GEN   L,\T$$CLEAN,SVCTAG
                        .IF LE  SVCTAG
014532                  L10017:
                        .MEXIT
                        .ENDC
                        .LIST
                                                                        L10017:
                                .NLIST
        010000          S$LSYM=T$LSYM
014532                  M$SVC   C$CLEAN
                        .MCALL  M$GNINS,M$TSTLAB
014532                  M$TSTLAB
                        .MCALL  M$TLABEL,M$INCR
                        .IIF LT T$TSTMAC, .MEXIT
                        .RADIX  10
                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                        .RADIX  8
                        M$INCR  T$TSTSEQ
014532                  M$GNINS <TRAP   C$CLEAN>
                        .IF LT SVCINS
                        TRAP    C$CLEAN
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
014532  104412                  TRAP    C$CLEAN
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                        TRAP    C$CLEAN
                                        .NLIST
                        .ENDC
        000041          I$CLN=F$END
```

```
                                .IFF
                                M$ENDERR        ENDCLN,T$TEMP
                                .ENDC
30
31 014534                               ENDMOD
                                .MCALL  M$POP,M$ENDERR
                                .IF EQ  F$BGN-I$MOD
            000041              I$MOD=F$END
                                .IFF
                                .ERROR  ; MISSING 'BGNMOD''
                                .MEXIT
                                .ENDC
   014534                       M$POP   T$NS,T$NESTLEV,T$TEMP
                                .MCALL  M$GETS,M$DECR
                                .IF LT  T$NESTLEV
                                .ERROR  T$NESTLEV       ; MACRO T$NS UNDERFLOW
                                .MEXIT
                                .ENDC
   014534                       M$GETS  T$NS,\T$NESTLEV,T$TEMP
            000000              T$TEMP=T$NS0
   014534                       M$DECR  T$NESTLEV
            177777              T$NESTLEV=T$NESTLEV-1
                                .IF NE F$MOD-T$TEMP
                                M$ENDERR        ENDMOD,T$TEMP
                                .ENDC
32
```

```
                                ;       .TITLE  HARDWARE TESTS
                                        .SBTTL  TEST 1:
                                ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                                ;       APPEND THE NAME OF THIS TEST TO THE .SBTTL, AS SHOWN IN THE
                                ;       FOLLOWING EXAMPLE.      .SBTTL  TEST 1:  NAME OF TEST
                                ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%


  014534                                BGNMOD
                                .MCALL  M$GNGBL,M$PUSH
                                .IF NE  F$END-I$MOD
                                .ERROR  ;'BGNMOD'' IN MOD
                                .MEXIT
                                .IFF
          000040                I$MOD=F$BGN
                                .ENDC
                                .IF NB
                                M$GNGBL
                                .ENDC
  014534                        M$PUSH  T$NS,T$NESTLEV,F$MOD
                                .MCALL  M$INCR,M$SETS
  014534                        M$INCR  T$NESTLEV
          000000                T$NESTLEV=T$NESTLEV+1
  014534                        M$SETS  T$NS,\T$NESTLEV,F$MOD
          000000                T$NS0=F$MOD

                                ;++
                                ; TEST TO ...
                                ;--

                                ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                                ;       CHANGE THE PHRASE ''TEST TO ...'' TO BE A FUNCTIONAL
                                ;       DESCRIPTION OF THE HARDWARE TEST WHICH FOLLOWS.
                                ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

                                ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                                ;       INSERT PROGRAM EQUATES THAT ARE USED ONLY IN THIS TEST.
                                ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

  014534                                BGNTST
                                .MCALL  M$INCR,M$GNTEST,M$PUSH,M$INCR
                                .IF NE  F$END-I$SUB
                                .ERROR  ;'BGNTST'' IN SUB
                                .MEXIT
                                .ENDC
                                .IF NE  F$END-I$SEG
                                .ERROR  ;'BGNTST'' IN SEG
                                .MEXIT
                                .ENDC
                                .IF NE  F$END-I$TST
                                .ERROR  ;'BGNTST'' IN TST
                                .MEXIT
                                .IFF
          000040                I$TST=F$BGN
                                .ENDC
                                .IF B
  014534                        M$INCR  T$TESTNUM
```

```
          000001        T$TESTNUM=T$TESTNUM+1
                        .IFF
                        T$TESTNUM=
                        .ENDC
          000000        T$SUBNUM=0
          000012        .RADIX  10
   014534               M$GNTEST        \T$TESTNUM
                        .MCALL  M$GEN
   014534               M$GEN   T,1:,SVCTST
                        .IF LE  SVCTST
   014534               T1::
                        .MEXIT
                        .ENDC
                        .LIST
                                                                T1::
                                .NLIST
          000010        .RADIX  8
   014534               M$PUSH  T$NS,T$NESTLEV,F$TEST
                        .MCALL  M$INCR,M$SETS
   014534               M$INCR  T$NESTLEV
          000001        T$NESTLEV=T$NESTLEV+1
   014534               M$SETS  T$NS,\T$NESTLEV,F$TEST
          000001        T$NS1=F$TEST
          010020        T$$TEST=T$TAGNUM
   014534               M$INCR T$TAGNUM
          010021        T$TAGNUM=T$TAGNUM+1
          000001        T$TSTSEQ=1
25 014534                       PRINTF  #JFK1
                        .MCALL  M$PRINT
                        .IF B   #JFK1
                        .ERROR  ;MISSING FORMAT
                        .MEXIT
                        .ENDC
                        .IF B   <>
   014534               M$PRINT C$PNTF,#JFK1
                        .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
          000001        T$ARGCNT=1
   014534               M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                        .IF NB <>
                        M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                        .ENDC
                        .IF NB <>
                        T$ARGCNT=T$ARGCNT+1
                        .ENDC
                        .IRP    N,<\T$ARGCNT>
                        M$PUT   #N,#JFK1,<>,<>,<>,<>,<>,<>,<>,<>
                        .ENDM
   014534               M$PUT   #1,#JFK1,<>,<>,<>,<>,<>,<>,<>,<>
                        .MCALL  M$PUT1
                        .IF NB  <#JFK1>
   014534               M$PUT   <#JFK1>,<>,<>,<>,<>,<>,<>,<>,<>
                        .MCALL  M$PUT1
                        .IF NB  <>
                        M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                        .ENDC
                        .IF NB  <#JFK1>
   014534               M$PUT1  #JFK1
```

```
                                        .MCALL  M$GNINS
                                        .IF B
        014534                          M$GNINS <MOV    #JFK1,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #JFK1,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
        014534  012746  014653                  MOV     #JFK1,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        MOV     #JFK1,-(SP)
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#JFK1>
                                        .ERROR  ;ILL. ARG. "#JFK1" ONLY 'B' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR    -(SP)>
                                        M$GNINS <BISB   ,(SP)>
                                        .ENDC
                                        .ENDC
                                        .ENDC
                                        .IF NB  <#1>
        014540                          M$PUT1  #1
                                        .MCALL  M$GNINS
                                        .IF B
        014540                          M$GNINS <MOV    #1,-(SP)>
                                        .IF LT SVCINS
                                        MOV     #1,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
        014540  012746  000001                  MOV     #1,-(SP)
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        MOV     #1,-(SP)
                                                        .NLIST
                                        .ENDC
                                        .IFF
                                        .IF DIF B,<#1>
                                        .ERROR  ;ILL. ARG. "#1" ONLY 'B' IS ALLOWED.
                                        .MEXIT
                                        .ENDC
                                        M$GNINS <CLR    -(SP)>
                                        M$GNINS <BISB   ,(SP)>
                                        .ENDC
                                        .ENDC
        014544                          M$GNINS <MOV    SP,R0>
                                        .IF LT SVCINS
                                        MOV     SP,R0
                                        .MEXIT
```

```
                                          .ENDC
                                          .IF EQ SVCINS
      014544  010600                             MOV     SP,R0
                                          .MEXIT
                                          .ENDC
                                          .IF GT SVCINS
                                          .LIST
                                                                                          MOV     SP,R0
                                                         .NLIST
                                          .ENDC
      014546                              M$SVC   C$PNTF
                                          .MCALL  M$GNINS,M$TSTLAB
      014546                              M$TSTLAB
                                          .MCALL  M$TLABEL,M$INCR
                                          .IIF LT T$TSTMAC, .MEXIT
                                          .RADIX  10
                                          M$TLABEL       \T$TESTNUN,\T$TSTSEQ
                                          .RADIX  8
                                          M$INCR  T$TSTSEQ
      014546                              M$GNINS <TRAP   C$PNTF>
                                          .IF LT SVCINS
                                          TRAP    C$PNTF
                                          .MEXIT
                                          .ENDC
                                          .IF EQ SVCINS
      014546  104417                             TRAP    C$PNTF
                                          .MEXIT
                                          .ENDC
                                          .IF GT SVCINS
                                          .LIST
                                                                                          TRAP    C$PNTF
                                                         .NLIST
                                          .ENDC
                                          .IRP    N,<\T$ARGCNT*2+2>
                                          M$GNINS <ADD    #N,SP>
                                          .ENDM
      014550                              M$GNINS <ADD    #4,SP>
                                          .IF LT SVCINS
                                          ADD     #4,SP
                                          .MEXIT
                                          .ENDC
                                          .IF EQ SVCINS
      014550  062706  000004                     ADD     #4,SP
                                          .MEXIT
                                          .ENDC
                                          .IF GT SVCINS
                                          .LIST
                                                                                          ADD     #4,SP
                                                         .NLIST
                                          .ENDC
                                          .MEXIT
                                          .ENDC
                                          .IF B   <>
                                          M$PRINT C$PNTF,#JFK1,<>
                                          .MEXIT
                                          .ENDC
                                          .IF B   <>
```

```
                                M$PRINT C$PNTF,#JFK1,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTF,#JFK1,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTF,#JFK1,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTF,#JFK1,<>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTF,#JFK1,<>,<>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                .IF B   <>
                                M$PRINT C$PNTF,#JFK1,<>,<>,<>,<>,<>,<>,<>
                                .MEXIT
                                .ENDC
                                M$PRINT C$PNTF,#JFK1,<>,<>,<>,<>,<>,<>,<>,<>

 014554  004737  011650                 CALL    RUNDM                   ; START DMS RUNNING

 014560  005737  002220                 TST     URNING                  ; SEE IF ANY STARTED
 014564  001414                         BEQ     NOGOER                  ; NONE - FATAL

 014566  004737  004566                 CALL    RESPDM
                                                                        ; AWAIT FORMAT COMPLETION
 014572                                 PRINTF  #JFK5
                                .MCALL  M$PRINT
                                .IF B   #JFK5
                                .ERROR  ;MISSING FORMAT
                                .MEXIT
                                .ENDC
                                .IF B   <>
 014572                         M$PRINT C$PNTF,#JFK5
                                .MCALL  M$COUNT,M$PUT,M$GNINS,M$SVC
         000001                 T$ARGCNT=1
 014572                         M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>,<>
                                .IF NB <>
                                M$COUNT T$ARGCNT,<>,<>,<>,<>,<>,<>,<>
                                .ENDC
                                .IF NB <>
                                T$ARGCNT=T$ARGCNT+1
                                .ENDC
                                .IRP    N,<\T$ARGCNT>
                                M$PUT   #N,#JFK5,<>,<>,<>,<>,<>,<>,<>,<>
                                .ENDM
 014572                         M$PUT   #1,#JFK5,<>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
                                .IF NB  <#JFK5>
 014572                         M$PUT   <#JFK5>,<>,<>,<>,<>,<>,<>,<>,<>
                                .MCALL  M$PUT1
```

```
                                  .IF NB  <>
                                  M$PUT   <>,<>,<>,<>,<>,<>,<>,<>,<>
                                  .ENDC
                                  .IF NB  <#JFK5>
     014572                       M$PUT1  #JFK5
                                  .MCALL  M$GNINS
                                  .IF B
     014572                       M$GNINS <MOV    #JFK5,-(SP)>
                                  .IF LT SVCINS
                                  MOV     #JFK5,-(SP)
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
     014572  012746  014677               MOV     #JFK5,-(SP)
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                          MOV     #JFK5,-(SP)
                                            .NLIST
                                  .ENDC
                                  .IFF
                                  .IF DIF B,<#JFK5>
                                  .ERROR  ;ILL. ARG. ''#JFK5'' ONLY 'B'' IS ALLOWED.
                                  .MEXIT
                                  .ENDC
                                  M$GNINS <CLR    -(SP)>
                                  M$GNINS <BISB   ,(SP)>
                                  .ENDC
                                  .ENDC
                                  .ENDC
                                  .IF NB  <#1>
     014576                       M$PUT1  #1
                                  .MCALL  M$GNINS
                                  .IF B
     014576                       M$GNINS <MOV    #1,-(SP)>
                                  .IF LT SVCINS
                                  MOV     #1,-(SP)
                                  .MEXIT
                                  .ENDC
                                  .IF EQ SVCINS
     014576  012746  000001               MOV     #1,-(SP)
                                  .MEXIT
                                  .ENDC
                                  .IF GT SVCINS
                                  .LIST
                                                                          MOV     #1,-(SP)
                                            .NLIST
                                  .ENDC
                                  .IFF
                                  .IF DIF B,<#1>
                                  .ERROR  ;ILL. ARG. ''#1'' ONLY 'B'' IS ALLOWED.
                                  .MEXIT
                                  .ENDC
                                  M$GNINS <CLR    -(SP)>
                                  M$GNINS <BISB   ,(SP)>
                                  .ENDC
```

```
                                .ENDC
      014602                    M$GNINS <MOV     SP,R0>
                                .IF LT SVCINS
                                MOV      SP,R0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
      014602  010600                     MOV     SP,R0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                 MOV     SP,R0
                                         .NLIST
                                .ENDC
      014604                    M$SVC    C$PNTF
                                .MCALL  M$GNINS,M$TSTLAB
      014604                    M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL         \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
      014604                    M$GNINS <TRAP    C$PNTF>
                                .IF LT SVCINS
                                TRAP     C$PNTF
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
      014604  104417                     TRAP    C$PNTF
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                 TRAP    C$PNTF
                                         .NLIST
                                .ENDC
                                .IRP     N,<\T$ARGCNT*2+2>
                                M$GNINS <ADD     #N,SP>
                                .ENDM
      014606                    M$GNINS <ADD     #4,SP>
                                .IF LT SVCINS
                                ADD      #4,SP
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
      014606  062706  000004             ADD     #4,SP
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                 ADD     #4,SP
                                         .NLIST
                                .ENDC
                                .MEXIT
                                .ENDC
```

```
                                        .IF B   <>
                                        M$PRINT C$PNTF,#JFK5,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTF,#JFK5,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTF,#JFK5,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTF,#JFK5,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTF,#JFK5,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTF,#JFK5,<>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        .IF B   <>
                                        M$PRINT C$PNTF,#JFK5,<>,<>,<>,<>,<>,<>,<>
                                        .MEXIT
                                        .ENDC
                                        M$PRINT C$PNTF,#JFK5,<>,<>,<>,<>,<>,<>,<>,<>
 35
 36 014612                                      EXIT    TST
                                        .MCALL  M$SVC,M$EXIT,M$EXSEG,M$EXTJ,M$GETTOP,M$CHECK,M$WORD,XFER
                 000041                 T$FLAG=F$END
    014612                              M$CHECK TST,T$TEMP,T$FLAG
                                        .IF IDN <TST>,<TST>
                 010020                 T$TEMP=T$$TEST
                 000040                 T$FLAG=I$TST
                                        .MEXIT
                                        .ENDC
                                        .IF IDN <SUB>,<TST>
                                        T$TEMP=T$$SUB
                                        T$FLAG=I$SUB
                                        .MEXIT
                                        .ENDC
                                        .IF IDN <SEG>,<TST>
                                        T$TEMP=T$$SEG
                                        T$FLAG=I$SEG
                                        .MEXIT
                                        .ENDC
                                        .IF IDN <INIT>,<TST>
                                        T$TEMP=T$$INIT
                                        T$FLAG=I$INIT
                                        .MEXIT
                                        .ENDC
                                        .IF IDN <CLN>,<TST>
                                        T$TEMP=T$$CLEAN
                                        T$FLAG=I$CLN
```

```
                        .MEXIT
                        .ENDC
                        .IF IDN <SRV>,<TST>
                        T$TEMP=T$$SRV
                        T$FLAG=I$SRV
                        .MEXIT
                        .ENDC
                        .IF IDN <MSG>,<TST>
                        T$TEMP=T$$MSG
                        T$FLAG=F$JMP
                        .MEXIT
                        .ENDC
                        .IF IDN <RPT>,<TST>
                        T$TEMP=T$$RPT
                        T$FLAG=F$JMP
                        .MEXIT
                        .ENDC
                        .IF IDN <DU>,<TST>
                        T$TEMP=T$$DU
                        T$FLAG=F$JMP
                        .MEXIT
                        .ENDC
                        .IF IDN <AU>,<TST>
                        T$TEMP=T$$AU
                        T$FLAG=F$JMP
                        .MEXIT
                        .ENDC
                        .IF EQ T$FLAG-F$JMP
                        M$WORD  J$JMP
                        M$EXTJ  \T$TEMP
                        .MEXIT
                        .ENDC
                        .IF EQ  T$FLAG-F$BGN
014612                  M$SVC    C$EXIT
                        .MCALL  M$GNINS,M$TSTLAB
014612                  M$TSTLAB
                        .MCALL  M$TLABEL,M$INCR
                        .IIF LT T$TSTMAC, .MEXIT
                        .RADIX  10
                        M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                        .RADIX  8
                        M$INCR  T$TSTSEQ
014612                  M$GNINS <TRAP    C$EXIT>
                        .IF LT SVCINS
                        TRAP    C$EXIT
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
014612  104432                  TRAP    C$EXIT
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                        TRAP    C$EXIT
                                .NLIST
                        .ENDC
                        .IF IDN <SEG>,<TST>
```

```
                                M$GETTOP T$SEK,T$SEGLEV,T$TEMP
                                M$EXSEG \T$TEMP
                                .IFF
     014614                     M$EXIT  \T$TEMP
                                .MCALL  M$GNINS
     014614                     M$GNINS <.WORD  L10020-.>
                                .IF LT SVCINS
                                .WORD   L10020-.
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     014614  000114                     .WORD   L10020-.
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                    .WORD   L10020-.
                                          .NLIST
                                .ENDC
                                .ENDC
                                .MEXIT
                                .ENDC
                                .IF IDN <HRD>,<TST>
                                M$GETTOP        T$NS,T$NESTLEV,T$TEMP
                                .IF EQ  F$HARD-T$TEMP
                                .IRP    N,<\T$$HARD>
                                XFER    L'N
                                .ENDM
                                .MEXIT
                                .ENDC
                                .ENDC
                                .IF IDN <SFT>,<TST>
                                M$GETTOP        T$NS,T$NESTLEV,T$TEMP
                                .IF EQ  F$SOFT-T$TEMP
                                .IRP    N,<\T$$SOFT>
                                XFER    L'N
                                .ENDM
                                .MEXIT
                                .ENDC
                                .ENDC
                                .ERROR  ;ILL. "EXIT TST" STMT.
  37
  38 014616                     NOGOER: ERRSF   NOGOM
                                .MCALL  M$ERRINS
     014616                     M$ERRINS        NOGOM,,,C$ERSF
                                .MCALL  M$GNINS,M$WORD,M$TSTLAB
     014616                     M$SVC   C$ERSF
                                .MCALL  M$GNINS,M$TSTLAB
     014616                     M$TSTLAB
                                .MCALL  M$TLABEL,M$INCR
                                .IIF LT T$TSTMAC, .MEXIT
                                .RADIX  10
                                M$TLABEL        \T$TESTNUN,\T$TSTSEQ
                                .RADIX  8
                                M$INCR  T$TSTSEQ
     014616                     M$GNINS <TRAP   C$ERSF>
                                .IF LT SVCINS
```

```
                                TRAP    C$ERSF
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
        014616  104454                  TRAP    C$ERSF
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        TRAP    C$ERSF
                                        .NLIST
                                .ENDC
                000012          .RADIX  10
                                .IF NB  NOGOM
                014626          T$ERRNUM=NOGOM
                                .IFF
                                .ERROR  ;MISSING ERROR-NR
                                .ENDC
        014620                  M$WORD  \T$ERRNUM
                                .MCALL  M$GNINS
                                .IRP    N,<6550>
                                M$GNINS <.WORD  N>
                                .ENDM
        014620                  M$GNINS <.WORD  6550>
                                .IF LT SVCINS
                                .WORD   6550
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
        014620  014626                  .WORD   6550
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   6550
                                        .NLIST
                                .ENDC
                000010          .RADIX  8
                                .IF NB
                                M$WORD
                                .IFF
        014622                  M$WORD  0
                                .MCALL  M$GNINS
                                .IRP    N,<0>
                                M$GNINS <.WORD  N>
                                .ENDM
        014622                  M$GNINS <.WORD  0>
                                .IF LT SVCINS
                                .WORD   0
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
        014622  000000                  .WORD   0
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
```

```
                                                                        .WORD   0
                                               .NLIST
                                   .ENDC
                                   .ENDC
                                   .IF NB
                                   M$WORD
                                   .IFF
   014624                          M$WORD  0
                                   .MCALL  M$GNINS
                                   .IRP    N,<0>
                                   M$GNINS <.WORD  N>
                                   .ENDM
   014624                          M$GNINS <.WORD  0>
                                   .IF LT SVCINS
                                   .WORD   0
                                   .MEXIT
                                   .ENDC
                                   .IF EQ SVCINS
   014624  000000                          .WORD   0
                                   .MEXIT
                                   .ENDC
                                   .IF GT SVCINS
                                   .LIST
                                                                        .WORD   0
                                               .NLIST
                                   .ENDC
                                   .ENDC
   014626     045     116     045  NOGOM:  .ASCIZ  /%N%ANO UNITS STARTED/
   014653     045     116     045  JFK1:   .ASCIZ  /%N%AFORMAT(S) BEGUN/
   014677     045     116     045  JFK5:   .ASCIZ  /%N%AFORMAT(S) COMPLETED/

                                           .EVEN

   014730                                  ENDTST
                                   .MCALL  M$POP,M$GNTAG,M$SVC,M$ENDERR
                                   .IF EQ  F$BGN-I$TST
           000041                  I$TST=F$END
                                   .IFF
                                   .ERROR  ;MISSING 'BGNTST''
                                   .MEXIT
                                   .ENDC
   014730                          M$POP   T$NS,T$NESTLEV,T$TEMP
                                   .MCALL  M$GETS,M$DECR
                                   .IF LT  T$NESTLEV
                                   .ERROR  T$NESTLEV        ; MACRO T$NS UNDERFLOW
                                   .MEXIT
                                   .ENDC
   014730                          M$GETS  T$NS,\T$NESTLEV,T$TEMP
           000001                  T$TEMP=T$NS1
   014730                          M$DECR  T$NESTLEV
           000000                  T$NESTLEV=T$NESTLEV-1
                                   .IF EQ F$TEST-T$TEMP
   014730                          M$GNTAG L,T$$TEST
                                   .MCALL  M$GEN
   014730                          M$GEN   L,\T$$TEST,SVCTAG
                                   .IF LE  SVCTAG
   014730                          L10020:
```

```
                                    .MEXIT
                                    .ENDC
                                    .LIST
                                                                               L10020:
                                          .NLIST
              010000                S$LSYM=T$LSYM
      014730                        M$SVC    C$ETST
                                    .MCALL   M$GNINS,M$TSTLAB
      014730                        M$TSTLAB
                                    .MCALL   M$TLABEL,M$INCR
                                    .IIF LT T$TSTMAC, .MEXIT
                                    .RADIX  10
                                    M$TLABEL          \T$TESTNUN,\T$TSTSEQ
                                    .RADIX  8
                                    M$INCR   T$TSTSEQ
      014730                        M$GNINS <TRAP    C$ETST>
                                    .IF LT SVCINS
                                    TRAP     C$ETST
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
      014730  104401                      TRAP     C$ETST
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                                     TRAP    C$ETST
                                                .NLIST
                                    .ENDC
              000041                I$TST=F$END
                                    .IFF
                                    M$ENDERR          ENDTST,T$TEMP
                                    .ENDC
    46
    47 014732                             ENDMOD
                                    .MCALL   M$POP,M$ENDERR
                                    .IF EQ   F$BGN-I$MOD
              000041                I$MOD=F$END
                                    .IFF
                                    .ERROR   ; MISSING 'BGNMOD''
                                    .MEXIT
                                    .ENDC
      014732                        M$POP    T$NS,T$NESTLEV,T$TEMP
                                    .MCALL   M$GETS,M$DECR
                                    .IF LT   T$NESTLEV
                                    .ERROR   T$NESTLEV        ; MACRO T$NS UNDERFLOW
                                    .MEXIT
                                    .ENDC
      014732                        M$GETS   T$NS,\T$NESTLEV,T$TEMP
              000000                T$TEMP=T$NS0
      014732                        M$DECR   T$NESTLEV
              177777                T$NESTLEV=T$NESTLEV-1
                                    .IF NE F$MOD-T$TEMP
                                    M$ENDERR          ENDMOD,T$TEMP
                                    .ENDC
```

```
                              ;       .TITLE PARAMETER CODING
                                      .SBTTL  HARDWARE PARAMETER CODING SECTION

  014732                              BGNMOD
                              .MCALL  M$GNGBL,M$PUSH
                              .IF NE  F$END-I$MOD
                              .ERROR  ;''BGNMOD'' IN MOD
                              .MEXIT
                              .IFF
          000040              I$MOD=F$BGN
                              .ENDC
                              .IF NB
                              M$GNGBL
                              .ENDC
  014732                      M$PUSH  T$NS,T$NESTLEV,F$MOD
                              .MCALL  M$INCR,M$SETS
  014732                      M$INCR  T$NESTLEV
          000000              T$NESTLEV=T$NESTLEV+1
  014732                      M$SETS  T$NS,\T$NESTLEV,F$MOD
          000000              T$NS0=F$MOD

                              ;++
                              ; THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
                              ; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
                              ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
                              ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
                              ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
                              ; WITH THE OPERATOR.
                              ;--

  014732                              BGNHRD
                              .MCALL  M$PUSH,M$INCR,M$GNINS,M$GNGBL
          000040              I$HRD=F$BGN
  014732                      M$PUSH  T$NS,T$NESTLEV,F$HARD
                              .MCALL  M$INCR,M$SETS
  014732                      M$INCR  T$NESTLEV
          000001              T$NESTLEV=T$NESTLEV+1
  014732                      M$SETS  T$NS,\T$NESTLEV,F$HARD
          000004              T$NS1=F$HARD
          010021              T$$HARD=T$TAGNUM
  014732                      M$INCR   T$TAGNUM
          010022              T$TAGNUM=T$TAGNUM+1
                              .IRP    TAG,<\T$$HARD>
                              M$GNINS <.WORD L'TAG'-L$HARD/2>
                              .ENDM
  014732                      M$GNINS <.WORD L10021-L$HARD/2>
                              .IF LT SVCINS
                              .WORD L10021-L$HARD/2
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
  014732  000052                      .WORD L10021-L$HARD/2
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                                .WORD L10021-L$HARD/2
```

```
                                                .NLIST
                                        .ENDC
   014734                               M$GNGBL L$HARD
                                        .MCALL  M$GEN
                                        .IF NB,L$HARD
                                        .IF NB,
                                        M$GEN   L$HARD,:,SVCGBL,
                                        .ENDC
                                        .IF B,
   014734                               M$GEN   L$HARD,:,SVCGBL,< >
                                        .IF LE  SVCGBL
   014734                               L$HARD::
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                                L$HARD::
                                                .NLIST
                                        .ENDC
                                        .ENDC


                                        ;
                                        ;       HARDWARE PARAMATER TABLE FORMAT
                                        ;

                 000000                 PT.UBA  =       0       ; UNIBUS ADDRESS
                 000002                 PT.UNIT =       2       ; UNIT NUMBER
                 000004                 PT.FLAG =       4       ; STARTUP FLAGS
                 000006                 PT.SNUM =       6       ; SERIAL NUMBER

   014734                                       GPRMA   PTM.UBA ,PT.UBA,0,0,-1,YES
                                        .MCALL  M$RADIX,M$DEFAULT,M$EXCP,M$WORD,M$CNTOP
                                        .IF IDN A,O
                                        .ERROR  ;INVALID RADIX
                                        .ENDC
                 000000                 T$TEMP=PT.UBA&1
                                        .IF NE  T$TEMP & 1
                                        .ERROR  ;ODD OFFSET
                                        .ENDC
                                        .IF LT  G$OFSIZE-PT.UBA
                                        .ERROR  ;OFFSET TOO BIG
                                        .ENDC
                 000001                 T$CODE=G$PRMA + <PT.UBA * G$OFFSET>
   014734                               M$RADIX O,T$TEMP
                                        .IF IDN B,O
                                        T$TEMP=G$RADB
                                        .MEXIT
                                        .ENDC
                                        .IF IDN O,O
                 000020                 T$TEMP=G$RADO
                                        .MEXIT
                                        .ENDC
                                        .IF IDN D,O
                                        T$TEMP=G$RADD
                                        .MEXIT
                                        .ENDC
                                        .IF IDN L,O
                                        T$TEMP=G$RADL
```

```
                                        .MEXIT
                                        .ENDC
                                        .IF IDN A,0
                                        T$TEMP=G$RADA
                                        .MEXIT
                                        .ENDC
                                        T$TEMP=-1
                                        .ERROR  ;ILL. RADIX "0"
               000021                   T$CODE=T$CODE ! T$TEMP
        014734                          M$DEFAULT       YES,T$TEMP
                                        .IF IDN YES,YES
               000010                   T$TEMP=G$YES
                                        .MEXIT
                                        .ENDC
                                        .IF IDN NO,YES
                                        T$TEMP=G$NO
                                        .MEXIT
                                        .ENDC
                                        T$TEMP=-1
                                        .ERROR  ;DEFAULT "YES" MUST BE "YES" OR "NO"
               000031                   T$CODE=T$CODE ! T$TEMP
               000000                   T$EXCP=0
        014734                          M$EXCP  T$CODE,T$EXCP,G$LOLIM,T$LOLIM,0
                                        .IF IDN <@>,<0>
                                        .IF LT G$OFSIZE-
                                        .ERROR  ;INDIRECT PAR. TOO BIG
                                        .MEXIT
                                        .ENDC
                                        T$LOLIM=/2
                                        T$CODE=T$CODE ! G$EXCP
                                        T$EXCP=T$EXCP ! G$LOLIM
                                        .IFF
                                        .IF B,
               000000                   T$LOLIM=0
                                        .IFF
                                        .ERROR  ;ILL. DEFERRED MODE
                                        .ENDC
                                        .ENDC
        014734                          M$EXCP  T$CODE,T$EXCP,G$HILIM,T$HILIM,-1
                                        .IF IDN <@>,<-1>
                                        .IF LT G$OFSIZE-
                                        .ERROR  ;INDIRECT PAR. TOO BIG
                                        .MEXIT
                                        .ENDC
                                        T$HILIM=/2
                                        T$CODE=T$CODE ! G$EXCP
                                        T$EXCP=T$EXCP ! G$HILIM
                                        .IFF
                                        .IF B,
               177777                   T$HILIM=-1
                                        .IFF
                                        .ERROR  ;ILL. DEFERRED MODE
                                        .ENDC
                                        .ENDC
        014734                          M$CNTOP <>,<T$CODE>
                                        .IF NB
                                        .IF NE  I$SFT - F$BGN
```

```
                                .ERROR  ; ''COUNT'' OPTION VALID ONLY IN S.W. QUES.
                                .MEXIT
                                .ENDC
                                T$CODE=T$CODE ! G$CNTOP
                                .ENDC
     014734                     M$WORD  <T$CODE,PTM.UBA,T$LOLIM,T$HILIM>
                                .MCALL  M$GNINS
                                .IRP    N,<T$CODE,PTM.UBA,T$LOLIM,T$HILIM>
                                M$GNINS <.WORD  N>
                                .ENDM
     014734                     M$GNINS <.WORD  T$CODE>
                                .IF LT SVCINS
                                .WORD   T$CODE
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     014734  000031                     .WORD   T$CODE
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                            .WORD   T$CODE
                                                .NLIST
                                .ENDC
     014736                     M$GNINS <.WORD  PTM.UBA>
                                .IF LT SVCINS
                                .WORD   PTM.UBA
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     014736  015060                     .WORD   PTM.UBA
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                            .WORD   PTM.UBA
                                                .NLIST
                                .ENDC
     014740                     M$GNINS <.WORD  T$LOLIM>
                                .IF LT SVCINS
                                .WORD   T$LOLIM
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     014740  000000                     .WORD   T$LOLIM
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                            .WORD   T$LOLIM
                                                .NLIST
                                .ENDC
     014742                     M$GNINS <.WORD  T$HILIM>
                                .IF LT SVCINS
                                .WORD   T$HILIM
                                .MEXIT
                                .ENDC
```

```
                                        .IF EQ SVCINS
        014742  177777                          .WORD   T$HILIM
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        .WORD   T$HILIM
                                                        .NLIST
                                        .ENDC
                                        .IF NE  T$EXCP
                                        M$WORD  T$EXCP
                                        .ENDC
                                        .IF NB
                                        M$WORD </2>
                                        .ENDC
     27 014744                                  GPRMD   PTM.UNIT,PT.UNIT,D,-1,0,255,YES
                                        .MCALL  M$RADIX,M$DEFAULT,M$EXCP,M$WORD,M$CNTOP
                                        .IF IDN A,D
                                        .IF EQ T$GMANID
                                        .ERROR  ;ASCII RADIX VALID ONLY ON ''GMANID''
                                        .ENDC
                                        .ENDC
                000000                  T$TEMP=PT.UNIT&1
                                        .IF NE  T$TEMP & 1
                                        .ERROR  ;ODD OFFSET
                                        .ENDC
                                        .IF LT  G$OFSIZE-PT.UNIT
                                        .ERROR  ;OFFSET TOO BIG
                                        .ENDC
                001002                  T$CODE=G$PRMD + <PT.UNIT * G$OFFSET>
        014744                          M$RADIX D,T$TEMP
                                        .IF IDN B,D
                                        T$TEMP=G$RADB
                                        .MEXIT
                                        .ENDC
                                        .IF IDN O,D
                                        T$TEMP=G$RADO
                                        .MEXIT
                                        .ENDC
                                        .IF IDN D,D
                000040                  T$TEMP=G$RADD
                                        .MEXIT
                                        .ENDC
                                        .IF IDN L,D
                                        T$TEMP=G$RADL
                                        .MEXIT
                                        .ENDC
                                        .IF IDN A,D
                                        T$TEMP=G$RADA
                                        .MEXIT
                                        .ENDC
                                        T$TEMP=-1
                                        .ERROR  ;ILL. RADIX ''D''
                001042                  T$CODE=T$CODE ! T$TEMP
        014744                          M$DEFAULT       YES,T$TEMP
                                        .IF IDN YES,YES
                000010                  T$TEMP=G$YES
```

```
                               .MEXIT
                               .ENDC
                               .IF IDN NO,YES
                               T$TEMP=G$NO
                               .MEXIT
                               .ENDC
                               T$TEMP=-1
                               .ERROR  ;DEFAULT ''YES'' MUST BE ''YES'' OR ''NO''
          001052               T$CODE=T$CODE ! T$TEMP
          000000               T$EXCP=0
 014744                        M$EXCP  T$CODE,T$EXCP,G$LOLIM,T$LOLIM,0
                               .IF IDN <@>,<0>
                               .IF LT G$OFSIZE-
                               .ERROR  ;INDIRECT PAR. TOO BIG
                               .MEXIT
                               .ENDC
                               T$LOLIM=/2
                               T$CODE=T$CODE ! G$EXCP
                               T$EXCP=T$EXCP ! G$LOLIM
                               .IFF
                               .IF B,
          000000               T$LOLIM=0
                               .IFF
                               .ERROR  ;ILL. DEFERRED MODE
                               .ENDC
                               .ENDC
 014744                        M$EXCP  T$CODE,T$EXCP,G$HILIM,T$HILIM,255
                               .IF IDN <@>,<255>
                               .IF LT G$OFSIZE-
                               .ERROR  ;INDIRECT PAR. TOO BIG
                               .MEXIT
                               .ENDC
                               T$HILIM=/2
                               T$CODE=T$CODE ! G$EXCP
                               T$EXCP=T$EXCP ! G$HILIM
                               .IFF
                               .IF B,
          000255               T$HILIM=255
                               .IFF
                               .ERROR  ;ILL. DEFERRED MODE
                               .ENDC
                               .ENDC
 014744                        M$CNTOP <>,<T$CODE>
                               .IF NB
                               .IF NE  I$SFT - F$BGN
                               .ERROR  ; ''COUNT'' OPTION VALID ONLY IN S.W. QUES.
                               .MEXIT
                               .ENDC
                               T$CODE=T$CODE ! G$CNTOP
                               .ENDC
 014744                        M$WORD  <T$CODE,PTM.UNIT,-1,T$LOLIM,T$HILIM>
                               .MCALL  M$GNINS
                               .IRP    N,<T$CODE,PTM.UNIT,-1,T$LOLIM,T$HILIM>
                               M$GNINS <.WORD  N>
                               .ENDM
 014744                        M$GNINS <.WORD  T$CODE>
                               .IF LT SVCINS
```

```
                        .WORD   T$CODE
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
014744  001052                  .WORD   T$CODE
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                .WORD   T$CODE
                                        .NLIST
                        .ENDC
014746                  M$GNINS <.WORD  PTM.UNIT>
                        .IF LT SVCINS
                        .WORD   PTM.UNIT
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
014746  015106                  .WORD   PTM.UNIT
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                .WORD   PTM.UNIT
                                        .NLIST
                        .ENDC
014750                  M$GNINS <.WORD  -1>
                        .IF LT SVCINS
                        .WORD   -1
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
014750  177777                  .WORD   -1
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                .WORD   -1
                                        .NLIST
                        .ENDC
014752                  M$GNINS <.WORD  T$LOLIM>
                        .IF LT SVCINS
                        .WORD   T$LOLIM
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
014752  000000                  .WORD   T$LOLIM
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                .WORD   T$LOLIM
                                        .NLIST
                        .ENDC
014754                  M$GNINS <.WORD  T$HILIM>
                        .IF LT SVCINS
                        .WORD   T$HILIM
```

```
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
      014754  000255                      .WORD    T$HILIM
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                      .WORD    T$HILIM
                                          .NLIST
                                .ENDC
                                .IF NE  T$EXCP
                                M$WORD  T$EXCP
                                .ENDC
                                .IF NB
                                M$WORD </2>
                                .ENDC
   28 014756                              GPRML    PTM.RES,PT.FLAG,USERES,YES        ; Q1
                                .MCALL  M$RADIX,M$DEFAULT,M$WORD,M$CNTOP
              000000            T$TEMP=PT.FLAG&1
                                .IF NE  T$TEMP & 1
                                .ERROR  ;ODD OFFSET
                                .ENDC
                                .IF LT  G$OFSIZE-PT.FLAG
                                .ERROR  ;OFFSET TOO BIG
                                .ENDC
              002000            T$CODE=G$PRML + <PT.FLAG * G$OFFSET>
      014756                    M$RADIX L,T$TEMP
                                .IF IDN B,L
                                T$TEMP=G$RADB
                                .MEXIT
                                .ENDC
                                .IF IDN O,L
                                T$TEMP=G$RADO
                                .MEXIT
                                .ENDC
                                .IF IDN D,L
                                T$TEMP=G$RADD
                                .MEXIT
                                .ENDC
                                .IF IDN L,L
              000120            T$TEMP=G$RADL
                                .MEXIT
                                .ENDC
                                .IF IDN A,L
                                T$TEMP=G$RADA
                                .MEXIT
                                .ENDC
                                T$TEMP=-1
                                .ERROR  ;ILL. RADIX "L"
              002120            T$CODE=T$CODE ! T$TEMP
      014756                    M$DEFAULT         YES,T$TEMP
                                .IF IDN YES,YES
              000010            T$TEMP=G$YES
                                .MEXIT
                                .ENDC
                                .IF IDN NO,YES
```

```
                                T$TEMP=G$NO
                                .MEXIT
                                .ENDC
                                T$TEMP=-1
                                .ERROR  ;DEFAULT ''YES'' MUST BE ''YES'' OR ''NO''
                002130          T$CODE=T$CODE ! T$TEMP
        014756                  M$CNTOP <>,<T$CODE>
                                .IF NB
                                .IF NE  I$SFT - F$BGN
                                .ERROR  ; ''COUNT'' OPTION VALID ONLY IN S.W. QUES.
                                .MEXIT
                                .ENDC
                                T$CODE=T$CODE ! G$CNTOP
                                .ENDC
        014756                  M$WORD  <T$CODE,PTM.RES,USERES>
                                .MCALL  M$GNINS
                                .IRP    N,<T$CODE,PTM.RES,USERES>
                                M$GNINS <.WORD  N>
                                .ENDM
        014756                  M$GNINS <.WORD  T$CODE>
                                .IF LT SVCINS
                                .WORD   T$CODE
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
        014756  002130                  .WORD   T$CODE
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   T$CODE
                                        .NLIST
                                .ENDC
        014760                  M$GNINS <.WORD  PTM.RES>
                                .IF LT SVCINS
                                .WORD   PTM.RES
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
        014760  015134                  .WORD   PTM.RES
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   PTM.RES
                                        .NLIST
                                .ENDC
        014762                  M$GNINS <.WORD  USERES>
                                .IF LT SVCINS
                                .WORD   USERES
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
        014762  000001                  .WORD   USERES
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
```

```
                                .LIST
                                                                                    .WORD   USERES
                                                .NLIST
                                .ENDC
                                .IF NB
                                M$WORD  </2>
                                .ENDC
     29 014764                          XFERF   ASKDLL                       ;      'N' -> Q4
                                .MCALL  M$XFER
        014764                  M$XFER  X$FALSE,ASKDLL
                                .MCALL  M$GETTOP,M$WORD
        014764                  M$GETTOP        T$NS,T$NESTLEV,T$CODE
                                .MCALL  M$GETS
        014764                  M$GETS  T$NS,\T$NESTLEV,T$CODE
               000004           T$CODE=T$NS1
                                .IF NE F$HARD - T$CODE
                                .IF NE F$SOFT - T$CODE
                                .ERROR  ;''XFER'S'' MUST BE IN GPRM CODING.
                                .MEXIT
                                .ENDC
                                .ENDC
               000014           T$CODE=ASKDLL - .
                                .IF GT T$CODE-376
                                .ERROR  ;''XFER'' RANGE TOO BIG
                                .MEXIT
                                .ENDC
               006000           T$CODE=T$CODE * X$OFFSET
               006044           T$CODE=T$CODE + G$XFER + X$FALSE
        014764                  M$WORD  T$CODE
                                .MCALL  M$GNINS
                                .IRP    N,<T$CODE>
                                M$GNINS <.WORD  N>
                                .ENDM
        014764                  M$GNINS <.WORD  T$CODE>
                                .IF LT SVCINS
                                .WORD   T$CODE
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
        014764  006044                  .WORD   T$CODE
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                    .WORD   T$CODE
                                                .NLIST
                                .ENDC
     30 014766                          GPRML   PTM.STP,PT.FLAG,STPBAD,YES          ; Q2
                                .MCALL  M$RADIX,M$DEFAULT,M$WORD,M$CNTOP
               000000           T$TEMP=PT.FLAG&1
                                .IF NE  T$TEMP & 1
                                .ERROR  ;ODD OFFSET
                                .ENDC
                                .IF LT  G$OFSIZE-PT.FLAG
                                .ERROR  ;OFFSET TOO BIG
                                .ENDC
               002000           T$CODE=G$PRML + <PT.FLAG * G$OFFSET>
```

```
014766                  M$RADIX L,T$TEMP
                        .IF IDN B,L
                        T$TEMP=G$RADB
                        .MEXIT
                        .ENDC
                        .IF IDN O,L
                        T$TEMP=G$RADO
                        .MEXIT
                        .ENDC
                        .IF IDN D,L
                        T$TEMP=G$RADD
                        .MEXIT
                        .ENDC
                        .IF IDN L,L
        000120          T$TEMP=G$RADL
                        .MEXIT
                        .ENDC
                        .IF IDN A,L
                        T$TEMP=G$RADA
                        .MEXIT
                        .ENDC
                        T$TEMP=-1
                        .ERROR  ;ILL. RADIX ''L''
        002120          T$CODE=T$CODE ! T$TEMP
014766                  M$DEFAULT        YES,T$TEMP
                        .IF IDN YES,YES
        000010          T$TEMP=G$YES
                        .MEXIT
                        .ENDC
                        .IF IDN NO,YES
                        T$TEMP=G$NO
                        .MEXIT
                        .ENDC
                        T$TEMP=-1
                        .ERROR  ;DEFAULT ''YES'' MUST BE ''YES'' OR ''NO''
        002130          T$CODE=T$CODE ! T$TEMP
014766                  M$CNTOP <>,<T$CODE>
                        .IF NB
                        .IF NE  I$SFT - F$BGN
                        .ERROR  ; ''COUNT'' OPTION VALID ONLY IN S.W. QUES.
                        .MEXIT
                        .ENDC
                        T$CODE=T$CODE ! G$CNTOP
                        .ENDC
014766                  M$WORD  <T$CODE,PTM.STP,STPBAD>
                        .MCALL  M$GNINS
                        .IRP    N,<T$CODE,PTM.STP,STPBAD>
                        M$GNINS <.WORD  N>
                        .ENDM
014766                  M$GNINS <.WORD  T$CODE>
                        .IF LT SVCINS
                        .WORD   T$CODE
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
014766  002130                  .WORD   T$CODE
                        .MEXIT
```

```
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                             .WORD   T$CODE
                                                     .NLIST
                                        .ENDC
   014770                               M$GNINS <.WORD  PTM.STP>
                                        .IF LT SVCINS
                                        .WORD   PTM.STP
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
   014770  015155                              .WORD   PTM.STP
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                             .WORD   PTM.STP
                                                     .NLIST
                                        .ENDC
   014772                               M$GNINS <.WORD  STPBAD>
                                        .IF LT SVCINS
                                        .WORD   STPBAD
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
   014772  000002                              .WORD   STPBAD
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                             .WORD   STPBAD
                                                     .NLIST
                                        .ENDC
                                        .IF NB
                                        M$WORD  </2>
                                        .ENDC
   014774                                      XFERT   PTDONE                       ;     'Y' -> DONE
                                        .MCALL  M$XFER
   014774                               M$XFER  X$TRUE,PTDONE
                                        .MCALL  M$GETTOP,M$WORD
   014774                               M$GETTOP        T$NS,T$NESTLEV,T$CODE
                                        .MCALL  M$GETS
   014774                               M$GETS  T$NS,\T$NESTLEV,T$CODE
           000004                       T$CODE=T$NS1
                                        .IF NE F$HARD - T$CODE
                                        .IF NE F$SOFT - T$CODE
                                        .ERROR  ;''XFER'S'' MUST BE IN GPRM CODING.
                                        .MEXIT
                                        .ENDC
                                        .ENDC
           000064                       T$CODE=PTDONE - .
                                        .IF GT T$CODE-376
                                        .ERROR  ;''XFER'' RANGE TOO BIG
                                        .MEXIT
                                        .ENDC
           032000                       T$CODE=T$CODE * X$OFFSET
```

```
        032024          T$CODE=T$CODE + G$XFER + X$TRUE
  014774                M$WORD  T$CODE
                        .MCALL  M$GNINS
                        .IRP    N,<T$CODE>
                        M$GNINS <.WORD  N>
                        .ENDM
  014774                M$GNINS <.WORD  T$CODE>
                        .IF LT SVCINS
                        .WORD   T$CODE
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
  014774  032024                .WORD   T$CODE
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                        .WORD   T$CODE
                                        .NLIST
                        .ENDC
32 014776                       XFER    GTSNUM                  ;       'N' -> Q3
                        .MCALL  M$XFER
  014776                M$XFER  X$ALWAYS,GTSNUM
                        .MCALL  M$GETTOP,M$WORD
  014776                M$GETTOP        T$NS,T$NESTLEV,T$CODE
                        .MCALL  M$GETS
  014776                M$GETS  T$NS,\T$NESTLEV,T$CODE
        000004          T$CODE=T$NS1
                        .IF NE F$HARD - T$CODE
                        .IF NE F$SOFT - T$CODE
                        .ERROR  ;''XFER'S'' MUST BE IN GPRM CODING.
                        .MEXIT
                        .ENDC
                        .ENDC
        000012          T$CODE=GTSNUM - .
                        .IF GT T$CODE-376
                        .ERROR  ;''XFER'' RANGE TOO BIG
                        .MEXIT
                        .ENDC
        005000          T$CODE=T$CODE * X$OFFSET
        005004          T$CODE=T$CODE + G$XFER + X$ALWAYS
  014776                M$WORD  T$CODE
                        .MCALL  M$GNINS
                        .IRP    N,<T$CODE>
                        M$GNINS <.WORD  N>
                        .ENDM
  014776                M$GNINS <.WORD  T$CODE>
                        .IF LT SVCINS
                        .WORD   T$CODE
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
  014776  005004                .WORD   T$CODE
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
```

```
                                                                                    .WORD   T$CODE
                                                  .NLIST
                                  .ENDC
     33 015000                    ASKDLL:
     34 015000                            GPRML   PTM.DLL,PT.FLAG,DLLFCT,YES       ; Q4
                                  .MCALL  M$RADIX,M$DEFAULT,M$WORD,M$CNTOP
            000000                T$TEMP=PT.FLAG&1
                                  .IF NE  T$TEMP & 1
                                  .ERROR  ;ODD OFFSET
                                  .ENDC
                                  .IF LT  G$OFSIZE-PT.FLAG
                                  .ERROR  ;OFFSET TOO BIG
                                  .ENDC
            002000                T$CODE=G$PRML + <PT.FLAG * G$OFFSET>
        015000                    M$RADIX L,T$TEMP
                                  .IF IDN B,L
                                  T$TEMP=G$RADB
                                  .MEXIT
                                  .ENDC
                                  .IF IDN O,L
                                  T$TEMP=G$RADO
                                  .MEXIT
                                  .ENDC
                                  .IF IDN D,L
                                  T$TEMP=G$RADD
                                  .MEXIT
                                  .ENDC
                                  .IF IDN L,L
            000120                T$TEMP=G$RADL
                                  .MEXIT
                                  .ENDC
                                  .IF IDN A,L
                                  T$TEMP=G$RADA
                                  .MEXIT
                                  .ENDC
                                  T$TEMP=-1
                                  .ERROR  ;ILL. RADIX ''L''
            002120                T$CODE=T$CODE ! T$TEMP
        015000                    M$DEFAULT           YES,T$TEMP
                                  .IF IDN YES,YES
            000010                T$TEMP=G$YES
                                  .MEXIT
                                  .ENDC
                                  .IF IDN NO,YES
                                  T$TEMP=G$NO
                                  .MEXIT
                                  .ENDC
                                  T$TEMP=-1
                                  .ERROR  ;DEFAULT ''YES'' MUST BE ''YES'' OR ''NO''
            002130                T$CODE=T$CODE ! T$TEMP
        015000                    M$CNTOP <>,<T$CODE>
                                  .IF NB
                                  .IF NE  I$SFT - F$BGN
                                  .ERROR  ; ''COUNT'' OPTION VALID ONLY IN S.W. QUES.
                                  .MEXIT
                                  .ENDC
                                  T$CODE=T$CODE ! G$CNTOP
```

```
                                        .ENDC
      015000                            M$WORD  <T$CODE,PTM.DLL,DLLFCT>
                                        .MCALL  M$GNINS
                                        .IRP    N,<T$CODE,PTM.DLL,DLLFCT>
                                        M$GNINS <.WORD  N>
                                        .ENDM
      015000                            M$GNINS <.WORD  T$CODE>
                                        .IF LT SVCINS
                                        .WORD   T$CODE
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      015000  002130                            .WORD   T$CODE
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                      .WORD   T$CODE
                                                        .NLIST
                                        .ENDC
      015002                            M$GNINS <.WORD  PTM.DLL>
                                        .IF LT SVCINS
                                        .WORD   PTM.DLL
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      015002  015211                            .WORD   PTM.DLL
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                      .WORD   PTM.DLL
                                                        .NLIST
                                        .ENDC
      015004                            M$GNINS <.WORD  DLLFCT>
                                        .IF LT SVCINS
                                        .WORD   DLLFCT
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      015004  000004                            .WORD   DLLFCT
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                      .WORD   DLLFCT
                                                        .NLIST
                                        .ENDC
                                        .IF NB
                                        M$WORD  </2>
                                        .ENDC
   35 015006                                    XFERT   PTDONE                 ;      'Y' -> DONE
                                        .MCALL  M$XFER
      015006                            M$XFER  X$TRUE,PTDONE
                                        .MCALL  M$GETTOP,M$WORD
      015006                            M$GETTOP        T$NS,T$NESTLEV,T$CODE
                                        .MCALL  M$GETS
```

```
      015006                            M$GETS  T$NS,\T$NESTLEV,T$CODE
              000004                    T$CODE=T$NS1
                                        .IF NE F$HARD - T$CODE
                                        .IF NE F$SOFT - T$CODE
                                        .ERROR  ;''XFER'S'' MUST BE IN GPRM CODING.
                                        .MEXIT
                                        .ENDC
                                        .ENDC
              000052                    T$CODE=PTDONE - .
                                        .IF GT T$CODE-376
                                        .ERROR  ;''XFER'' RANGE TOO BIG
                                        .MEXIT
                                        .ENDC
              025000                    T$CODE=T$CODE * X$OFFSET
              025024                    T$CODE=T$CODE + G$XFER + X$TRUE
      015006                            M$WORD  T$CODE
                                        .MCALL  M$GNINS
                                        .IRP    N,<T$CODE>
                                        M$GNINS <.WORD  N>
                                        .ENDM
      015006                            M$GNINS <.WORD  T$CODE>
                                        .IF LT SVCINS
                                        .WORD   T$CODE
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
      015006  025024                            .WORD   T$CODE
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                                   .WORD   T$CODE
                                                        .NLIST
                                        .ENDC
   36 015010                            GTSNUM:
   37 015010                                    GPRMD   PTM.SNUM,PT.SNUM,D,-1,0,-1,NO   ; Q3
                                        .MCALL  M$RADIX,M$DEFAULT,M$EXCP,M$WORD,M$CNTOP
                                        .IF IDN A,D
                                        .IF EQ T$GMANID
                                        .ERROR  ;ASCII RADIX VALID ONLY ON ''GMANID''
                                        .ENDC
                                        .ENDC
              000000                    T$TEMP=PT.SNUM&1
                                        .IF NE  T$TEMP & 1
                                        .ERROR  ;ODD OFFSET
                                        .ENDC
                                        .IF LT  G$OFSIZE-PT.SNUM
                                        .ERROR  ;OFFSET TOO BIG
                                        .ENDC
              003002                    T$CODE=G$PRMD + <PT.SNUM * G$OFFSET>
      015010                            M$RADIX D,T$TEMP
                                        .IF IDN B,D
                                        T$TEMP=G$RADB
                                        .MEXIT
                                        .ENDC
                                        .IF IDN O,D
                                        T$TEMP=G$RADO
```

```
                        .MEXIT
                        .ENDC
                        .IF IDN D,D
        000040          T$TEMP=G$RADD
                        .MEXIT
                        .ENDC
                        .IF IDN L,D
                        T$TEMP=G$RADL
                        .MEXIT
                        .ENDC
                        .IF IDN A,D
                        T$TEMP=G$RADA
                        .MEXIT
                        .ENDC
                        T$TEMP=-1
                        .ERROR  ;ILL. RADIX "D"
        003042          T$CODE=T$CODE ! T$TEMP
015010                  M$DEFAULT       NO,T$TEMP
                        .IF IDN YES,NO
                        T$TEMP=G$YES
                        .MEXIT
                        .ENDC
                        .IF IDN NO,NO
        000000          T$TEMP=G$NO
                        .MEXIT
                        .ENDC
                        T$TEMP=-1
                        .ERROR  ;DEFAULT "NO" MUST BE "YES" OR "NO"
        003042          T$CODE=T$CODE ! T$TEMP
        000000          T$EXCP=0
015010                  M$EXCP  T$CODE,T$EXCP,G$LOLIM,T$LOLIM,0
                        .IF IDN <@>,<0>
                        .IF LT G$OFSIZE-
                        .ERROR  ;INDIRECT PAR. TOO BIG
                        .MEXIT
                        .ENDC
                        T$LOLIM=/2
                        T$CODE=T$CODE ! G$EXCP
                        T$EXCP=T$EXCP ! G$LOLIM
                        .IFF
                        .IF B,
        000000          T$LOLIM=0
                        .IFF
                        .ERROR  ;ILL. DEFERRED MODE
                        .ENDC
                        .ENDC
015010                  M$EXCP  T$CODE,T$EXCP,G$HILIM,T$HILIM,-1
                        .IF IDN <@>,<-1>
                        .IF LT G$OFSIZE-
                        .ERROR  ;INDIRECT PAR. TOO BIG
                        .MEXIT
                        .ENDC
                        T$HILIM=/2
                        T$CODE=T$CODE ! G$EXCP
                        T$EXCP=T$EXCP ! G$HILIM
                        .IFF
                        .IF B,
```

```
         177777                  T$HILIM=-1
                                 .IFF
                                 .ERROR  ;ILL. DEFERRED MODE
                                 .ENDC
                                 .ENDC
 015010                          M$CNTOP <>,<T$CODE>
                                 .IF NB
                                 .IF NE  I$SFT - F$BGN
                                 .ERROR  ; ''COUNT'' OPTION VALID ONLY IN S.W. QUES.
                                 .MEXIT
                                 .ENDC
                                 T$CODE=T$CODE ! G$CNTOP
                                 .ENDC
 015010                          M$WORD  <T$CODE,PTM.SNUM,-1,T$LOLIM,T$HILIM>
                                 .MCALL  M$GNINS
                                 .IRP    N,<T$CODE,PTM.SNUM,-1,T$LOLIM,T$HILIM>
                                 M$GNINS <.WOPD  N>
                                 .ENDM
 015010                          M$GNINS <.WORD  T$CODE>
                                 .IF LT SVCINS
                                 .WORD   T$CODE
                                 .MEXIT
                                 .ENDC
                                 .IF EQ SVCINS
 015010  003042                          .WORD   T$CODE
                                 .MEXIT
                                 .ENDC
                                 .IF GT SVCINS
                                 .LIST
                                                                                  .WORD   T$CODE
                                                 .NLIST
                                 .ENDC
 015012                          M$GNINS <.WORD  PTM.SNUM>
                                 .IF LT SVCINS
                                 .WORD   PTM.SNUM
                                 .MEXIT
                                 .ENDC
                                 .IF EQ SVCINS
 015012  015234                          .WORD   PTM.SNUM
                                 .MEXIT
                                 .ENDC
                                 .IF GT SVCINS
                                 .LIST
                                                                                  .WORD   PTM.SNUM
                                                 .NLIST
                                 .ENDC
 015014                          M$GNINS <.WORD  -1>
                                 .IF LT SVCINS
                                 .WORD   -1
                                 .MEXIT
                                 .ENDC
                                 .IF EQ SVCINS
 015014  177777                          .WORD   -1
                                 .MEXIT
                                 .ENDC
                                 .IF GT SVCINS
                                 .LIST
```

```
                                                                                        .WORD   -1
                                                  .NLIST
                                    .ENDC
      015016                        M$GNINS <.WORD  T$LOLIM>
                                    .IF LT SVCINS
                                    .WORD   T$LOLIM
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
      015016  000000                        .WORD   T$LOLIM
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                                        .WORD   T$LOLIM
                                                  .NLIST
                                    .ENDC
      015020                        M$GNINS <.WORD  T$HILIM>
                                    .IF LT SVCINS
                                    .WORD   T$HILIM
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
      015020  177777                        .WORD   T$HILIM
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                                        .WORD   T$HILIM
                                                  .NLIST
                                    .ENDC
                                    .IF NE  T$EXCP
                                    M$WORD  T$EXCP
                                    .ENDC
                                    .IF NB
                                    M$WORD </2>
                                    .ENDC
   38 015022                                GPRMD   PTM.S2,PT.SNUM+2,D,-1,0,-1,NO
                                    .MCALL  M$RADIX,M$DEFAULT,M$EXCP,M$WORD,M$CNTOP
                                    .IF IDN A,D
                                    .IF EQ T$GMANID
                                    .ERROR  ;ASCII RADIX VALID ONLY ON ''GMANID''
                                    .ENDC
                                    .ENDC
              000000                T$TEMP=PT.SNUM+2&1
                                    .IF NE  T$TEMP & 1
                                    .ERROR  ;ODD OFFSET
                                    .ENDC
                                    .IF LT  G$OFSIZE-PT.SNUM+2
                                    .ERROR  ;OFFSET TOO BIG
                                    .ENDC
              004002                T$CODE=G$PRMD + <PT.SNUM+2 * G$OFFSET>
      015022                        M$RADIX D,T$TEMP
                                    .IF IDN B,D
                                    T$TEMP=G$RADB
                                    .MEXIT
                                    .ENDC
```

```
                                        .IF IDN O,D
                                        T$TEMP=G$RADO
                                        .MEXIT
                                        .ENDC
                                        .IF IDN D,D
            000040                      T$TEMP=G$RADD
                                        .MEXIT
                                        .ENDC
                                        .IF IDN L,D
                                        T$TEMP=G$RADL
                                        .MEXIT
                                        .ENDC
                                        .IF IDN A,D
                                        T$TEMP=G$RADA
                                        .MEXIT
                                        .ENDC
                                        T$TEMP=-1
                                        .ERROR  ;ILL. RADIX ''D''
            004042                      T$CODE=T$CODE ! T$TEMP
015022                                  M$DEFAULT       NO,T$TEMP
                                        .IF IDN YES,NO
                                        T$TEMP=G$YES
                                        .MEXIT
                                        .ENDC
                                        .IF IDN NO,NO
            000000                      T$TEMP=G$NO
                                        .MEXIT
                                        .ENDC
                                        T$TEMP=-1
                                        .ERROR  ;DEFAULT ''NO'' MUST BE ''YES'' OR ''NO''
            004042                      T$CODE=T$CODE ! T$TEMP
            000000                      T$EXCP=0
015022                                  M$EXCP  T$CODE,T$EXCP,G$LOLIM,T$LOLIM,0
                                        .IF IDN <a>,<0>
                                        .IF LT G$OFSIZE-
                                        .ERROR  ;INDIRECT PAR. TOO BIG
                                        .MEXIT
                                        .ENDC
                                        T$LOLIM=/2
                                        T$CODE=T$CODE ! G$EXCP
                                        T$EXCP=T$EXCP ! G$LOLIM
                                        .IFF
                                        .IF B,
            000000                      T$LOLIM=0
                                        .IFF
                                        .ERROR  ;ILL. DEFERRED MODE
                                        .ENDC
                                        .ENDC
015022                                  M$EXCP  T$CODE,T$EXCP,G$HILIM,T$HILIM,-1
                                        .IF IDN <a>,<-1>
                                        .IF LT G$OFSIZE-
                                        .ERROR  ;INDIRECT PAR. TOO BIG
                                        .MEXIT
                                        .ENDC
                                        T$HILIM=/2
                                        T$CODE=T$CODE ! G$EXCP
                                        T$EXCP=T$EXCP ! G$HILIM
```

```
                                        .IFF
                                        .IF B,
         177777                         T$HILIM=-1
                                        .IFF
                                        .ERROR  ;ILL. DEFERRED MODE
                                        .ENDC
                                        .ENDC
015022                                  M$CNTOP <>,<T$CODE>
                                        .IF NB
                                        .IF NE  I$SFT - F$BGN
                                        .ERROR  ; ''COUNT'' OPTION VALID ONLY IN S.W. QUES.
                                        .MEXIT
                                        .ENDC
                                        T$CODE=T$CODE ! G$CNTOP
                                        .ENDC
015022                                  M$WORD  <T$CODE,PTM.S2,-1,T$LOLIM,T$HILIM>
                                        .MCALL  M$GNINS
                                        .IRP    N,<T$CODE,PTM.S2,-1,T$LOLIM,T$HILIM>
                                        M$GNINS <.WORD  N>
                                        .ENDM
015022                                  M$GNINS <.WORD  T$CODE>
                                        .IF LT SVCINS
                                        .WORD   T$CODE
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
015022  004042                                  .WORD   T$CODE
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                .WORD   T$CODE
                                                        .NLIST
                                        .ENDC
015024                                  M$GNINS <.WORD  PTM.S2>
                                        .IF LT SVCINS
                                        .WORD   PTM.S2
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
015024  015320                                  .WORD   PTM.S2
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                .WORD   PTM.S2
                                                        .NLIST
                                        .ENDC
015026                                  M$GNINS <.WORD  -1>
                                        .IF LT SVCINS
                                        .WORD   -1
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
015026  177777                                  .WORD   -1
                                        .MEXIT
                                        .ENDC
```

```
                                .IF GT SVCINS
                                .LIST
                                                                                .WORD   -1
                                          .NLIST
                                .ENDC
     015030                     M$GNINS <.WORD  T$LOLIM>
                                .IF LT SVCINS
                                .WORD   T$LOLIM
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     015030  000000                     .WORD   T$LOLIM
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                .WORD   T$LOLIM
                                          .NLIST
                                .ENDC
     015032                     M$GNINS <.WORD  T$HILIM>
                                .IF LT SVCINS
                                .WORD   T$HILIM
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     015032  177777                     .WORD   T$HILIM
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                .WORD   T$HILIM
                                          .NLIST
                                .ENDC
                                .IF NE  T$EXCP
                                M$WORD  T$EXCP
                                .ENDC
                                .IF NB
                                M$WORD </2>
                                .ENDC
  39 015034                             GPRMD   PTM.S3,PT.SNUM+4,D,-1,0,-1,NO
                                .MCALL  M$RADIX,M$DEFAULT,M$EXCP,M$WORD,M$CNTOP
                                .IF IDN A,D
                                .IF EQ T$GMANID
                                .ERROR  ;ASCII RADIX VALID ONLY ON ''GMANID''
                                .ENDC
                                .ENDC
             000000             T$TEMP=PT.SNUM+4&1
                                .IF NE  T$TEMP & 1
                                .ERROR  ;ODD OFFSET
                                .ENDC
                                .IF LT  G$OFSIZE-PT.SNUM+4
                                .ERROR  ;OFFSET TOO BIG
                                .ENDC
             005002             T$CODE=G$PRMD + <PT.SNUM+4 * G$OFFSET>
     015034                     M$RADIX D,T$TEMP
                                .IF IDN B,D
                                T$TEMP=G$RADB
```

```
                        .MEXIT
                        .ENDC
                        .IF IDN O,D
                        T$TEMP=G$RADO
                        .MEXIT
                        .ENDC
                        .IF IDN D,D
         000040         T$TEMP=G$RADD
                        .MEXIT
                        .ENDC
                        .IF IDN L,D
                        T$TEMP=G$RADL
                        .MEXIT
                        .ENDC
                        .IF IDN A,D
                        T$TEMP=G$RADA
                        .MEXIT
                        .ENDC
                        T$TEMP=-1
                        .ERROR  ;ILL. RADIX ''D''
         005042         T$CODE=T$CODE ! T$TEMP
015034                  M$DEFAULT       NO,T$TEMP
                        .IF IDN YES,NO
                        T$TEMP=G$YES
                        .MEXIT
                        .ENDC
                        .IF IDN NO,NO
         000000         T$TEMP=G$NO
                        .MEXIT
                        .ENDC
                        T$TEMP=-1
                        .ERROR  ;DEFAULT ''NO'' MUST BE ''YES'' OR ''NO''
         005042         T$CODE=T$CODE ! T$TEMP
         000000         T$EXCP=0
015034                  M$EXCP  T$CODE,T$EXCP,G$LOLIM,T$LOLIM,0
                        .IF IDN <@>,<0>
                        .IF LT G$OFSIZE-
                        .ERROR  ;INDIRECT PAR. TOO BIG
                        .MEXIT
                        .ENDC
                        T$LOLIM=/2
                        T$CODE=T$CODE ! G$EXCP
                        T$EXCP=T$EXCP ! G$LOLIM
                        .IFF
                        .IF B,
         000000         T$LOLIM=0
                        .IFF
                        .ERROR  ;ILL. DEFERRED MODE
                        .ENDC
                        .ENDC
015034                  M$EXCP  T$CODE,T$EXCP,G$HILIM,T$HILIM,-1
                        .IF IDN <@>,<-1>
                        .IF LT G$OFSIZE-
                        .ERROR  ;INDIRECT PAR. TOO BIG
                        .MEXIT
                        .ENDC
                        T$HILIM=/2
```

```
                        T$CODE=T$CODE ! G$EXCP
                        T$EXCP=T$EXCP ! G$HILIM
                        .IFF
                        .IF B,
        177777          T$HILIM=-1
                        .IFF
                        .ERROR  ;ILL. DEFERRED MODE
                        .ENDC
                        .ENDC
015034                  M$CNTOP <>,<T$CODE>
                        .IF NB
                        .IF NE  I$SFT - F$BGN
                        .ERROR  ; ''COUNT'' OPTION VALID ONLY IN S.W. QUES.
                        .MEXIT
                        .ENDC
                        T$CODE=T$CODE ! G$CNTOP
                        .ENDC
015034                  M$WORD  <T$CODE,PTM.S3,-1,T$LOLIM,T$HILIM>
                        .MCALL  M$GNINS
                        .IRP    N,<T$CODE,PTM.S3,-1,T$LOLIM,T$HILIM>
                        M$GNINS <.WORD  N>
                        .ENDM
015034                  M$GNINS <.WORD  T$CODE>
                        .IF LT SVCINS
                        .WORD   T$CODE
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
015034  005042                  .WORD   T$CODE
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                        .WORD   T$CODE
                                        .NLIST
                        .ENDC
015036                  M$GNINS <.WORD  PTM.S3>
                        .IF LT SVCINS
                        .WORD   PTM.S3
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
015036  015327                  .WORD   PTM.S3
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                        .WORD   PTM.S3
                                        .NLIST
                        .ENDC
015040                  M$GNINS <.WORD  -1>
                        .IF LT SVCINS
                        .WORD   -1
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
015040  177777                  .WORD   -1
```

```
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                                .WORD   -1
                                        .NLIST
                        .ENDC
  015042                M$GNINS <.WORD  T$LOLIM>
                        .IF LT SVCINS
                        .WORD   T$LOLIM
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
  015042  000000                .WORD   T$LOLIM
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                                .WORD   T$LOLIM
                                        .NLIST
                        .ENDC
  015044                M$GNINS <.WORD  T$HILIM>
                        .IF LT SVCINS
                        .WORD   T$HILIM
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
  015044  177777                .WORD   T$HILIM
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                                .WORD   T$HILIM
                                        .NLIST
                        .ENDC
                        .IF NE  T$EXCP
                        M$WORD  T$EXCP
                        .ENDC
                        .IF NB
                        M$WORD </2>
                        .ENDC
40 015046                       GPRMD   PTM.S4,PT.SNUM+6,D,-1,0,-1,NO
                        .MCALL  M$RADIX,M$DEFAULT,M$EXCP,M$WORD,M$CNTOP
                        .IF IDN A,D
                        .IF EQ T$GMANID
                        .ERROR  ;ASCII RADIX VALID ONLY ON ''GMANID''
                        .ENDC
                        .ENDC
          000000        T$TEMP=PT.SNUM+6&1
                        .IF NE  T$TEMP & 1
                        .ERROR  ;ODD OFFSET
                        .ENDC
                        .IF LT  G$OFSIZE-PT.SNUM+6
                        .ERROR  ;OFFSET TOO BIG
                        .ENDC
          006002        T$CODE=G$PRMD + <PT.SNUM+6 * G$OFFSET>
  015046                M$RADIX D,T$TEMP
```

```
                                .IF IDN B,D
                                T$TEMP=G$RADB
                                .MEXIT
                                .ENDC
                                .IF IDN O,D
                                T$TEMP=G$RADO
                                .MEXIT
                                .ENDC
                                .IF IDN D,D
            000040              T$TEMP=G$RADD
                                .MEXIT
                                .ENDC
                                .IF IDN L,D
                                T$TEMP=G$RADL
                                .MEXIT
                                .ENDC
                                .IF IDN A,D
                                T$TEMP=G$RADA
                                .MEXIT
                                .ENDC
                                T$TEMP=-1
                                .ERROR  ;ILL. RADIX 'D''
            006042              T$CODE=T$CODE ! T$TEMP
    015046                      M$DEFAULT       NO,T$TEMP
                                .IF IDN YES,NO
                                T$TEMP=G$YES
                                .MEXIT
                                .ENDC
                                .IF IDN NO,NO
            000000              T$TEMP=G$NO
                                .MEXIT
                                .ENDC
                                T$TEMP=-1
                                .ERROR  ;DEFAULT 'NO'' MUST BE ''YES'' OR 'NO''
            006042              T$CODE=T$CODE ! T$TEMP
            000000              T$EXCP=0
    015046                      M$EXCP  T$CODE,T$EXCP,G$LOLIM,T$LOLIM,0
                                .IF IDN <@>,<0>
                                .IF LT G$OFSIZE-
                                .ERROR  ;INDIRECT PAR. TOO BIG
                                .MEXIT
                                .ENDC
                                T$LOLIM=/2
                                T$CODE=T$CODE ! G$EXCP
                                T$EXCP=T$EXCP ! G$LOLIM
                                .IFF
                                .IF B,
            000000              T$LOLIM=0
                                .IFF
                                .ERROR  ;ILL. DEFERRED MODE
                                .ENDC
                                .ENDC
    015046                      M$EXCP  T$CODE,T$EXCP,G$HILIM,T$HILIM,-1
                                .IF IDN <@>,<-1>
                                .IF LT G$OFSIZE-
                                .ERROR  ;INDIRECT PAR. TOO BIG
                                .MEXIT
```

```
                                    .ENDC
                                    T$HILIM=/2
                                    T$CODE=T$CODE ! G$EXCP
                                    T$EXCP=T$EXCP ! G$HILIM
                                    .IFF
                                    .IF B,
         177777                     T$HILIM=-1
                                    .IFF
                                    .ERROR  ;ILL. DEFERRED MODE
                                    .ENDC
                                    .ENDC
 015046                             M$CNTOP <>,<T$CODE>
                                    .IF NB
                                    .IF NE  I$SFT - F$BGN
                                    .ERROR  ; "COUNT" OPTION VALID ONLY IN S.W. QUES.
                                    .MEXIT
                                    .ENDC
                                    T$CODE=T$CODE ! G$CNTOP
                                    .ENDC
 015046                             M$WORD  <T$CODE,PTM.S4,-1,T$LOLIM,T$HILIM>
                                    .MCALL  M$GNINS
                                    .IRP    N,<T$CODE,PTM.S4,-1,T$LOLIM,T$HILIM>
                                    M$GNINS <.WORD  N>
                                    .ENDM
 015046                             M$GNINS <.WORD  T$CODE>
                                    .IF LT SVCINS
                                    .WORD   T$CODE
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
 015046  006042                             .WORD   T$CODE
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                                    .WORD   T$CODE
                                                .NLIST
                                    .ENDC
 015050                             M$GNINS <.WORD  PTM.S4>
                                    .IF LT SVCINS
                                    .WORD   PTM.S4
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
 015050  015336                             .WORD   PTM.S4
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                                    .WORD   PTM.S4
                                                .NLIST
                                    .ENDC
 015052                             M$GNINS <.WORD  -1>
                                    .IF LT SVCINS
                                    .WORD   -1
                                    .MEXIT
                                    .ENDC
```

```
                                .IF EQ SVCINS
     015052  177777                   .WORD   -1
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                      .WORD   -1
                                           .NLIST
                                .ENDC
     015054                     M$GNINS <.WORD  T$LOLIM>
                                .IF LT SVCINS
                                .WORD   T$LOLIM
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     015054  000000                   .WORD   T$LOLIM
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                      .WORD   T$LOLIM
                                           .NLIST
                                .ENDC
     015056                     M$GNINS <.WORD  T$HILIM>
                                .IF LT SVCINS
                                .WORD   T$HILIM
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
     015056  177777                   .WORD   T$HILIM
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                      .WORD   T$HILIM
                                           .NLIST
                                .ENDC
                                .IF NE  T$EXCP
                                M$WORD  T$EXCP
                                .ENDC
                                .IF NB
                                M$WORD </2>
                                .ENDC
  41 015060                     PTDONE:
  42
  43 015060                           ENDHRD
                                .MCALL  M$POP,M$GNINS,M$GNTAG,M$ENDERR
     015060                     M$POP   T$NS,T$NESTLEV,T$TEMP
                                .MCALL  M$GETS,M$DECR
                                .IF LT  T$NESTLEV
                                .ERROR  T$NESTLEV       ; MACRO T$NS UNDERFLOW
                                .MEXIT
                                .ENDC
     015060                     M$GETS  T$NS,\T$NESTLEV,T$TEMP
             000004             T$TEMP=T$NS1
     015060                     M$DECR  T$NESTLEV
             000000             T$NESTLEV=T$NESTLEV-1
```

```
                                                  .IF EQ F$HARD-T$TEMP
   015060                                         M$GNINS .EVEN
                                                  .IF LT SVCINS
                                                  .EVEN
                                                  .MEXIT
                                                  .ENDC
                                                  .IF EQ SVCINS
                                                          .EVEN
                                                  .MEXIT
                                                  .ENDC
                                                  .IF GT SVCINS
                                                  .LIST
                                                                                                  .EVEN
                                                                  .NLIST
                                                  .ENDC
   015060                                         M$GNTAG L,T$$HARD
                                                  .MCALL  M$GEN
   015060                                         M$GEN   L,\T$$HARD,SVCTAG
                                                  .IF LE  SVCTAG
   015060                                         L10021:
                                                  .MEXIT
                                                  .ENDC
                                                  .LIST
                                                                                           L10021:
                                                          .NLIST
           010000                                 S$LSYM=T$LSYM
           000041                                 I$HRD=F$END
                                                  .IFF
                                                  M$ENDERR        ENDHRD,T$TEMP
                                                  .ENDC

                                                          .NLIST  BEX
   015060     125      116      111   PTM.UBA:            .ASCIZ  'UNIBUS ADDRESS OF UDA''
   015106     125      116      111   PTM.UNIT:           .ASCIZ  'UNIT NUMBER TO FORMAT''
   015134     125      123      105   PTM.RES:            .ASCIZ  'USE RESIDENT FCT'
   015155     123      124      117   PTM.STP:            .ASCIZ  'STOP IF RESIDENT FCT IS BAD'
   015211     104      117      127   PTM.DLL:            .ASCIZ  'DOWN LINE LOAD FCT'
   015234     123      105      122   PTM.SNUM:           .ASCIZ  'SERIAL NUMBER TO BE ASSIGNED (TOTAL 4 WORDS) WORD 1'
   015320     127      117      122   PTM.S2:             .ASCIZ  'WORD 2'
   015327     127      117      122   PTM.S3:             .ASCIZ  'WORD 3'
   015336     127      117      122   PTM.S4:             .ASCIZ  'WORD 4'

                                                          .EVEN

           000004                     DLLFCT  =           4       ; DOWN LINE LOAD FCT FLAG
           000002                     STPBAD  =           2       ; STOP IF FCT COPY IS BAD FLAG
           000001                     USERES  =           1       ; USE RESIDENT FCT FLAG
```

```
      1                                         .SBTTL  SOFTWARE PARAMETER CODING SECTION
      2 015346                                  BGNSFT
                                        .MCALL  M$PUSH,M$INCR,M$GNINS,M$GNGBL
                000040                  I$SFT=F$BGN
        015346                          M$PUSH  T$NS,T$NESTLEV,F$SOFT
                                        .MCALL  M$INCR,M$SETS
        015346                          M$INCR  T$NESTLEV
                000001                  T$NESTLEV=T$NESTLEV+1
        015346                          M$SETS  T$NS,\T$NESTLEV,F$SOFT
                000005                  T$NS1=F$SOFT
                010022                  T$$SOFT=T$TAGNUM
        015346                          M$INCR T$TAGNUM
                010023                  T$TAGNUM=T$TAGNUM+1
                                        .IRP    TAG,<\T$$SOFT>
                                        M$GNINS <.WORD L'TAG'-L$SOFT/2>
                                        .ENDM
        015346                          M$GNINS <.WORD L10022-L$SOFT/2>
                                        .IF LT SVCINS
                                        .WORD L10022-L$SOFT/2
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
        015346  000024                          .WORD L10022-L$SOFT/2
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                                        .WORD L10022-L$SOFT/2
                                                        .NLIST
                                        .ENDC
        015350                          M$GNGBL L$SOFT
                                        .MCALL  M$GEN
                                        .IF NB,L$SOFT
                                        .IF NB,
                                        M$GEN   L$SOFT,:,SVCGBL,
                                        .ENDC
                                        .IF B,
        015350                          M$GEN   L$SOFT,:,SVCGBL,< >
                                        .IF LE  SVCGBL
        015350                          L$SOFT::
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                                                L$SOFT::
                                                .NLIST
                                        .ENDC
                                        .ENDC
      3
      4 015350                                  GPRMD   STM.DATE,0,D,-1,0,-1,YES
                                        .MCALL  M$RADIX,M$DEFAULT,M$EXCP,M$WORD,M$CNTOP
                                        .IF IDN A,D
                                        .IF EQ T$GMANID
                                        .ERROR  ;ASCII RADIX VALID ONLY ON "GMANID"
                                        .ENDC
                                        .ENDC
                000000                  T$TEMP=0&1
                                        .IF NE  T$TEMP & 1
```

```
                              .ERROR  ;ODD OFFSET
                              .ENDC
                              .IF LT  G$OFSIZE-0
                              .ERROR  ;OFFSET TOO BIG
                              .ENDC
          000002              T$CODE=G$PRMD + <0 * G$OFFSET>
015350                        M$RADIX D,T$TEMP
                              .IF IDN B,D
                              T$TEMP=G$RADB
                              .MEXIT
                              .ENDC
                              .IF IDN O,D
                              T$TEMP=G$RADO
                              .MEXIT
                              .ENDC
                              .IF IDN D,D
          000040              T$TEMP=G$RADD
                              .MEXIT
                              .ENDC
                              .IF IDN L,D
                              T$TEMP=G$RADL
                              .MEXIT
                              .ENDC
                              .IF IDN A,D
                              T$TEMP=G$RADA
                              .MEXIT
                              .ENDC
                              T$TEMP=-1
                              .ERROR  ;ILL. RADIX ''D''
          000042              T$CODE=T$CODE ! T$TEMP
015350                        M$DEFAULT       YES,T$TEMP
                              .IF IDN YES,YES
          000010              T$TEMP=G$YES
                              .MEXIT
                              .ENDC
                              .IF IDN NO,YES
                              T$TEMP=G$NO
                              .MEXIT
                              .ENDC
                              T$TEMP=-1
                              .ERROR  ;DEFAULT ''YES'' MUST BE ''YES'' OR ''NO''
          000052              T$CODE=T$CODE ! T$TEMP
          000000              T$EXCP=0
015350                        M$EXCP  T$CODE,T$EXCP,G$LOLIM,T$LOLIM,0
                              .IF IDN <@>,<0>
                              .IF LT G$OFSIZE-
                              .ERROR  ;INDIRECT PAR. TOO BIG
                              .MEXIT
                              .ENDC
                              T$LOLIM=/2
                              T$CODE=T$CODE ! G$EXCP
                              T$EXCP=T$EXCP ! G$LOLIM
                              .IFF
                              .IF B,
          000000              T$LOLIM=0
                              .IFF
                              .ERROR  ;ILL. DEFERRED MODE
```

```
                              .ENDC
                              .ENDC
   015350                     M$EXCP  T$CODE,T$EXCP,G$HILIM,T$HILIM,-1
                              .IF IDN <@>,<-1>
                              .IF LT G$OFSIZE-
                              .ERROR  ;INDIRECT PAR. TOO BIG
                              .MEXIT
                              .ENDC
                              T$HILIM=/2
                              T$CODE=T$CODE ! G$EXCP
                              T$EXCP=T$EXCP ! G$HILIM
                              .IFF
                              .IF B,
          177777              T$HILIM=-1
                              .IFF
                              .ERROR  ;ILL. DEFERRED MODE
                              .ENDC
                              .ENDC
   015350                     M$CNTOP <>,<T$CODE>
                              .IF NB
                              .IF NE  I$SFT - F$BGN
                              .ERROR  ; ''COUNT'' OPTION VALID ONLY IN S.W. QUES.
                              .MEXIT
                              .ENDC
                              T$CODE=T$CODE ! G$CNTOP
                              .ENDC
   015350                     M$WORD  <T$CODE,STM.DATE,-1,T$LOLIM,T$HILIM>
                              .MCALL  M$GNINS
                              .IRP    N,<T$CODE,STM.DATE,-1,T$LOLIM,T$HILIM>
                              M$GNINS <.WORD  N>
                              .ENDM
   015350                     M$GNINS <.WORD  T$CODE>
                              .IF LT SVCINS
                              .WORD   T$CODE
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
   015350  000052                     .WORD   T$CODE
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                          .WORD   T$CODE
                                              .NLIST
                              .ENDC
   015352                     M$GNINS <.WORD  STM.DATE>
                              .IF LT SVCINS
                              .WORD   STM.DATE
                              .MEXIT
                              .ENDC
                              .IF EQ SVCINS
   015352  015420                     .WORD   STM.DATE
                              .MEXIT
                              .ENDC
                              .IF GT SVCINS
                              .LIST
                                                                          .WORD   STM.DATE
```

```
                                                .NLIST
                                    .ENDC
      015354                        M$GNINS <.WORD  -1>
                                    .IF LT SVCINS
                                    .WORD   -1
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
      015354  177777                        .WORD   -1
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                                    .WORD   -1
                                                .NLIST
                                    .ENDC
      015356                        M$GNINS <.WORD  T$LOLIM>
                                    .IF LT SVCINS
                                    .WORD   T$LOLIM
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
      015356  000000                        .WORD   T$LOLIM
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                                    .WORD   T$LOLIM
                                                .NLIST
                                    .ENDC
      015360                        M$GNINS <.WORD  T$HILIM>
                                    .IF LT SVCINS
                                    .WORD   T$HILIM
                                    .MEXIT
                                    .ENDC
                                    .IF EQ SVCINS
      015360  177777                        .WORD   T$HILIM
                                    .MEXIT
                                    .ENDC
                                    .IF GT SVCINS
                                    .LIST
                                                                                    .WORD   T$HILIM
                                                .NLIST
                                    .ENDC
                                    .IF NE  T$EXCP
                                    M$WORD  T$EXCP
                                    .ENDC
                                    .IF NB
                                    M$WORD </2>
                                    .ENDC
    5 015362                                GPRMD   STM.D2,2,D,-1,0,-1,YES
                                    .MCALL  M$RADIX,M$DEFAULT,M$EXCP,M$WORD,M$CNTOP
                                    .IF IDN A,D
                                    .IF EQ T$GMANID
                                    .ERROR  ;ASCII RADIX VALID ONLY ON "GMANID"
                                    .ENDC
                                    .ENDC
```

```
         000000                T$TEMP=2&1
                               .IF NE  T$TEMP & 1
                               .ERROR  ;ODD OFFSET
                               .ENDC
                               .IF LT  G$OFSIZE-2
                               .ERROR  ;OFFSET TOO BIG
                               .ENDC
         001002                T$CODE=G$PRMD + <2 * G$OFFSET>
015362                         M$RADIX D,T$TEMP
                               .IF IDN B,D
                               T$TEMP=G$RADB
                               .MEXIT
                               .ENDC
                               .IF IDN O,D
                               T$TEMP=G$RADO
                               .MEXIT
                               .ENDC
                               .IF IDN D,D
         000040                T$TEMP=G$RADD
                               .MEXIT
                               .ENDC
                               .IF IDN L,D
                               T$TEMP=G$RADL
                               .MEXIT
                               .ENDC
                               .IF IDN A,D
                               T$TEMP=G$RADA
                               .MEXIT
                               .ENDC
                               T$TEMP=-1
                               .ERROR  ;ILL. RADIX 'D'
         001042                T$CODE=T$CODE ! T$TEMP
015362                         M$DEFAULT       YES,T$TEMP
                               .IF IDN YES,YES
         000010                T$TEMP=G$YES
                               .MEXIT
                               .ENDC
                               .IF IDN NO,YES
                               T$TEMP=G$NO
                               .MEXIT
                               .ENDC
                               T$TEMP=-1
                               .ERROR  ;DEFAULT 'YES' MUST BE 'YES' OR 'NO'
         001052                T$CODE=T$CODE ! T$TEMP
         000000                T$EXCP=0
015362                         M$EXCP  T$CODE,T$EXCP,G$LOLIM,T$LOLIM,0
                               .IF IDN <@>,<0>
                               .IF LT G$OFSIZE-
                               .ERROR  ;INDIRECT PAR. TOO BIG
                               .MEXIT
                               .ENDC
                               T$LOLIM=/2
                               T$CODE=T$CODE ! G$EXCP
                               T$EXCP=T$EXCP ! G$LOLIM
                               .IFF
                               .IF B,
         000000                T$LOLIM=0
```

```
                                .IFF
                                .ERROR  ;ILL. DEFERRED MODE
                                .ENDC
                                .ENDC
015362                          M$EXCP  T$CODE,T$EXCP,G$HILIM,T$HILIM,-1
                                .IF IDN <@>,<-1>
                                .IF LT G$OFSIZE-
                                .ERROR  ;INDIRECT PAR. TOO BIG
                                .MEXIT
                                .ENDC
                                T$HILIM=/2
                                T$CODE=T$CODE ! G$EXCP
                                T$EXCP=T$EXCP ! G$HILIM
                                .IFF
                                .IF B,
        177777                  T$HILIM=-1
                                .IFF
                                .ERROR  ;ILL. DEFERRED MODE
                                .ENDC
                                .ENDC
015362                          M$CNTOP <>,<T$CODE>
                                .IF NB
                                .IF NE  I$SFT - F$BGN
                                .ERROR  ; ''COUNT'' OPTION VALID ONLY IN S.W. QUES.
                                .MEXIT
                                .ENDC
                                T$CODE=T$CODE ! G$CNTOP
                                .ENDC
015362                          M$WORD  <T$CODE,STM.D2,-1,T$LOLIM,T$HILIM>
                                .MCALL  M$GNINS
                                .IRP    N,<T$CODE,STM.D2,-1,T$LOLIM,T$HILIM>
                                M$GNINS <.WORD  N>
                                .ENDM
015362                          M$GNINS <.WORD  T$CODE>
                                .IF LT SVCINS
                                .WORD   T$CODE
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
015362  001052                          .WORD   T$CODE
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                    .WORD   T$CODE
                                                .NLIST
                                .ENDC
015364                          M$GNINS <.WORD  STM.D2>
                                .IF LT SVCINS
                                .WORD   STM.D2
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
015364  015467                          .WORD   STM.D2
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
```

```
                          .LIST
                                                                      .WORD   STM.D2
                                        .NLIST
                          .ENDC
  015366                  M$GNINS <.WORD  -1>
                          .IF LT SVCINS
                          .WORD   -1
                          .MEXIT
                          .ENDC
                          .IF EQ SVCINS
  015366  177777                  .WORD   -1
                          .MEXIT
                          .ENDC
                          .IF GT SVCINS
                          .LIST
                                                                      .WORD   -1
                                        .NLIST
                          .ENDC
  015370                  M$GNINS <.WORD  T$LOLIM>
                          .IF LT SVCINS
                          .WORD   T$LOLIM
                          .MEXIT
                          .ENDC
                          .IF EQ SVCINS
  015370  000000                  .WORD   T$LOLIM
                          .MEXIT
                          .ENDC
                          .IF GT SVCINS
                          .LIST
                                                                      .WORD   T$LOLIM
                                        .NLIST
                          .ENDC
  015372                  M$GNINS <.WORD  T$HILIM>
                          .IF LT SVCINS
                          .WORD   T$HILIM
                          .MEXIT
                          .ENDC
                          .IF EQ SVCINS
  015372  177777                  .WORD   T$HILIM
                          .MEXIT
                          .ENDC
                          .IF GT SVCINS
                          .LIST
                                                                      .WORD   T$HILIM
                                        .NLIST
                          .ENDC
                          .IF NE  T$EXCP
                          M$WORD  T$EXCP
                          .ENDC
                          .IF NB
                          M$WORD </2>
                          .ENDC
6 015374                          GPRMD   STM.D3,4,D,-1,0,-1,YES
                          .MCALL  M$RADIX,M$DEFAULT,M$EXCP,M$WORD,M$CNTOP
                          .IF IDN A,D
                          .IF EQ T$GMANID
                          .ERROR  ;ASCII RADIX VALID ONLY ON "GMANID"
```

```
                                .ENDC
                                .ENDC
            000000              T$TEMP=4&1
                                .IF NE  T$TEMP & 1
                                .ERROR  ;ODD OFFSET
                                .ENDC
                                .IF LT  G$OFSIZE-4
                                .ERROR  ;OFFSET TOO BIG
                                .ENDC
            002002              T$CODE=G$PRMD + <4 * G$OFFSET>
    015374                      M$RADIX D,T$TEMP
                                .IF IDN B,D
                                T$TEMP=G$RADB
                                .MEXIT
                                .ENDC
                                .IF IDN O,D
                                T$TEMP=G$RADO
                                .MEXIT
                                .ENDC
                                .IF IDN D,D
            000040              T$TEMP=G$RADD
                                .MEXIT
                                .ENDC
                                .IF IDN L,D
                                T$TEMP=G$RADL
                                .MEXIT
                                .ENDC
                                .IF IDN A,D
                                T$TEMP=G$RADA
                                .MEXIT
                                .ENDC
                                T$TEMP=-1
                                .ERROR  ;ILL. RADIX ''D''
            002042              T$CODE=T$CODE ! T$TEMP
    015374                      M$DEFAULT       YES,T$TEMP
                                .IF IDN YES,YES
            000010              T$TEMP=G$YES
                                .MEXIT
                                .ENDC
                                .IF IDN NO,YES
                                T$TEMP=G$NO
                                .MEXIT
                                .ENDC
                                T$TEMP=-1
                                .ERROR  ;DEFAULT ''YES'' MUST BE ''YES'' OR ''NO''
            002052              T$CODE=T$CODE ! T$TEMP
            000000              T$EXCP=0
    015374                      M$EXCP  T$CODE,T$EXCP,G$LOLIM,T$LOLIM,0
                                .IF IDN <@>,<0>
                                .IF LT G$OFSIZE-
                                .ERROR  ;INDIRECT PAR. TOO BIG
                                .MEXIT
                                .ENDC
                                T$LOLIM=/2
                                T$CODE=T$CODE ! G$EXCP
                                T$EXCP=T$EXCP ! G$LOLIM
                                .IFF
```

```
                                .IF B,
        000000                  T$LOLIM=0
                                .IFF
                                .ERROR  ;ILL. DEFERRED MODE
                                .ENDC
                                .ENDC
015374                          M$EXCP  T$CODE,T$EXCP,G$HILIM,T$HILIM,-1
                                .IF IDN <@>,<-1>
                                .IF LT G$OFSIZE-
                                .ERROR  ;INDIRECT PAR. TOO BIG
                                .MEXIT
                                .ENDC
                                T$HILIM=/2
                                T$CODE=T$CODE ! G$EXCP
                                T$EXCP=T$EXCP ! G$HILIM
                                .IFF
                                .IF B,
        177777                  T$HILIM=-1
                                .IFF
                                .ERROR  ;ILL. DEFERRED MODE
                                .ENDC
                                .ENDC
015374                          M$CNTOP <>,<T$CODE>
                                .IF NB
                                .IF NE  I$SFT - F$BGN
                                .ERROR  ; ''COUNT'' OPTION VALID ONLY IN S.W. QUES.
                                .MEXIT
                                .ENDC
                                T$CODE=T$CODE ! G$CNTOP
                                .ENDC
015374                          M$WORD  <T$CODE,STM.D3,-1,T$LOLIM,T$HILIM>
                                .MCALL  M$GNINS
                                .IRP    N,<T$CODE,STM.D3,-1,T$LOLIM,T$HILIM>
                                M$GNINS <.WORD  N>
                                .ENDM
015374                          M$GNINS <.WORD  T$CODE>
                                .IF LT SVCINS
                                .WORD   T$CODE
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
015374  002052                          .WORD   T$CODE
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                    .WORD   T$CODE
                                                .NLIST
                                .ENDC
015376                          M$GNINS <.WORD  STM.D3>
                                .IF LT SVCINS
                                .WORD   STM.D3
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
015376  015476                          .WORD   STM.D3
                                .MEXIT
```

```
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   STM.D3
                                          .NLIST
                                .ENDC
  015400                        M$GNINS <.WORD  -1>
                                .IF LT SVCINS
                                .WORD   -1
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
  015400  177777                     .WORD   -1
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   -1
                                          .NLIST
                                .ENDC
  015402                        M$GNINS <.WORD  T$LOLIM>
                                .IF LT SVCINS
                                .WORD   T$LOLIM
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
  015402  000000                     .WORD   T$LOLIM
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   T$LOLIM
                                          .NLIST
                                .ENDC
  015404                        M$GNINS <.WORD  T$HILIM>
                                .IF LT SVCINS
                                .WORD   T$HILIM
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
  015404  177777                     .WORD   T$HILIM
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                        .WORD   T$HILIM
                                          .NLIST
                                .ENDC
                                .IF NE  T$EXCP
                                M$WORD  T$EXCP
                                .ENDC
                                .IF NB
                                M$WORD </2>
                                .ENDC
7 015406                             GPRMD   STM.D4,6,D,-1,0,-1,YES
                                .MCALL  M$RADIX,M$DEFAULT,M$EXCP,M$WORD,M$CNTOP
                                .IF IDN A,D
```

```
                        .IF EQ T$GMANID
                        .ERROR  ;ASCII RADIX VALID ONLY ON ''GMANID''
                        .ENDC
                        .ENDC
        000000          T$TEMP=6&1
                        .IF NE  T$TEMP & 1
                        .ERROR  ;ODD OFFSET
                        .ENDC
                        .IF LT  G$OFSIZE-6
                        .ERROR  ;OFFSET TOO BIG
                        .ENDC
        003002          T$CODE=G$PRMD + <6 * G$OFFSET>
015406                  M$RADIX D,T$TEMP
                        .IF IDN B,D
                        T$TEMP=G$RADB
                        .MEXIT
                        .ENDC
                        .IF IDN O,D
                        T$TEMP=G$RADO
                        .MEXIT
                        .ENDC
                        .IF IDN D,D
        000040          T$TEMP=G$RADD
                        .MEXIT
                        .ENDC
                        .IF IDN L,D
                        T$TEMP=G$RADL
                        .MEXIT
                        .ENDC
                        .IF IDN A,D
                        T$TEMP=G$RADA
                        .MEXIT
                        .ENDC
                        T$TEMP=-1
                        .ERROR  ;ILL. RADIX 'D''
        003042          T$CODE=T$CODE ! T$TEMP
015406                  M$DEFAULT       YES,T$TEMP
                        .IF IDN YES,YES
        000010          T$TEMP=G$YES
                        .MEXIT
                        .ENDC
                        .IF IDN NO,YES
                        T$TEMP=G$NO
                        .MEXIT
                        .ENDC
                        T$TEMP=-1
                        .ERROR  ;DEFAULT ''YES'' MUST BE ''YES'' OR 'NO''
        003052          T$CODE=T$CODE ! T$TEMP
        000000          T$EXCP=0
015406                  M$EXCP  T$CODE,T$EXCP,G$LOLIM,T$LOLIM,0
                        .IF IDN <@>,<0>
                        .IF LT G$OFSIZE-
                        .ERROR  ;INDIRECT PAR. TOO BIG
                        .MEXIT
                        .ENDC
                        T$LOLIM=/2
                        T$CODE=T$CODE ! G$EXCP
```

```
                                T$EXCP=T$EXCP ! G$LOLIM
                                .IFF
                                .IF B,
        000000                  T$LOLIM=0
                                .IFF
                                .ERROR  ;ILL. DEFFRRED MODE
                                .ENDC
                                .ENDC
015406                          M$EXCP  T$CODE,T$EXCP,G$HILIM,T$HILIM,-1
                                .IF IDN <@>,<-1>
                                .IF LT G$OFSIZE-
                                .ERROR  ;INDIRECT PAR. TOO BIG
                                .MEXIT
                                .ENDC
                                T$HILIM=/2
                                T$CODE=T$CODE ! G$EXCP
                                T$EXCP=T$EXCP ! G$HILIM
                                .IFF
                                .IF B,
        177777                  T$HILIM=-1
                                .IFF
                                .ERROR  ;ILL. DEFFRRED MODE
                                .ENDC
                                .ENDC
015406                          M$CNTOP <>,<T$CODE>
                                .IF NB
                                .IF NE  I$SFT - F$BGN
                                .ERROR  ; ''COUNT'' OPTION VALID ONLY IN S.W. QUES.
                                .MEXIT
                                .ENDC
                                T$CODE=T$CODE ! G$CNTOP
                                .ENDC
015406                          M$WORD  <T$CODE,STM.D4,-1,T$LOLIM,T$HILIM>
                                .MCALL  M$GNINS
                                .IRP    N,<T$CODE,STM.D4,-1,T$LOLIM,T$HILIM>
                                M$GNINS <.WORD  N>
                                .ENDM
015406                          M$GNINS <.WORD  T$CODE>
                                .IF LT SVCINS
                                .WORD   T$CODE
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
015406  003052                          .WORD   T$CODE
                                .MEXIT
                                .ENDC
                                .IF GT SVCINS
                                .LIST
                                                                                  .WORD   T$CODE
                                                .NLIST
                                .ENDC
015410                          M$GNINS <.WORD  STM.D4>
                                .IF LT SVCINS
                                .WORD   STM.D4
                                .MEXIT
                                .ENDC
                                .IF EQ SVCINS
```

```
        015410  015505                  .WORD   STM.D4
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                .WORD   STM.D4
                                        .NLIST
                        .ENDC
        015412          M$GNINS <.WORD  -1>
                        .IF LT SVCINS
                        .WORD   -1
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
        015412  177777                  .WORD   -1
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                .WORD   -1
                                        .NLIST
                        .ENDC
        015414          M$GNINS <.WORD  T$LOLIM>
                        .IF LT SVCINS
                        .WORD   T$LOLIM
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
        015414  000000                  .WORD   T$LOLIM
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                .WORD   T$LOLIM
                                        .NLIST
                        .ENDC
        015416          M$GNINS <.WORD  T$HILIM>
                        .IF LT SVCINS
                        .WORD   T$HILIM
                        .MEXIT
                        .ENDC
                        .IF EQ SVCINS
        015416  177777                  .WORD   T$HILIM
                        .MEXIT
                        .ENDC
                        .IF GT SVCINS
                        .LIST
                                                                .WORD   T$HILIM
                                        .NLIST
                        .ENDC
                        .IF NE  T$EXCP
                        M$WORD  T$EXCP
                        .ENDC
                        .IF NB
                        M$WORD </2>
                        .ENDC
   8
```

```
 9 015420                                  ENDSFT
                               .MCALL  M$POP,M$GNINS,M$GNTAG,M$ENDERR
   015420                      M$POP   T$NS,T$NESTLEV,T$TEMP
                               .MCALL  M$GETS,M$DECR
                               .IF LT  T$NESTLEV
                               .ERROR  T$NESTLEV        ; MACRO T$NS UNDERFLOW
                               .MEXIT
                               .ENDC
   015420                      M$GETS  T$NS,\T$NESTLEV,T$TEMP
            000005             T$TEMP=T$NS1
   015420                      M$DECR  T$NESTLEV
            000000             T$NESTLEV=T$NESTLEV-1
                               .IF EQ F$SOFT-T$TEMP
   015420                      M$GNINS .EVEN
                               .IF LT SVCINS
                               .EVEN
                               .MEXIT
                               .ENDC
                               .IF EQ SVCINS
                                       .EVEN
                               .MEXIT
                               .ENDC
                               .IF GT SVCINS
                               .LIST
                                                                                  .EVEN
                                                .NLIST
                               .ENDC
   015420                      M$GNTAG L,T$$SOFT
                               .MCALL  M$GEN
   015420                      M$GEN   L,\T$$SOFT,SVCTAG
                               .IF LE  SVCTAG
   015420                      L10022:
                               .MEXIT
                               .ENDC
                               .LIST
                                                                             L10022:
                                       .NLIST
            010000             S$LSYM=T$LSYM
            000041             I$SFT=F$END
                               .IFF
                               M$ENDERR         ENDSFT,T$TEMP
                               .ENDC
10 015420     104   101   124  STM.DATE:        .ASCIZ  'DATE VAX FORMAT (TOTAL 4 WORDS) WORD 1'
11 015467     127   117   122  STM.D2:          .ASCIZ  'WORD 2'
12 015476     127   117   122  STM.D3:          .ASCIZ  'WORD 3'
13 015505     127   117   122  STM.D4:          .ASCIZ  'WORD 4'
14
15 015514                      $PATCH::
16 015514                              .BLKW   20
17
18                             ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
19                             ;       THIS IS A PATCH AREA THAT SHOULD BE INCLUDED IN ALL DIAGNOSTICS.
20                             ;       ADJUST THE SIZE TO FIT YOUR OWN PREFERENCES.
21                             ;%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
22
23 015554                              LASTAD
                               .MCALL  M$GNINS,M$GNGBL
```

```
 015554                    M$GNINS .EVEN
                           .IF LT SVCINS
                           .EVEN
                           .MEXIT
                           .ENDC
                           .IF EQ SVCINS
                                   .EVEN
                           .MEXIT
                           .ENDC
                           .IF GT SVCINS
                           .LIST
                                                                       .EVEN
                                           .NLIST
                           .ENDC
         000001            T$LAST=1
                           .IF EQ O$SETUP
                           M$WORD  <0>
                           M$WORD  <0>
                           .IFF
 015554                    M$GNINS <.WORD T$FREE>
                           .IF LT SVCINS
                           .WORD T$FREE
                           .MEXIT
                           .ENDC
                           .IF EQ SVCINS
 015554  015602                    .WORD T$FREE
                           .MEXIT
                           .ENDC
                           .IF GT SVCINS
                           .LIST
                                                                       .WORD T$FREE
                                           .NLIST
                           .ENDC
 015556                    M$GNINS <.WORD T$SIZE>
                           .IF LT SVCINS
                           .WORD T$SIZE
                           .MEXIT
                           .ENDC
                           .IF EQ SVCINS
 015556  000011                    .WORD T$SIZE
                           .MEXIT
                           .ENDC
                           .IF GT SVCINS
                           .LIST
                                                                       .WORD T$SIZE
                                           .NLIST
                           .ENDC
                           .ENDC
         000000            SVCGBL=0
 015560                    M$GNGBL L$LAST
                           .MCALL  M$GEN
                           .IF NB,L$LAST
                           .IF NB,
                           M$GEN   L$LAST,:,SVCGBL,
                           .ENDC
                           .IF B,
 015560                    M$GEN   L$LAST,:,SVCGBL,< >
```

```
                                .IF LE  SVCGBL
   015560                       L$LAST::
                                .MEXIT
                                .ENDC
                                .LIST
                                                                      L$LAST::
                                     .NLIST
                                .ENDC
                                .ENDC
            000001              T$LTNO=T$TESTNUM
24 015560                            ENDMOD
                                .MCALL  M$POP,M$ENDERR
                                .IF EQ  F$BGN-I$MOD
            000041              I$MOD=F$END
                                .IFF
                                .ERROR  ; MISSING 'BGNMOD"
                                .MEXIT
                                .ENDC
   015560                       M$POP    T$NS,T$NESTLEV,T$TEMP
                                .MCALL  M$GETS,M$DECR
                                .IF LT  T$NESTLEV
                                .ERROR  T$NESTLEV        ; MACRO T$NS UNDERFLOW
                                .MEXIT
                                .ENDC
   015560                       M$GETS  T$NS,\T$NESTLEV,T$TEMP
            000000              T$TEMP=T$NS0
   015560                       M$DECR  T$NESTLEV
            177777              T$NESTLEV=T$NESTLEV-1
                                .IF NE F$MOD-T$TEMP
                                M$ENDERR        ENDMOD,T$TEMP
                                .ENDC
```

```
      1                                              .SBTTL  DEFAULT P-TABLE
      2 015560                                       BGNSETUP        1
                                        .MCALL  M$INCR
                                        .IF NE  F$END - I$SETUP
                                        .ERROR  ; ONLY 1 SETUP!
                                        .MEXIT
                                        .ENDC
                                        .IF NE  T$LAST-1
                                        .ERROR  ; ''LASTAD'' MUST PRECEDE 'BGNSETUP''
                                        .MEXIT
                                        .ENDC
                000040                  I$SETUP=F$BGN
                010023                  T$$PTAB=T$TAGNUM
        015560                          M$INCR   T$TAGNUM
                010024                  T$TAGNUM=T$TAGNUM+1
                                        .IF NB 1
                000001                  T$PCNT=1
                000001                  T$$PC=1
                                        .IFF
                                        .ERROR  ; MISSING # OF PTABLES
                                        T$PCNT=1
                                        .ENDC
      3 015560                                       BGNPTAB
                                        .MCALL M$INCR,M$DECR,M$WORD.M$GNINS,M$GNTAG
                                        .IF NE F$BGN-I$SETUP
                                        .ERROR  ; MISSING 'BGNSETUP''
                                        .MEXIT
                                        .ENDC
                                        .IF NE F$END-I$PTAB
                                        .ERROR  ; MISSING ''ENDPTAB''
                                        .MEXIT
                                        .ENDC
                000040                  I$PTAB=F$BGN
                010024                  T$PTAB=T$TAGNUM
        015560                          M$INCR   T$TAGNUM
                010025                  T$TAGNUM=T$TAGNUM+1
        015560                          M$DECR   T$PCNT
                000000                  T$PCNT=T$PCNT-1
                                        .IF LE T$PCNT
        015560                          M$WORD <0>
                                        .MCALL  M$GNINS
                                        .IRP    N,<0>
                                        M$GNINS <.WORD  N>
                                        .ENDM
        015560                          M$GNINS <.WORD  0>
                                        .IF LT SVCINS
                                        .WORD   0
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
        015560  000000                               .WORD   0
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                               .WORD   0
                                                           .NLIST
```

```
                                        .ENDC
                                        .IFF
                                        .IRP N,<\T$PTAB>
                                        M$GNINS <.WORD  L'N>
                                        .ENDM
                                        .ENDC
          010025                        T$$DAT=T$TAGNUM
  015562                                M$INCR   T$TAGNUM
          010026                        T$TAGNUM=T$TAGNUM+1
                                        .IRP     N,<\T$$DAT>
                                        M$GNINS <.WORD  L'N-./2-1>
                                        .ENDM
  015562                                M$GNINS <.WORD  L10025-./2-1>
                                        .IF LT SVCINS
                                        .WORD   L10025-./2-1
                                        .MEXIT
                                        .ENDC
                                        .IF EQ SVCINS
  015562  000007                                .WORD   L10025-./2-1
                                        .MEXIT
                                        .ENDC
                                        .IF GT SVCINS
                                        .LIST
                                                                                        .WORD   L10025-./2-1
                                                        .NLIST
                                        .ENDC
  015564                                M$GNTAG L,T$$PTAB
                                        .MCALL  M$GEN
  015564                                M$GEN    L,\T$$PTAB,SVCTAG
                                        .IF LE   SVCTAG
  015564                                L10023:
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                                L10023:
                                                .NLIST
          010024                        T$$PTAB=T$PTAB
  015564                                M$INCR  T$PTNUM
          000001                        T$PTNUM=T$PTNUM+1
 4
 5 015564 172150                                .WORD   172150          ; UDAIP
 6 015566 000000                                .WORD   0               ; UNIT 0
 7 015570 000003                                .WORD   USERES+STPBAD   ; USE RESIDENT FCT
 8 015572 000000  000000  000000                .WORD   0,0,0,0         ; SERIAL NUMBER
 9
10 015602                                       ENDPTAB
                                        .MCALL  M$GNTAG
                                        .IF NE  F$BGN - I$PTAB
                                        .ERROR  ; MISSING 'BGNPTAB'
                                        .MEXIT
                                        .ENDC
          000041                        I$PTAB=F$END
  015602                                M$GNTAG L,T$$DAT
                                        .MCALL  M$GEN
  015602                                M$GEN    L,\T$$DAT,SVCTAG
                                        .IF LE  SVCTAG
  015602                                L10025:
```

```
                                        .MEXIT
                                        .ENDC
                                        .LIST
                                                                        L10025:
                                               .NLIST
     11
     12 015602                                 ENDSETUP
                                        .IF NE  F$BGN - I$SETUP
                                        .ERROR  ; MISSING 'BGNSETUP''
                                        .MEXIT
                                        .ENDC
              000041                    I$SETUP=F$END
                                        .IF NE  T$$PC - T$PTNUM
                                        .ERROR  ; PTABLE COUNT INCORRECT
                                        .ENDC
              015602                    T$FREE=.
              000011                    T$SIZE=.-L$LAST / 2
              000001                    T$PTHV=T$PTNUM
     13       000001                    .END
```

```
ADR    = 000020 G
ALOCM    002474
ASKDLL   015000
ASKFIL   014345
ASSEMB= 000010
ASSUMP= ******
BIT0  = 000001 G
BIT00 = 000001 G
BIT01 = 000002 G
BIT02 = 000004 G
BIT03 = 000010 G
BIT04 = 000020 G
BIT05 = 000040 G
BIT06 = 000100 G
BIT07 = 000200 G
BIT08 = 000400 G
BIT09 = 001000 G
BIT1  = 000002 G
BIT10 = 002000 G
BIT11 = 004000 G
BIT12 = 010000 G
BIT13 = 020000 G
BIT14 = 040000 G
BIT15 = 100000 G
BIT2  = 000004 G
BIT3  = 000010 G
BIT4  = 000020 G
BIT5  = 000040 G
BIT6  = 000100 G
BIT7  = 000200 G
BIT8  = 000400 G
BIT9  = 001000 G
BLDCMD  002520
BLDC1   002564
BLKFND  002752
BOE   = 000400 G
CF.AVL= 100000
CF.MSC= 040000
CF.OTH= 020000
CF.RPL= 000001
CF.SHD= 000002
CF.THS= 010000
CF.576= 000004
CLRBFL  002642
CLRBUF  002614
CTRLRS  002200
CT.AVL= 100000
CT.BRL= 007000
CT.CMD= 000004
CT.LD = 000001
CT.MSG= 000010
CT.REQ= 000020
CT.RN = 000002
CT.UNT= 000177
CT.VEC= 000777
CYLCMP  005204
C$AU  = 000052

C$AUTO= 000061
C$BRK = 000022
C$BSEG= 000004
C$BSUB= 000002
C$CEFG= 000045
C$CLCK= 000062
C$CLEA= 000012
C$CLOS= 000035
C$CLP1= 000006
C$CVEC= 000036
C$DCLN= 000044
C$DODU= 000051
C$DRPT= 000024
C$DU  = 000053
C$EDIT= 000003
C$ERDF= 000055
C$ERHR= 000056
C$ERRO= 000060
C$ERSF= 000054
C$ERSO= 000057
C$ESCA= 000010
C$ESEG= 000005
C$ESUB= 000003
C$ETST= 000001
C$EXIT= 000032
C$GETB= 000026
C$GETW= 000027
C$GMAN= 000043
C$GPHR= 000042
C$GPLO= 000030
C$GPRI= 000040
C$INIT= 000011
C$INLP= 000020
C$MANI= 000050
C$MEM = 000031
C$MSG = 000023
C$OPEN= 000034
C$PNTB= 000014
C$PNTF= 000017
C$PNTS= 000016
C$PNTX= 000015
C$QIO = 000377
C$RDBU= 000007
C$REFG= 000047
C$RESE= 000033
C$REVI= 000003
C$RFLA= 000021
C$RPT = 000025
C$SEFG= 000046
C$SPRI= 000041
C$SVEC= 000037
C$TPRI= 000013
C.CNT = 000040
C.DFLG= 000022
C.FBLK= 000026
C.FBUF= 000024
C.FLG = 000014

C.INIT= 000020
C.NEXT= 000000
C.REF = 000016
C.RING= 000010
C.SIZE= 000044
C.SNUM= 000030
C.TO  = 000012
C.UADR= 000002
C.UNIT= 000004
C.UNUM= 000020
C.VEC = 000006
DATE    002150
DFPTBL  002130 G
DIAGMC= 000000
DLLFCT= 000004
DMOVRL  002206
DMPROG  002204
DMTRLN  002210
DUPERM  014300
DUPERR  014270
DUP.VC= 001001
EF.BBR= 000200
EF.BBU= 000100
EF.CON= 000036 G
EF.FRS= 000200
EF.LST= 000100
EF.MIS= 000001
EF.NEW= 000035 G
EF.PWR= 000034 G
EF.RES= 000037 G
EF.SDF= 000017
EF.SD0= 000001
EF.SD1= 000002
EF.SD2= 000004
EF.SD3= 000010
EF.SHE= 000040
EF.STA= 000040 G
ERRBLK  002166 G
ERRMSG  002164 G
ERRNBR  002162 G
ERRTYP  002160 G
EVL   = 000004 G
E$END = 002100
E$LOAD= 000035
FCTFIL  014410
FDATA   004436
FFREE   002170 G
FMEM    002174
FMEMS   002176
FMERR   002310
FMERRM  002330
FMTDNE  005440
FMTERR  006062
FNAME   004422
FSIZE   002172 G
FWORD   003646
F$AU  = 000015

F$AUTO= 000020
F$BGN = 000040
F$CLEA= 000007
F$DU  = 000016
F$END = 000041
F$HARD= 000004
F$HW  = 000013
F$INIT= 000006
F$JMP = 000050
F$MOD = 000000
F$MSG = 000011
F$PROT= 000021
F$PWR = 000017
F$RPT = 000012
F$SEG = 000003
F$SOFT= 000005
F$SRV = 000010
F$SUB = 000002
F$SW  = 000014
F$TEST= 000001
GETBLK  002656
GETDMR  003110
GETEOF  002764
GETFCT  005364
GTSNUM  015010
G$CNTO= 000200
G$DELM= 000372
G$DISP= 000003
G$EXCP= 000400
G$HILI= 000002
G$LOLI= 000001
G$NO  = 000000
G$OFFS= 000400
G$OFSI= 000376
G$PRMA= 000001
G$PRMD= 000002
G$PRML= 000000
G$RADA= 000140
G$RADB= 000000
G$RADD= 000040
G$RADL= 000120
G$RADO= 000020
G$XFER= 000004
G$YES = 000010
HCOMM   003144
HC.BF1= 000160
HC.BF2= 000212
HC.BSZ= 000032
HC.CCT= 000006
HC.CEV= 000074
HC.CMD= 000004
HC.CPK= 000100
HC.MCT= 000002
HC.MEV= 000010
HC.MPK= 000014
HC.MSG= 000000
HC.PSZ= 000060

HC.RES= 000010
HC.RSZ= 000004
HC.SIZ= 000254
HC.VC = 000012
HDR.MN= 000000
HDR.OV= 000004
HOE   = 100000 G
IBE   = 010000 G
ICONT = 000002 G
IDU   = 000040 G
IER   = 020000 G
IFLAGS  002222 G
INIT1   013714
INIT2   013736
INIT3   014006
INIT4   014044
INIT5   014062
INTBF   012750 G
INTBFL  013040
INTB1M  013461
INTB2M  013530
INTB3M  013575
INTB4M  013631
INTHD   013074
INTM1   013121
INTM2   013221
INTM3   013253
INTM4   013331
INTM5   013411
INTM6   013435
INTR1   012552 G
INTR2   012616 G
INTR3   012662 G
IN.MS1= 003777
IN.MS2= 003500
IN.MS3= 002000
IN.MS4= 003777
IN.RS1= 004000
IN.RS2= 010200
IN.RS3= 020000
IN.RS4= 040000
IN.WT1= 100000
IN.WT3= 000000
ISCAN   003170
ISCANX  003224
ISR   = 000100 G
ISTART= 000001 G
IXE   = 004000 G
I$AU  = 000041
I$AUTO= 000041
I$CLN = 000041
I$DU  = 000041
I$HRD = 000041
I$INIT= 000041
I$MOD = 000041
I$MSG = 000041
I$PROT= 000040
```

```
I$PTAB= 000041      L$LAST  015560 G    MD.EXP= 100000      O$POIN= 000001      P.SFTW= 000040
I$PWR = 000041      L$LOAD  002100 G    MD.FEU= 000002      O$SETU= 000001      P.SHST= 000020
I$RPT = 000041      L$LUN   002074 G    MD.NXU= 010000      PNT   = 001000 G    P.SHUN= 000016
I$SEG = 000041      L$MREV  002050 G    MD.ORD= 000040      POWDLY  013746      P.STS = 000012
I$SETU= 000041      L$NAME  002000 G    MD.SCH= 002000      PRI   = 002000 G    P.SZOF= 000012
I$SFT = 000041      L$PRIO  002042 G    MD.SCL= 001000      PRI00 = 000000 G    P.TIME= 000024
I$SRV = 000041      L$PROT  013664 G    MD.SEC= 000100      PRI01 = 000040 G    P.TRCK= 000026
I$SUB = 000041      L$PRT   002112 G    MD.SER= 000020      PRI02 = 000100 G    P.TRLN= 000014
I$TST = 000041      L$REPP  002062 G    MD.SFT= 004000      PRI03 = 000140 G    P.UADR= 000020
JFK1    014653      L$REV   002010 G    MD.SPD= 000001      PRI04 = 000200 G    P.UNCL= 000034
JFK5    014677      L$RPT   013656 G    MD.SSH= 000010      PRI05 = 000240 G    P.UNFL= 000014
J$JMP = 000167      L$SOFT  015350 G    MD.VOL= 000003      PRI06 = 000300 G    P.UNIT= 000004
KRANTZ  005244      L$SPC   002056 G    MD.WBN= 000400      PRI07 = 000340 G    P.UNSZ= 000040
LDDM    011660      L$SPCP  002020 G    MD.WBV= 000200      PTDONE  015060      P.UNTI= 000020
LDERR   011740      L$SPTP  002024 G    MIDERR  003014      PTM.DL  015211      P.USEF= 000020
LDERRM  011752      L$STA   002030 G    M.ER0   010627      PTM.RE  015134      P.VSER= 000044
LDNEXT  011734      L$SW    002150 G    M.ER1   010672      PTM.SN  015234      RDERR   002320
LOAD    003226      L$TEST  002114 G    M.ER10  011212      PTM.ST  015155      RDERRM  002411
LOADDM  003444      L$TIML  002014 G    M.ER11  011225      PTM.S2  015320      RDERR1  003710
LOADER  003466      L$UNIT  002012 G    M.ER12  011245      PTM.S3  015327      RDHIGH  002214
LOADEX  003460      L.CHVR= 000015      M.ER13  011312      PTM.S4  015336      RDLOW   002212
LOADE1  003326      L.CNTI= 000014      M.ER14  011332      PTM.UB  015060      RDREC   003500
LOADM1  003356      L.CYL = 000034      M.ER15  011351      PTM.UN  015106      RD.AT   002216
LOE   = 040000 G    L.DATA= 000050      M.ER16  011371      PT.FLA= 000004      RD.SZ = 000100
LOT   = 000010 G    L.ERLC= 000030      M.ER17  011402      PT.SNU= 000006      READDM  004440
L$ACP   002110 G    L.EVNT= 000000      M.ER18  011421      PT.UBA= 000000      READWD  004556
L$APT   002036 G    L.GRP = 000040      M.ER19  011442      PT.UNI= 000002      REMMSG  006202
L$AUT   002070 G    L.SCTR= 000042      M.ER2   010715      P.BCNT= 000014      RESPCT  004572
L$AUTO  014524 G    L.SLOT= 000002      M.ER20  011521      P.BUFF= 000020      RESPDM  004566
L$CCP   002106 G    L.TRCK= 000041      M.ER21= 000000      P.CMST= 000020      RG.FLG= 040000
L$CLEA  014526 G    L.UHVR= 000027      M.ER22  011544      P.CNCL= 000020      RG.OWN= 100000
L$CO    002032 G    L.UNTI= 000016      M.ER3   010734      P.CNT = 000006      RM.CMP  006572
L$DEPO  002011 G    L.USVR= 000026      M.ER4   010765      P.CNTF= 000014      RM.DCX  010027
L$DESC  002260 G    L.VSER= 000044      M.ER5   011007      P.CNTI= 000024      RM.DC1  007707
L$DESP  002076 G    L10000  002146      M.ER6   011031      P.CRF = 000000      RM.DC2  007755
L$DEVP  002060 G    L10001  002160      M.ER7   011070      P.CTMO= 000016      RM.DNE  006644
L$DISP  002124 G    L10002  002472      M.ER8   011121      P.CYL = 000022      RM.D1P  007005
L$DLY   002116 G    L10003  003764      M.ER9   011172      P.ELGF= 000034      RM.D1S  007067
L$DTP   002040 G    L10004  004042      NEWTAB  014102      P.FBBK= 000034      RM.D1T  006723
L$DTYP  002034 G    L10005  004110      NODLL   014224      P.FLGS= 000011      RM.D2D  007151
L$DUT   002072 G    L10006  010416      NOGOER  014616      P.GRP = 000024      RM.D2H  007233
L$DVTY  002224 G    L10007  012614      NOGOM   014626      P.HSTI= 000030      RM.D3D  007315
L$EF    002052 G    L10010  012660      NORESP  006132      P.HTMO= 000016      RM.D3H  007377
L$ENVI  002044 G    L10011  012746      NXTTAB  014234      P.LBN = 000034      RM.D4D  007461
L$ERRT  002160 G    L10012  013072      ONEFIL= 000001      P.LGDT= 000014      RM.D4H  007543
L$ETP   002102 G    L10013  013662      OPENLF  003470      P.MAIN= 000020      RM.ER1  010270
L$EXP1  002046 G    L10015  014522      OP.DLE= 000002      P.MOD = 000012      RM.ER2  010324 G
L$EXP4  002064 G    L10016  014524      OP.END= 000200      P.OPCD= 000010      RM.ER3  010420
L$EXP5  002066 G    L10017  014532      OP.RCV= 000005      P.OTRF= 000014      RM.ER4  010472
L$HARD  014734 G    L10020  014730      OP.SND= 000004      P.OVRL= 000034      RM.ER5  010545
L$HIME  002120 G    L10021  015060      O$APTS= 000000      P.RBN = 000014      RM.FM0  010106
L$HPCP  002016 G    L10022  015420      O$AU  = 000000      P.RBNS= 000034      RM.FM1  010156
L$HPTP  002022 G    L10023  015564      O$BGNR= 000001      P.RCTC= 000035      RM.FM2  010222
L$HW    002130 G    L10025  015602      O$BGNS= 000001      P.RCTP= 000032      RM.RET  007625
L$ICP   002104 G    MAXERR= 000026      O$DU  = 000000      P.RCTS= 000030      RNGLEN= 000004
L$INIT  013672 G    MD.CMP= 020000      O$ERRT= 000001      P.RGID= 000034      RSPDNE  004734
L$LADP  002026 G    MD.ERR= 040000      O$GNSW= 000001      P.RGOF= 000040      RSPDRP  004710
```

SYMBOL TABLE

```
RSPIN   004752       SA.S3 = 020000       SVCTST= 000000       T$TAGN= 010026       UDARSP  012426
RSPMWR  005012       SA.S4 = 040000       S$LSYM= 010000       T$TEMP= 000000       UDARSX  012544
RSPNXT  004700       SFTBL   002150 G     TBLERR  011572       T$TEST= 000001       UDARS1  012440
RSPPKE  006276       SNDCMD  012010       TSTTAB  002202       T$TSTM= 177777       UDARS2  012522
RSPPNE  006432       SNDC1   012032       T$ARGC= 000001       T$TSTS= 000001       UDAXXX  012540
RSPPRE  006346       STM.DA  015420       T$CODE= 003052       T$$AUT= 010016       UF.AVL= 000001
RSPPTW  005076       STM.D2  015467       T$ERRN= 014626       T$$CLE- 010017       UF.CMR= 020000
RSPPT2  005116       STM.D3  015476       T$EXCP= 000000       T$$DAT= 010025       UF.CMW= 010000
RSPREF  005054       STM.D4  015505       T$FLAG= 000040       T$$HAR= 010021       UF.FRS= 000002
RSPSTE  006514       STPBAD= 000002       T$FREE= 015602       T$$HW  = 010000      UF.INA= 100000
RSPSTS  005032       ST.ABO= 000002       T$GMAN= 000000       T$$INI= 010015       UF.LST= 000004
RUNDM   011650       ST.AVL= 000005       T$HILI= 177777       T$$MSG= 010012       UF.MDL= 000006
RUNDMX  011736       ST.CMD= 000001       T$LAST= 000001       T$$PC  = 000001      UF.MLT= 000006
RWORDT  003630       ST.CMP= 000007       T$LOLI= 000000       T$$PRO= 010014       UF.RMV= 000100
RWRDEM  004112       ST.CNT= 000012       T$LSYM= 010000       T$$PTA= 010024       UF.RPL= 004000
RWRDE1  003670       ST.DAT= 000010       T$LTNO= 000001       T$$RPT= 010013       UF.SCH= 002000
RWRDE3  003700       ST.DIA= 000037       T$NEST= 177777       T$$SOF= 010022       UF.SCL= 001000
RWRDF1  004172       ST.DRV= 000013       T$NS0  = 000000      T$$SW  = 010001      UF.WBN= 000400
RWRDF2  004230       ST.HST= 000011       T$NS1  = 000005      T$$TES= 010020       UF.WPR= 040000
RWRDF3  004316       ST.MSK= 000037       T$PCNT= 000000       T1        014534 G   UF.576= 000010
RWRDF4  004376       ST.OFL= 000004       T$PTAB= 010024       UAM    = 000200 G    URNING  002220
RWRDM1  003720 G     ST.SHE= 000003       T$PTHV= 000001       UDAIEX  012200       USERES= 000001
RWRDM2  003766 G     ST.SUB= 000040       T$PTNU= 000001       UDAINT  012110       WAITMS  013644
RWRDM3  004044 G     ST.SUC= 000000       T$SAVL= 177777       UDAIST  012204       X$ALWA= 000000
SA.ERC= 003777       ST.WPR= 000006       T$SEGL= 177777       UDAIXX  012412       X$FALS= 000040
SA.ERR= 100000       SVCGBL= 000000       T$SIZE= 000011       UDAIXY  012422       X$OFFS= 000400
SA.GO  = 000001      SVCINS= 000000       T$SUBN= 000000       UDAIZE  012170       X$TRUE= 000020
SA.S1  = 004000      SVCSUB= 000000       T$TAGL= 177777       UDARSD  012550       $PATCH  015514 G
SA.S2  = 010000      SVCTAG= 000000

. ABS.  015602    000
        000000    001
ERRORS DETECTED:  0

VIRTUAL MEMORY USED:  28160 WORDS  ( 110 PAGES)
DYNAMIC MEMORY AVAILABLE FOR  71 PAGES
,B:ZUDEB0/C=[20,0]SVC34R.MLB/P:1,B:ZUDEA0.DOC,B:ZUDEA0
```

```
$PATCH   63-15#
ADR       8-25#
ALOCM    23-18#   28-15    36-21    36-39    57-18    57-37
ASKDLL   62-29    62-33#
ASKFIL   57-41    58-4#
ASSEMB    5-7      5-7
BIT0      8-25#   17-20    19-25
BIT00     8-25     8-25#
BIT01     8-25     8-25#
BIT02     8-25     8-25#
BIT03     8-25     8-25#
BIT04     8-25     8-25#
BIT05     8-25     8-25#
BIT06     8-25     8-25#
BIT07     8-25     8-25#
BIT08     8-25     8-25#
BIT09     8-25     8-25#
BIT1      8-25#   17-21    19-26
BIT10     8-25#
BIT11     8-25#
BIT12     8-25#
BIT13     8-25#
BIT14     8-25#
BIT15     8-25#   17-13
BIT2      8-25#   17-22
BIT3      8-25#   17-23
BIT4      8-25#   17-25
BIT5      8-25#
BIT6      8-25#
BIT7      8-25#
BIT8      8-25#
BIT9      8-25#
BLDC1    24-25#   24-27
BLDCMD   24-15#   27-3     30-14    40-3     40-30
BLKFND   26-27    26-39#
BOE       8-25#
C$AU      5-7#
C$AUTO    5-7#    59-17
C$BRK     5-7#    37-23    47-10
C$BSEG    5-7#
C$BSUB    5-7#
C$CEFG    5-7#
C$CLCK    5-7#
C$CLEA    5-7#    60-29
C$CLOS    5-7#    26-19    26-52    34-44
C$CLP1    5-7#
C$CVEC    5-7#
C$DCLN    5-7#
C$DODU    5-7#
C$DRPT    5-7#
C$DU      5-7#
C$EDIT    5-7#     5-49
C$ERDF    5-7#    44-40    46-48    47-61    48-27    49-5
C$ERHR    5-7#    31-4     38-15    38-22    38-29    39-17    42-13
C$ERRO    5-7#
C$ERSF    5-7#    22-11    22-12    35-1     35-2     35-3     58-1     61-38
```

```
C$ERSO    5-7#
C$ESCA    5-7#
C$ESEG    5-7#
C$ESUB    5-7#
C$ETST    5-7#     61-45
C$EXIT    5-7#     54-39    57-59    60-17    61-36
C$GETB    5-7#     34-1     34-6     34-26    34-33    34-40    34-48    34-51
C$GETW    5-7#     26-32
C$GMAN    5-7#     57-41
C$GPHR    5-7#     56-9
C$GPLO    5-7#
C$GPRI    5-7#
C$INIT    5-7#     58-9
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C$MANI    5-7#
C$MEM     5-7#     55-2
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C$OPEN    5-7#     26-24    33-1
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         50-5      50-9     50-10    50-14    50-15    50-16    50-20
C$PNTF    5-7#     41-1     61-25    61-34
C$PNTS    5-7#     41-7     41-8     41-9     41-10    41-11    41-12    41-13    41-14    41-15    41-16    41-19    41-23
C$PNTX    5-7#     39-20    50-21    50-22    50-25
C$QIO     5-7#
C$RDBU    5-7#
C$REFG    5-7#     54-33    54-36    54-41
C$RESE    5-7#      5-7#    55-1
C$REVI    5-7#      5-49
C$RFLA    5-7#
C$RPT     5-7#     52-36
C$SEFG    5-7#
C$SPRI    5-7#
C$SVEC    5-7#
C$TPRI    5-7#
C.CNT    17-35#    17-38    37-15*   37-18*   37-20*   38-4*    38-5*    57-31*   57-32*
C.DFLG   17-30#    17-31    40-13
C.FBLK   17-32#    17-34    26-17    26-20*   26-22    26-26    26-29*   26-47    26-51*   57-39*
C.FBUF   17-31#    17-32    26-31    40-37    57-38*
C.FLG    17-19#    17-28    27-7*    29-10    29-14*   29-15*   30-22*   32-19*   37-10    37-14    37-33*   38-3*    38-10    38-34
         39-3*     44-28*   44-33*   45-27*   57-9     57-10
C.INIT   17-37#    37-20    38-5     57-32
C.NEXT   17-9#     17-10    37-25    44-24    44-25    56-20    57-3     57-4
C.REF    17-28#    17-29    24-28*   24-29    38-27    57-10    57-11
C.RING   17-17#    17-18    24-16    28-18*   37-9     45-15    46-24    46-36    47-36    50-23    57-7     57-8
C.SIZE   17-38#    57-17
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C.TO     17-18#    17-19    57-8     57-9
C.UADR   17-10#    17-11    45-26    47-14    56-16    57-4     57-5
C.UNIT   17-11#    17-14    31-3     37-13    44-27    44-29    57-5     57-6
C.UNUM   17-29#    17-30    40-12    57-11
C.VEC    17-14#    17-17    57-6     57-7
CF.576   14-9#
CF.AVL   14-4#
CF.MSC   14-5#
CF.OTH   14-6#
CF.RPL   14-3#
CF.SHD   14-8#
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CLRBUF   25-17#   27-5     40-5     40-32
CT.AVL   17-13#   44-29
CT.BRL   17-16#
CT.CMD   17-22#   29-10    29-14    30-22    45-27
CT.LD    17-20#   32-19
CT.MSG   17-23#   29-15    37-14    38-3
CT.REQ   17-25#   27-7     38-10    38-34    39-3
CT.RN    17-21#   37-10    37-33    44-33
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DMTRLN   19-18#   30-15    36-32*   40-9
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E$LOAD    5-7#     5-49
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EF.BBU   13-23#
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EF.PWR    8-25#   54-41
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EF.SD1   13-28#
EF.SD2   13-27#
EF.SD3   13-26#
EF.SDF   13-25#
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ERRNBR   19-8#
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F$AU      5-7#
F$AUTO    5-7#    59-10    59-17
F$BGN     5-7#     5-25     7-23     8-12    22-10    35-5     35-10    35-15    35-30    43-36    50-3     50-8     50-13    50-19
         52-3     52-10    53-8     54-8     54-39    57-59    59-10    60-8     60-17    60-31    61-9     61-24    61-36    61-45
         61-47    62-4     62-15    63-2     63-24    64-2     64-3     64-3     64-10    64-12
F$CLEA    5-7#    60-8     60-29
F$DU      5-7#
F$END     5-7      5-7      5-7      5-7      5-7      5-7      5-7      5-7      5-7      5-7      5-7      5-7      5-7      5-7
          5-7      5-7      5-7#     5-25     7-23     8-12    22-18    35-8     35-13    35-18    35-30    43-40    50-6     50-11
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F$HARD    5-7#    62-15    62-29    62-31    62-32    62-35    62-43
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F$MOD     5-7#     5-25     7-23     8-12    35-30    52-3     60-31    61-9     61-47    62-4     63-24
F$MSG     5-7#    22-10    22-18    35-5     35-8     35-10    35-13    35-15    35-18    43-36    43-40    50-3     50-6     50-8
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F$PROT    5-7#    53-8     53-14
F$PWR     5-7#
F$RPT     5-7#    52-10    52-36
F$SEG     5-7#
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F$SW      5-7#     7-19     7-21
F$TEST    5-7#    61-24    61-45
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FMTDNE   39-10    41-1#
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G$DELM    5-7#    48-21    54-45
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G$HILI    5-7#
G$LOLI    5-7#
G$NO      5-7#    57-41    62-37    62-38    62-39    62-40
G$OFFS    5-7#    57-41    62-26    62-27    62-28    62-30    62-34    62-37    62-38    62-39    62-40    63-4     63-5     63-6
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G$OFSI    5-7#    57-41    62-26    62-27    62-28    62-30    62-34    62-37    62-38    62-39    62-40    63-4     63-5     63-6
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G$PRMA    5-7#    62-26
G$PRMD    5-7#    57-41    62-27    62-37    62-38    62-39    62-40    63-4     63-5     63-6     63-7
G$PRML    5-7#    62-28    62-30    62-34
G$RADA    5-7#    57-41
G$RADB    5-7#
G$RADD    5-7#    62-27    62-37    62-38    62-39    62-40    63-4     63-5     63-6     63-7
G$RADL    5-7#    62-28    62-30    62-34
G$RADO    5-7#    62-26
G$XFER    5-7#    62-29    62-31    62-32    62-35
G$YES     5-7#    62-26    62-27    62-28    62-30    62-34    63-4     63-5     63-6     63-7
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HC.BF2   10-31#   10-33    27-4     39-4     39-20    40-26    41-3     42-1     43-37    43-38
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HC.CCT   10-24#    45-25*
HC.CEV   10-28#    10-29     45-22*    45-23*
HC.CMD   10-23#    10-24     10-25     24-21*
HC.CPK   10-29#    10-30     24-20     24-23     24-29*    24-31*    25-19*    25-20*    30-15*    30-16*    30-17*
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HC.MPK   10-27#    10-28     24-18     24-20     30-20     38-13     38-20     38-27     45-16
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HC.PSZ   10-10#    10-28     10-30     24-24     45-18     45-22
HC.RES   10-13#    10-33     28-17
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HC.SIZ   10-33#    28-14
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HCOMM    28-14#    57-43
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I$AUTO    5-7#     59-10#    59-17#
I$CLN     5-7#     60-8#     60-17     60-29#
I$DU      5-7#
I$HRD    62-15#    62-43#
I$INIT    5-7#     54-8#     54-39     57-59     58-9#
I$MOD     5-7#      5-25      5-25#     7-23      7-23#     8-12      8-12#    35-30     35-30#    52-3      52-3#     60-31     60-31#    61-9
         61-9#     61-47     61-47#    62-4      62-4#     63-24     63-24#
I$MSG     5-7#     22-10#    22-18#    35-5#     35-8#     35-10#    35-13#    35-15#    35-18#    43-36#    43-40#    50-3#     50-6#     50-8#
         50-11#    50-13#    50-17#    50-19#    50-28#
I$PROT    5-7#     53-8#
I$PTAB    5-7#     64-3      64-3#     64-10     64-10#
I$PWR     5-7#
I$RPT     5-7#     52-10#    52-36#
I$SEG     5-7#     61-24
I$SETU    5-7#     64-2      64-2#     64-3      64-12     64-12#
I$SFT    63-2#     63-9#
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I$SUB     5-7#     61-24
I$TST     5-7#     61-24     61-24#    61-36     61-45     61-45#    61-45#
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IN.MS2    9-23#    47-32
IN.MS3    9-27#    47-42
IN.MS4    9-31#    47-52
IN.RS1    9-20#    47-22
IN.RS2    9-24#    47-33
IN.RS3    9-28#    47-43
IN.RS4    9-32#    47-53
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IN.WT3    9-29#    47-46
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INTM2	50-5	50-10	50-32#		
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L$ACP	5-49#				
L$APT	5-49#				
L$AUT	5-49#				
L$AUTO	5-49	59-10#			
L$CCP	5-49#				
L$CLEA	5-49	60-8#			
L$CO	5-49#				
L$DEPO	5-49#				
L$DESC	5-49	20-17#			
L$DESP	5-49#				
L$DEVP	5-49#				
L$DISP	5-49	6-8#			
L$DLY	5-49#	48-21	54-45		
L$DTP	5-49#				
L$DTYP	5-49#				
L$DUT	5-49#				
L$DVTY	5-49	20-12#			
L$EF	5-49#				
L$ENVI	5-49#				
L$ERRT	5-49	19-8#			
L$ETP	5-49#				
L$EXP1	5-49#				
L$EXP4	5-49#				
L$EXP5	5-49#				
L$HARD	5-49	62-15	62-15#		
L$HIME	5-49#				
L$HPCP	5-49#				
L$HPTP	5-49#				
L$HW	5-49	7-10	7-10#		
L$ICP	5-49#				
L$INIT	5-49	54-8#			

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L$LUN     5-49#    31-3*    37-13*   37-21    37-31    39-20    41-1     44-27*
L$MREV    5-49#
L$NAME    5-49#
L$PRIO    5-49#
L$PROT    5-49     53-8#
L$PRT     5-49#
L$REPP    5-49#
L$REV     5-49#
L$RPT     5-49     52-10#
L$SOFT    5-49     63-2     63-2#
L$SPC     5-49#
L$SPCP    5-49#
L$SPTP    5-49#
L$STA     5-49#
L$SW      5-49      7-19     7-19#
L$TEST    5-49#
L$TIML    5-49#
L$UNIT    5-49#    57-49
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L.CNTI   16-11#    16-12#
L.CYL    16-18#
L.DATA   16-23#
L.ERLC   16-17#
L.EVNT   16-9#
L.GRP    16-19#
L.SCTR   16-21#
L.SLOT   16-10#
L.TRCK   16-20#
L.UHVR   16-16#
L.UNTI   16-14#
L.USVR   16-15#
L.VSER   16-22#
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L10001    7-19      7-21#
L10002   22-18#
L10003   35-8#
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L10005   35-18#
L10006   43-40#
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L10010   50-11#
L10011   50-17#
L10012   50-28#
L10013   52-22     52-36#
L10015   54-39     57-59    58-9#
L10016   59-17#
L10017   60-17     60-29#
L10020   61-36     61-45#
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L10022   63-2      63-9#
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LOT      8-25#
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M.ER1   43-48#   43-74
M.ER10  43-57#   43-75
M.ER11  43-58#   43-75
M.ER12  43-59#   43-75
M.ER13  43-60#   43-75
M.ER14  43-61#   43-75
M.ER15  43-62#   43-75
M.ER16  43-63#   43-75
M.ER17  43-64#   43-76
M.ER18  43-65#   43-76
M.ER19  43-66#   43-76
M.ER2   43-49#   43-74
M.ER20  43-67#   43-76
M.ER21  43-68#   43-76
M.ER22  43-69#   43-76
M.ER3   43-50#   43-74
M.ER4   43-51#   43-74
M.ER5   43-52#   43-74
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M.ER8   43-55#   43-74
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MD.FEU  13-16#
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MD.SCH  13-7#
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MD.SER  13-10#
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MD.SSH  13-11#
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NOGOER  61-30    61-38#
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O$BGNR    5-7#      5-32#     5-49
O$BGNS    5-7#      5-32#     5-49
O$DU      5-7#      5-49
O$ERRT    5-7#      5-32#     5-49
O$GNSW    5-7#      5-32#     5-49
O$POIN    5-7#      5-32      5-32#     5-32#     5-32#     5-32#     5-32#     5-49
O$SETU    5-7#      5-32#     5-49      63-23
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OP.DLE    12-5#     30-13
OP.END    12-4#     38-9      38-12
OP.RCV    12-7#     27-2      38-12
OP.SND    12-6#     38-9      40-2      40-29
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P.BUFF    14-19#    14-20
P.CMST    15-15#
P.CNCL    15-41#
P.CNT     15-48#
P.CNTF    14-38#    15-39#
P.CNTI    15-42#
P.CRF     14-14#    15-4#     15-46#    24-29*    38-27
P.CTMO    15-40#
P.CYL     15-21#
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P.FBBK    15-10#
P.FLGS    15-7#     15-50#
P.GRP     15-22#
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P.MAIN    14-50#    30-16*
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P.OPCD    14-16#    15-6#     15-49#    24-31*    38-13
P.OTRF    14-25#    15-14#
P.OVRL    14-51#    30-17*
P.RBN     14-35#
P.RBNS    15-26#
P.RCTC    15-27#
P.RCTP    15-25#
P.RCTS    15-24#
P.RGID    14-44#
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P.SHST    15-20#
P.SHUN    14-29#    15-19#    15-31#
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P.TIME    14-41#
P.TRCK    15-23#
P.TRLN    14-49#    30-15*
P.UADR    14-20#    25-19*
P.UNCL    15-34#
P.UNFL    14-28#    15-18#    15-30#
P.UNIT    14-15#    15-5#     15-47#
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P.UNTI   14-30#   15-32#
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P.VSER   15-36#
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PRI01     8-25#
PRI02     8-25#
PRI03     8-25#
PRI04     8-25#
PRI05     8-25#
PRI06     8-25#
PRI07     5-49     8-25#
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PTM.S3   62-39    62-53#
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PTM.SN   62-37    62-51#
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PTM.UB   62-26    62-46#
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T$$SOF   63-2     63-2#    63-9
T$$SW     7-19     7-19#    7-21
T$$TES   61-24#   61-36    61-45
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	41-23	41-23#	41-26	41-26	41-26#	43-37	43-37	43-37	43-37#	43-38	43-38	43-38	43-38#	43-39
	43-39	43-39	43-39#	50-4	50-4	50-4#	50-5	50-5	50-5	50-5#	50-9	50-9	50-9#	50-10
	50-10	50-10	50-10#	50-14	50-14	50-14#	50-15	50-15	50-15	50-15#	50-16	50-16	50-16	50-16#
	50-20	50-20	50-20#	50-21	50-21	50-21#	50-22	50-22	50-22#	50-25	50-25	50-25	50-25	50-25#

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        35-16#  35-16#  35-17   35-17   35-17#  35-17#  37-21   37-21   37-21   37-21#  37-21#  37-21#  37-31   37-31
        37-31   37-31#  37-31#  37-31#  39-20   39-20   39-20   39-20   39-20#  39-20#  39-20#  39-20#  41-1    41-1
        41-1    41-1#   41-1#   41-1#   41-7    41-7    41-7    41-7#   41-7#   41-7#   41-8    41-8    41-8    41-8#
        41-8#   41-8#   41-9    41-9    41-9    41-9#   41-9#   41-9#   41-10   41-10   41-10   41-10#  41-10#  41-10#
        41-11   41-11   41-11   41-11#  41-11#  41-11#  41-12   41-12   41-12   41-12#  41-12#  41-12#  41-13   41-13
        41-13   41-13#  41-13#  41-13#  41-14   41-14   41-14   41-14#  41-14#  41-14#  41-15   41-15   41-15   41-15#
        41-15#  41-15#  41-16   41-16   41-16   41-16#  41-16#  41-16#  41-19   41-19   41-19#  41-19#  41-23   41-23
        41-23#  41-23#  41-26   41-26   41-26#  41-26#  43-37   43-37   43-37   43-37#  43-37#  43-37#  43-38   43-38
        43-38   43-38#  43-38#  43-38#  43-39   43-39   43-39   43-39#  43-39#  43-39#  50-4    50-4    50-4#   50-4#
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        50-10#  50-10#  50-14   50-14   50-14#  50-14#  50-15   50-15   50-15   50-15#  50-15#  50-15#  50-16   50-16
        50-16   50-16#  50-16#  50-16#  50-20   50-20   50-20#  50-20#  50-21   50-21   50-21#  50-21#  50-22   50-22
        50-22#  50-22#  50-25   50-25   50-25   50-25   50-25#  50-25#  50-25#  50-25#  61-25   61-25   61-25#  61-25#
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        62-38   62-38#  62-39   62-39#  62-40   62-40#  63-4    63-4#   63-5    63-5#   63-6    63-6#   63-7    63-7#
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M$SETS   5-25    5-25#   7-10    7-10#   7-19    7-19#   8-12    8-12#  22-10   22-10#  35-5    35-5#   35-10   35-10#
        35-15   35-15#  43-36   43-36#  50-3    50-3#   50-8    50-8#   50-13   50-13#  50-19   50-19#  52-3    52-3#
        52-10   52-10#  53-8    53-8#   54-8    54-8#   59-10   59-10#  60-8    60-8#   61-9    61-9#   61-24   61-24#
        62-4    62-4#   62-15   62-15#  63-2    63-2#
M$SVC   22-11   22-12   22-18   22-18#  26-19   26-19#  26-24   26-24#  26-32   26-32#  26-52   26-52#  31-4    33-1
        33-1#   34-1    34-1#   34-6    34-6#   34-26   34-26#  34-33   34-33#  34-40   34-40#  34-44   34-44#  34-48
        34-48#  34-51   34-51#  35-1    35-2    35-3    35-6    35-6#   35-7    35-7#   35-8    35-8#   35-11   35-11#
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        41-16   41-16#  41-19   41-19#  41-23   41-23#  41-26   41-26#  42-13   43-37   43-37#  43-38   43-38#  43-39
        43-39#  43-40   43-40#  44-40   46-48   47-10   47-10#  47-61   48-27   49-5    50-4    50-4#   50-5    50-5#
        50-6    50-6#   50-9    50-9#   50-10   50-10#  50-11   50-11#  50-14   50-14#  50-15   50-15#  50-16   50-16#
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        52-36#  54-33   54-33#  54-36   54-36#  54-39   54-39#  54-41   54-41#  55-1    55-1#   55-2    55-2#   56-9
        56-9#   57-41   57-41#  57-59   57-59#  58-1    58-9    58-9#   59-17   59-17#  60-17   60-17#  60-29   60-29#
        61-25   61-25#  61-34   61-34#  61-36   61-36#  61-38   61-45   61-45#
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        34-44#  34-48#  34-51#  35-1#   35-2#   35-3#   35-6#   35-7#   35-8#   35-11#  35-12#  35-13#  35-16#  35-17#
        35-18#  37-21#  37-23#  37-31#  38-15#  38-22#  38-29#  39-17#  39-20#  41-1#   41-7#   41-8#   41-9#   41-10#
        41-11#  41-12#  41-13#  41-14#  41-15#  41-16#  41-19#  41-23#  41-26#  42-13#  43-37#  43-38#  43-39#  43-40#
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        34-33#  34-40   34-40#  34-44   34-44#  34-48   34-48#  34-51   34-51#  35-1    35-1#   35-1#   35-2    35-2#
        35-2#   35-3    35-3#   35-3#   35-6    35-6#   35-7    35-7#   35-8    35-8#   35-11   35-11#  35-12   35-12#
        35-13   35-13#  35-16   35-16#  35-17   35-17#  35-18   35-18#  37-21   37-21#  37-23   37-23#  37-31   37-31#
        38-15   38-15#  38-15#  38-22   38-22#  38-22#  38-29   38-29#  38-29#  39-17   39-17#  39-17#  39-20   39-20#
        41-1    41-1#   41-7    41-7#   41-8    41-8#   41-9    41-9#   41-10   41-10#  41-11   41-11#  41-12   41-12#
        41-13   41-13#  41-14   41-14#  41-15   41-15#  41-16   41-16#  41-19   41-19#  41-23   41-23#  41-26   41-26#
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        46-48   46-48#  46-48#  47-10   47-10#  47-61   47-61#  47-61#  48-27   48-27#  48-27#  49-5    49-5#   49-5#
        50-4    50-4#   50-5    50-5#   50-6    50-6#   50-9    50-9#   50-10   50-10#  50-11   50-11#  50-14   50-14#
        50-15   50-15#  50-16   50-16#  50-17   50-17#  50-20   50-20#  50-21   50-21#  50-22   50-22#  50-25   50-25#
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        55-2    55-2#   56-9    56-9#   57-41   57-41#  57-59   57-59#  58-1    58-1#   58-1#   58-9    58-9#   59-17
        59-17#  60-17   60-17#  60-29   60-29#  61-25   61-25#  61-34   61-34#  61-36   61-36#  61-38   61-38#  61-38#
        61-45   61-45#
M$WORD   5-49    5-49#   6-8     6-8     6-8#   22-11   22-11   22-11   22-11#  22-12   22-12   22-12   22-12#  31-4
        31-4    31-4    31-4#   35-1    35-1    35-1    35-1#   35-2    35-2    35-2    35-2#   35-3    35-3    35-3
        35-3#   38-15   38-15   38-15   38-15#  38-22   38-22   38-22   38-22#  38-29   38-29   38-29   38-29#  39-17
        39-17   39-17   39-17#  42-13   42-13   42-13   42-13#  44-40   44-40   44-40   44-40#  46-48   46-48   46-48
        46-48#  47-61   47-61   47-61   47-61#  48-27   48-27   48-27   48-27#  49-5    49-5    49-5    49-5#   52-22
        52-22#  54-39#  57-41   57-41   57-41#  57-41#  57-59#  58-1    58-1    58-1    58-1#   60-17#  61-36#  61-38
        61-38   61-38   61-38#  62-26   62-26#  62-27   62-27#  62-28   62-28#  62-29   62-29#  62-30   62-30#  62-31
        62-31#  62-32   62-32#  62-34   62-34#  62-35   62-35#  62-37   62-37#  62-38   62-38#  62-39   62-39#  62-40
        62-40#  63-4    63-4#   63-5    63-5#   63-6    63-6#   63-7    63-7#   64-3    64-3#
M$XFER  62-29   62-29#  62-31   62-31#  62-32   62-32#  62-35   62-35#
MEMORY  55-2
OPEN    26-24   33-1
OR      18-7#
POINTE   5-32
POP     18-17#  23-23   24-30   24-31   25-26   26-40   26-53   30-23   31-5    45-29
PRINTB  35-6    35-7    35-11   35-12   35-16   35-17   37-21   37-31   41-26   43-37   43-38   43-39   50-4    50-5
        50-9    50-10   50-14   50-15   50-16   50-20
PRINTF  41-1    61-25   61-34
PRINTS  41-7    41-8    41-9    41-10   41-11   41-12   41-13   41-14   41-15   41-16   41-19   41-23
PRINTX  39-20   50-21   50-22   50-25
PUSH    18-11#  23-18   24-15   25-17   26-16   30-12   45-14
READEF  54-33   54-36   54-41
SOB     18-23#  26-35   34-31   41-18   41-22   46-27   46-40   50-27
SVC      5-6#    5-7
XFER    52-22#  54-39#  57-59#  60-17#  61-36#  62-32
XFERF   62-29
XFERT   62-31   62-35
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