RX02

SS PERF EXER

CZRXDA0

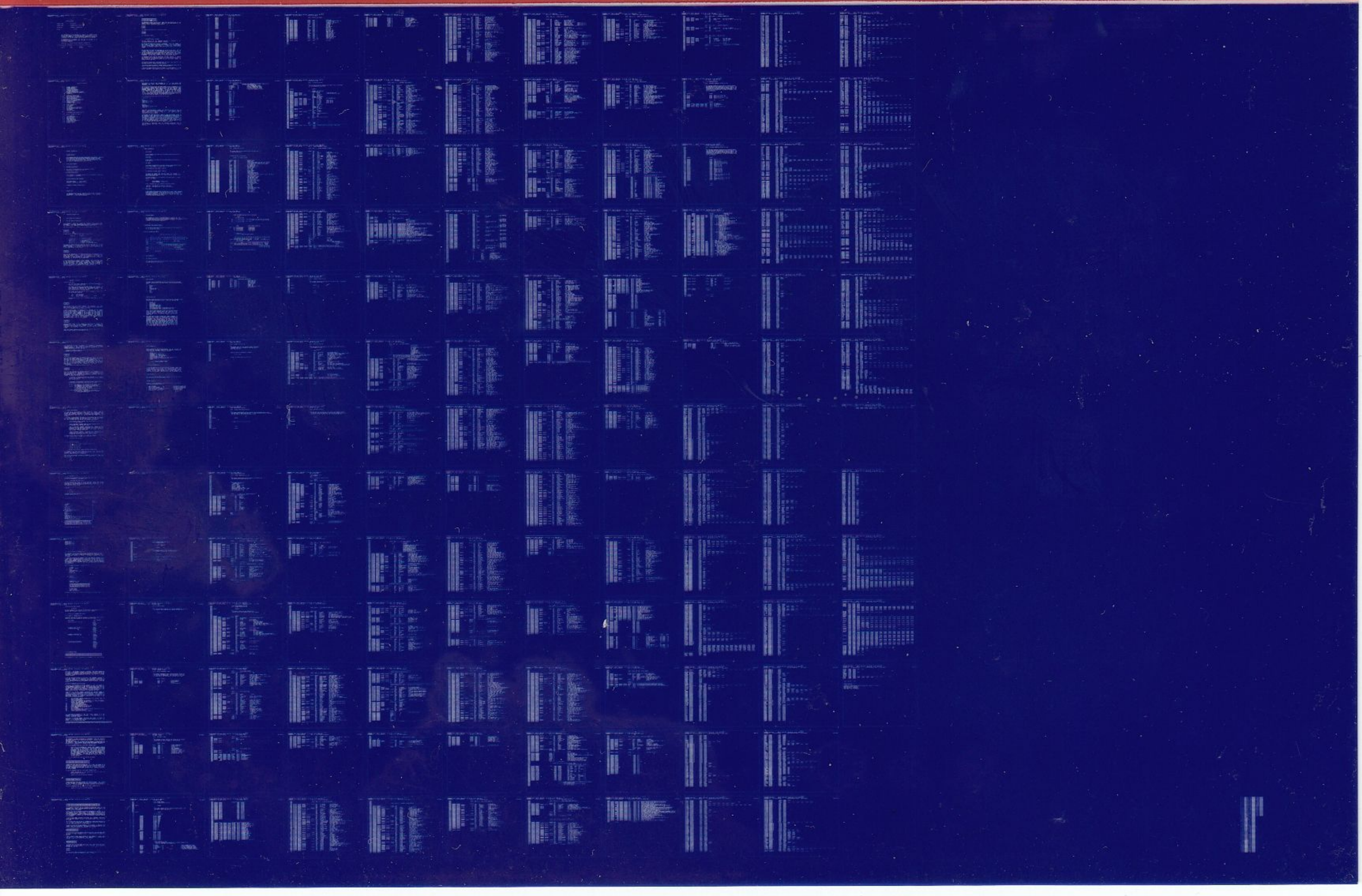
AH-E513A-MC

FICHE 1 OF 1

AUG 1978

digital

MADE IN USA



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IDENTIFICATION

PRODUCT CODE	AC-E512A-MC
PRODUCT NAME	CZRXDA0 RX02 SS PERF EXER
MAINTAINER	DIAGNOSTIC ENGINEERING
AUTHOR	L S PRUCHA

TABLE OF CONTENTS

1.0 GENERAL INFORMATION

1.1 PROGRAM ABSTRACT

THIS PROGRAM EXERCISES TWO RX02 SUBSYSTEMS (FOUR DRIVES), MAINTAINS DRIVE STATISTICS AND PROVIDES RUN SUMMARIES SO THAT SEEK AND DATA ERROR RATES MAY BE DETERMINED. THE PERFORMANCE EXERCISER WILL GIVE THE USER CONFIDENCE, AFTER RUNNING SUCCESSFULLY, THAT THE SYSTEM IS PERFORMING WITHIN SPECIFICATION

1.2 SYSTEM REQUIREMENTS

1.2.1 HARDWARE REQUIREMENTS

PDP-11/LSI-11 PROCESSOR WITH 16K OR MORE OF MEMORY
CONSOLE DEVICE (LA30, LA36, VT50, ETC)

1.2.2 SOFTWARE REQUIREMENTS

THIS DIAGNOSTIC IS DESIGNED TO RUN WITH THE DIAGNOSTIC SUPERVISOR AS DESCRIBED IN PARAGRAPH 2.0

1.3 RELATED DOCUMENTS AND STANDARDS

XXDP USERS MANUAL MD-11-DZQXA
DIAGNOSTIC SUPERVISOR PROGRAM LISTING

1.4 DIAGNOSTIC HIERARCY PREREQUISITES

NONE

1.5 ASSUMPTIONS

THE HARDWARE OTHER THAN THE SUBSYSTEM BEING TESTED IS ASSUMED TO WORK PROPERLY. FALSE ERRORS MAY BE REPORTED IF THE PROCESSOR, MEMORY, ETC , DO NOT FUNCTION PROPERLY.

2 0 OPERATING INSTRUCTIONS

2 1 HOW TO RUN THIS DIAGNOSTIC

2 1 1 THE SIX STEPS OF EXECUTION

THIS DIAGNOSTIC SHOULD BE LOADED AND STARTED USING NORMAL XXDP PROCEDURES. THE START COMMAND SHOULD NOT SPECIFY AN ADDRESS, BECAUSE THE DIAGNOSTIC HAS THE PROPER TRANSFER ADDRESS CODED INTO IT

WHEN THIS DIAGNOSTIC IS STARTED, THE FOLLOWING STEPS WILL OCCUR

****
* STEP 1 *
****

A SHORT SERIES OF "HARDCORE QUESTIONS" WILL BE ASKED

QUESTION	MEANING
L-CLK (L) N ?	IS THERE AN L-CLOCK?
P-CLK (L) N ?	" " " P-CLOCK?
50HZ (L) N ?	IS THE POWER 50 CYCLES (AS IN EUROPE)?
LSI (L) N ?	IS MACHINE AN LSI?
LPT (L) N ?	IS THERE A LINE PRINTER?
MEM (K) (D) 16 ?	HOW MANY K OF MEMORY ARE THERE?

THE DEFAULTS (SHOWN AFTER EACH QUESTION) CAN BE SELECTED BY HITTING CARRIAGE RETURN. IT IS POSSIBLE THAT NOT ALL OF THE QUESTIONS WILL BE ASKED: FOR EXAMPLE, IF YOU SAY "YES" TO THE L-CLOCK QUESTION, THE P-CLOCK QUESTION WILL NOT BE ASKED

****
* STEP 2 *
****

WHEN YOU HAVE ANSWERED ALL THE HARDCORE QUESTIONS, THE DIAGNOSTIC WILL ISSUE THE PROMPT "DS-B)". FROM THIS POINT UNTIL THE TIME WHEN YOU RESTART XXDP, YOU WILL BE TALKING TO THE DIAGNOSTIC, NOT XXDP. WE WILL REFER TO THE PRESENCE OF THIS PROMPT AS BEING IN DIAGNOSTIC COMMAND MODE, AS OPPOSED TO XXDP COMMAND MODE

AT THIS POINT YOU WILL ENTER A "START" COMMAND. THIS IS NOT THE SAME AS THE XXDP "START" COMMAND, WHICH YOU ALREADY ISSUED IN RESPONSE TO THE XXDP DOT PROMPT. THIS "START" COMMAND CAN TAKE A NUMBER OF SWITCHES AND FLAGS (ALL OPTIONAL) AND THE DETAILS OF THESE ARE SET FORTH IN "2.3 DETAILS OF COMMANDS AND SYNTAX". HOWEVER, IN ORDER TO USE THE PROGRAM, ALL YOU NEED TO SAY IS SOMETHING LIKE THIS

STA/PASS:1/FLAGS.HOE

THINGS TO NOTE HERE:

1. ONLY THE FIRST THREE CHARACTERS OF THIS OR ANY COMMAND AT THE "DS-B)" LEVEL NEED TO BE TYPED.

2. THE "PASS" SWITCH SPECIFIES HOW MANY PASSES YOU DESIRE. A PASS CONSISTS OF RUNNING THE FULL DIAGNOSTIC AGAINST ALL UNITS BEING TESTED (THIS WILL BE EXPLAINED SHORTLY). ONE PASS IS SPECIFIED IN THE ABOVE EXAMPLE

3. THE "FLAGS" SWITCH MAY SPECIFY ANY OF A NUMBER OF FLAGS, BUT THE MAIN USEFUL ONES ARE:

LOE	LOOP ONE ERROR
HOE	HALT ON ERROR
IER	INHIBIT ERROR PRINTOUT

   THE HOE FLAG IS SPECIFIED IN THE ABOVE EXAMPLE (WE'LL SEE WHY SHORTLY)

****
* STEP 3 *
****

WHEN YOU HAVE TYPED IN A "START" COMMAND, THE DIAGNOSTIC WILL COME BACK WITH THE QUESTION "# UNITS?" TO WHICH YOU SHOULD RESPOND BY TYPING IN THE NUMBER OF DEVICES YOU WISH TO TEST.

A WORD OF WARNING HERE: THE NUMBER OF UNITS DEPENDS ON THE TARGET DEVICE OF THE DIAGNOSTIC. FOR EXAMPLE, IF THE DIAGNOSTIC IS DIRECTED AT A DISK DRIVE, THEN THE NUMBER OF UNITS WOULD BE THE NUMBER OF DRIVES TO BE TESTED. WHEREAS IF THE DIAGNOSTIC WAS DIRECTED AT THE DISK CONTROLLER, THEN THE NUMBER OF UNITS WOULD BE THE NUMBER OF CONTROLLERS. THE TARGET DEVICE OF A DIAGNOSTIC CAN ALWAYS BE DETERMINED BY INSPECTING THE "HEADER" STATEMENT NEAR THE BEGINNING OF THE SOURCE CODE ONE OF THE OPERANDS OF THIS "HEADER" STATEMENT SHOULD BE THE DEVICE TYPE OF THE DIAGNOSTIC

****
* STEP 4 *
****

WHEN YOU HAVE TYPED IN THE NUMBER OF UNITS TO BE TESTED, THE DIAGNOSTIC WILL ASK YOU THE "HARDWARE QUESTIONS" THE ANSWERS TO THESE QUESTIONS ARE USED TO BUILD TABLES IN CORE, CALLED "HARDWARE P-TABLES". ONE HARDWARE P-TABLE WILL BE BUILT FOR EACH UNIT TO BE TESTED.

THERE ARE SEVERAL HARDWARE QUESTIONS AND THE ENTIRE SERIES WILL BE POSED N TIMES, WHERE N IS THE NUMBER OF UNITS

THIS REPRESENTS A NEW PHILOSOPHY IN DIAGNOSTIC ENGINEERING
DIAGNOSTIC WILL IN THE FUTURE NOT BE WRITTEN TO AUTOSIZE OR ASSUME
STANDARD ADDRESSES: INSTEAD, THEY WILL ASK THE OPERATOR FOR ALL THE
INFORMATION THEY NEED TO TEST THE DEVICE

--> ANSWER THE EXPANSION QUESTION WITH A "CR" OR 0 AND "CR" THIS WORD
IS RESERVED FOR FUTURE EXPANSION

****
* STEP 5 *
****

AFTER YOU HAVE ANSWERED ALL THE HARDWARE QUESTIONS FOR ALL THE UNITS,
YOU WILL BE ASKED "CHANGE SW?" IF YOU WANT TO BE ASKED THE SOFTWARE
QUESTIONS THAT DETERMINE THE BEHAVIOR OF THIS PROGRAM, TYPE "Y" IF
YOU WANT TO TAKE ALL THE DEFAULTS TO THESE QUESTIONS, TYPE "N" IF
YOU TYPE "Y" YOU WILL BE ASKED THE SOFTWARE QUESTIONS, AND THE ANSWERS
WILL BE PUT INTO THE SOFTWARE P-TABLE IN THE PROGRAM. THE SERIES OF
QUESTIONS WILL BE ASKED JUST ONCE, REGARDLESS OF THE NUMBER OF UNITS
TO BE TESTED.
--> AGAIN ANSWER THE EXPANSION QUESTION WITH A "CR"

****
* STEP 6 *
****

AFTER YOU HAVE ANSWERED THE SOFTWARE QUESTIONS, THE DIAGNOSTIC WILL
BEGIN TO EXECUTE THE HARDWARE TEST CODE. THERE ARE SEVERAL THINGS
THAT CAN HAPPEN NEXT, DEPENDING ON WHETHER A HARDWARE ERROR IS
ENCOUNTERED AND ALSO ON WHAT SWITCH VALUES YOU SELECTED ON THE START
COMMAND. CONSIDER THE POSSIBILITIES:

1. IF NO ERROR IS ENCOUNTERED, THEN THE DIAGNOSTIC WILL SIMPLY EXECUTE THE DESIRED NUMBER OF PASSES AND RETURN TO COMMAND MODE (PROMPT DS-B>)

2. IF AN ERROR IS ENCOUNTERED, THEN ONE OF THREE THINGS HAPPENS, DEPENDING ON THE SETTINGS OF THE HOE AND LOE FLAGS.

   HOE SET: THE ERROR WILL BE REPORTED ON THE CONSOLE AND THE DIAGNOSTIC WILL RETURN TO COMMAND MODE
   LOE SET: THE DIAGNOSTIC WILL LOOP ENDLESSLY ON THE BLOCK OF CODE THAT DETECTED THE ERROR IF NO ERROR PRINT OUT IS DESIRED, THEN ALSO SET THE IER FLAG (SEE BELOW).
   NEITHER HOE NOR LOE SET: THE ERROR WILL BE REPORTED ON THE CONSOLE AND NORMAL EXECUTION WILL RESUME AS IF NO ERROR HAD OCCURED

2.1.2 SAMPLE RUN-THROUGH

LET'S SEE HOW ALL THIS WORKS IN A REAL SITUATION. RECALL THAT WE ENTERED THE COMMAND "STA/PASS:1/FLAGS:HOE" THIS WOULD BE A VERY TYPICAL WAY TO RUN THE DIAGNOSTIC. IF NO ERRORS ARE ENCOUNTERED, THE SINGLE REQUESTED PASS WILL BE EXECUTED AND THE PROMPT WILL BE REISSUED.

IF AN ERROR IS ENCOUNTERED, THE ERROR WILL BE REPORTED AND THE PROMPT WILL BE REISSUED (BECAUSE THE HOE FLAG IS SET) AT THIS POINT THERE ARE FOUR DIFFERENT WAYS YOU CAN GET THE PROGRAM GOING AGAIN:

1. ISSUE ANOTHER "START" COMMAND (THUS GOING THRU ALL OF STEPS 2, 3, 4, 5, AND 6 AGAIN)

2. ISSUE A "RESTART" COMMAND (SAME AS START COMMAND EXCEPT THAT THE HARDWARE QUESTIONS ARE NOT ASKED)

3 ISSUE A "CONTINUE" COMMAND (EXECUTION WILL RESUME AT THE BEGINNING OF THE PARTICULAR HARDWARE TEST (MOST DIAGNOSTICS CONSIST OF A NUMBER OF THESE) THAT IT WAS IN WHEN THE ERROR HALT OCCURED. NO QUESTIONS ASKED.

4 ISSUE A "PROCEED" COMMAND. EXECUTION WILL RESUME AT THE INSTRUCTION FOLLOWING THE ERROR REPORT (THIS IS A SPECIAL COMMAND AND CAN BE ISSUED ONLY AT A HALT ON ERROR)

THE MOST TYPICAL THING TO DO HERE IS TO ISSUE THE PROCEED, BUT WITH DIFFERENT FLAG SETTINGS PROBABLY YOU WOULD WANT TO SAY

```
PRO/FLAGS IER LOE HOE=0
```

THIS WILL DO THE FOLLOWING

1 TURN ON THE IER (INHIBIT ERROR PRINTOUT) FLAG

2. TURN ON THE LOE FLAG

3 TURN OFF THE HOE FLAG

4. RESUME EXECUTION AT INSTRUCTION AFTER ERROR REPORT

THE DIAGNOSTIC WILL NOW LOOP ON THE BLOCK OF CODE THAT DETECTED AND REPORTED THE ERROR, BUT NO ERROR PRINTOUT WILL OCCUR THUS YOU CAN STUDY THE ERROR OR SCOPE IT OR WHATEVER

WHEN YOU'VE SEEN ENOUGH, YOU MAY HIT CONTROL/C THIS WILL TAKE YOU OUT OF THE LOOP AND PUT YOU BACK INTO COMMAND MODE YOU NOW HAVE THREE CHOICES

1. START

2. RESTART

3. CONTINUE

LET'S SAY YOU'VE REPAIRED THE DEFECT FOUND ABOVE AND WANT TO FINISH RUNNING THE DIAGNOSTIC YOU WOULD TYPE

CON/FLAGS.HOE:IER=0:LOE=0

THIS WILL RESTORE THE FLAGS TO THEIR ORIGINAL VALUES AND RESUME EXECUTION AT THE BEGINNING OF THE HARDWARE TEST YOU WERE IN IF THE ERROR DOES NOT RECUR, THE EXECUTION WILL FLOW RIGHT ON THRU TO THE NEXT ERROR OR TO END OF PASS.

IF AT END OF PASS YOU WANT TO RUN THE DIAGNOSTIC AGAIN, YOU HAVE TWO CHOICES.

1 START

2. RESTART

YOU WOULD CHOOSE ONE, DEPENDING ON WHETHER YOU WANTED TO ANSWER THE HARDWARE QUESTIONS AGAIN.

THE FULL PRINT-OUT FROM THE ABOVE DIALOGUE MIGHT LOOK LIKE THIS

```
                                                    BY
                                                    WHOM
                                                    ENTERED
 R DZRKXX                                           0
DZRKXX                                              D
L-CLK (L) N ? Y                                     D,0
50HZ (L) N ?                                        D
LSI (L) N ?                                         D
LPT (L) N ?                                         D
MEM (K) (D) 16 ?                                    D
DS-B>STA/PASS 1/FLAGS HOE                           D,0
# UNITS (D) ? 2                                     D,0
UNIT 1                                              D
DRIVE (0) ? 0                                       D,0
UNIT 2                                              D
DRIVE (0) ? 1                                       D,0
CHANGE SW (L) ? N                                   D,0
DZRKXX HARD ERR 00004 TST 003 SUB 002 PC 004130     D
ERR HLT                                             D
DS-B>PRO/FLAGS:IER:LOE:HOE=0                        D,0

**************************************************
AT THIS POINT THE DIAGNOSTIC IS LOOPING ON THE
ERROR WITHOUT PRINTING ANYTHING.  YOU CAN SCOPE
THE ERROR UNTIL YOU HAVE LOCATED IT, THEN  C OUT
**************************************************

 C                                                  0
DS-B>CON/FLAGS.HOE.IER:LOE=0                        D,0
```

```
CHANGE SW (L) ? N                                    D,0
DZRKXX EOP 1                                         D
DS-B>RESTART/PASS 1                                  D,0
CHANGE SW (L) ? N                                    D,0
------------------
------------------
------------------
------------------
------------------
```

2 2 HOW TO CREATE A CHAINABLE FILE

THE DIAGNOSTIC AS RECEIVED FROM RELEASE ENGINEERING CANNOT BE RUN IN CHAIN MODE THA IS WHY IT BEARS THE EXTENSION "BIN" INSTEAD OF "BIC" THERE 'S A WAY, HOWEVER, TO CREATE A CHAINABLE PROGRAM FROM WHAT YOU'VE GOT.

IT CONSISTS OF RUNNING THE PROGRAM WITH THE SPECIAL COMMAND "CCI" ISSUED WHERE YOU WOULD NORMALLY ISSUE A START COMMAND (TO THE PROMPT DS-B>. THIS COMMAND CAUSES THE DIAGNOSTIC TO GO THRU ALL THE QUESTIONS AND ANSWERS AND THEN TO HALT, JUST WHERE IT WOULD ORDINARILY BEGIN EXECUTION OF THE HARDWARE TEST CODE AT THIS POINT YOU CAN DUMP THE PROGRAM AS IT SITS IN CORE TO THE LOAD MEDIUM, WITH THE NEW EXTENSION "BIC".

HERE IS A SAMPLE DIALOGUE TO ACCOMPLISH THIS

```
.R UPD2
RESTART:  XXXXXX
*CLR
*LOAD DIAG.BIN
XFER:200   CORE 0,60602
*START 200
L-CLK (L) N ?
-------------
-------------
-------------
DS-B>CCI
# UNITS (D) ? 4
-------------
-------------
-------------
CHANGE SW (L) ? N
PTAB END:  60632

**************************************
*AT THIS POINT THE MACHINE HALTS AND*
*YOU MUST RESTART AT ADDRESS  XXXXXX*
**************************************

*HICORE 60632
CORE:  0,60632
*DUMP DK0: DIAG.BIC
```

THE RESULT OF DOING THIS IS THAT YOU CAN NOW BUILD AN XXDP CHAIN FILE

CONTAINING THE XXDP COMMAND

.R DIAG.BIC

AND THE DIAGNOSTIC WILL EXECUTE WITHOUT MANUAL INTERVENTION, USING THE ANSWERS THAT YOU GAVE IT WHEN YOU DID THE CCI COMMAND.

2.3 DETAILS OF COMMANDS AND SYNTAX

2.3.1 TABLE OF COMMAND VALIDITY

THERE ARE FOUR WAYS OF ENTERING DIAGNOSTIC COMMAND MODE, AND DIFFERENT SUBSETS OF THE DIAG COMMAND SET ARE AVAILABLE WITH EACH.

	HOW ENTERED	LEGAL COMMANDS
1	OPERATOR ENTERED 'RUN DIAG'	START PRINT DISPLAY FLAGS ZFLAGS
2	DIAGNOSTIC HAS FINISHED ALL ITS REQUESTED PASSED	START RESTART PRINT DISPLAY FLAGS ZFLAGS
3.	OPERATOR INTERRUPTED THE DIAGNOSTIC WITH CTRL/C	START RESTART CONTINUE PRINT DISPLAY FLAGS ZFLAGS
4	AN ERROR WAS ENCOUNTERED WITH THE HOE FLAG SET SET	START RESTART CONTINUE PROCEED PRINT DISPLAY FLAGS ZFLAGS

2.3.2 COMMAND SYNTAX

```
**********************************************************************
STA(RT)/TESTS:TEST-LIST/PASS:PASS-CNT/FLAGS:FLAG-LIST/EOP EOP-INCR
**********************************************************************
```

THE DIAGNOSTIC IN CORE IS EXECUTED IN ACCORDANCE WITH THE SWITCHES

SPECIFIED THE MESSAGE "# UNITS?" IS PRINTED. THE START COMMAND MAY BE ISSUED WHEN DIAGNOSTIC COMMAND MODE HAS BEEN ENTERED VIA ONE OF THE FOLLOWING: A) OPERATOR TYPED "RUN DIAGNOSTIC" B) DIAGNOSTIC FINISHED EXECUTING C) ERROR WAS ENCOUNTERED WITH HOE FLAG SET D) OPERATOR ENTERED CONTROL/C.

AFTER THE OPERATOR RESPONDS TO "# UNITS?", THE HARDWARE DIALOGUE IS INITIATED WHEN IT IS COMPLETED, THE QUESTIONS "CHANGE SW?" IS ISSUED, AND THE ANSWERS, IF GIVEN, BECOME THE NEW DEFAULTS. THEREFORE IT IS NECESSARY TO RELOAD THE PROGRAM IN ORDER TO RETURN TO THE LOAD DEFAULTS.

THE SWITCH ARGUMENTS ARE AS FOLLOWS:

"TEST-LIST" IS A SEQUENCE OF DECIMAL NUMBERS (1:2 ETC.) OR RANGES OF DECIMAL NUMBERS (1-5:8-10 ETC.) THAT SPECIFY THE TESTS TO BE EXECUTED THE NUMBERS ARE SEPARATED BY COLONS. THE NUMBERS RANGE FROM 1 TO THE LARGEST TEST NUMBER IN THE DIAGNOSTIC. THEY MAY BE SPECIFIED IN ANY ORDER. TESTS WILL BE EXECUTED IN NUMBERICAL ORDER REGARDLESS OF THE ORDER OF SPECIFICATION. THE DEFAULT IS TO EXECUTE ALL TESTS.

"PASS-CNT" IS A DECIMAL NUMBER INDICATING THE DESIRED NUMBER OF PASSES. A PASS IS DEFINED AS THE EXECUTION OF THE FULL DIAGNOSTIC (ALL SELECTED TESTS) AGAINST ALL UNITS SUMBITTED. THE DEFAULT IS NON-ENDING EXECUTION. B "FLAG-LIST" IS A SEQUENCE OF ELEMENTS OF THE FORM <FLAG>, <FLAG=1>, OR <FLAG=0>, SEPARATED BY COLONS, WHERE <FLAG> HAS ONE OF THE FOLLOWING VALUES:

HOE	HALT ON ERROR, CAUSING COMMAND MODE TO BE ENTERED WHEN AN ERROR IS ENCOUNTERED
LOE	LOOP ON ERROR, CAUSING THE DIAGNOSTIC TO LOOP CONTINUOUSLY WITHIN THE SMALLEST DEFINED BLOCK OF CODING (SEGMENT, SUBTEST, OR TEST) CONTAINING THE ERROR
IER	INHIBIT ERROR REPORTING
IBE	INHIBIT BASIC ERROR REPORTS
IXE	INHIBIT EXTENDED ERROR REPORTS
PRI	DIRECT ALL MESSAGES TO A LINE PRINTER
PNT	PRINT NUMBER OF TES BEING EXECUTED
BOE	BELL ON ERROR
UAM	RUN IN UNATTENDED MODE, BYPASSING MANUAL INTERVENTION TESTS
ISR	INHIBIT STATISTICAL REPORTS
IDU	INHIBIT DROPPING OF UNITS BY DIAGNOSTIC

THE FLAGS NAMED OR EQUATED TO 1 ARE SET, THOSE EQUATED TO 0 ARE CLEARED A FLAG NOT SPECIFIED IS CLEARED. IF THE FLAGS SWITCH IS NOT GIVEN ALL FLAGS ARE CLEARED.

"EOP-INCR" IS A DECIMAL NUMBER INDICATING HOW OFTEN (IN TERMS OF PASSES) IT IS DESIRED THAT THE END OF PASS MESSAGE BE PRINTED THE DEFAULT IS AT THE END OF EVERY PASS.

****

RES(TART)/TEST TEST-LIST/PASS PASS-CNT/FLAGS FLAG-LIST/EOP EOP-INCR/UNITS UNIT-LIST

****

THE DIAGNOSTIC IN CORE IS EXECUTED IN ACCORDANCE WITH THE SWITCHES SPECIFIED. HOWEVER, NEW P-TABLES ARE NOT BUILT. INSTEAD, THE ONES IN CORE ARE USED.
THE QUESTION "CHANGE SW?" IS ASKED, AND THE ANSERS IF GIVEN BECOME THE NEW DEFAULTS. THE COMMAND MAY BE ISSUED WHEN COMAND MODE HAS BEEN ENTERED VIA A) DIAGNOSTIC IS FINISHED B) HALT ON ERROR C) CONTROL/C.

THE SWITCH ARGUMENTS ARE AS IN THE START COMMAND EXCEPT:

1. "UNIT-LIST" IS A SEQUENCE OF LOGICAL UNIT NUMBERS RANGING FROM 1 THRU N (N = NUMBER OF UNITS BEING TESTED) SPECIFYING WHICH UNITS ARE TO BE TESTED. THE LOGICAL UNIT NUMBER DESIGNATES THE POSITION OF THE P-TABLE IN CORE, ACCORDING TO THE ORDER IN WHICH THEY WERE BUILT. THE UNITS SPECIFIED MUST NOT HAVE BEEN DROPPED BY THE OPERATOR DROP COMMAND. THE UNIT-LIST DEFAULTS TO "ALL THAT HAVE NOT BEEN DROPPED BY OPERATOR COMMAND". THE EFFECT OF THE UNIT-LIST LASTS UNTIL THE NEXT START (WHERE IT IS AUTOMATICALLY RESET TO "ALL") OR THE NEXT RESTART.

2. ALL UNSPECIFIED FLAG SETTINGS ARE UNCHANGED

****
CON(TINUE)/PASS.<PASS-CNT/FLAGS:<FLAG-LIST>
****

COMMAND MODE MUST HAVE BEEN ENTERED DUE TO A HALT ON ERROR OR A CONTROL/C. THE EFFECT OF THE COMMAND IS TO GO TO THE BEGINNING OF THE TEST THAT WAS BEING EXECUTED WHEN THE HALT OR CONTROL/C TOOK PLACE SOFTWARE DIALOGUE MAY OPTIONALLY BE REEXECUTED HARDWARE PARAMETERS MAY NOT BE CHANGED.

THE SWITCH ARGUMENTS ARE AS IN THE START COMMAND EXCEPT

1. DEFALT FOR PASS-CNT IS THE UNSATISFIED PASS-CNT FROM THE PREVIOUS START OR RESTART

2. UNSPECIFIED FLAG SETTINGS ARE UNCHANGED

****
PRO(CEED)/FLAGS:<FLAG-LIST>
****

COMMAND MODE MUST HAVE BEEN ENTERED VIA A HALT ON ERROR THE EFFECT OF THE COMMAND IS TO BEGIN EXECUTION AT THE LOCATION FOLLOWING THE ERROR CALL. NEITHER HARDWARE NOR SOFTWARE PARAMETERS MAY BE ALTERED

THE SWITCH ARGUMENTS ARE THE SAME AS THE START COMMAND EXCEPT

1. UNSPECIFIED FLAG SETTINGS ARE UNCHANGED

****
CCI/TEST: TEST-LIST/PASS: PASS-CNT/FLAGS: FLAG-LIST/EOP: EOP-INCR
****

THE DIAGNOSTIC EXECUTES THRU ALL OPERATOR DIALOGUE AND HALTS AT THE HARDWARE TEST CODE. NOW THE OPERATOR CAN DUMP THE CORE IMAGE TO THE MEDIUM WITH A BIC EXTENSION.

THE BIC FILE MUST BE HANDLED DIFFERENTLY DEPENDING ON WHETHER IT IS RUN MANUALLY OR IN CHAIN MODE. IF RUN MANUALLY IT CAN BE INVOKED EITHER WITH A "START" (IN WHICH CASE IT WILL BEHAVE LIKE THE BIN FILE: THE PRE-GENERATED ANSWERS TO OPERATOR QUESTIONS WILL BE IGNORED) OR WITH A "RESTART" (IN WHICH CASE THE PRE-GENERATED OPERATOR ANSWERS WILL BE USED).

IF RUN IN CHAIN MODE, AUTOMATIC EXECUTION WILL COMMENCE IMMEDIATELY FROM THE XXDP COMMAND ". R DIAG". THE COMMAND PROMPT "DS-B>" WILL NOT BE ISSUED.

ANY SWITCHES SPECIFIED ON THE CCI COMMAND WILL CARRY OVER WHEN THE BIC FILE IS RUN IN CHAIN MODE (EXCEPT THAT UAM IS ALWAYS SET THERE) BUT WILL NOT CARRY OVER WHEN IT IS RUN MANUALLY.

TO DO A CCI ON A FULL SIZED DIAGNOSTIC (14.5K WORDS), A MACHINE SIZE LARGER THAN 16K IS REQUIRED. THE EXACT SIZE NEEDED DEPENDS ON WHICH UTILITY IS USED TO EXECUTE THE DIAGNOSTIC AT CCI TIME

****
DRO(P)/UNITS: UNIT-LIST
****

THE UNITS SPECIFIED ARE DROPPED FROM TESTING UNTIL THEY ARE ADDED BACK OR UNTIL A START COMMAND IS GIVEN A DROP CANNOT BE FOLLOWED BY A PROCEED.

THERE IS ALSO A "DROP" MACRO INTERNAL TO THE DIAGNOSTIC, WHICH GIVES THE FACILITY OF AUTO-DROPPING THE DURATION OF A PROGRAM DROP, HOWEVER, IS ONLY UNTIL THE NEXT START OR RESTART

****
ADD/UNITS UNIT-LIST
****

THE UNITS SPECIFIED ARE ADDED BACK (THEY MUST HAVE BEEN PREVIOUSLY DROPPED BY THE DROP COMMAND) TO THE TEST SEQUENCE AN ADD CANNOT BE FOLLOWED BY A PROCEED

****
PRI(NT)
****

ALL STATISTICS TABLES ACCUMULATED BY THE DIAGNOSTIC ARE PRINTED THE ISR (INHIBIT STATISTICAL REPORTING) FLAG S CLEARED

****
DIS(PLAY)/UNITS <UNIT-LIST>
****

THE HARDWARE P-TABLES FOR ALL UNITS UNDER TEST ARE PRINTED OUT IN THE FORMAT IN WHICH THEY WERE ENTERED ANY UNITS THAT WERE DROPPED BY THE OPERATOR "DROP" COMMAND ARE SO DESIGNATED

****
FLA(GS)
****.**

THE CURRENT SETTINGS OF ALL FLAGS ARE PRINTED

****
ZFL(AGS)
****

ALL FLAGS ARE CLEARED

2 4 EXTENDED P-TABLE DIALOGUE

THE FULL CAPABILITY OF THE HARDWARE DIALOGUE IS REVEALED BY THE FOLLOWING DISCUSSION OF WHAT HAPPENS INTERNALLY

AS SOON AS THE QUESTION "# UNITS?" IS ANSWERED (WITH THE NUMBER N, SAY) SPACE IN CORE IS ALLOCATED FOR N P-TABLES ALL OF THE P-TABLES ARE OF THE SAME FORMAT, AND THERE IS A ONE-TO-ONE CORRESPONDENCE BETWEEN THE HARDWARE PARAMETER QUESTIONS AND THE SLOTS IN THE P-TABLE FORMAT.

ON THE FIRST TRIP THRU THE QUESTIONS, ALL OF THE SLOTS IN ALL OF THE P-TABLES ARE FILLED. IF THE OPERATOR TYPES IN LESS THAN N EXPLICIT VALUES IN RESPONSE TO A PARTICULAR QUESTION, THESE VALUES ARE PLACED IN THE P-TABLES (ONE VALUE GOING INTO THE PROPER SLOT OF EACH P-TABLE BEGINNING WITH THE FIRST P-TABLE) UNTIL THE STRING OF VALUES IS EXHAUSTED. THE LAST VALUE THAT SLOT IN THE REMAINING P-TABLES

ON SUBSEQUENT TRIPS THRU THE QUESTIONS, THE SAME PROCESS IS CARRIED OUT, EXCEPT THAT THE EARLIEST P-TABLE NOT TO HAVE RECEIVED AN EXPLICIT VALUE IN ANY OF ITS SLOTS NOW ASSUMES THE ROLE THAT TABLE NUMBER ONE PLAYED IN THE FIRST TRIP

THE SERIES OF QUESTIONS IS REISSUED UNTIL AT LEAST ONE QUESTION HAS RECEIVED N EXPLICIT VALUES FROM THE OPERATOR

IN GIVING A STRING OF VALUES, COMMAS WITHOUT INTERVENING VALUES MAY BE USED TO INDICATE A REPETITION OF THE LAST NAMED VALUE

A STRING OF VALUES MAY BE GIVEN AS A RANGE (6-10 FOR EXAMPLE) IF THE VALUES REPRESENT PURE NUMERICAL DATA, THIS SAMPLE RANGE TRANLATES TO

THE STRING 6,7,8,9,10 (AN INCREMENT OF 1) IF THE VALUES ARE ADDRESSES, THE SAMPLE RANGE TRANSLATES TO THE STRING 6,8,10 (AN INCREMENT OF 2)

NOW LET US SEE HOW WE COULD USE THESE CAPABILITIES TO CONSTRUCT A SET OF P-TABLES. ASSUME THAT WE HAVE 64 UNITS, AND THAT THERE ARE THREE HARDWARE PARAMETERS FOR EACH (THREE SLOTS IN THE P-TABLE, THREE HARDWARE QUESTIONS IN THE DIALOGUE). LET THE DESIRED VALUE FOR THE FIRST PARAMETER BE THE NUMBER 75 FOR ALL 64 TABLES. LET THE DESIRED VALUE FOR THE SECOND PARAMETER BE EQUAL TO THE UNIT NUMBER (1,2,3,...,64) EXCEPT FOR UNIT 50, WHICH SOULD RECEIVE THE VALUE 49 LET THE DESIRED VALUE FOR THE THIRD PARAMETER BE THE NUMBER 76 FOR THE FIRST 20 UNITS AND THE NUMBER 77 FOR THE LAST 44 UNITS

THE FOLLOWING DIALOGUE WOULD ACCOMPLISH THIS GOAL

```
# UNITS (D) ? 64

UNIT 1
<QUESTION 1> ? 75
<QUESTION 2> ? 1-20
<QUESTION 3> ? 76

UNIT 21
<QUESTION 1> ?
<QUESTION 2> ? 21-49,,51-64
<QUESTION 3> ? 77
```

THE FIRST TIME THE SERIES IS ASKED, SLOT ONE RECEIVES A 75 IN ALL 64 TABLES. SLOT TWO RECEIVES THE VALUES 1,2,3,. . ,20 IN TABLES 1 THRU 20 AND A CONSTANT 20 IN TABLES 21 THRU 64. SLOT THREE RECEIVES A CONSTANT 76 IN ALL 64 TABLES.

THE SECOND TIME THRU THE SERIES, TABLES 21 THRU THE END ARE GOING TO BE AFFECTED (NOTE THAT THIS PIECE OF INFORMATION IS PRINTED OUT FOR THE OPERATOR IN THE FORM "UNIT XX" AT THE BEGINNING OF EACH SERIES) QUESTION 1 IS RESPONDED TO BY A <CR>, SO SLOT ONE STAYS A CONSTANT 75 IN TABLES 21 THRU 64, SINCE NO NEW EXLICIT VALUES ARE TYPED IN. SLOT TWO GETS THE VALUES 21,22,23, . ,49 IN TABLES 21 THRU 49, AND GETS A 49 IN SLOT 50, AND GETS THE VALUES 51,52,53,. . ,64 IN TABLES 51 THRU 64 SLOT THREE GETS THE VALUE 77 IN TABLES 21 THRU 64

THE DIALOGUE IS TERMINATED WHEN THE SOFTWARE RECOGNIZES THAT 64 EXPLICIT VALUES HAVE BEEN GIVEN FOR AT LEAST ON QUESTION (NAMELY QUESTION 2)

3 0 ERROR INFORMATION

3 1 WRITE ERROR

A WRITE ERROR IS AN ERROR WHICH OCCURRED DURING EXECUTION OF A WRITE FUNCTION

READ ERROR

A READ ERROR IS AN ERROR WHICH OCCURRED DURING EXECUTION OF A READ FUNCTION

3 2 CRC ERROR

THIS ERROR IS DETECTED BY THE DRIVE DURING A READ OPERATION AND ALSO BY THE PROGRAM IF A DATA CHECK IS PERFORMED

3 3 NO CRC ERROR BUT DATA ERROR - BAD CRC

3 4 CRC ERROR BUT NO DATA ERROR - BAD CRC

THE ABOVE TWO ERRORS ARE DETECTED WHEN THE PROGRAM IS VERIFYING THE DATA READ OFF THE DISKETTE AGAINST THE DATA THAT SHOULD HAVE BEEN READ

THE DATA PATTERNS WILL BE FORMATTED FOR DOUBLE DENSITY (SINGLE DENSITY) AS SHOWN.

BYTE #
- 0 (TRACK ADDRESS, BITS 6 - 0)
- 1 (SECTOR ADDRESS, BITS 4 - 0)

BYTES 2 THROUGH 253 (125) CONTAIN A SELECTED PATTERN

- 254(126) (THE SUM OF ALL BYTES 0 - 253(125))
- 255(127) (THE NEGATIVE OF 2 TIMES BYTE 254(126))

3 5 SEEK ERROR

A SEEK ERROR CAN BE DETECTED VIA BYTE #0 IF A CRC, DATA, CHECKSUM ERROR HAS NOT OCCURRED ALSO THE DRIVE MAY DETECT A SEEK ERROR IF THE DISKETTE HEADER IS NOT RECOGNIZED OR COULD NOT BE FOUND A PROGRAMMED RECALIBRATE IS ISSUED TO TRY TO CORRECT EACH SEEK ERROR, IF SELECTED DURING PROGRAM DIALOG

3 6 CHECKSUM ERROR

THE PROGRAM WILL DETECT A CHECKSUM ERROR BY SUMMING ALL THE DATA READ FROM THE DISKETTE AND COMPARING THAT SUM WITH THE CHECKSUM BYTES A CHECKSUM ERROR RESULTS FROM AN INCORRECT TRANSFER OF DATA INTERNAL TO THE RX21/RX02 SUBSYSTEM.

4 0 PERFORMANCE AND PROGRESS REPORTS

AT THE END OF EACH PASS A STATISTICAL REPORT WILL BE PRINTED OUT OF ALL ACCUMULATED ERRORS

5 0 DEVICE INFORMATION TABLES

***** RX02 REGISTER BITS *****

	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
RXCS:	ERR	INT	XM	XM	RX2		SID	DEN	TR	IE	DON	DRV	FUN	FUN	FUN	GO
RXWC:	X	X	X	X	X	X	X	X	WORD COUNT							
RXBA:	BUS ADDRESS															
RXES:	X	X	X	X	NXM	WC OVF	SID #1	DRV #1	DRV RDY	DEL DAT	DSK DEN	AC ERR	INT LOW	SID DON	CRC RDY	
RXTA:	X	X	X	X	X	X	X	X	0	TRACK ADDRESS						
RXSA:	X	X	X	X	X	X	X	X	0	0	0	SECTOR ADDRESS				
RXDB:	DATA BUFFER															

6.0 TEST SUMMARIES

6 1 UNIT/DRIVE SELECTION

UNIT AND DRIVE SELECTION WILL BE ACCOMPLISHED BY MODIFYING HARDWARE P-TABLES DURING A START DIALOG

6 2 DATA PATTERNS

AVAILABLE DATA PATTERNS ARE SELECTED BY MODIFYING THE SOFTWARE P-TABLE DURING START OR RESTART DIALOG DATA PATTERNS AVAILABLE ARE

0 = DEFAULT TO 7
1 = ZEROS
2 = ONES
3 = FLOATING ZERO
4 = FLOATING ONE
5 = 125
6 = 333
7 = RANDOM

6 3 EXERCISE OPTIONS

AVAILABLE EXERCISES ARE SELECTED BY MODIFYING THE SOFTWARE P-TABLE DURING A START OR RESTART DIALOG. EXERCISES AVAILABLE ARE

0 = DEFAULT TO 7
1 = WRITE ONLY
2 = WRITE/READ
3 = WRITE/READ/DATA CHECK
4 = READ/DATA CHECK ONLY
5 = READ ONLY (CRC CHECK)
6 = WRITE/READ/DATA CHECK ON ALTERNATING DRIVES (*)
7 = WRITE/READ/DATA CHECK +/READ/DATA CHECK (**)

(*) TEST 6 WRITES THEN READ CHECKS ANY SELECTED DATA PATTERN USING ANY TRACK SEQUENCE, BUT ONE TRACK AT A TIME FIRST ON DRIVE 0 THEN DRIVE WHEN BOTH UNIES HAVE ACCESSED THAT TRACK, IT GOES BACK TO UNIT 0 FOR THE NEXT TRACK, ETC.

(**) THE FIRST HALF OF TEST 7 FORCES THE TRACK SEQUENCE TO INCREMENT UP THROUGH ALL TRACKS DOING WRITE/READ/DATA CHECK FUNCTIONS. THIS VERIFIES THAT ALL TRACKS ARE ACCESSABLE. THE SECOND HALF OF THE PASS WILL USE THE SEQUENCE SELECTED BY THE OPERATOR AS INDICATED BELOW, AND ONLY READ AND CHECK THE DATA JUST WRITTEN THIS VERIFIES THAT THE DATA CAN BE READ FROM A TRACK AFTER THE HEAD HAS BEEN MOVED AWAY FROM AND BACK TO THAT TRACK. AT THE COMPLETION OF THE PASS THE DELETED DATA BIT IN TEST CONDITIONS IS COMPLEMENTED AND THE NEXT PASS WILL BE RUN UNDER THIS NEW CONDITION

6 4 TRACK SEQUENCING

TRACK SEQUENCE OR TYPE OF HEAD MOVEMENT MAY BE SELECTED BY MODIFYING THE SOFTWARE P-TABLE OF THE DIAGNOSTIC SUPERVISOR TRACK SEQUENCES AVAILABLE FOR SELECTION ARE.

0 = DEFAULT TO 7
1 = INCREMENT O.D. UP TO I D
2 = DECREMENT I.D. DOWN TO O D.
3 = INCREMENT O.D., THEN DECREMENT I D
4 = BOUNCE BETWEEN O.D. AND I D
5 = BOUNCE BETWEEN DECREASING I D AND INCREASING O D
6 = BOUNCE BETWEEN O.D. AND DECREASING I D
7 = RANDOM

O D = OUTSIDE DIAMETER (TRACK)
I D = INSIDE DIAMETER (TRACK)

6 5 SECTOR/TRACK ADDRESSING

IT WILL BE POSSIBLE TO TEST THE DISKETTES BETWEEN TRACK AND SECTOR ADDRESS LIMITS OTHER THAN BETWEEN THE NORMAL OUTER DIAMETER (OD) AND INNER DIAMETER (ID) TRACK ADDRESSES, AND/OR MINIMUM (FIRST) AND MAXIMUM (LAST) SECTOR ADDRESS, BY MODIFYING THE SOFTWARE P-TABLE DURING A START OR RESTART DIALOG

6 6 DISKETTE DENSITY

ALL TESTS WILL RUN AT DOUBLE DENSITY UNLESS SELECTED AS SINGLE DENSITY DURING A START OR RESTART DIALOG

6 7 PROGRAM CONTROL

BEHAVIOR OF THE PERFORMANCE EXERCISOR MAYBE MODIFIED BY USE OF THE FOLLOWING PROGRAM CONTROLS

1	HALT ON ERROR	PROVIDED BY SUPERVISOR
2.	HALT AT END OF PASS	PROVIDED BY SUPERVISOR
3.	DON'T PRINT ERROR MESSAGE	PROVIDED BY SUPERVISOR
4.	RETRY ON ERROR. LOG HARD/SOFT ERRORS	SOFTWARE P-TABLE
5	RECALIBRATE ON SEEK ERRORS	SOFTWARE P-TABLE

7 0 LISTING INDEX

7.1 LISTING

```
                                        TITLE PROGRAM HEADER AND TABLES
                                        SBTTL  PROGRAM HEADER

                                                ENABL  ABS,AMA
         002000                               =        2000

002000                                         BGNMOD

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

002000                                         POINTER ALL

002000                                         HEADER  CZRXDA0,0,0,2100,2100,2100,,E,TITLEX

                                       ;-----------------------------------------------------------------------
002110  054122  031060  051440  TITLEX   ASCIZ  /RX02 SS PERF EXER/
                                                EVEN
                                       ;-----------------------------------------------------------------------
```

```
                                .SBTTL  DISPATCH TABLE

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

002132                                  DISPATCH 1
```

```
                                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 RUN-TIME P-TABLE
                               ;--

002136                                 BGNHW   DFPTBL

002140  177170                          WORD   177170          ;UNIBUS ADDRESS
002142  000264                          WORD   264             ;VECTOR ADDRESS
002144  000000                          WORD   0               ;DRIVE #
002146  000000                          WORD   0               ;FUTURE EXPANSION

002150                                 ENDHW
```

```
                                .SBTTL  SOFTWARE P-TABLE

                                ;++
                                ; THE SOFTWARE P-TABLE CONTAINS THE VALUES OF THE PROGRAM
                                ; PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR
                                ;--

002150                                  BGNSW   SFPTBL

002152  000000         RXXX.  .WORD   0               ;FUTURE EXPANSION-RX
002154  000000                .WORD   0               ;CONTROL WORD FOR
002156  000000         TSTN:  .WORD   0               ;TEST #
002160  000000         TSTPAT:.WORD   0               ;TEST PATTERN #
002162  000000         TRKSEQ:.WORD   0               ;TRACK SEQUENCE #
002164  000021         SWREG: .WORD   21              ;SOFTWARE SWITCH REG
002166  000000         OTDITK:.WORD   0               ;OUTSIDE DIA. TRACK LIMIT
002170  000114         INDITK:.WORD   114             ;INSIDE DIA. TRACK LIMIT
002172  000001         MINSEC:.WORD   1               ;MINIMUM SECTOR LIMIT
002174  000032         MAXSEC:.WORD   32              ;MAXIMUM SECTOR LIMIT

002176                                  ENDSW

002176                                  ENDMOD
```

```
                                 TITLE GLOBAL AREAS
                                .SBTTL  GLOBAL EQUATES SECTION

002176                                   BGNMOD

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

002176                                   EQUALS
(1)                             ;
(1)                             ; BIT DIFINITIONS
(1)                             ;
(1)          100000             BIT15== 100000
(1)          040000             BIT14== 40000
(1)          020000             BIT13== 20000
(1)          010000             BIT12== 10000
(1)          004000             BIT11== 4000
(1)          002000             BIT10== 2000
(1)          001000             BIT09== 1000
(1)          000400             BIT08== 400
(1)          000200             BIT07== 200
(1)          000100             BIT06== 100
(1)          000040             BIT05== 40
(1)          000020             BIT04== 20
(1)          000010             BIT03== 10
(1)          000004             BIT02== 4
(1)          000002             BIT01== 2
(1)          000001             BIT00== 1
(1)                             ;
(1)          001000             BIT9==  BIT09
(1)          000400             BIT8==  BIT08
(1)          000200             BIT7==  BIT07
(1)          000100             BIT6==  BIT06
(1)          000040             BIT5==  BIT05
(1)          000020             BIT4==  BIT04
(1)          000010             BIT3==  BIT03
(1)          000004             BIT2==  BIT02
(1)          000002             BIT1==  BIT01
(1)          000001             BIT0==  BIT00
(1)                             ;
(1)                             ; EVENT FLAG DEFINITIONS
(1)                             ;   EF32 EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
(1)                             ;   EF16 EF01 AVAILABLE FOR PROGRAM USE
(1)                             ;
(1)          000040             EF START==      32                  ; START COMMAND WAS ISSUED
(1)          000037             EF RESTART==    31                  ; RESTART COMMAND WAS ISSUED
(1)          000036             EF CONTINUE==   30                  ; CONTINUE COMMAND WAS ISSUED
(1)          000035             EF NEW==        29                  ; A NEW PASS HAS BEEN STARTED
(1)          000034             EF PWR==        28                  ; A POWER-FAIL/POWER-UP OCCURRED
(1)                             ;
(1)          000020             EF16==  16
(1)          000017             EF15==  15
(1)          000016             EF14==  14
```

```
   (1)          000015                  EF13==  13
   (1)          000014                  EF12==  12
   (1)          000013                  EF11==  11
   (1)          000012                  EF10==  10
   (1)          000011                  EF09==  9
   (1)          000010                  EF08==  8
   (1)          000007                  EF07==  7
   (1)          000006                  EF06==  6
   (1)          000005                  EF05==  5
   (1)          000004                  EF04==  4
   (1)          000003                  EF03==  3
   (1)          000002                  EF02==  2
   (1)          000001                  EF01==  1
   (1)                                  ;
   (1)                                  ; PRIORITY LEVEL DEFINITIONS
   (1)                                  ;
   (1)          000340                  PRI07== 340
   (1)          000300                  PRI06== 300
   (1)          000240                  PRI05== 240
   (1)          000200                  PRI04== 200
   (1)          000140                  PRI03== 140
   (1)          000100                  PRI02== 100
   (1)          000040                  PRI01== 40
   (1)          000000                  PRI00== 0
  3214
  3215                                  ;
  3216                                  ;BIT DEFINITIONS
  3217                                  ;
  3218          100000                  BIT15== 100000
  3219          040000                  BIT14== 40000
  3220          020000                  BIT13== 20000
  3221          010000                  BIT12== 10000
  3222          004000                  BIT11== 4000
  3223          002000                  BIT10== 2000
  3224          001000                  BIT09== 1000
  3225          000400                  BIT08== 400
  3226          000200                  BIT07== 200
  3227          000100                  BIT06==100
  3228          000040                  BIT15== 40
  3229          000020                  BIT04== 20
  3230          000010                  BIT03== 10
  3231          000004                  BIT02== 4
  3232          000002                  BIT01== 2
  3233          000001                  BIT00=  1
  3234                                  ;
  3235          001000                  BIT9==  BITC9
  3236          000400                  BIT8==  BIT08
  3237          000200                  BIT7==  BIT07
  3238          000100                  BIT6==  BIT06
  3239          000040                  BIT5==  BIT05
  3240          000020                  BIT4==  BIT04
  3241          000010                  BIT3==  BIT03
  3242          000004                  BIT2==  BIT02
  3243          000002                  BIT1==  BIT01
  3244          000001                  BIT0==  BIT00
  3245                                  ;
```

```
                                ;EVENT FLAG DEFINITIONS
                                ;       EF32:EF17       RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
                                ;       EF16:EF01       AVAILABLE FOR PROGRAM USE
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
                                ;
000020                          EF16==  16
000017                          EF15==  15
000016                          EF14==  14
000015                          EF13==  13
000014                          EF12==  12
000013                          EF11==  11
000012                          EF10==  10
000011                          EF09==  9
000010                          EF08==  8
000007                          EF07==  7
000006                          EF06==  6
000005                          EF05==  5
000004                          EF04==  4
000003                          EF03==  3
000002                          EF02==  2
000001                          EF01==  1
                                ;
                                ;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
                                ;
                                ;PROGRAM DEFINITIONS
                                ;
000200                          TRBIT==200
000040                          DNBIT==40
```

```
                        SBTTL  GLOBAL DATA SECTION

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

                        ;
                        ; STORAGE FOR DEVICE REGISTERS
                        ;
002176                          DEVREG  0,0,DEVDAT,REGMSK

                        ;-----------------------------------------------------------------------
002204  000000          RESTAR  .WORD   0               ;RESTART FLAG
002206  000000          ABORT   .WORD   0               ;ABORT FLAG
002210  000000          SDD     .WORD   0               ;SYSTEM DRIVES DONE (SEE REG  DEF  BELOW)
002212  000000          SUT     .WORD   0               ;SYSTEM UNDER TEST (SEE REG. DEF. BELOW)
002214  000000          UUT     .WORD   0               ;UNIT UNDER TEST (SEE REG. DEF. BELOW)
002216  000000          UUTADR  .WORD   0               ;UUT UNIBUS ADR
002220  000000          UUTOFF  .WORD   0               ;UUT ADDRESSING OFFSET
002222  000000          DEN.    .WORD   0               ;DENSITY FLAG
002224  000000          DELDAT: .WORD   0               ;DELETED DATA FLAG
002226  000000          U0ADR   .WORD   0               ;UNIT 0 ADR
002230  000000          U1ADR.  .WORD   0               ;UNIT 1 ADR
002232  000000          SYSERR: .WORD   0               ;SYSTEM ERROR
002234  000000          ERRTYP: .WORD   0               ;ERROR TYPE
002236  000000          CSRUUT: .WORD   0               ;CONT/STATUS REG UUT
002240  000000          ESRUUT: .WORD   0               ;ERROR/STATUS REG UUT
002242  000000          RETRY:  .WORD   0               ;//(10)DATART/(4)RDRT/(2)WTRT/(1)SEEK/ SEE BELOW
002244  000000          SEEKRT: .WORD   0               ;SEEK RETRY COUNT
002246  000000          CKSMRT: .WORD   0               ;CHECK SUM RETRY COUNT
002250  000000          CRCBRT: .WORD   0               ;CRC BAD RETRY COUNT
002252  000000          CRCERT: .WORD   0               ;CRC ERR RETRY COUNT
002254  000000          DATART: .WORD   0               ;DATA RETRY COUNT
002256  000000          DARDRT: .WORD   0               ;DATA READ RETRY COUNT
002260  000000          DAWTRT: .WORD   0               ;DATA WRITE RETRY COUNT
002262  000000          READRT: .WORD   0               ;READ RETRY COUNT
002264  000000          WRTRT:  .WORD   0               ;WRITE RETRY COUNT
002266  000000          DDERCT: .WORD   0               ;D D  ERR RETRY COUNT
002270  000000          WDCNT:  .WORD   0               ;WORD COUNT
002272  000000          TRACK:  .WORD   0               ;TRACK ADR
002274  000000          SECTOR: .WORD   0               ;SECTOR ADR
002276  000000          TRKDN:  .WORD   0               ;TRACK DONE (UUT) FLAG
002300  000000          SECDN:  .WORD   0               ;SECTOR DONE (UUT) FLAG
002302  000000          U0VECT: .WORD   0               ;UNIT 0 VECTOR
002304  000000          U1VECT: .WORD   0               ;UNIT 1 VECTOR
002306  000000          HARDER  WORD    0               ;HARD ERROR
002310  000000          PRTECD  WORD    0               ;PRINT ERR CODE FLAG
```

```
3349
3350                ;*****  SOFTWARE REGISTER DEFINITIONS  *****
3351
3352                ;          !    BIT#
3353                ;          ! 03! 02! 01! 00
3354                ;   -------+---+---+---+---+
3355                ;   SDD:   ! 11! 10! 01! 00! <- UUT CODES-EQUIV TO A BIT SET IN THIS REG
3356                ;    &   --+---+---+---+---+             -THAT IS UUT=00 IS SDD BIT#0 SET
3357                ;   SUT:   ! 11! 10! 01! 00! <- UUT CODES-
3358                ;   -------+---+---+---+---+
3359                ;
3360                ;-----------------------------------------------------------------
3361                ;
3362                ;          ! RX02            !    RXXX-FUTURE EXPANSION
3363                ;-----------------------------------------------------------------
3364                ;UUT:    00 = UNIT#0/DRV#0          SIDE#0/DRV#0
3365                ;        01 = UNIT#0/DRV#1          SIDE#0/DRV#1
3366                ;        10 = UNIT#1/DRV#0          SIDE#1/DRV#0
3367                ;        11 = UNIT#1/DRV#1          SIDE#1/DRV#1
3368                ;
3369                ;        !!
3370                ;        !!---<DRIVE #
3371                ;        !----<UNIT # (RX02) OR SIDE # (RXXX)
3372                ;-----------------------------------------------------------------
3373                ;          !        !        !        !        !        !
3374                ;        ! 15! 14! 13! 12! 11! 10! 09! 08! 07! 06! 05! 04! 03! 02! 01! 00!
3375                ;        !---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---!
3376                ;        !ERR!ERR!DON!ITR!WRT! RD!FIL!UNK!   ! DD! DD!   !   ! CK!   !   !
3377                ;ERRTYP  !BIT!NOT! NO! NO!ERR!ERR!EMP!ERR! - !MIS!UNX! - !DAT!SUM!CRC!SEK!
3378                ;        !   !SET!ITR!DON!   !   !ERR!   !   !   !   !   !   !   !   !   !
3379                ;========!===+===+===+===+===+===+===+===+===+===+===+===+===+===+===+===!
3380                ;        !   !   !   !DRV!   !   ! WRONG !DON!SID!DRV!NO DONE! FUNCTION  !
3381                ;SYSERR  !UNR! TO!DEN!DEN!SYS!DAG!-------!FUN!RDY!RDY!-------!  CAUSING  !
3382                ;        !ERR!ERR!ERR!ERR!ERR!ERR!SID!DRV! #2!ERR!ERR!FUN!INT!   ERROR   !
3383                ;========+===+===+===+===+===+===+===+===+===+===+===+===+===+===+===!
3384                ;        !                                       !   !CRC!DAT! RD!WRT!SEK!
3385                ;RETRY   !                                       !   ! RT! RT! RT! RT! RT!
3386                ;-----------------------------------------------------------------!
3387
3388                ;NOTE    RXXX IS REFERENCE FOR FURTHER EXPANSION
```

```
                                  .SBTTL          READ ERROR CODE BUFFER
                                  ;-----------------------------------------------------------------
      002312      000             XERUUT: .BYTE   0                       ;ERROR CODE UUT
      002313      000             WC:     .BYTE   0                       ;WORD COUNT UUT
      002314      000             CTK0:   .BYTE   0                       ;CUR TRK DRV#0
      002315      000             CTK1:   .BYTE   0                       ;CUR TRK DRV#1
      002316      000             TTRK:   .BYTE   0                       ;TARGET TRK
      002317      000             TSEC:   .BYTE   0                       ;TARGET SEC
      002320      000             SFTSTS: .BYTE   0                       ;MICRO CODE SOFT STATUS
      002321      000             BTRK:   .BYTE   0                       ;BAD TRK ADR
                                  ;-----------------------------------------------------------------
```

```
                        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
                       ;
002322                        DEVTYP  RX02+


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

```
                                 SBTTL  GLOBAL ERROR REPORT SECTION

                                ;++
                                ; THE GLOBAL ERROR REPORT SECTION CONTAINS THE PRINTB AND PRINTX CALLS
                                ; THAT ARE USED IN MORE THAN ONE TEST   IT ALSO INCLUDES THE ASCII MESSAGES
                                ; THAT ARE USED BY THE PRINTB AND PRINTX CALLS
                                ;--


002330                                  BGNMSG


                                ;
                                ; BIT-NAMES FOR THE DEVICE REGISTERS
                                ;


                                  EVEN

002330                                  ENDMSG
```

```
                        SBTTL  GLOBAL SUBROUTINES SECTION

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

                       ;++
                       ; FUNCTIONAL DESCRIPTION:
                       ;    SUBROUTINE TO. . .
                       ; INPUTS:  NONE
                       ; IMPLICIT INPUTS:  NONE
                       ; OUTPUTS:  RANUM
                       ; IMPLICIT OUTPUTS.  NONE
                       ; SUBORDINATE ROUTINES USED   NONE
                       ; FUNCTIONAL SIDE EFFECTS   NONE
                       ; CALLING SEQUENCE.  SUB
                       ;--


                        SBTTL          MOD U.1 0 - RANDOM GENERATOR
                       ;---------- RANDOM GENERATOR ----------------------------------------
002332  012700  000001  RANGEN: MOV     #1,R0
002336  063700  002420          ADD     RAN1,R0
002342  063700  002422          ADD     RAN2,R0
002346  042700  170000          BIC     #170000,R0
002352  000241                  CLC
002354  006100                  ROL     R0
002356  006100                  ROL     R0
002360  010037  002420          MOV     R0,RAN1
002364  005000                  CLR     R0
002366  013700  002422          MOV     RAN2,R0
002372  006000                  ROR     R0
002374  006000                  ROR     R0
002376  063700  002420          ADD     RAN1,R0
002402  042700  170000          BIC     #170000,R0
002406  010037  002422          MOV     R0,RAN2
002412  010037  002424          MOV     R0,RANUM
002416  000207                  RTS     PC

002420  000000          RAN1    0
002422  000000          RAN2    0
002424  000000          RANUM:  0
                       ;-------------------------------------------------------------------
```

```
3600                                    SBTTL           MOD U.A.1 - CONVERSION UUT CODE --> SUTPTR
3601                                    ;---------------------------------------------------------------
3602
3603  002426  000240                  CVUTST  NOP                     ;
3604  002430  005037  002530                  CLR     SUTCV           ;CLEAR SYS UNDER TEST CONVERTED
3605  002434  032737  000001  002526          BIT     #1,CVUNIT       ;IF DRIVE #0.
3606  002442  001014                          BNE     2$              ;SELECTED, THEN
3607  002444  032737  000002  002526          BIT     #2,CVUNIT       ;IF UNIT #0 OR RX04 SIDE #0,
3608  002452  001004                          BNE     1$              ;THEN
3609  002454  052737  000001  002530          BIS     #1,SUTCV        ;SET FOR UNIT CODE=00 IN SUT WORD
3610  002462  000420                          BR      ENDCVT          ;BR TO END
3611  002464  052737  000004  002530  1$      BIS     #4,SUTCV        ;ELSE, SET FOR UNIT CODE=10 IN SUT WORD
3612  002472  000414                          BR      ENDCVT          ;BR TO END
3613  002474  032737  000002  002526  2$      BIT     #2,CVUNIT       ;IF UNIT #0 OR RX04 SIDE #0,
3614  002502  001004                          BNE     3$              ;THEN
3615  002504  052737  000002  002530          BIS     #2,SUTCV        ;SET FOR UNIT CODE=01 IN SUT WORD
3616  002512  000404                          BR      ENDCVT          ;BR TO END
3617  002514  052737  000010  002530  3$      BIS     #10,SUTCV       ;ELSE, SET FOR UNIT CODE=11 IN SUT WORD
3618  002522  000240                          NOP                     ;
3619  002524  000207                  ENDCVT  RTS     PC              ;RETURN
3620                                    ;---------------------------------------------------------------
3621  002526  000000                  CVUNIT: 0                       ;UNIT CODE TO BE CONVERTED
3622  002530  000000                  SUTCV:  0                       ;SYS UNDER TEST AS CONVERTED
3623                                    ;MOD U A 1 ----- END MODULE -----------------------------------
3624
3625                                    SBTTL           MOD U A 2 - CONVERSION SUTPTR --> UUT CODE
3626                                    ;---------------------------------------------------------------
3627
3628  002532  013705  015644          CVSTUT  MOV     SUTPTR,R5       ;SAVE SUT POINTER IN R5
3629  002536  005004                          CLR     R4              ;CLEAR R4 (RESET UNIT CODE)
3630  002540  032705  000001          1$      BIT     #1,R5           ;IF LSB R5
3631  002544  001003                          BNE     2$              ;EQUALS 1 ,THEN BR TO 2$
3632  002546  006205                          ASR     R5              ;SHIFT RIGHT R5
3633  002550  005204                          INC     R4              ;INCREMENT R4
3634  002552  000772                          BR      1$              ;BR TO 1$
3635  002554  010437  002600          2$      MOV     R4,UNITST       ;THEN R4 CONTAINS UUT CODE
3636  002560  006304                          ASL     R4              ;DOUBLE UNIT CODE FOR ADR
3637  002562  010437  002220                  MOV     R4,UUTOFF       ;SET UUT OFFSET
3638  002566  062704  007356                  ADD     #UT00,R4        ;GET UUT UNIT# FOR PRINT
3639  002572  011437  006620                  MOV     (R4),UNIT       ;SET UNIT=PRINT UNIT#
3640  002576  000207                          RTS     PC              ;RETURN
3641                                    ;---------------------------------------------------------------
3642  002600  000000                  UNITST: 0                       ;
3643                                    ;MOD 2.0A ----- END MODULE -----------------------------------
3644
3645  002602                                  ENDMOD
3646
```

```
                                 TITLE MISCELLANEOUS SECTIONS
                                .SBTTL  REPORT CODING SECTION

002602                                   BGNMOD

                                ,++
                                , THE REPORT CODING SECTION CONTAINS THE
                                , "PRINTS" CALLS THAT GENERATE STATISTICAL REPORTS
                                ,--

                                ;-------------------------------------------------------------------
002602                                   BGNRPT
002602  000240                  REPORT:  NOP                     ,
002604  012737  003354  003140          MOV     #PT19SP,PRT1    ,SETUP REPORT HEADER PART 1
002612  012737  003436  003142          MOV     #PTUNT1,PRT2    ,
002620  004737  003046                  CALL    PRTHDR          ,PRINT HEADER
002624  000240                          NOP                     ,SETUP DATA PART 1
002626  005037  003272                  CLR     LINECT          ,       ZERO LINE COUNTER
002632  005037  003300                  CLR     PRNUM           ,       CLEAR PRINT MODE
002636  012702  004442                  MOV     #CKSML,R2       ,       SET BEGIN ADR OF DATA-PART 1
002642  012701  003506                  MOV     #PRIDXX,R1      ,       SET BEGIN ADR OF TABLE LABLES-PART 1
002646  012737  000023  003274          MOV     #19.,LINES      ,       SET # OF LINES TO PRINT
002654  004737  003144                  CALL    PRTDAT          ,PRINT DATA
002660  000240                          NOP                     ,
002662  012737  003363  003140          MOV     #PTEC,PRT1      ,SETUP HEADER PART 2
002670  012737  003436  003142          MOV     #PTUNT1,PRT2    ,
002676  004737  003046                  CALL    PRTHDR          ,PRINT HEADER
002702  000240                          NOP                     ,SETUP DATA PART 2
002704  012737  000001  003272          MOV     #1,LINECT       ,       SET LINE COUNTER=1
002712  012737  000001  003300          MOV     #1,PRNUM        ,       SET PRINT MODE=1
002720  012702  004672                  MOV     #ECLOG,R2       ,       SET BEGIN ADR ERROR CODE DATA-PART 2
002724  012701  003455                  MOV     #PTECN,R1       ,       SET ERROR CODE PRINT-FORMATED MSG-PART 2
002730  012737  000027  003274          MOV     #23.,LINES      ,       SET # OF LINES TO PRINT
002736  012737  003455  003276          MOV     #PTECN,LINTYP   ,
002744  000240                          NOP                     ,
002746  004737  003144                  CALL    PRTDAT          ,PRINT DATA
002752  000240                          NOP                     ,
002754  000240                          NOP                     ,
002756  012737  003410  003140          MOV     #PTTK,PRT1      ,SETUP HEADER PART 3
002764  012737  003436  003142          MOV     #PTUNT1,PRT2    ,
002772  004737  003046                  CALL    PRTHDR          ,PRINT HEADER
002776  000240                          NOP                     ,
003000  005037  003272                  CLR     LINECT          ,
003004  012737  000001  003300          MOV     #1,PRNUM        ,
003012  012702  005156                  MOV     #TKXX,R2        ,SETUP DATA PART 3
003016  012737  000115  003274          MOV     #77.,LINES      ,
003024  012737  003471  003276          MOV     #PTTKN,LINTYP   ,
003032  004737  003144                  CALL    PRTDAT          ,PRINT DATA PART 3
003036  000240                  ENDRPT.  NOP                     ,
003040                                   ENDRPT
                                ,-------------------------------------------------------------------
003042  000000                  UTTST.   0                       ,UNIT #
003044  000000                  UTCNT    0                       ,UNIT COUNT
                                ,-------------------------------------------------------------------
```

```
3750                                    .SBTTL          PRINT REPORT HEADER
3751                                    ;---------------------------------------------------------------
3752  003046  005003                    PRTHDR: CLR     R3              ;
3753  003050  000240                            NOP                     ;
3754  003052  013705  003140                    MOV     PRT1,R5         ;SETUP 1ST PART OF HEADER PRINT
3755  003056  004737  003332                    CALL    PREPT2          ,PRINT 1ST PART
3756  003062  012737  007356  003042            MOV     #UTOO,UTTST     ,GET BEGIN ADR OF UNITS-->TESTED FLAGS
3757  003070  012737  000003  003044            MOV     #3,UTCNT        ;SET UNIT COUNTER
3758  003076  005777  177740            1$:     TST     @UTTST          ;IF UNIT TESTED FLAG
3759  003102  100407                            BMI     2$              ,NOT=-1, THEN
3760  003104  017737  177732  003330            MOV     @UTTST,PAR      ;SET UNIT TESTED # FOR PRINT
3761  003112  013705  003142                    MOV     PRT2,R5         ,SET UNIT MSG
3762  003116  004737  003302                    CALL    PREPT1          ,PRINT UNIT #
3763  003122  062737  000002  003042    2$      ADD     #2,UTTST        ;ADVANCE ADR OF UNIT TESTED FLAG
3764  003130  005337  003044                    DEC     UTCNT           ,DECREMENT UNIT COUNT
3765  003134  001360                            BNE     1$              ,IF UNIT COUNT=0, THEN
3766  003136  000207                            RTS     PC              ,RETURN
3767                                    ;---------------------------------------------------------------
3768  003140  000000                    PRT1:   0                       ;
3769  003142  000000                    PRT2:   0                       ;
3770                                    ;---------------------------------------------------------------
3771
3772                                     SBTTL          PRINT REPORT DATA
3773                                    ;---------------------------------------------------------------
3774  003144  000240                    PRTDAT  NOP                     ;
3775  003146  005737  003300            1$      TST     PRNUM           ;IF MODE
3776  003152  001410                            BEQ     2$              ;
3777  003154  013737  003272  003330            MOV     LINECT,PAR      ;SETUP LINE # TO PRINT
3778  003162  013705  003276                    MOV     LINTYP,R5       ;SETUP LINE TYPE TO PRINT
3779  003166  004737  003302                    CALL    PREPT1          ;PRINT LINE #
3780  003172  000403                            BR      3$              ;
3781  003174  012105                    2$      MOV     (R1)+,R5        ;SETUP LOG TITLE ADR
3782  003176  004737  003332                    CALL    PREPT2          ;PRINT LOG TITLES
3783  003202  012737  007356  003042    3$      MOV     #UTOO,UTTST     ;GET UNIT # FOR PRINT
3784  003210  012737  000004  003044            MOV     #4,UTCNT        ;SETUP UNIT COUNT
3785  003216  012237  003330            4$      MOV     (R2)+,PAR       ;SETUP DATA TO PRINT
3786  003222  005777  177614                    TST     @UTTST          ;IF UNIT # NOT = -1
3787  003226  100404                            BMI     5$              ;THEN
3788  003230  012705  003426                    MOV     #PTDAT1,R5      ;SETUP TO PRINT
3789  003234  004737  003302                    CALL    PREPT1          ;PRINT DATA
3790  003240  062737  000002  003042    5$      ADD     #2,UTTST        ;SETUP TO CK NEXT UNIT
3791  003246  005337  003044                    DEC     UTCNT           ;DECREMENT UNIT COUNT
3792  003252  001361                            BNE     4$              ;IF DONE ALL UNITS THEN
3793  003254  005237  003272                    INC     LINECT          ;INCREMENT LINE COUNT
3794  003260  023737  003274  003272            CMP     LINES,LINECT    ;IF DONE ALL
3795  003266  101327                            BHI     1$              ;LINES, THEN
3796  003270  000207                            RTS     PC              ;RETURN
3797                                    ;---------------------------------------------------------------
3798  003272  000000                    LINECT  0                       ;LINE COUNTER
3799  003274  000000                    LINES   0                       ;# OF LINES TO PRINT
3800  003276  000000                    LINTYP  0                       ;LINE PRINT TYPE
3801  003300  000000                    PRNUM   0                       ;PRINT MODE
3802                                    ;---------------------------------------------------------------
```

```
3804                                    .SBTTL          PRINT REPORT TYPE 1
3805                                    ;---------------------------------------------------------------
3806  003302  000240                    PREPT1: NOP                     ;
3807  003304                                    PRINTS  R5,PAR
3808  003326  000207                            RTS     PC              ;
3809                                    ;---------------------------------------------------------------
3810  003330  000000                    PAR.    0                       ;
3811                                    ,---------------------------------------------------------------
3812
3813
3814
3815
3816
3817                                    .SBTTL          PRINT REPORT TYPE 2
3818                                    ;---------------------------------------------------------------
3819  003332  000240                    PREPT2: NOP
3820  003334                                    PRINTS  R5
3821  003352  000207                            RTS     PC
3822                                    ;---------------------------------------------------------------
3823  003354  047045  051445  034461    PT19SP: .ASCIZ  /%N%S19/
3824  003363     045  022516  022516    PTEC:   .ASCIZ  /%N%N%ERR%N%ACODE#  /
3825  003410  047045  047045  040445    PTTK:   .ASCIZ  /%N%N%ATRACK# /
3826  003426  040445  020040  042045    PTDAT1: .ASCIZ  /%A  %D6/
3827  003436  040445  052440  044516    PTUNT1: .ASCIZ  /%A UNIT#%D1%A /
3828  003455     045  022516  031117    PTECN:  .ASCIZ  /%N%02%AD%S3/
3829  003471     045  022516  030523    PTTKN:  .ASCIZ  /%N%S1%D2%S3/
3830          003506                            .EVEN
3831                                    ;---------------------------------------------------------------
```

```
3833                                    ;-----------------------------------------------------------------------
3834  003506  003554                    PRIDXX  .WORD   PRID01
3835  003510  003603                            .WORD   PRID02
3836  003512  003632                            .WORD   PRID03
3837  003514  003661                            .WORD   PRID04
3838  003516  003710                            .WORD   PRID05
3839  003520  003737                            .WORD   PRID06
3840  003522  003766                            .WORD   PRID07
3841  003524  004015                            .WORD   PRID08
3842  003526  004044                            .WORD   PRID09
3843  003530  004073                            .WORD   PRID10
3844  003532  004122                            .WORD   PRID11
3845  003534  004151                            .WORD   PRID12
3846  003536  004200                            .WORD   PRID13
3847  003540  004227                            .WORD   PRID14
3848  003542  004256                            .WORD   PRID15
3849  003544  004305                            .WORD   PRID16
3850  003546  004334                            .WORD   PRID17
3851  003550  004363                            .WORD   PRID18
3852  003552  004412                            .WORD   PRID19
3853                                    ;-----------------------------------------------------------------------
3854
3855                                    ;-----------------------------------------------------------------------
3856  003554  047045  040445  044103  PRID01: .ASCIZ  /%NXACHECK SUM.          /
3857  003603     045  022516  043101  PRID02: .ASCIZ  /%NXAFILL-EMP BUFF LOG /
3858  003632  047045  040445  047516  PRID03: .ASCIZ  /%NXANO ERR BIT         /
3859  003661     045  022516  044501  PRID04. .ASCIZ  /%NXAINTER-NO DONE ERR /
3860  003710  047045  040445  047111  PRID05: .ASCIZ  /%NXAINTERRUPT ERR      /
3861  003737     045  022516  051501  PRID06: .ASCIZ  /%NXASEEK:              /
3862  003766  047045  040445  051103  PRID07: .ASCIZ  /%NXACRC ERR           /
3863  004015     045  022516  041501  PRID08: .ASCIZ  /%NXACRC BAD           /
3864  004044  047045  040445  042522  PRID09: .ASCIZ  /%NXAREAD ERR          /
3865  004073     045  022516  053501  PRID10: .ASCIZ  /%NXAWRITE ERR         /
3866  004122  047045  040445  040504  PRID11: .ASCIZ  /%NXADATA ERR          /
3867  004151     045  022516  042101  PRID12: .ASCIZ  /%NXADEL  DATA ERR     /
3868  004200  047045  040445  051110  PRID.3: .ASCIZ  /%NXAHRD SEEK          /
3869  004227     045  022516  044101  PRID14: .ASCIZ  /%NXAHRD CRC ERR       /
3870  004256  047045  040445  051110  PRID15: .ASCIZ  /%NXAHRD CRC BAD       /
3871  004305     045  022516  044101  PRID16: .ASCIZ  /%NXAHRD READ          /
3872  004334  047045  040445  051110  PRID17  .ASCIZ  /%NXAHRD WRITE         /
3873  004363     045  022516  044101  PRID18  .ASCIZ  /%NXAHRD DATA          /
3874  004412  047045  040445  051110  PRID19  .ASCIZ  /%NXAHRD DEL  DATA ERR /
3875          004442                          EVEN
3876                                    ;-----------------------------------------------------------------------
```

```
                                   SBTTL  STATISTICAL TABLES

                                  ;----------------------------------------------------------------------

004442  000004                    CKSML   .BLKW   4               ,CKSUM LOG
004452  000004                    BUFERL: .BLKW   4               ,FILL/EMPTY BUFFER ERROR LOG
004462  000004                    NOERL.  .BLKW   4               ,NO ERR BIT LOG
004472  000004                    UKINT   .BLKW   4               ,INTERRUPT - NO DONE LOG
004502  000004                    INTER.  .BLKW   4               ,INTERRUPT ERR
004512  000004                    SEK     BLKW    4               ,SEEK ERR
004522  000004                    CRC     BLKW    4               ;CRC ERR
004532  000004                    CRCBAD. BLKW    4               ,CRC BAD ERR
004542  000004                    RD      BLKW    4               ,READ ERR
004552  000004                    WRT     BLKW    4               ,WRITE ERR
004562  000004                    DATA    BLKW    4               ,DATA ERR
004572  000004                    DLDTER: .BLKW   4               ,DEL DATA  ERR
004602  000004                    HSEK    BLKW    4               ,HARD SEEK ERR
004612  000004                    HCRC    .BLKW   4               ,HARD CRC ERR
004622  000004                    HCRCBD: BLKW    4               ,HARD CRC BAD ERR
004632  000004                    HRD     BLKW    4               ,HARD READ ERR
004642  000004                    HWRT    BLKW    4               ,HARD WRITE ERR
004652  000004                    HDATA   BLKW    4               ,HARD DATA ERR
004662  000004                    HDD     BLKW    4               ;HARD DEL DATA ERR
004672  000132                    ECLOG   BLKW    90              ,ERROR CODE LOG
005156  000464                    TKXX    BLKW    308             ,TRACK ERR LOG
                                  ,-------------------------------------------------------------
006326  000000                    ENDST   WORD    0               ,END TABLE


                                          EVEN

```

```
3920                                        SBTTL  INITIALIZE SECTION
3921
3922                                   ,++
3923                                   , THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
3924                                   , AT THE BEGINNING OF EACH PASS
3925                                   ,--
3926
3927  006330                                   BGNINIT
3928
3929  006330                           INIT    READEF  #EF CONTINUE
3930  006336                                   BCOMPLETE FIN
3931  006340  005037  002204                   CLR     RESTAR          ,CLEAR RESTART FLAG
3932  006344  005037  002212                   CLR     SUT             ,CLEAR SYS UNDER TST WORD
3933  006350  023727  002012  000004           CMP     L$UNIT,#4
3934  006356  003046                           BGT     INITER
3935  006360                                   READEF  #EF.RESTART
3936  006366                                   BNCOMPLETE SETUP
3937  006370  012737  000001  002204           MOV     #1,RESTAR       ,SET RESTART FLAG
3938  006376  012737  177777  006620   SETUP   MOV     #-1,UNIT
3939  006404  012737  177777  007356           MOV     #-1,UT00        ,RESET UNIT#1
3940  006412  012737  177777  007360           MOV     #-1,UT01         RESET UNIT#2
3941  006420  012737  177777  007362           MOV     #-1,UT10        ;RESET UNIT#3
3942  006426  012737  177777  007364           MOV     #-1,UT11        ,RESET UNIT#4
3943  006434  062737  000001  006620   1$      ADD     #1,UNIT
3944  006442  023737  002012  006620           CMP     L$UNIT,UNIT
3945  006450  001425                           BEQ     FIN
3946  006452                                   GPHARD  UNIT,PLOC
3947  006464                                   BNCOMPLETE 1$
3948  006466  004737  006674                   JSR     PC,UNPKHP
3949  006472  000760                           BR      1$
3950  006474                           INITER  PRINTF  #INTER1
3951  006514  012737  000001  002206           MOV     #1,ABORT
3952  006522                                   DOCLN
3953  006524                           FIN     SETVEC  U0VECT,#INTH0,#PRI07
3954  006552  005737  002304                   TST     U1VECT
3956  006556  001001                           BNE     1$
3956  006560  000413                           BR      2$
3957  006562                           1$      SETVEC  U1VECT,#INTH1,#PRI07
3958  006610  000240                   2$      NOP
3968
3969  006612                                   EXIT    INIT
3970
3982                                   ,------------------------------------------------------------------
3983  006616  000000                   PLOC    .WORD   0
3984  006620  177777                   UNIT:    WORD   -1
3985                                   ,------------------------------------------------------------------
3986  006622  047045  040445  047117   INTER1  .ASCIZ  /%N%AONLY FOUR UNITS ALLOWED, START OVER/
3987                                            EVEN
3988                                   ,------------------------------------------------------------------
3989  006672                                   ENDINIT
```

```
                                SBTTL  MOD 1 1 - UNPACK HARDWARE P-TABLES
                               ;-----------------------------------------------------------------
                               UNPKHP  NOP                     ,
006674  000240                 IFA11   BNE     IFB11           ;IS ZERO
006676  005037  007354                 CLR     UNT             ,CLEAR UNT
006702  013701  006616                 MOV     PLOC,R1         ,SAVE P-TABLE LOCATION
006706  005737  006620                 TST     UNIT            ;IF UNIT
006712  001005                         BNE     IFB11           ;IS ZERO
006714  012137  002226                 MOV     (R1)+,UOADR     ,LOAD UNIT #0 ADR
006720  012137  002302                 MOV     (R1)+,UOVECT    ,LOAD UNIT #0 VECTOR
006724  000426                         BR      E1A11           ;BR TO END IF 'A'
006726  021137  002226                 IFB11   CMP     (R1),UOADR      ,IF THIS ADR
006732  001003                         BNE     IFC11           ;EQUALS UNIT #0 ADR
006734  062701  000004                 ADD     #4,R1           ;INCREMENT TEMP #1 BY 4
006740  000420                         BR      E1A11           ;BR TC END IF 'A'
006742  005737  002230                 IFC11.  TST     U1ADR           ;IF UN1 ADDRESS
006746  001005                         BNE     IFD11           ;NOT LOADED PREVIOUSLY
006750  012137  002230                 MOV     (R1)+,U1ADR     ,LOAD UNIT#1 ADR
006754  012137  002304                 MOV     (R1)+,U1VECT    ;LOAD UNIT #1 VECTOR
006760  000405                         BR      E1C11           ,BR TO END IF 'C'
006762  021137  002230                 IFD11   CMP     (R1),U1ADR      ,IF UNIT ADR
006766  001155                         BNE     ELD11           ;EQUALS UNIT #1 ADR
006770  062701  000004                 ADD     #4,R1           ,THEN ADD 4 TO TEMP #1
006774  012737  000001  007354         E1C11   MOV     #1,UNT          ,SET UNT=1
007002  000240                         E1A11   NOP                     ;
007004  005737  002152                 IFE11   TST     RXXX            ,IF RXXX
007010  001446                         BEQ     IF111           ,THEN
007012  000240                         IFF11   NOP                     ,
007014  005711                         TST     (R1)            ,IF DRIVE #0
007016  001021                         BNE     IFH11           ,THEN
007020  062701  000002                 IFG11   ADD     #2,R1           ,ADD 2 TO TEMP #1
007024  005711                         TST     (R1)            ,IF SIDE #0 SELECTED
007026  001006                         BNE     ELG11           ,THEN
007030  052737  000001  002212         BIS     #1,SUT          ,SET SIDE #0, DRIVE #0
007036  005037  007352                 CLR     UNTCOD          ,CLEAR UNIT CODE
007042  000501                         BR      E1F11           ,BR TO END IF 'F'
007044  052737  000004  002212         ELG11   BIS     #4,SUT          ,SET SIDE #1, DRIVE #0
007052  012737  000002  007352         MOV     #2,UNTCOD       ,SET UNIT CODE = 10
007060  000472                         BR      E1F11           ,BR TO END IF 'F'
007062  062701  000002                 IFH11   ADD     #2,R1           ,ADD 2 TO TEMP #1
007066  005711                         TST     (R1)            ,IF SIDE #0 SELECTED
007070  001007                         BNE     ELH11           ,THEN
007072  052737  000002  002212         BIS     #2,SUT          ,SET SIDE #0, DRIVE #1
007100  012737  000001  007352         MOV     #1,UNTCOD       ,SET UNIT CODE = 11
007106  000457                         BR      E1F11           ,BR TO END IF 'F'
007110  052737  000010  002212         ELH11   BIS     #10,SUT         ;SET SIDE #1, DRIVE #1
007116  012737  000003  007352         MOV     #3,UNTCOD       ,SET UNIT CODE = 11
007124  000460                         BR      E1F11           ,BR TO END IF 'F'
007126  062701  000002                 IF.11   ADD     #2,R1           ,ADD 2 TO R1
007132  005711                         TST     (R1)            ,IF SIDE
007134  001061                         BNE     EL111           ,EQUALS 0, THEN
007136  162701  000002                 IFJ11   SUB     #2,R1           ,SUBTRACT 2 FROM TEMP #1
007142  005711                         TST     (R1)            ,IF DRIVE
007144  001020                         BNE     IFL11           ,EQUALS ZERO, THEN
007146  005737  007354                 IFK11   TST     UNT             ,IF UNIT
007152  001006                         BNE     ELK11           ,EQUALS ZERO
```

```
4047  007154  052737  000001  002212          BIS     #1,SUT          ;SET UNIT #0, DRIVE #0
4048  007162  005037  007352                  CLR     UNTCOD          ;CLEAR UNIT CODE
4049  007166  000427                          BR      EIF11           ;BR TO END IF 'F'
4050  007170  052737  000004  002212  ELK11.  BIS     #4,SUT          ;SET UNIT #1, DRIVE #0
4051  007176  012737  000002  007352          MOV     #2,UNTCOD       ;SET UNIT CODE = 10
4052  007204  000420                          BR      EIF11           ;BR TO END IF 'F'
4053  007206  005737  007354          IFL11   TST     UNT             ;IF UNIT
4054  007212  001007                          BNE     ELL11           ;EQUALS 0
4055  007214  052737  000002  002212          BIS     #2,SUT          ;SET UNIT #0, DRIVE #1
4056  007222  012737  000001  007352          MOV     #1,UNTCOD       ;SET UNIT CODE = 01
4057  007230  000406                          BR      EIF11           ;BR TO END IF 'F'
4058  007232  052737  000010  002212  ELL11   BIS     #10,SUT         ;SET UNIT #1, DRIVE #1
4059  007240  012737  000003  007352          MOV     #3,UNTCOD       ;SET UNIT CODE = 11
4060  007246  000240                  EIF11   NOP                     ;
4061  007250  012701  007356                  MOV     #UT00,R1        ,GET BEGINING OF UNIT CODE TABLE
4062  007254  013702  007352                  MOV     UNTCOD,R2       ,GET UNIT CODE
4063  007260  006302                          ASL     R2              ,DOUBLE R2 FOR ADDRESSING
4064  007262  060201                          ADD     R2,R1           ,FIND ADDRESS FOR THIS UNIT CODE
4065  007264  013703  006620                  MOV     UNIT,R3         ,GET LOGICAL UNIT#
4066  007270  062703  000001                  ADD     #1,R3           ,ADD 1 TO LOGICAL UNIT# TO PRINT USER UNIT#
4067  007274  010311                          MOV     R3,(R1)         ,SET USER UNIT# FOR PRINT OUT
4068  007276  000424                          BR      END11           ,BR TO END MOD
4069  007300                          EL111   PRINTF  INMSG2
4070  007320  000413                          BR      END11           ,BR TO END MOD
4071  007322                          ELD11   PRINTF  INMSG3,UNIT     ,
4072  007346  000240                          NOP
4073  007350  000207                  END11   RTS     PC              ,RETURN
4074                                  ,---------------------------------------------------------------
4075  007352  000000                  UNTCOD  0                       ,UNIT CODE
4076  007354  000000                  UNT     0                       ,UNIT FLAG
4077  007356  177777                  UT00    -1                      ,****UUT CODE# TABLE****
4078  007360  177777                  UT01    -1                      ,       >STORAGE OF USER UNIT#
4079  007362  177777                  UT10:   -1                      ,                FOR PRINT OUT &
4080  007364  177777                  UT11:   -1                      ,                LOOKUP
4081                                  ,---------------------------------------------------------------
4082  007366  047045  046445  051525  INMSG2  .ASCIZ  /%N%MUST SELECT RXXX TO SELECT SIDE #1/
4083  007434  047045  052445  044516  INMSG3: .ASCIZ  /%N%UNIT#%D1%NOT SCHEDULED-TWO BUS ADDRESS ONLY/
4084          007514                          EVEN
4085                                  ,MOD 1 1 ----- END MODULE ------- ---------------------------------
```

```
                     .SBTTL  CLEANUP CODING SECTION

                     ;++
                     ; THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED
                     ; AT THE END OF EACH PASS
                     ;--

007514                       BGNCLN


007514                       EXIT    CLN


                              .EVEN

007520                       ENDCLN
```

```
                                        SBTTL  DROP UNIT SECTION

                                       ;++
                                       ; THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
                                       ; TO NO LONGER BE TESTED.
                                       ;--

007522                                         BGNDU

007522  010037  007704                 MOV     R0,UNITDP       ;GET LOGICAL UNIT #
007526  005002                         CLR     R2              ;LET R2=UNIT CODE# & UNIT COUNT /CLEAR IT!
007530  062737  000001  007704         ADD     #1,UNITDP       ;MAKE LOGICAL UNIT# = USER UNIT#
007536  012701  007356                 MOV     #UTOO,R1        ;GET BEGIN UNIT CODE ADRESS
007542  023721  007704         1$      CMP     UNITDP,(R1)+    ;IF USER UNIT#
007546  001420                         BEQ     2$              ;IS  = UNIT CODE - UNIT#
007550  005202                         INC     R2              ;INCREMENT UNIT CODE# & UNIT COUNT
007552  022702  000005                 CMP     #5,R2           ;IF MAX # OF UNITS
007556  101371                         BHI     1$              ;EXCEEDED
007560  000240                         NOP                     ;THEN
007562                                 PRINTB  #DUMSG2,UNITDP  ;PRINT UNIT# NOT FOUND
007606  000434                         BR      3$              ;BR TO EXIT
007610  010237  002526         2$      MOV     R2,CVUNIT       ;SET UNIT CODE FOR CONVERSION
007614  004737  002426                 CALL    CVUTST          ;CALL MOD U A 1 CONVERT UNIT# TO SUT CODE
007620  013737  002530  007706         MOV     SUTCV,SUTDRP    ;SET SUT DROP CODE = SUT CONVERTED CODE
007626  000240                         NOP                     ;
007630  013737  002530  007706         MOV     SUTCV,SUTDRP    ;GET SUT CODE
007636  043737  007706  002212         BIC     SUTDRP,SUT      ;DROP UNIT SPEC IN SUTDRP
007644  043737  007706  002210         BIC     SUTDRP,SDD      ;CLEAR UNIT SPEC IN SUT DROP
007652                                 PRINTB  #DUMSG1,UNITDP
007676  000240                         NOP                     ;

007700                         3$      EXIT    DU
                                       ;-----------------------------------------------------------------------
007704  000000                 UNITDP  0                       ;UNIT TO BE DROPPED
007706  000000                 SUTDRP  0                       ;SYS UNDER TST, DROP BIT
                                       ;-----------------------------------------------------------------------
007710  047045  040445  042040 DUMSG1   ASCIZ  /%N%A DROP UNIT#%D1%A FROM TEST%N/
007751     045  022516  020101 DUMSG2   ASCIZ  /%N%A COULD NOT DROP UNIT#%D1%A -NOT SELECTED%N/
                                       ;-------------- -------------------------------------------------------


                                        EVEN

010030                                 ENDDU
```

```
 4185                                    SBTTL  ADD UNIT SECTION
 4186
 4187                                   ;++
 4188                                   ;  THE ADD-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
 4189                                   ;    TO BE (A) TESTED FOR THE FIRST TIME. OR (B) RESUMED IN TESTING   IF
 4190                                   ;    "EF AUNIT" IS SET, THE UNIT WILL BE TESTED AS A NEW UNIT
 4191                                   ;--
 4192
 4193  010032                                   BGNAU
 4194
 4200
 4201  010032                                   EXIT    AU
 4202
 4214
 4215                                     EVEN
 4216
 4217  010036                                   ENDAU
 4218
```

```
                                      TITLE HARDWARE TESTS
                                      SBTTL  TEST 1:
                                     ;++
                                     ; TEST TO EXCERCISE RX02/03 SYSTEM
                                     ;--
010040                                      BGNTST
                                      SBTTL  MOD 0.0 - EXERCISE A SYSTEM
                                     ;-----------------------------------------------------------------------

010040  000240                       CONTRL: NOP
010042  005037  010244               BDB00:  CLR     EXCMP           ;CLEAR EXERCISE COMPLETE
010046  005037  002206                       CLR     ABORT           ;CLEAR ABORT FLAG
010052  012737  000001  010242               MOV     #1,INITL        ;SET INITIALIZE FLAG
010060  005037  002242                       CLR     RETRY           ;CLEAR RETRY FLAGS
010064  005037  002210                       CLR     SDD             ;CLEAR SYS DRIVES DONE
010070  005037  002232                       CLR     SYSERR          ;CLEAR SYSTEM ERROR FLAGS
010074  005037  002234                       CLR     ERRTYP          ;CLEAR DEVICE ERROR FLAGS
010100  005037  002236                       CLR     CSRUUT          ;CLEAR UUT CSR
010104  005037  002240                       CLR     ESRUUT          ;CLEAR UUT ESR
010110  005037  002312                       CLR     XERUUT          ;CLEAR UUT TEST ERROR REG
010114  012737  000001  015644               MOV     #1,SUTPTR       ;PRESET SYS UNDER TST PTR
010122  004737  010246                       CALL    GTSYEX          ;CALL MOD 1.0 GET SYS EXER
010126  005737  002206               IFA00   TST     ABORT           ;IF ABORT
010132  001404                               BEQ     IFC00           ;NOT = 0, THEN
010134  005737  002232               IFB00   TST     SYSERR          ;IF SYS ERR
010140  001012                               BNE     THD00           ;EQUALS 0, THEN
010142  000416                               BR      THE00           ;BR TO THEN 'E'
010144  005737  002232               IFC00   TST     SYSERR          ;IF SYS ERR
010150  001006                               BNE     THD00           ;NOT=0, THEN BR TO THEN 'D', ELSE
010152                               BDA00   BGNSEG                  ;BEGIN SEGMENT FOR ERROR LOOPS
010154  004737  015110                       CALL    SCSYEX          ;CALL MOD 2.0 - SCDED SYS EX
010160  005737  002232               IFD00   TST     SYSERR          ;IF SYS ERR
010164  001410                               BEQ     ELD00           ;NOT=0, THEN
010166  004737  026650               THD00:  CALL    OTSYER          ;CALL MOD 4.0 - O/P SYS ERR
010172  005737  002206               IFE00   TST     ABORT           ;IF ABORT
010176  001403                               BEQ     ELD00           ;NOT=0, THEN
010200  000240                       THE00   NOP                     ;
010202                                       DOCLN                   ;DO CLEAN UP
010204  000414                               BR      END00           ;BR TO END
010206                               ELD00   CKLOOP                  ;SEE IF LOOP ON ERROR
010210                                       ENDSEG                  ;END SEGMENT FOR ERROR LOOPS
010212  004737  026626                       CALL    OTEXCM          ;CALL MOD 3.0 O/P SYS  EX  COMPLETE
010216  005737  010244               DUA00   TST     EXCMP           ;DO UNTIL EXERCISE COMPLETE
010222  001753                               BEQ     BDA00           ;EQUALS 1
010224  032737  100000  012164       DUB00:  BIT     #100000,SWREG   ;IF LOOP SET
010232  001303                               BNE     BDB00           ;NOT SET, THEN
010234                                       DORPT
010236  000240                       END00   NOP
010240                                       ENDTST
                                     ;-----------------------------------------------------------------------
010242  000000                       INITL   0                       ;INITIALIZE POINTERS FLAG
010244  000000                       EXCMP   0                       ;EXERCISE COMPLETE FLAG
                                     ;MOD 0.0 ----- END MODULE ---------------------------------------------
```

```
 4274
 4275
 4276                                    SBTTL  MOD 1 0 - GET SYSTEM EXERCISE
 4277                                    ;-------------------------------------------------------------
 4278  010246  000240                    GTSYEX. NOP
 4279  010250  004737  010312                    JSR     PC,GTEXCD
 4280  010254  000240                            NOP
 4281  010256  032737  040000  002164    IFA10.  BIT     #40000,SWREG    ;IF NO INITIALIZE
 4282  010264  001002                            BNE     ELA10           ;NOT SET, THEN
 4283  010266  004737  010436                    JSR     PC,GTSYS
 4284  010272  000240                    ELA10:  NOP
 4285  010274  004737  013474                    JSR     PC,GTEX
 4286  010300  000240                            NOP
 4287  010302  005037  010310                    CLR     FIRST           ;CLEAR FIRST PASS FLAG
 4288  010306  000207                            RTS     PC
 4289                                    ;-------------------------------------------------------------
 4290  010310  000001                    FIRST   1                       ;FIRST PASS FLAG
 4291                                    ;MOD 1 0 ----- END MODULE -----------------------------------
 4292
 4293
```

```
                                          .SBTTL  MOD 1.1 - GET EXERCISE CONDITIONS
                                          ;--------------------------------------------------------------

010312  000240                            GTEXCD: NOP
010314  032737  000001  002164            IFA11:  BIT     #1,SWREG        ;IF SET FOR DOUBLE DENSITY
010322  001404                                    BEQ     ELA11           ;THEN
010324  012737  000200  002270                    MOV     #200,WDCNT      ;SET WORD COUNT=256 BYTES
010332  000403                                    BR      EIA11           ;BR TO END IF 'A'
010334  012737  000100  002270            ELA11:  MOV     #100,WDCNT      ;SET WORD COUNT=128 BYTES
010342  013737  002166  015056            EIA11:  MOV     OTDITK,OD       ;SET OUTSIDE TRACK ADR. (FROM SOFTW P-TAB)
010350  013737  002170  015060                    MOV     INDITK,ID       ;SET INSIDE TRACK ADR. (FROM SOFT P-TAB)
010356  000240                                    NOP
010360  032737  000002  002164                    BIT     #2,SWREG        ;IF DEL DATA SET
010366  001404                                    BEQ     ELB11           ;THEN
010370  012737  000010  002224                    MOV     #10,DELDAT      ;SET DEL DATA MODE
010376  000402                                    BR      EIB11           ;BR TO END IF 'B'
010400  005037  002224                    ELB11:  CLR     DELDAT          ;CLEAR DEL DATA MODE
010404  000240                            EIB11:  NOP                     ;
010406  032737  000001  002164            IFC11:  BIT     #1,SWREG        ;IF DOUBLE DEN IS SET IN SOFT SWREG
010414  001404                                    BEQ     ELC11           ;THEN
010416  012737  000400  002222                    MOV     #400,DEN        ;SET DEN=DOUBLE
010424  000402                                    BR      EIC11           ;BR TO END IF 'C'
010426  005037  002222                    ELC11:  CLR     DEN             ;SET DEN=SINGLE
010432  000240                            EIC11:  NOP                     ;
010434  000207                                    RTS     PC              ;RETURN
                                          ;MOD 1.1 ----- END MODULE ----------------------------------------
```

```
4327
4328
4329                                    .SBTTL  MOD 1.2 - GET SYSTEM TO EXERCISE
4330                                    ;---------------------------------------------------------------
4331
4332  010436                            GTSYS:  BRESET                  ;ISSUE BUS RESET
4333  010440  012737  000040  021550            MOV     #DNBIT,RDYWD    ;SET READY WORD = DONE
4334  010446  013737  002226  021552            MOV     UOADR,CSRADR    ;SET ADDRESS
4335  010454  004737  021450                    CALL    DELAY           ;CALL MOD - DELAY FOR DONE
4336  010460  032777  000040  171540  IFA12:    BIT     #DNBIT,@UOADR   ;IF UNIT #0 DONE BIT
4337  010466  001011                            BNE     ELA12           ;NOT SET THEN
4338  010470  013737  007356  012114            MOV     UTOO,UNITN      ;SET UNIT # FOR PRINT
4339  010476  012737  012116  012112            MOV     #INTER2,ITMSG   ;SET PRINT MSG#
4340  010504  004737  012062                    CALL    ITPRNT          ;PRINT-UO-NO DONE BIT
4341  010510  000445                            BR      EIA12           ;BR TO END IF 'A'
4342  010512  012777  040000  171506  ELA12:    MOV     #40000,@UOADR   ;ELSE-ISSUE PROG INIT TO UO
4343  010520  012737  000040  021550            MOV     #DNBIT,RDYWD    ;SET READY WORD = DONE
4344  010526  013737  002226  021552            MOV     UOADR,CSRADR    ;SET TEST ADDRESS
4345  010534  004737  021450                    CALL    DELAY           ;CALL MOD - DELAY FOR DONE
4346  010540  032777  000040  171460  IFB12:    BIT     #DNBIT,@UOADR   ;IF UNIT #0 DONE BIT
4347  010546  001011                            BNE     ELB12           ;NOT SET THEN
4348  010550  013737  007356  012114            MOV     UTOO,UNITN      ;SET UNIT# FOR PRINT
4349  010556  012737  012214  012112            MOV     #INTER3,ITMSG   ;SET PRINT MSG#
4350  010564  004737  012062                    CALL    ITPRNT          ;PRINT-UO, NO DONE BIT
4351  010570  000415                            BR      EIA12           ;BR TO END IF 'A'
4352  010572  012737  000002  011432  ELB12.    MOV     #2,UNTCNT       ,SET # DRVS TO CK
4353  010600  012737  000001  011436            MOV     #1,SUTPOS       ,SET POSITION IN SUT TO TEST = 1
4354  010606  005037  011434                    CLR     UNTCD           ,SET UUT CODE = 0
4355  010612  013704  002226                    MOV     UOADR,R4        ,SET TEMP #4 = UO ADDRESS
4356  010616  004737  011102                    CALL    CKDVAV          ,CALL MOD 1.2.1 - CK DRIVE STATUS
4357  010622  000412                            BR      IFC12           ,BR TO IF 'C'
4358  010624  005737  002152          EIA12     TST     RXXX            ,IF RXXX
4359  010630  001404                  IFH12:    BEQ     ELH12           ;THEN
4360  010632  042737  000017  002212            BIC     #17,SUT         ,CLEAR RXXX UO SELECTED DRIVES
4361  010640  000403                            BR      IFC12           ;BR TO IF 'C'
4362  010642  042737  000003  002212  ELH12.    BIC     #3,SUT          ,CLEAR RX02 UO SELECTED DRIVES
4363  010650  005737  002152          IFC12:    TST     RXXX            ,IF RXXX
4364  010654  001401                            BEQ     IFD12           ,THEN
4365  010656  000471                            BR      IFG12           ,BR TO IF 'G'
4366  010660  032737  000014  002212  IFD12:    BIT     #14,SUT         ,IF U1
4367  010666  001465                            BEQ     IFG12           ,SELECTED THEN
4368  010670  032777  000040  171332  IFE12     BIT     #DNBIT,@U1ADR   ,IF U1 DONE BIT
4369  010676  001446                            BEQ     ELE12           ,SET THEN
4370  010700  012777  040000  171322            MOV     #40000,@U1ADR   ,INITIALIZE DEVICE U1
4371  010706  012737  000040  021550            MOV     #DNBIT,RDYWD    ;SET READY WORD = DONE BIT
4372  010714  013737  002230  021552            MOV     U1ADR,CSRADR    ;SET TEST ADR
4373  010722  004737  021450                    CALL    DELAY           ,CALL MOD - WAIT FOR DONE
4374  010726  032777  000040  171274  IFF12.    BIT     #DNBIT,@U1ADR   ,IF U1 DONE BIT
4375  010734  001416                            BEQ     ELF12           ,SET THEN
4376  010736  012737  000004  011436            MOV     #4,SUTPOS       ,SET POSITION IN SUT = 4
4377  010744  012737  000002  011432            MOV     #2,UNTCNT       ;SET # DRVS TO CK = 2
4378  010752  012737  000002  011434            MOV     #2,UNTCD        ,SET UUT CODE = 2
4379  010760  013704  002230                    MOV     U1ADR,R4        ,SET TEMP #4 = U1 ADR
4380  010764  004737  011102                    CALL    CKDVAV          ,CALL MOD 1 2 1 - CK DRIVE STATUS
4381  010770  000424                            BR      IFG12           ,BR TO IF 'G'
4382  010772  013737  007362  012114  ELF12     MOV     UT10,UNITN      ,SET UNIT# FOR PRINT
```

```
 4383  011000  012737  012214  012112          MOV     #INTER3,ITMSG   ;SET MSG#
 4384  011006  004737  012062                  CALL    ITPRNT          ;PRINT - U1 - NO DONE BIT - PROG INIT
 4385  011012  000410                          BR      EIE12           ;BR TO END IF 'E'
 4386  011014  013737  007362  012114  ELE12:  MOV     UT10,UNITN      ;SET UNIT# FOR PRINT
 4387  011022  012737  012116  012112          MOV     #INTER2,ITMSG   ;SET MSG#
 4388  011030  004737  012062                  CALL    ITPRNT          ;PRINT - U1 - NO DONE BIT - BUS INIT
 4389  011034  042737  000014  002212  EIE12:  BIC     #14,SUT         ;
 4390  011042  005737  002212          IFG12:  TST     SUT             ;IF SYSTEM UNDER TEST
 4391  011046  001013                          BNE     ELG12           ;EQUALS 0, THEN
 4392  011050                                  PRINTB  #INTER4         ,PRINT - NO SYS TO TEST
 4393  011070  012737  000001  002206          MOV     #1,ABORT        ,SET ABORT FLAG
 4394  011076  000240                  ELG12:  NOP                     ,
 4395  011100  000207                          RTS     PC              ,RETURN
 4396                                  ,MOD 1 2 ----- END MODULE ----------------------------------------------
```

```
                                        .SBTTL  MOD 1.2.1 - CK DRIVE AVAILABLE
                                        ;---------------------------------------------------------------
011102  012737  000001  011416  CKDVAV: MOV     #1,REFORM       ,SET REFORMAT CK
011110  010437  011426                  MOV     R4,ITCSAD       ,SAVE C & S ADR
011114  062704  000002                  ADD     #2,R4           ,SET DATA BUFFER ADR
011120  010437  011430                  MOV     R4,ITDBAD       ,SAVE DB ADR
011124  000240                  BDA121: NOP                     ,
011126  033737  011436  002212  IFA121: BIT     SUTPOS,SUT      ,IF BIT IN TEMP #1 & SUT
011134  001512                  BEQ     EIA121          ;EQUAL, THEN
011136  013701  011434                  MOV     UNTCD,R1        ,SAVE UNIT #
011142  006301                  ASL     R1              ,DOUBLE UNIT CD FOR ADR
011144  062701  007356                  ADD     #UTOD,R1        ;FIND ADR UNIT#
011150  011137  012114                  MOV     (R1),UNITN      ,SET UNIT# FOR PRINT
011154  032737  000001  011434  IFB121: BIT     #1,UNTCD        ;IF DRIVE #1 SET IN TEMP #3
011162  001407                  BEQ     ELB121          ;THEN
011164  012737  000033  011422          MOV     #33,INTCMD      ;SET READ STATUS DRV #1
011172  012737  000001  011424          MOV     #1,DRIVEN       ,SET PRINT FOR DRV #1
011200  000406                  BR      EIB121          ,BR TO END IF 'B'
011202  012737  000013  011422  ELB121: MOV     #13,INTCMD      ,SET READ STATUS DRV #0
011210  005037  011424                  CLR     DRIVEN          ;SET PRINT FOR DRIVE #0
011214  013777  011422  000204  EIB121: MOV     INTCMD,@ITCSAD  ;EXECUTE READ STATUS ON DRIVE AT TEMP #4
011222  013737  011426  021552          MOV     ITCSAD,CSRADR   ;PASS DOWN ADRS
011230  012737  000040  021550          MOV     #DNBIT,RDYWD    ;PASS DOWN "DONE" BIT TO TEST
011236  004737  021450                  CALL    DELAY           ;CALL MOD - DELAY FOR DONE BIT
011242  032777  000010  000160  IFH121: BIT     #10,@ITDBAD     ;IF AC LOW BIT
011250  001404                  BEQ     IFC121          ,SET, THEN
011252  012737  013340  012112          MOV     #ITER3,ITMSG    ,SET MSG# -  AC LOW
011260  000426                  BR      EIC121          ,BR TO END IF 'C'
011262  032777  000200  000140  IFC121  BIT     #200,@ITDBAD    ,IF DRV RDY BIT
011270  001004                  BNE     IFD121          ,NOT SET, THEN
011272  012737  012343  012112          MOV     #ITMSG1,ITMSG   ,SET MSG# - NO DRIVE READY
011300  000416                  BR      EIC121          ;BR TO END IF 'C'
011302  005737  002152          IFD121  TST     RXXX            ;IF UNIT IS TO BE TESTED AS RXXX
011306  001420                  BEQ     IFG121          ,THEN
011310  032737  000002  011434  IFE121: BIT     #2,UNTCD        ;IF SIDE #1
011316  001414                  BEQ     IFG121          ;SELECTED
011320  032777  000002  000102  IFF121 BIT     #2,@ITDBAD      ;IF SIDE #1
011326  001010                  BNE     IFG121          ,NOT READY, THEN
011330  012737  012402  012112          MOV     #ITMSG2,ITMSG   ;SET MSG#
011336  004737  012062          EIC121: CALL    ITPRNT          ,CALL PRINT - NO SIDE RDY
011342  004737  013454                  CALL    ITDROP          ;CALL DROP UNIT
011346  000406                  BR      EIA121          ,BR TO ENDIF 'A'
011350  005737  011416          IFG121  TST     REFORM          ,IF REFORMAT FLAG
011354  001402                  BEQ     EIA121          ;NOT SET, THEN
011356  004737  011442                  CALL    REFDRV          ;CALL REFORMAT DRIVE DENSITY
011362  006137  011436  EIA121  ROL     SUTPOS          ,MOVE SELECT BIT TO TEST SYS UNDER TEST
011366  005337  011432          DEC     UNTCNT          ,DECREMENT UNIT COUNT
011372  006237  011434          INC     UNTCD           ,INCREMENT UNIT UNDER TEST CODE
011376  005737  011432  DUA121  TST     UNTCNT          ,DO
011402  001402                  BEQ     END121          ,UNTIL
011404  000137  011124                  JMP     BDA121          ,ALL UNITS DONE
011410  005037  011416  END121  CLR     REFORM          ,CLEAR REFORMAT CK
011414  000207                  RTS     PC              ,RETURN
                                        ;--------------------------------------------------------------- -------
```

```
4454                          ;------------------------------------------------------------
4455 011416 000000            REFORM  0                    ;REFORMAT CHECK
4456 011420 000000            REFCMD  0                    ;REFORMAT COMMAND
4457 011422 000000            INTCMD  0                    ;INITIAL COMMAND WORD
4458 011424 000000            DRIVEN: 0                    ;DRIVE NUMBER
4459 011426 000000            ITCSAD  0                    ;INITIAL C & S ADR
4460 011430 000000            ITDBAD  0                    ;INITIAL DATA BUFFER ADR
4461 011432 000000            UNTCNT: 0                    ;UNIT COUNT
4462 011434 000000            UNTCD:  0                    ;UNIT CODE
4463 011436 000000            SUTPOS  0                    ;SYS UNDER TST POSITION
4464 011440 000000            FORMCK: 0                    ;FORMATT CK FLAG
4465                          ;------------------------------------------------------------
```

```
                                        .SBTTL  MOD 1.2.1.1 - REFORMAT DRIVE DENSITY
                                        ;-------------------------------------------------------------
                                        
011442  033737  011436  002212  REFDRV. BIT     SUTPOS,SUT      ;IF UNIT SELECTED IN
011450  001002                          BNE     IA1211          ;SYS UNDER TEST
011452  000137  012060                  JMP     X1211           ;THEN
011456  032737  000001  002164  IA1211: BIT     #1,SWREG        ;IF DOUBLE DENSITY
011464  001412                          BEQ     IC1211          ;SET, THEN
011466  032777  000040  177734  IB1211: BIT     #40,@ITDBAD     ;IF DISKETTE IS DOUBLE DENSITY
011474  001171                          BNE     X1211           ;THEN BR TO END, ELSE
011476  012737  012440  012112          MOV     #ITMSG3,ITMSG   ;SET MSG# DSK SGL DEN
011504  004737  012062                  CALL    ITPRNT          ;CALL PRINT -
011510  000414                          BR      LB1211          ;BR TO ELSE 'B'
011512  032777  000040  177710  IC1211: BIT     #40,@ITDBAD     ;IF DISKETTE
011520  001557                          BEQ     X1211           ;IS NOT SINGLE DENSITY, THEN
011522  012737  012646  012112          MOV     #ITMSG6,ITMSG   ;SET MSG# DSK DBL DEN
011530  004737  012062                  CALL    ITPRNT          ;CALL PRINT -
011534  005037  011420                  CLR     REFCMD          ;SET REFORMAT CMD TO SINGLE DENSITY
011540  000403                          BR      ID1211          ;BR TO IF 'D'
011542  012737  000400  011420  LB1211: MOV     #BIT8,REFCMD    ;SET REFORMAT CMD TO DOUBLE DENSITY
011550                          ID1211: MANUAL                  ;IF MANUAL INTERVENTION
011552                                  BNCOMPLETE      LD1211  ;IS ALLOWED,THEN
011554                                  GMANIL  FCKMSG,FORMCK,1,YES
011570  005737  011440          IE1211: TST     FORMCK          ;IF REFORMATT
011574  001516                          BEQ     LE1211          ;OK, THEN
011576  005037  011440                  CLR     FORMCK          ;CLEAR REFORMATT CK
011602  052737  000011  011420          BIS     #11,REFCMD      ;SET REFORMAT CMD
011610  032737  000001  011434  IF1211: BIT     #1,UNTCD        ;IF DRIVE #1
011616  001403                          BEQ     IG1211          ;SELECTED
011620  052737  000020  011420          BIS     #BIT4,REFCMD    ;SET DRIVE #1 ON REFORMAT CMD
011626  005737  002152          IG1211: TST     RXXX            ;IF RXXX
011632  001407                          BEQ     EG1211          ;DEVICE AND
011634  032737  000002  011434          BIT     #2,UNTCD        ;SIDE #1
011642  001403                          BEQ     EG1211          ;SELECTED, THEN
011644  052737  001000  011420          BIS     #BIT9,REFCMD    ;SET SIDE #1 ON REFORMAT CMD
011652  013777  011420  177546  EG1211: MOV     REFCMD,@ITCSAD  ;SEND REFORMAT CMD
011660  013737  011426  021552          MOV     ITCSAD,CSRADR   ;PASS UNIT ADRS
011666  012737  000200  021550          MOV     #TRBIT,RDYWD    ;PASS "TR" BIT TO TEST
011674  004737  021450                  CALL    DELAY           ;CALL DELAY
011700  005737  002232          IH1211  TST     SYSERR          ;IF
011704  001046                          BNE     LH1211          ;T O  ERR
011706  012777  000111  177514          MOV     #111,@ITDBAD    ;SEND VARIFY WORD (ASCII "I")
011714  012737  013067  012112          MOV     #ITMSG9,ITMSG   ;SET MSG# WRG DEN REFORMAT
011722  004737  012062                  CALL    ITPRNT          ;CALL PRINT -
011726  013737  011426  021552          MOV     ITCSAD,CSRADR   ;SET UNIT BUS ADR
011734  012737  000040  021550          MOV     #DNBIT,RDYWD    ;SET DONE BIT TST
011742  012737  001000  021544          MOV     #1000,RYDX      ;SET DELAY MULT HIGH
011750  004737  021450                  CALL    DELAY           ;DELAY UNTIL DONE OR T  O
011754  012737  000020  021544          MOV     #20,RYDX        ;RESET DELAY MULT
011762  032777  000040  177436  II1211: BIT     #40,@ITCSAD     ;IF DONE BIT
011770  001410                          BEQ     LI1211          ;SET ,THEN
011772  032777  100000  177426  IJ1211: BIT     #100000,@ITCSAD ;IF ERR BIT NOT SET
012000  001427                          BEQ     X1211           ;THEN BR TO EXIT
012002  012737  013146  012112          MOV     #ITER1,ITMSG    ;ELSE, SET "ERROR ON REFORMATT" MSG
012010  000417                          BR      ED1211          ;BR TO END IF 'D'
012012  012737  013244  012112  LI1211: MOV     #ITER2,ITMSG    ;SET "NO DONE BIT AFTER REFORMATT" MSG
```

```
4523  012020  000413                          BR      ED1211          ;BR TO END IF 'D'
4524  012022  012737  012526  012112  LH1211: MOV     #ITMSG4,ITMSG   ;SET MSG# NO "TR" BIT TIME OUT ERR
4525  012030  000407                          BR      ED1211          ;BR TO END IF 'D'
4526  012032  012737  012735  012112  LE1211: MOV     #ITMSG7,ITMSG   ;SET MSG# DISK WRG DEN
4527  012040  000403                          BR      ED1211          ;BR TO END IF 'D'
4528  012042  012737  013003  012112  LD1211  MOV     #ITMSG8,ITMSG   ;SET MSG# MAN INTERVENTION NOT ALL
4529  012050  004737  012062          ED1211: CALL    ITPRNT          ;CALL PRINT - MSG SET UP
4530  012054  004737  013454                  CALL    ITDROP          ;CALL DROP UNIT
4531  012060  000207                  X1211   RTS     PC              ;RETURN
4532                                  ;---------------------------------------------------------------------
```

```
4534
4535                                    SBTTL  MOD U 1 2 - INITIALIZE PRINT
4536                                    ;-------------------------------------------------------------------
4537
4538  012062  000240                    ITPRNT  NOP                             ,
4539  012064                                    PRINTB  ITMSG,UNITN
4540  012110  000207                            RTS     PC                      ;RETURN
4541                                    ;-------------------------------------------------------------------
4542  012112  000000                    ITMSG   0                               ,INITIALIZE MSG#
4543  012114  000000                    UNITN:  0                               ;UNIT# FOR PRINT
4544                                    ;-------------------------------------------------------------------
4545  012116  047045  040445  047125  INTER2: .ASCIZ  /%N%AUNIT#%D1%A---NO DONE BIT AFTER BUS INITIALIZE - DROP UNIT/
4546  012214  047045  040445  047125  INTER3: .ASCIZ  /%N%AUNIT#%D1%A---NO DONE BIT AFTER PROG. INITIALIZE - DROP UNIT/
4547  012314  047045  040445  047040  INTER4: .ASCIZ  /%N%A NO SYSTEM TO TEST/
4548  012343     045  022516  052501  ITMSG1: .ASCIZ  /%N%AUNIT#%D1%A- NO DRIVE READY/
4549  012402  047045  040445  047125  ITMSG2: .ASCIZ  /%N%AUNIT#%D1%A- NO SIDE READY/
4550  012440  047045  040445  047125  ITMSG3: .ASCIZ  /%N%AUNIT#%D1%A- WRONG DENSITY-SINGLE DENSITY DISKETTE/
4551  012526  047045  040445  047125  ITMSG4: .ASCIZ  /%N%AUNIT#%D1%A- NO "TR" BIT AFTER SET DENSITY CMD/
4552  012610  047045  040445  047125  ITMSG5: .ASCIZ  /%N%AUNIT#%D1%A- WRONG DENSITY/
4553  012646  047045  040445  047125  ITMSG6: .ASCIZ  /%N%AUNIT#%D1%A-WRONG DENSITY - DOUBLE DENSITY DISKETTE/
4554  012735     045  022516  052501  ITMSG7: .ASCIZ  /%N%AUNIT#%D1%A DISKETTE WRONG DENSITY/
4555  013003     045  022516  020101  ITMSG8: .ASCIZ  /%N%A UNIT#%D1%A MANL INTERVENTION REQ'D - REFORMATT/
4556  013067     045  020101  047125  ITMSG9: .ASCIZ  /%A UNIT#%D1%A-REFORMATTING, DO NOT INTERRUPT%N/
4557  013146  047045  040445  047125  ITER1:  .ASCIZ  /%N%AUNIT#%D1%A- ERROR BIT SET AFTER REFORMAT COMMAND SEQUENCE/
4558  013244  047045  040445  047125  ITER2:  .ASCIZ  /%N%AUNIT#%D1%A- NO DONE BIT AFTER REFORMAT COMMAND SEQUENCE/
4559  013340  047045  040445  047125  ITER3:  .ASCIZ  /%N%AUNIT#%D1%A- AC LOW BIT SET/
4560  013377     104  051511  042513  FCKMSG: .ASCIZ  /DISKETTE WILL BE REFORMATTED - ARE YOU SURE?/
4561                                            .EVEN
4562                                    ;-------------------------------------------------------------------
4563  013454  013737  011436  007706  ITDROP. MOV     SUTPOS,SUTDRP   ,SETUP SYS  UNDER TEST DROP BIT
4564  013462                                    DODU    UNTCD           ;DROP THIS UNIT FROM TEST
4565  013470  000240                            NOP                     ,
4566  013472  000207                            RTS     PC              ,RETURN
4567                                    ,MOD 1 2.1 ----- END MODULE ----------------------------------------
4568
```

```
4570
4571                                    SBTTL  MOD 1 3 - GET EXERCISE
4572                                    ;-------------------------------------------------------------------
4573
4574  013474  000240                    GTEX    NOP                     ;
4575  013476  000240                            NOP                     ;
4576  013500  000240                            NOP                     ;
4577  013502  013737  002160  014154            MOV     TSTPAT,PAT      ;GET TEST PATTERN #
4578  013510  000240                            NOP                     ;
4579  013512  004737  013602                    CALL    STSTPA          ;CALL MOD 1.3.1 SET TEST PATTERN
4580  013516  013737  002162  015062            MOV     TRKSEQ,SEQUEN   ;GET TRACK SEQ #
4581  013524  000240                            NOP                     ;
4582  013526  013737  002106  015056            MOV     OTDITK,OD       ;GET OUTSIDE DIA. TRK
4583  013534  013737  002170  015060            MOV     INDITK,ID       ;GET INSIDE DIA. TRK
4584  013542  004737  014156                    CALL    STKSEQ          ;CALL MOD 1.3.2 SET TRACK SEQUENCE
4585  013546  005737  010310            IFB13:  TST     FIRST           ;IF A FIRST PASS
4586  013552  001007                            BNE     THC13           ;THEN
4587  013554  032737  000040  002164    IFC13.  BIT     #40,SWREG       ;IF CLEAR STATISTICAL TABLES
4588  013562  001406                            BEQ     END13           ;IS SELECTED THEN
4589  013564  042737  000040  002164            BIC     #40,SWREG       ;CLEAR SELECTED - CLR STAT TABLE
4590  013572  004737  015064            THC13.  CALL    CLRSTA          ;CALL MOD 1 3.3 - CLEAR STATISTICAL TABLES
4591  013576  000240                            NOP                     ;
4592  013600  000207                    END13   RTS     PC              ;RETURN
4593                                    ;MOD 1 3 ----- END MODULE ----------------------------------------
4594
4595
```

```
                                        .SBTTL  MOD 1.3.1 - SET DATA PATTERN
                                        ;---------------------------------------------------------------
                                        ;  PAT #                                    DATA PATTERN
                                        ,  -----                                    ------------
                                        ;    0                                     NO PATTERN SPECIFIED (FORCE RANDOM DATA)
                                        ;    1                                     ALL ZEROS
                                        ,    2                                     ALL ONES
                                        ,    3                                     FLOATING ZERO
                                        ,    4                                     FLOATING ONE
                                        ,    5                                     ALTERNATING BITS
                                        ,    6                                     ALTERNATING PAIRS OF BITS
                                        ,    7                                     RANDOM
                                        ,NOTE:  DATA PATTERNS WILL BE MODIFIED SO BYTE #0 WILL CONTAIN TRACK ADDRESS
                                        ,       AND  BYTE #1 THE SECTOR ADDRESS IN WHICH THE DATA IS WRITTEN.
                                        ,       THE LAST TWO BYTES CONTAIN THE CHECK SUM NUMBERS.
                                        ,,---------------------------------------------------------------
013602  042737  000377  013666  STSTPA: BIC     #377,@#BRONPT   ,CLEAR BRANCH OFFSET
013610  005037  014150          STSTPA: CLR     SUM             ,SET UP FOR ACCUMULATION OF CHECK SUM
013614  005737  014154                  TST     PAT             ,IF NO PATTERN SPECIFIED FORCE PATTERN 7
013620  001003                          BNE     1$
013622  012737  000007  014154          MOV     #7,PAT
013630  013704  014154          1$      MOV     PAT,R4          ,GET PATTERN BITS
013634  005304                          DEC     R4              ,ADJUST FOR CORRECT OFFSET
013636  006304                          ASL     R4
013640  150437  013666                  BISB    R4,@#BRONPT     ,INSERT OFFSET
013644  012704  035564                  MOV     #DATPAT+2,R4    ,SET UP ADDRESS OF FIRST BYTE
013650  013705  002270                  MOV     WDCNT,R5        ,SETUP WORD COUNT
013654  006305                          ASL     R5              ,DOUBLE  WORD COUNT FOR ADR
013656  062705  035562                  ADD     #DATPAT,R5      ,ADD DATA PATTERN ADR
013662  162705  000004                  SUB     #4,R5           ,ADJ.  FOR CHECKSUM
013666  000777          BRONPT  BR              ,BRANCH BY OFFSET SELECTED
013670  000137  013724                  JMP     DATA0           ,000 DATA BYTE
013674  000137  013742                  JMP     DATA1           ,377 DATA BYTE
013700  000137  013752                  JMP     FLOAT0          ,FLOAT A 0 THROUGH ALL 1'S
013704  000137  014020                  JMP     FLOAT1          ,FLOAT A 1 THROUGH ALL 0'S
013710  000137  014026                  JMP     PAT125          ,125/052 DATA WORD
013714  000137  014052                  JMP     PAT333          ,314/063 DATA WORD
013720  000137  014062                  JMP     RANDAT          ,RANDOM DATA BYTE
                                        ,,---------------------------------------------------------------
                                        ;LOAD SOFTWARE BUFFER WITH ALL ZEROS (P = 1)

013724  005037  014152          DATA0:  CLR     DATBYT
013730  004737  014110          PG.     JSR     PC,LOAD         ,GO LOAD THE DATA BUFFER
013734  005705                          TST     R5              ,IF R5
013736  001463                          BEQ     END131          ,NOT =0 ,THEN
013740  000773                          BR      PG
                                        ,,---------------------------------------------------------------
                                        ;LOAD SOFTWARE BUFFER WITH ALL ONES (P = 2)

013742  112737  000377  014152  DATA1   MOVB    #377,DATBYT
013750  000767                          BR      PG
```

```
4649                                    ;;-----------------------------------------------------------------
4650                                    ;FLOAT A 0 THROUGH ONES IN SOFTWARE BUFFER (P = 3)
4651
4652  013752  112737  000376  014152  FLOAT0: MOVB    #376,DATBYT     ;SET UP A ONES FIELD
4653  013760  000261                  XPG     SEC                     ;SET THE C BIT TO ROTATE THROUGH THE DATA
4654  013762  012702  000000          1$      MOV     #0,R2           ;CLR R2 (CAN'T USE "CLR" AS IT CLEARS "C" BIT)
4655  013766  103001                          BCC     2$              ;BR IF THE "C" BIT IS CLEARED
4656  013770  005202                          INC     R2              ;SET R2 IF NOT
4657  013772  004737  014110          2$      JSR     PC,LOAD         ;GO LOAD THE DATA BUFFER
4658  013776  005705                          TST     R5              ;IF R5
4659  014000  001442                          BEQ     END131          ;NOT ZERO THEN
4660  014002  000241                          CLC
4661  014004  005702                          TST     R2              ;IS R2 NONZERO
4662  014006  001401                          BEQ     3$
4663  014010  000261                          SEC                     ;YES, SET THE "C" BIT
4664  014012  106137  014152          3$      ROLB    DATBYT
4665  014016  000761                          BR      1$
4666                                    ;;-----------------------------------------------------------------
4667                                    ;FLOAT A 1 THROUGH ALL ZEROS IN SOFTWARE BUFFER (P = 4)
4668
4669  014020  005037  014152          FLOAT1: CLR     DATBYT
4670  014024  000755                          BR      XPG
4671                                    ;;-----------------------------------------------------------------
4672                                    ;ALTERNATING 1 & 0 IN ONE BYTE AND COMPLIMENT INTO THE NEXT (P = 5)
4673
4674  014026  112737  000125  014152  PAT125: MOVB    #125,DATBYT
4675  014034  004737  014110          XXPG:   JSR     PC,LOAD
4676  014040  005705                          TST     R5              ;IF R5
4677  014042  001421                          BEQ     END131          ;NOT ZERO THEN
4678  014044  105137  014152                  COMB    DATBYT
4679  014050  000771                          BR      XXPG
4680                                    ;;-----------------------------------------------------------------
4681                                    ;ALTERNATING 0 AND 1'S PAIR IN ONE BYTE & COMPLIMENT INTO NEXT (P = 6)
4682
4683  014052  112737  000333  014152  PAT333: MOVB    #333,DATBYT
4684  014060  000765                          BR      XXPG
4685                                    ;;-----------------------------------------------------------------
4686                                    ;LOAD SOFTWARE BUFFER WITH RANDOM DATA PATTERN (P = 0 OR 7)
4687
4688  014062  004737  002332          RANDAT: JSR     PC,RANGEN       ;GET RANDOM NUMBER
4689  014066  113737  002424  014152          MOVB    RANUM,DATBYT
4690  014074  004737  014110                  JSR     PC,LOAD
4691  014100  005705                          TST     R5              ;IF R5
4692  014102  001401                          BEQ     END131          ;NOT ZERO THEN
4693  014104  000766                          BR      RANDAT
4694                                    ;;-----------------------------------------------------------------
4695  014106  000207                  END131  RTS     PC              ;RETURN
4696                                    ;-----------------------------------------------------------------
4697
```

```

                                    ;------------------------------------------------------------------------
014110  063737  014152  014150  LOAD.   ADD     DATBYT,SUM      ;ACCUMULATE THE PATTERN CHECK SUM
014116  113724  014152                  MOVB    DATBYT,(R4)+    ;LOAD THE DATA BUFFER
014122  020504                          CMP     R5,R4           ;HAVE 124 BYTES BEEN GENERATED
014124  001401                          BEQ     1$              ;IF YES, RETURN
014126  000407                          BR      ENDLD           ;IF NO, RETURN TO PATTERN GENERATOR
014130  113724  014150          1$      MOVB    SUM,(R4)+       ;PUT CHECKSUM INTO TABLE
014134  005137  014150                  COM     SUM             ;COMPLIMENT CHECKSUM
014140  113714  014150                  MOVB    SUM,(R4)        ;PUT COMP CHECK SUM INTO TABLE
014144  005005                          CLR     R5              ;CLEAR TEMP #5 - FLAG DONE MODULE
014146  000207                  ENDLD   RTS     PC              ;RETURN
                                    ;--------------------------------------------------------------------
014150  000000                  SUM.    0
014152  000000                  DATBYT. 0
014154  000000                  PAT.    0
                                ;MOD 1 3 1 ----- END MODULE ---------- ---------- ---------- - ---
```

```
4717
4718                                    SBTTL  MOD 1 3 2 - SET TRACK SEQUENCE
4719                                    ;-----------------------------------------------------------------
4720                                    ;   SEQ #                  SEQUENCE
4721                                    ;   -----                  --------
4722                                    ;     0                    NO SEQUENCE SPECIFIED (DEFAULT TO SEQ 7)
4723                                    ;     1                    INCREMENT FROM OD TO ID
4724                                    ;     2                    DECREMENT FROM ID TO OD
4725                                    ;     3                    DO PREVIOUS 2 SEQUENCES
4726                                    ;     4                    BOUNCE BETWEEN ID AND OD
4727                                    ;     5                    DECREASING BOUNCE
4728                                    ;     6                    STROBE BETWEEN OD AND DECREMENTING ID
4729                                    ;     7                    RANDOM TRACK SELECTION
4730                                    ;-----------------------------------------------------------------
4731  014156  005037  015042          STKSEQ  CLR     TKTBPT          ;CLEAR TRK TBL PTR
4732  014162  005037  015050                  CLR     PRESTK          ;CLEAR PRESENT TRK
4733  014166  005037  015046                  CLR     TARGET          ;CLEAR TARGET TRK
4734  014172  112737  000177  015050          MOVB    #177,PRESTK     ,INIT PRESENT TRK TO HANDLE TRK #0
4735  014200  113737  015056  015046          MOVB    OD,TARGET       ,INIT OD AS TARGET TRACK
4736  014206  005037  015054                  CLR     XID             ,INIT WORDING ID AND OD LOCATIONS
4737  014212  113737  015060  015054          MOVB    ID,XID          ,SAVE INSIDE DIA. IN TEMP INSIDE DIA.
4738  014220  005037  015052                  CLR     XOD             ;CLEAR TEMP OUTSIDE DIA
4739  014224  113737  015056  015052          MOVB    OD,XOD          ,SAVE OUTSIDE DIA. IN TEMP OUTSIDE DIA
4740  014232  013737  015054  015044          MOV     XID,TRKCNT      ,SET UP NUMBER OF TRACK MOVEMENTS
4741  014240  163737  015052  015044          SUB     XOD,TRKCNT      ,
4742  014246  005237  015044                  INC     TRKCNT          ,INCREMENT # OF TRACKS
4743  014252  002005                          BGE     GTTK            ,IF # OF TRACKS IS NEGATIVE, THEN
4744  014254  012737  100000  002232          MOV     #100000,SYSERR  ,SET SYSTEM ERROR
4745  014262  000137  015040                  JMP     ENDTKS          ,EXIT
4746  014266  013737  002162  015062  GTTK    MOV     TRKSEQ,SEQUEN   ,GET TRACK SEQUENCE #
4747  014274  142737  000377  014332          BICB    #377,@#BRONTK   ,CLEAR OUT BRANCH OFFSET
4748  014302  005737  015062                  TST     SEQUEN          ;IF TRACK SEQUENCE
4749  014306  001003                          BNE     1$              ,EQUALS ZERO, THEN
4750  014310  012737  000007  015062          MOV     #7,SEQUEN       ,FORCE SEQ #7-RANDOM
4751  014316  013704  015062          1$      MOV     SEQUEN,R4       ,GET SEQUENCE BITS
4752  014322  005304                          DEC     R4              ,ADJUST FOR CORRECT OFFSET
4753  014324  006304                          ASL     R4              ,
4754  014326  150437  014332                  BISB    R4,@#BRONTK     ,THIS BR INST  IS MODIFIED SELECTED TRACK SEQUENCE
4755  014332  000777                  BRONTK  BR                      ,BRANCH TO SELECTED TRACK SEQUENCE
4756  014334  000137  014370                  JMP     SEQ1            ,
4757  014340  000137  014424                  JMP     SEQ2            ,
4758  014344  000137  014460                  JMP     SEQ3            ,
4759  014350  000137  014476                  JMP     SEQ4            ,BOUNCE ID TO OD
4760  014354  000137  014544                  JMP     SEQ5            ,DECREASING BOUNCE
4761  014360  000137  014626                  JMP     SEQ6            ,STROBE
4762  014364  000137  014702                  JMP     SEQ7            ,RANDOM
4763                                    ;-----------------------------------------------------------------
4764                                    ;INCREMENT FROM OD TO ID & RETURN TO OD
4765
4766  014370  123737  015054  015050  SEQ1    CMPB    XID,PRESTK      ,IF PRESENT TRACK=ID
4767  014376  001004                          BNE     1$              ,THEN
4768  014400  012737  177777  015046          MOV     #-1,TARGET      ,TERMINATE TABLE
4769  014406  000405                          BR      2$              ,END SEQ1
4770  014410  113737  015052  015046  1$      MOVB    XOD,TARGET      ,ELSE SET NEW TRACK-OUTSIDE DIA
4771  014416  005237  015052                  INC     XOD             ,INCREMENT OUTSIDE DIA
4772  014422  000565                  2$      BR      NEWTRK          ,END SEQ1
```

```
4773                                    ;-----------------------------------------------------------------
4774                                    ;DECREMENT FROM ID TO OD
4775
4776  014424  123737  015052  015050  SEQ2:   CMPB    XOD,PRESTK      ,
4777  014432  001004                          BNE     1$
4778  014434  012737  177777  015046          MOV     #-1,TARGET      ;TERMINATE TABLE
4779  014442  000405                          BR      2$              ,END SEQ2
4780  014444  013737  015054  015046  1$:     MOV     XID,TARGET      ,SET NEXT TRACK=INSIDIA
4781  014452  005337  015054                  DEC     XID             ;DECREMENT INSIDE DIA
4782  014456  000547                  2$:     BR      NEWTRK
4783                                    ;-----------------------------------------------------------------
4784                                    ;INCREMENT THEN DECREMENT TRACKS
4785
4786  014460  005701                  SEQ3:   TST     R1              ,IF MODE
4787  014462  001402                          BEQ     1$              ,NOT EQUAL TO ZERO
4788  014464  005001                          CLR     R1              ,THEN CHANGE MODE
4789  014466  000756                          BR      SEQ2            ,DO SEQ2
4790  014470  012701  000001          1$:     MOV     #1,R1           ,ELSE CHANGE MODE
4791  014474  000735                          BR      SEQ1            ,DO SEQ1
4792                                    ;-----------------------------------------------------------------
4793                                    ;BOUNCE BETWEEN ID & OD ONLY
4794
4795  014476  005701                  SEQ4:   TST     R1              ,IF MODE
4796  014500  001405                          BEQ     1$              ,NOT EQUAL TO ZERO
4797  014502  113737  015052  015046          MOVB    XOD,TARGET      ,THEN SET NEXT TRACK=OUTSIDE DIA
4798  014510  005001                          CLR     R1              ,CHANGE MODE
4799  014512  000405                          BR      2$              ,BR
4800  014514  113737  015054  015046  1$:     MOVB    XID,TARGET      ,ELSE SET NEXT TRACK=INSIDE DIA
4801  014522  012701  000001                  MOV     #1,R1           ,TERMINATE TABLE
4802  014526  005337  015044          2$:     DEC     TRKCNT          ,
4803  014532  001003                          BNE     3$              ,
4804  014534  012737  177777  015046          MOV     #-1,TARGET      ,TERMINATE TABLE
4805  014542  000515                  3$:     BR      NEWTRK          ,
4806                                    ;-----------------------------------------------------------------
4807                                    ;BOUNCE BETWEEN DECREASING ID AND INCREASING OD
4808
4809  014544  123737  015054  015052  SEQ5:   CMPB    XID,XOD         ,IF INSIDE & OUTSIDE DIA
4810  014552  001421                          BEQ     2$              ,NOT EQUAL
4811  014554  005701                          TST     R1              ,THEN, IF MODE
4812  014556  001407                          BEQ     1$              ,
4813  014560  005001                          CLR     R1              ,CHANGE MODE
4814  014562  013737  015052  015046          MOV     XOD,TARGET      ,SET NEXT TRACK=OUTSIDE DIA
4815  014570  005237  015052                  INC     XOD             ,INCREMENT OUTSIDE DIA
4816  014574  000413                          BR      3$              ,END SEQ5
4817  014576  012701  000001          1$      MOV     #1,R1           ,CHANGE MODE
4818  014602  013737  015054  015046          MOV     XID,TARGET      ,SET NEXT TRACK=INSIDE DIA
4819  014610  005337  015054                  DEC     XID             ,DECREMENT INSIDE DIA
4820  014614  000403                          BR      3$              ,END SET5
4821  014616  012737  177777  015046  2$      MOV     #-1,TARGET      ,TERMINATE TABLE
4822  014624  000464                  3$      BR      NEWTRK          ,
```

```
4824                                    ;-----------------------------------------------------------------
4825                                    ;STROBE BETWEEN OD AND DECREASING ID
4826
4827  014626  123737  015054  015052  SEQ6:   CMPB    XID,XOD
4828  014634  001416                          BEQ     1$
4829  014636  123737  015050  015052          CMPB    PRESTK,XOD      ,IF O.D.  JUST DONE
4830  014644  001006                          BNE     3$              ,THEN
4831  014646  113737  015054  015046          MOVB    XID,TARGET      ;SET TO DO I D.
4832  014654  005337  015054                  DEC     XID             ,DECREMENT I.D  FOR NEXT
4833  014660  000407                          BR      2$              ,
4834  014662  113737  015052  015046  3$:     MOVB    XOD,TARGET      ,ELSE SET TO DO O D
4835  014670  000403                          BR      2$
4836  014672  012737  177777  015046  1$:     MOV     #-1,TARGET
4837  014700  000436                  2$:     BR      NEWTRK
4838                                    ;-----------------------------------------------------------------
4839                                    ;RANDOM SEQUENCING OF TRACKS - THE OD/ID LIMITS SHOULD BE SET > THAN HALF THE TRACKS.
4840
4841  014702  000240                  SEQ7:   NOP
4842  014704  004737  002332                  JSR     PC,RANGEN       ,GET A RANDOM NUMBER
4843  014710  042737  177600  002424          BIC     #177600,RANUM   ,CLEAR ALL BUT LOW 7 BITS
4844  014716  123737  002424  015054  IDCOMP: CMPB    RANUM,XID       ,IF RANUM LARGER THAN ID ADDRESS
4845  014724  003401                          BLE     ODCOMP          ;THEN
4846  014726  000765                          BR      SEQ7            ;BR TO GET ANOTHER RANDOM NUMBER
4847  014730  123737  002424  015052  ODCOMP: CMPB    RANUM,XOD       ,IF RANUM SMALLER THAN OD ADDRESS
4848  014736  002001                          BGE     PRESCK          ,THEN
4849  014740  000760                          BR      SEQ7            ,BR TO GET ANOTHER RANDOM NUMBER
4850  014742  123737  002424  015050  PRESCK: CMPB    RANUM,PRESTK    ,IF RANUM EQUALS PRESENT TRACK
4851  014750  001754                          BEQ     SEQ7            ,GET ANOTHER RANDOM NUMBER
4852  014752  013737  002424  015046          MOV     RANUM,TARGET    ,RANUM OK PUT IT IN TARGET TRACK
4853  014760  005337  015044                  DEC     TRKCNT
4854  014764  001003                          BNE     1$
4855  014766  012737  177777  015046          MOV     #-1,TARGET      ,TERMINATE TABLE
4856  014774  000400                  1$:     BR      NEWTRK
4857                                    ;-----------------------------------------------------------------
4858  014776  012702  035327          NEWTRK: MOV     #TRKTBL-1,R2
4859  015002  005237  015042                  INC     TKTBPT
4860  015006  063702  015042                  ADD     TKTBPT,R2
4861  015012  113712  015046                  MOVB    TARGET,(R2)
4862  015016  005737  015046                  TST     TARGET
4863  015022  100406                          BMI     ENDTKS
4864  015024  000240                          NOP
4865  015026  113737  015046  015050          MOVB    TARGET,PRESTK
4866  015034  000137  014332                  JMP     BRONTK
4867  015040  000207                  ENDTKS. RTS     PC
4868                                    ;-----------------------------------------------------------------
4869  015042  000000                  TKTBPT: 0                       ,TRACK TABLE POINTER
4870  015044  000000                  TRKCNT: 0
4871  015046  000000                  TARGET: 0
4872  015050  000000                  PRESTK  0
4873  015052  000000                  XOD     0
4874  015054  000000                  XID     0
4875  015056  000000                  OD      0
4876  015060  000000                  ID      0
4877  015062  000000                  SEQUEN  0
4878                                    ;MOD 1 3.2 ----- END MODULE ----------------------------------------
4879
```

```
4881
4882                                    SBTTL  MOD 1 3 3 - CLEAR STATISTICAL TABLES
4883                                    ;-------------------------------------------------------------------
4884
4885  015064  000240                    CLRSTA  NOP                             ;
4886  015066  012701  004442                    MOV     #CKSML,R1               ;SET UP BEGINNING ADDRESS
4887  015072  012702  006326                    MOV     #ENDST,R2               ;SET UP TABLE LENGTH
4888  015076  005021                    BDA133  CLR     (R1)+                   ;CLEAR ADDRESSED LOCATION
4889  015100  020102                            CMP     R1,R2                   ;
4890  015102  001375                            BNE     BDA133                  ;DO UNTIL LAST ADDRESS DONE
4891  015104  000240                            NOP                             ;
4892  015106  000207                    END133  RTS     PC                      ;RETURN
4893                                    ;MOD 1 3 3 ----- END MODULE ---------------------------------------
4894
```

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                                          .SBTTL  MOD 2 0 - SCHEDULE SYSTEM EXERCISE
                                          ;-------------------------------------------------------------

015110  000240                            SCSYEX  NOP                         ;
015112  005737  010242                    IFK20   TST     INITL               ;IF INITIALIZE
015116  001417                                    BEQ     ELK20               ;THEN
015120  012737  000001  020454                    MOV     #1,INITTK           ;SET INITIALIZE TRK FLG
015126  005037  015646                            CLR     EXHCP               ;CLEAR EX HALF COMPL
015132  005037  015650                            CLR     BTHDRV              ;CLEAR BOTH DRV DONE FLG
015136  005037  015652                            CLR     BDVSCD              ;CLEAR BOTH DRV SEC DONE FLG
015142  005037  015660                            CLR     DVDNCK              ;CLEAR DRV DONE CK FLG
015146  005037  015662                            CLR     DRVDN               ;CLEAR DRV DONE
015152  005037  015670                            CLR     ERTSAV              ;CLEAR ERR TYP SAVE
015156  005037  015664                    ELK20   CLR     SFERR               ;CLEAR SFT ERR
015162  032737  015644  002212            IFA20   BIT     SUTPTR,SUT          ;IF SYSTEM UNDER TEST BIT
015170  001406                                    BEQ     ELA20               ;IS SET
015172  004737  002532                            CALL    CVSTUT              ;CALL MOD U.A.2 - CONVERT SUTPTR-->UUT
015176  013737  002600  002214                    MOV     UNITST,UUT          ;SET UNIT UNDER TEST
015204  000410                                    BR      BDB20               ;BR TO BEGIN 'B'
015206  006337  015644                    ELA20   ASL     SUTPTR              ;SHIFT SUT POINTER TO TEST
015212  022737  000020  015644            DUC20   CMP     #20,SUTPTR          ;DO UNTIL SUT POINTER
015220  003360                                    BGT     IFA20               ;EQUALS 10000 BIN
015222  000137  015622                            JMP     EDC20               ;BR TO END DO 'C'
015226                                    BDB20   BGNSEG                      ;BEGIN SEGMENT FOR ERROR LOOPS
015230  013737  002156  015642                    MOV     TSTN,EXN            ;GET TEST # = EXERCISE #
015236  004737  015672                            CALL    GETTST              ;CALL MOD 2.1 - GET A TEST
015242  013737  016364  015640                    MOV     TSTWD,TST           ;SAVE TEST WORD
015250  032737  000400  015640            IFB20   BIT     #400,TST            ;IF NEXT UNIT BIT
015256  001514                                    BEQ     ELB20               ;IS SET THEN
015260  004737  026534                            CALL    STDVDN              ;CALL MOD 2 6 -SET DRIVES DONE
015264  032737  004000  015640            IFC20   BIT     #4000,TST           ;IF ADV TRK BIT
015272  001001                                    BNE     IFI20               ;IS NOT SET THEN
015274  000411                                    BR      EIC20               ;BR TO END IF 'C'
015276  023727  015650  000003            IFI20   CMP     BTHDRV,#3           ;IF BOTH DRIVES DONE
015304  001066                                    BNE     IFL20               ;THEN
015306  013737  015650  015662                    MOV     BTHDRV,DRVDN        ;SET BOTH DRVS DONE TEST
015314  005037  015650                            CLR     BTHDRV              ;CLEAR BOTH DRIVES DONE FLAG & THEN
015320  013737  002214  015666            EIC20:  MOV     UUT,RESTK           ;SET UUT TO RESET TRK
015326  052737  002000  015666                    BIS     #2000,RESTK         ;SET INC TRK ONTO RESET TRK
015334  032737  001000  015640            IFF20:  BIT     #1000,TST           ;IF DEL DATA CK BIT
015342  001001                                    BNE     ELF20               ;IS SET THEN
015344  000410                                    BR      EIF20               ;BR TO IF 'F'
015346  012737  002000  015656            ELF20   MOV     #2000,ADVTRK        ;SET ADV TRK = INCR TRK
015354  005737  015646                    IFG20   TST     EXHCP               ;IF EXERCISE 1/2 COMPLETE
015360  001420                                    BEQ     IFH20               ;IS SET, THEN
015362  005037  015646                            CLR     EXHCP               ;CLEAR EX HALF COMPLETE
015366  053737  015662  002210            EIF20   BIS     DRVDN,SDD           ;SET THIS DRV DONE
015374  006337  015644                            ASL     SUTPTR              ;SETUP PTR TO CK NXT UNIT
015400  013737  002214  015666                    MOV     UUT,RESTK           ;GET UUT
015406  052737  002000  015666                    BIS     #2000,RESTK         ;SET INCTRK ON RESET TRK FLAG
015414  005037  015650                            CLR     BTHDRV              ;CLEAR BOTH DRV DN FLAG
015420  000506                                    BR      END20               ;BR TO END
015422  005737  002224                    IFH20   TST     DELDAT              ;IF DEL DATA MODE
015426  001403                                    BEQ     ELH20               ;IS SET
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4952  015430  005037  002224                  CLR     DELDAT          ,CLEAR DEL DATA MODE
4953  015434  000403                          BR      EIH20           ,BR TO END IF 'H'
4954  015436  012737  000010  002224  ELH20   MOV     #10,DELDAT      ;SET DEC DATA MODE
4955  015444  005037  015662          EIH20   CLR     DRVDN           ,CLEAR DRV DONE
4956  015450  012737  000001  015646          MOV     #1,EXHCP        ;SET EX 1/2 COMPLETE
4957  015456  000444                          BR      EIB20           ,BR TO END IF 'B'
4958  015460  032737  000003  015652  IFL20   BIT     #3,BDVSCD       ;IF BOTH DRV SEC DONE
4959  015466  001405                          BEQ     ELL20           ;THEN
4960  015470  005037  015652                  CLR     BDVSCD          ;CLEAR DRV SEC DONE FLAGS
4961  015474  012737  004000  015656          MOV     #4000,ADVTRK    ;ALLOW TRACK ADVANCE
4962  015502  004737  016526          ELL20.  CALL    GTDRV           ;CALL MOD 2.2 - GET A DRIVE
4963  015506  000430                          BR      EIB20           ;BR TO END IF 'B'
4964  015510  063737  015656  015654  ELB20   BIS     ADVTRK,INCTRK   ;SET ADV TRK  (IF SET BY PREV OP)
4965  015516  013737  015640  017520          MOV     TST,DRVTST      ;PASS DRIVE TEST
4966  015524  004737  016714                  CALL    XDVTST          ,CALL MOD 2.3  - EXECUTE DRIVE TEST
4967  015530  000240                          NOP                     ,
4968  015532  013737  017520  021634          MOV     DRVTST,TSTEV    ,PASS DRIVE TEST FOR EVAL
4969  015540  004737  021554                  CALL    EVTSTR          ,CALL MOD 2.4 - EVAL  TEST RESULTS
4970  015544  013701  015640                  MOV     TST,R1          ,GET DRV TST
4971  015550  042701  171777                  BIC     #171777,R1      ,SAVE TRK BITS
4972  015554  010137  015654                  MOV     R1,INCTRK       ,SET TRK BITS
4973  015560  005037  015656                  CLR     ADVTRK          ,CLEAR ADV TRK FLAG
4974  015564  005037  010242                  CLR     INITL           ,CLEAR INITIALIZE FLAG
4975  015570  000240          EIB20   NOP                     ,
4976  015572  005737  002234          IFM20.  TST     ERRTYP          ,IF ERR TYPE
4977  015576  001402                          BEQ     EIM20           ,NOT=0
4978  015600  004737  025106                  CALL    OTERTP          ,CALL MOD 2.5 - O/P ERR TYPE
4979  015604  000240          EIM20.  NOP
4980  015606  005737  002232          DUB20   TST     SYSERR          ,DO UNLESS SYSTEM ERROR
4981  015612  001011                          BNE     END20           ,NOT=0 THEN
4982  015614                                  ENDSEG                  ,END SEGMENT FOR ERROR LOOPS
4983  015616  000137  015226                  JMP     BDB20           ,BR TO END MOD
4984  015622  012737  000001  015644  EDC20   MOV     #1,SUTPTR       ,SET SYS UNDER TEST PTR
4985  015630  052737  000001  015664          BIS     #1,SFERR        ,SET SFT ERR
4986  015636  000207          END20.  RTS     PC              ,END MODULE
4987                                  ;-------------------------------------------------------------
4988  015640  000000          TST.    0                       ,TEST FOR EXECUTION
4989  015642  000000          EXN:    0                       ,EXERCISE #
4990  015644  000001          SUTPTR: 1                       ,SYSTEM UNDER TEST POINTER
4991  015646  000000          EXHCP:  0                       ,EXERCISE HALF COMPLETE (EX#7) DEL DATA PASS
4992  015650  000000          BTHDRV: 0                       ,BOTH DRIVES DONE FLAG
4993  015652  000000          BDVSCD: 0                       ,BOTH DRIVE SECTORS DONE FLAG
4994  015654  000000          INCTRK: 0                       ,INCREMENT TRACK FLAGS
4995  015656  000000          ADVTRK: 0                       ,ADVANCE TRACK FLAG
4996  015660  000000          DVDNCK: 0                       ,DRV DONE CK FLAG
4997  015662  000000          DRVDN:  0                       ,DRIVE DONE
4998  015664  000000          SFERR:  0                       ,SOFTWARE ERR
4999  015666  000000          RESTK:  0                       ,RESET TRK FLAG
5000  015670  000000          ERTSAV. 0                       ,ERR TYP SAVE REG
5001                                  ;MOD 2.0 ----- END MODULE ---------------------------------------
5002
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5005                                    SBTTL  MOD 2.1 - GET A TEST
5006                                    ;-------------------------------------------------------------------
5007
5008  015672  000240                    GETTST: NOP                     ;
5009  015674  013701  015642                    MOV     EXN,R1          ;GET EXERCISE NUMBER
5010  015700  006301                            ASL     R1              ;DOUBLE EXERCISE NUMBER
5011  015702  012702  016372                    MOV     #EXADTB,R2      ;GET EXERCISE ADDRESS TABLE
5012  015706  060102                            ADD     R1,R2           ;CAL EXERCISE TO BE USED
5013  015710  011237  016362                    MOV     (R2),EXADR      ;GET BEGIN ADR EXERCISE
5014  015714  005737  010242          IFL21:  TST     INITL           ;IF INITIALIZE
5015  015720  001405                            BEQ     IFA21           ;IS SET, THEN
5016  015722  005037  016360                    CLR     TSTPTR          ;CLEAR TST PTR
5017  015726                          IFF21:  INLOOP                  ;IF IN LOOP
5018  015730                                  BNCOMPLETE IFA21        ;SET, THEN
5019  015732  000576                            BR      EIF21           ;BR TO END IF 'F'
5020  015734  005737  002242          IFA21:  TST     RETRY           ;IF RETRY
5021  015740  001404                            BEQ     IFB21           ;NOT=0, AND
5022  015742  032737  000004  002164            BIT     #BIT02,SWREG    ;IF RETRY ON ERROR
5023  015750  001103                            BNE     IFH21           ;IS NOT SET, THEN
5024  015752  005737  016360          IFB21:  TST     TSTPTR          ;IF TST PTR
5025  015756  001006                            BNE     IFC21           ;EQUALS ZERO
5026  015760  012737  000002  016360            MOV     #2,TSTPTR       ;ADV. TST PTR 1 CMD
5027  015766  005037  016366                    CLR     TBPRCT          ;CLEAR TABLE PAIR COUNT
5028  015772  000556                            BR      EIF21           ;BR TO END IF 'F'
5029  015774  005737  002300          IFC21:  TST     SECDN           ;IF SECTOR DONE IS
5030  016000  001450                            BEQ     IFG21           ;SET THEN
5031  016002  005737  016366          IFK21:  TST     TBPRCT          ;IF TABLE PAIR CNT=1,
5032  016006  001445                            BEQ     IFG21           ;THEN
5033  016010  062737  000002  016360            ADD     #2,TSTPTR       ;ADVANCE ONE TEST CMD
5034  016016  005037  016366                    CLR     TBPRCT          ;CLEAR TABLE PAIR  COUNT
5035  016022  005037  015660                    CLR     DVDNCK          ;CLEAR DRV DONE CK FLAG
5036  016026  032737  040000  016364  IFD21:  BIT     #40000,TSTWD    ;IF DONE CK
5037  016034  001411                            BEQ     ELD21           ;IS SET, THEN
5038  016036  005737  002276                    TST     TRKDN           ;IF TRACK DONE IS
5039  016042  001406                            BEQ     ELD21           ;SET, THEN
5040  016044  005037  002276                    CLR     TRKDN           ;CLEAR TRK DONE
5041  016050  012737  000001  015660            MOV     #1,DVDNCK       ;SET DRV DONE CK
5042  016056  000524                            BR      EIF21           ;BR TO END IF 'F'
5043  016060  000240                  ELD21:  NOP                     ;
5044  016062  032737  006000  016364  IFM21:  BIT     #6000,TSTWD     ;IF ADV OR INCR TRK
5045  016070  001417                            BEQ     EIF21           ;IS SET, THEN
5046  016072  032737  100000  016364  IFN21:  BIT     #100000,TSTWD   ;IF '4 CMD SEQ'
5047  016100  001404                            BEQ     ELN21           ;IS SET, THEN
5048  016102  162737  000010  016360            SUB     #10,TSTPTR      ;BACK UP 4 CMDS
5049  016110  000507                            BR      EIF21           ;BR TO END IF 'F'
5050  016112  162737  000004  016360  ELN21:  SUB     #4,TSTPTR       ;BACK UP TWO TEST CMDS
5051  016120  000503                            BR      EIF21           ;BR TO END IF 'F'
5052  016122  005737  016366          IFG21:  TST     TBPRCT          ;IF TABLE PAIR COUNT
5053  016126  001406                            BEQ     ELG21           ;EQUALS 1 THEN
5054  016130  005037  016366                    CLR     TBPRCT          ;CLEAR TABLE PAIR COUNT
5055  016134  162737  000002  016360            SUB     #2,TSTPTR       ;BACK UP ONE CMD
5056  016142  000472                            BR      EIF21           ;BR END IF 'F'
5057  016144  005237  016366          ELG21:  INC     TBPRCT          ;INCREMENT TABLE PAIR COUNT
5058  016150  062737  000002  016360            ADD     #2,TSTPTR       ;ADVANCE ONE CMD
5059  016156  000464                            BR      EIF21           ;BR END IF 'F'
5060  016160  032737  000010  002242  IFH21:  BIT     #10,RETRY       ;IF NO DATA RETRY IS
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5061  016166  001005                        BNE     IF121           ,SET, OR
5062  016170  032737  000020  002242        BIT     #20,RETRY       ,IF NO CRC RETRY IS
5063  016176  001001                        BNE     IF121           ;SET, THEN
5064  016200  000453                        BR      EIF21           ;BR END IF 'F'
5065  016202  032737  000002  002242  IF121 BIT     #2,RETRY        ;IF WRITE RETRY IS
5066  016210  001412                        BEQ     IFJ21           ,SET, THEN
5067  016212  162737  000006  016360        SUB     #6,TSTPTR       ;BACK UP 3 CMDS
5068  016220  042737  000002  002242        BIC     #2,RETRY        ;CLEAR WRITE RETRY
5069  016226  012737  000003  016370        MOV     #3,TSAVCT       ;SET TEST ADV COUNT=3
5070  016234  000433                        BR      EI121           ,BR TO END IF 'I'
5071  016236  032737  000004  002242  IFJ21: BIT     #4,RETRY        ;IF READ RETRY IS
5072  016244  001412                        BEQ     ELJ21           ;SET THEN
5073  016246  162737  000002  016360        SUB     #2,TSTPTR       ;BACK UP 1 CMD
5074  016254  042737  000004  002242        BIC     #4,RETRY        ;CLEAR READ RETRY
5075  016262  012737  000001  016370        MOV     #1,TSAVCT       ;SET TEST ADV COUNT=1
5076  016270  000415                        BR      EI121           ;BR TO END IF 'I'
5077  016272  005337  016370        ELJ21:  DEC     TSAVCT          ;DECREMENT TEST ADV COUNT
5078  016276  062737  000002  016360        ADD     #2,TSTPTR       ;ADV TEST POINTER 1 CMD
5079  016304  005737  016370        IF021:  TST     TSAVCT          ,IF TEST ADV COUNTER
5080  016310  001007                        BNE     EIF21           ,EQUALS ZERO, THEN
5081  016312  005037  002242                CLR     RETRY           ;CLEAR RETRY
5082  016316  005237  016366                INC     TBPRCT          ;SET TABLE PAIR COUNT
5083  016322  000402                        BR      EIF21           ;BR T  END IF 'F'
5084  016324  006037  016366        EI121:  CLR     TBPRCT          ;CLEAR TABLE PAIR CNT
5085  016330  013703  016360        EIF21:  MOV     TSTPTR,R3       ,GET TEST POINTER
5086  016334  063703  016362                ADD     EXADR,R3        ,CAL  CUR  TEST OF THIS EXERCISE
5087  016340  011337  016364                MOV     (R3),TSTWD      ,PASS UP TEST WORD
5088  016344  105713                IFE21:  TSTB    (R3)            ,IF CMD LOWER BYTE
5089  016346  002002                        BGE     EIE21           ,EQUALS -1, THEN
5090  016350  005037  016360                CLR     TSTPTR          ,RESET TEST PTR
5091  016354  000240                EIE21:  NOP                     ,
5092  016356  000207                        RTS     PC              ,RETURN
5093                                ;-----------------------------------------------------------------
5094  016360  000000                TSTPTR: .WORD   0               ,TEST POINTER
5095  016362  000000                EXADR:  .WORD   0               ,CURRENT EXERCISE TABLE BASE ADDRESS
5096  016364  000000                TSTWD:  .WORD   0               ,TEST WORD TO PASS UP
5097  016366  000000                TBPRCT: .WORL   0               ,TABLE PAIR COUNT
5098  016370  000000                TSAVCT. .WORD   0               ,TEST ADVANCE COUNTER
5099
5100  016372  016506                EXADTB  .WORD   EX7             ,EXERCISE ADDRESS TABLE
5101  016374  016412                        .WORD   EX1
5102  016376  016422                         WORD   EX2
5103  016400  016436                        .WORD   EX3
5104  016402  016452                        .WORD   EX4
5105  016404  016462                        .WORD   EX5
5106  016406  016472                        .WORD   EX6
5107  016410  016506                         WORD   EX7
5108                                ,-----------------------------------------------------------------
5109
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                                ;--------------------------------------------------------------------
016412  177777                  EX1     .WORD   -1
016414  000000                          .WORD   0               ;-,                     / FILL BUFFER
016416  044002                          .WORD   44002           ;DCK,ADVTRK             / WRITE SECTOR
016420  000777                          .WORD   777             ;NXTUNT,                / -1
016422  177777                  EX2     .WORD   -1
016424  000000                          .WORD   0               ;-,                     / FILL BUFFER
016426  000002                          .WORD   2               ;-,                     / WRITE SECTOR
016430  000003                          .WORD   3               ;-,                     / READ SECTOR
016432  154001                          .WORD   154001          ;4CMD,DCK,ADVTRK,RAW,   / EMPTY BUFFER
016434  000777                          .WORD   777             ;NXTUNT,                / -1
016436  177777                  EX3     .WORD   -1
016440  000000                          .WORD   0               ;-,                     / FILL BUFFER
016442  000002                          .WORD   2               ;-,                     / WRITE SECTOR
016444  000003                          .WORD   3               ;-,                     / READ SECTOR
016446  174001                          .WORD   174001          ;4CMD,DCK,ADVTK,DACK,RAW/ EMPTY BUFFER
016450  000777                          .WORD   777             ;NXTUNT,                / -1
016452  177777                  EX4     .WORD   -1
016454  000003                          .WORD   3               ;-,                     / READ SECTOR
016456  064001                          .WORD   64001           ;DCK,ADVTRK,DATACK,     / EMPTY BUFFER
016460  000777                          .WORD   777             ;NXTUNT,                / -1
016462  177777                  EX5     .WORD   -1
016464  000003                          .WORD   3               ;-,                     / READ SECTOR
016466  044001                          .WORD   44001           ;DCK,ADVTRK,            / EMPTY BUFFER
016470  000777                          .WORD   777             ;NXTUNT,                / -1
016472  177777                  EX6     .WORD   -1
016474  000000                          .WORD   0               ;-,                     / FILL BUFFER
016476  000002                          .WORD   2               ;-,                     / WRITE SECTOR
016500  000003                          .WORD   3               ;-,                     / READ SECTOR
016502  170001                          .WORD   170001          ;4CMD,DCK,DATACK, RAW,  / EMPTY BUFFER
016504  004777                          .WORD   4777            ;ADVTRK, NXTUNT,        / -1
016506  177777                  EX7     .WORD   -1
016510  000000                          .WORD   0               ;-,                     / FILL BUFFER
016512  000002                          .WORD   2               ;-,                     / WRITE SECTOR
016514  000003                          .WORD   3               ;-,                     / READ SECTOR
016516  172001                          .WORD   172001          ;4CMD,DCK,DACK,RAW,INCTK/ EMPTY BUFFER
016520  000003                          .WORD   3               ;-,                     / READ SECTOR
016522  064001                          .WORD   64001           ;DCK,DATACK,ADVTRK,     / EMPTY BUFFER
016524  001777                          .WORD   1777            ;DDCHK, NXTUNT,         / -1
                                ;----------------------------------------------------------------------
                                ;       BIT#            NUMONIC         FUNCTION
                                ;       ----            -------         --------
                                ;
                                ;        15             4CMD            4 COMMAND SEQUENCE
                                ;        14             DCK             DONE CHECK
                                ;        13             DATACK          DO DATA CHECK
                                ;        12             RAW             READ AFTER WRITE FLAG
                                ;        11             ADVTRK          ADVANCE TRACK MODE
                                ;        10             INCTK           INCREMENT TRACK MODE
                                ;        09             DDCHK           DEL  DATA CHECK
                                ;        08             NXTUNT          GET NEXT UNIT, IF DONE LAST UNIT

                                ;MOD 2.1 ----- END MODULE ---------------------------------------------
```

```
5166
5167
5168                                    SBTTL  MOD 2.2 - GET A DRIVE
5169                                    ;---------------------------------------------------------------
5170
5171  016526  000240                    GTDRV:  NOP                     ;
5172  016530  032737  000001  002214    IFA22:  BIT     #1,UUT          ;IF UUT=DRIVE 0
5173  016536  001024                            BNE     IFD22           ;THEN
5174  016540  032737  000002  002214    IFB22:  BIT     #2,UUT          ;IF UNIT/SIDE UNDER TEST (UUT)
5175  016546  001404                            BEQ     ELB22           ;EQUALS 1
5176  016550  012737  000010  016712            MOV     #10,TSTSUT      ;SET TEST OF SYS. UNDER TEST UNIT/SIDE=1
5177  016556  000403                            BR      IFC22           ;BR TO IF 'C'
5178  016560  012737  000002  016712    ELB22   MOV     #2,TSTSUT       ;SET TEST OF SYS. UNDER TEST UNIT/SIDE=0
5179  016566  033737  016712  002212    IFC22:  BIT     TSTSUT,SUT      ;IF DRIVE 1 SELECTED FOR TEST
5180  016574  001404                            BEQ     ELC22           ;THEN
5181  016576  052737  000001  002214            BIS     #1,UUT          ;SET UNIT UNDER TEST TO DRV #1
5182  016604  000430                            BR      EIE22           ;BR TO END IF 'E'
5183  016606  000417                    ELC22   BR      THE22           ;BR TO THEN 'E'
5184  016610  032737  000002  002214    IFD22:  BIT     #2,UUT          ;IF UNIT/SIDE UNDER TEST (UUT)
5185  016616  001404                            BEQ     ELD22           ;EQUALS 1
5186  016620  012737  000004  016712            MOV     #4,TSTSUT       ;SET TEST OF SYS  UNDER TEST UNIT/SIDE 1
5187  016626  000403                            BR      IFE22           ;BR TO IF 'E'
5188  016630  012737  000001  016712    ELD22   MOV     #1,TSTSUT       ;SET TEST OF SYS  UNDER TEST UNIT/SIDE 0
5189  016636  033737  016712  002212    IFE22:  BIT     TSTSUT,SUT      ;IF DRIVE 0 SELECTED FOR TEST
5190  016644  001404                            BEQ     ELE22           ;THEN
5191  016646  042737  000001  002214    THE22   BIC     #1,UUT          ;SET UNIT UNDER TEST TO DRV#0
5192  016654  000404                            BR      EIE22           ;BR TO END IF 'E'
5193  016656  052737  000001  002214    ELE22   BIS     #1,UUT          ;SET UNIT UNDER TEST TO DRV#1
5194  016664  000240                            NOP                     ;
5195  016666  013704  002214            EIE22   MOV     UUT,R4          ;GET UNIT UNDER TEST
5196  016672  006304                            ASL     R4              ;DOUBLE IT
5197  016674  010437  002220                    MOV     R4,UUTOFF       ;SET UUT OFFSET
5198  016700  062704  007356                    ADD     #UTOO,R4        ;GET UUT UNIT # FOR PRINT
5199  016704  011437  006620                    MOV     (R4),UNIT       ;SET UNIT=PRINT UNIT #
5200  016710  000207                    END22   RTS     PC              ;RETURN
5201                                    ;---------------------------------------------------------------
5202  016712  000000                    TSTSUT: 0
5203                                    ;MOD 2.2 ----- END MODULE ----------------------------------------
5204
```

```
5206
5207
5208                                    .SBTTL  MOD 2.3 - EXECUTE DRIVE TEST
5209                                    ;-----------------------------------------------------------------
5210
5211  016714  013737  002270  017522  XDVTST  MOV     WDCNT,WDCT      ,SET DRIVE WORD CNT
5212  016722  013702  002220                  MOV     UUTOFF,R2       ;GET UUT OFFSET
5213  016726  005737  002152          IFA23   TST     RXXX            ;IF DEVICE IS AN
5214  016732  001010                  BNE     1$              ;RX02 THEN
5215  016734  032737  000002  002214          BIT     #2,UUT          ;IF UNIT UNDER TEST IS
5216  016742  001404                  BEQ     1$              ;#1 THEN
5217  016744  013737  002230  002216          MOV     U1ADR,UUTADR    ,GET UNIT #1 UNIBUS ADR
5218  016752  000403                  BR      E1A23           ,BR TO END IF 'A'
5219  016754  013737  002226  002216  1$      MOV     U0ADR,UUTADR    ,GET UNIT #0 UNIBUS ADR
5220  016762  000240                  E1A23   NOP                     ,
5221  016764  005737  015666          IF123   TST     RESTK           ,IF RESET TRK
5222  016770  001413                  BEQ     IFB23           ,IF SET, THEN
5223  016772  113705  015666                  MOVB    RESTK,R5        ,GET UUT OFFSET
5224  016776  006305                  ASL     R5              ,DOUBLE OFFSET
5225  017000  062705  017502                  ADD     #CTRK,R5        ;ADD TRK TABLE ADR
5226  017004  013715  002166                  MOV     OTDITK,(R5)     ,RESET TO MIN TRK
5227  017010  005037  002300                  CLR     SECDN           ,CLEAR SEC DONE FLAG
5228  017014  005037  015666                  CLR     RESTK           ,CLEAR RESET TRK FLAG
5229  017020  005737  010242          IFB23   TST     INITL           ,IF INITIALIZE IS
5230  017024  001415                  BEQ     E1B23           ,SET, THEN
5231  017026  012705  017472                  MOV     #CSEC,R5        ,GET START OF CUR TRK &SEC TBL
5232  017032  012704  000004                  MOV     #4,R4           ,SET TBL LENGTH
5233  017036  005025                  1$      CLR     (R5)+           ,CLEAR TABLES
5234  017040  005304                  DEC     R4              ,DECR TBL LENTGH
5235  017042  001375                  BNE     1$              ,DO UNTIL LENGHT=0
5236  017044  012704  000004                  MOV     #4,R4           ,SET TBL LENGTH
5237  017050  013725  002166          2$      MOV     OTDITK,(R5)+    ,SET STARTING TRACKS
5238  017054  005304                  DEC     R4              ,DECREMENT TBL LENGTH
5239  017056  001374                  BNE     2$              ;DO UNTIL LENGTH=0
5240  017060  012701  017502          E1B23   MOV     #CTRK,R1        ;GET BEGIN ADR DRIVE CURRENT TRK
5241  017064  060201                  ADD     R2,R1           ;CAL. DRIVE CUR. TRK  LOCATOR
5242  017066  010137  017514                  MOV     R1,CNTKLC       ,SAVE DRV. CUR  TRK
5243  017072  017737  000416  020442          MOV     @CNTKLC,CURTRK  ,GET DRIVE CUR. TRK.
5244  017100  012701  017472                  MOV     #CSEC,R1        ,GET BEGIN ADR DRIVE CUR  SEC
5245  017104  060201                  ADD     R2,R1           ;CAL. DRIVE CUR  SEC  LOCATOR
5246  017106  010137  017512                  MOV     R1,CNSCLC       ,SAVE DRV CUR SEC LOC
5247  017112  017737  000374  020106          MOV     @CNSCLC,CURSEC  ;GET DRIVE CUR SEC
5248  017120                          IFJ23:  INLOOP                  ,IF IN LOOP
5249  017122                          BNCOMPLETE IFC23                ;THEN
5250  017124  000526                  BR      E1J23           ,BR TO END IF 'I'
5251  017126  005737  002242          IFC23.  TST     RETRY           ,IF RETRY IS
5252  017132  001443                  BEQ     IFG23           ,NOT=0, AND
5253  017134  032737  000004  002164          BIT     #BIT02,SWREG    ,IF RETRY ON ERR
5254  017142  001437                  BEQ     IFG23           ,IS SET, THEN
5255  017144  032737  000001  002242  IFD23.  BIT     #1,RETRY        ,IF SEEK RETRY
5256  017152  001001                  BNE     1$              ,IS = 0
5257  017154  000404                  BR      2$              ,THEN BR TO 2$
5258  017156  032737  000010  002164  1$      BIT     #BIT03,SWREG    ,ELSE IF RECAL SWITCH
5259  017164  001003                  BNE     THD23           ,IS NOT SET
5260  017166  005037  017516          2$      CLR     SEEK            ,THEN CLEAR SEEK FUNCTION FLAG
5261  017172  000420                  BR      E1D23           ,BR TO END IF 'D'
```

```
5262  017174  012737  040000  020610  THD23:  MOV     #40000,DVTST    ;PASS PROGRAM INITIALIZE TO DRIVE TEST
5263  017202  004737  020456                  CALL    GTDVFN          ;CALL MOD 2.3.3 GET DRIVE FUNCTION
5264  017206  013737  017526  017524          MOV     DRVFN,WDOT      ,PASS DRIVE FUNCTION
5265  017214  013737  002216  021252          MOV     UUTADR,CSADR    ;SET ADR FOR DRIVE FUNCTION
5266  017222  004737  020612                  CALL    OTDVFN          ;CALL MOD 2.3.4 O/P DRIVE FUNCTION
5267  017226  012737  000001  017516          MOV     #1,SEEK         ;SET SEEK FLAG
5268  017234  005037  002242          EID23   CLR     RETRY           ;CLEAR RETRY FLAGS
5269  017240  000460                  EIJ23   BR      EIJ23           ;BR TO END IF 'C'
5270  017242  013705  017520          IFG23   MOV     DRVTST,R5       ;SETUP DRIVE TST
5271  017246  042705  177770                  BIC     #177770,R5      ;FOR TYPE CK
5272  017252  005705                          TST     R5              ,IF DRIVE TST
5273  017254  001404                          BEQ     IFE23           ,IS NOT 'FILL BUFF'
5274  017256  022705  000003                  CMP     #3,R5           ,OR
5275  017262  001401                          BEQ     IFE23           ,NOT 'READ SEC' , THEN
5276  017264  000434                          BR      IFH23           ,BR TO IF 'H'
5277  017266  005737  002300          IFE23.  TST     SECDN           ,IF SEC DONE
5278  017272  001417                          BEQ     ELE23           ,IS = 1
5279  017274  005737  015654          IFF23.  TST     INCTRK          ,IF INCR TRK FLAGS
5280  017300  001414                          BEQ     ELE23           ,ARE SET ,THEN
5281  017302  013737  015654  020440          MOV     INCTRK,TRKINC   ,PASS TRK FLAGS
5282  017310  004737  020142                  CALL    GETTRK          ,CALL MOD 2.3.2 GET TRACK
5283  017314  013777  020442  000172          MOV     CURTRK,@CNTKLC  ,SAVE CURRENT TRACK
5284  017322  012737  000001  017516          MOV     #1,SEEK         ,SET SEEK FLAG
5285  017330  000402                          BR      EIE23           ,BR TO END IF 'E'
5286  017332  005037  017516          ELE23   CLR     SEEK            ,RESET SEEK
5287  017336  017737  000150  020106  EIE23   MOV     @CNSCLC,CURSEC  ,PASS CURRENT SECTOR
5288  017344  004737  017530                  CALL    GETSEC          ,CALL MOD 2.3.1 GET A SECTOR
5289  017350  013777  020106  000134          MOV     CURSEC,@CNSCLC  ,SAVE UPDATED CURRENT SECTOR
5290  017356  032737  000006  017520  IFH23   BIT     #6,DRVTST       ,IF DRIVE TST
5291  017364  001006                          BNE     EIJ23           ,IS 'FILL BUFF' ,THEN
5292  017366  012701  035562                  MOV     #DATPAT,R1      ,SET UP DATA PATTERN ADR
5293  017372  117721  000116                  MOVB    @CNTKLC,(R1)+   ,SET TRK ADR IN DATA BUF BYTE #0
5294  017376  117711  000110                  MOVB    @CNSCLC,(R1)    ,SET SEC ADR IN DATA BUF BYTE#1
5295  017402  005037  020610          EIJ23   CLR     DVTST           ,CLEAR DRIVE TEST
5296  017406  113737  017520  020610          MOVB    DRVTST,DVTST    ,PASS DRIVE TEST
5297  017414  004737  020456                  CALL    GTDVFN          ,CALL MOD 2.3.3 GET DRIVE FUNCTION
5298  017420  013737  017526  017524          MOV     DRVFN,WDOT      ,PASS FUNCTION WORD     (PASS TO 2.3.4)
5299  017426  017737  000062  021254          MOV     @CNTKLC,TRKADR  ,PASS CURRENT TRACK     (PASS TO 2.3.4)
5300  017434  017737  000052  021256          MOV     @CNSCLC,SECADR  ,PASS CURRENT SECTOR    (PASS TO 2.3.4)
5301  017442  013737  002216  021252          MOV     UUTADR,CSADR    ,PASS UUT C&S ADR      (PASS TO 2.3.4)
5302  017450  004737  020612                  CALL    OTDVFN          ,CALL MOD 2.3.4 O/P DRIVE FUNCTION
5303  017454  013737  021254  002272          MOV     TRKADR,TRACK    ,SAVE TRACK ADDR IN GLOBAL
5304  017462  013737  021256  002274          MOV     SECADR,SECTOR   ,SAVE SECTOR ADDR IN GLOBAL
5305  017470  000207                          RTS     PC              ,RETURN
5306                        ;-----------------------------------------------------------------
```

```


                        ;------------------------------------------------------------------
017472  000000          CSEC:   .WORD   0               ;CURRENT DRV SECTOR TABLE
017474  000000                  .WORD   0
017476  000000                  .WORD   0
017500  000000                  .WORD   0
017502  000000          CTRK:   .WORD   0               ;CURRENT DRV TRK TABLE
017504  000000                  .WORD   0
017506  000000                  .WORD   0
017510  000000                  .WORD   0

017512  000000          CNSCLC: .WORD   0               ;CURRENT SECTOR LOCATOR
017514  000000          CNTKLC: .WORD   0               ;CURRENT TRACK LOCATOR
017516  000000          SEEK:   .WORD   0               ;SEEK FLAG
017520  000000          DRVTST: .WORD   0               ;DRIVE TEST
017522  000000          WDCT:   .WORD   0               ;WORD COUNT
017524  000000          WDOT:   .WORD   0               ;FUNCTION WORD TO SEND OUT
017526  000000          DRVFN:  .WORD   0               ;DRIVE FUNCTION WORD
                        ;MOD 2.3 ----- END MODULE ---------------------------------------

```

```
                                        .SBTTL  MOD 2.3.1 - GET A SECTOR
                                        ;---------------------------------------------------------------
                                        
017530  005037  020102          GETSEC: CLR     UTSCDN          ;CLEAR UUT SECTOR DONE
017534  013705  002214                  MOV     UUT,R5          ,GET UNIT UNDER TST
017540  006305                          ASL     R5              ,DOUBLE FOR WRD ADR
017542  005737  010242          IF1231: TST     INITL           ;IF INITIALIZE IS
017546  001406                          BEQ     E11231          ;SET, THEN
017550  012701  020062                  MOV     #SSEC,R1        ,GET STARTING SEC ADR
017554  005021                          CLR     (R1)+           ;CLEAR UNIT00 SSEC
017556  005021                          CLR     (R1)+           ;CLEAR UNIT01 SSEC
017560  005021                          CLR     (R1)+           ;CLEAR UNIT10 SSEC
017562  005011                          CLR     (R1)            ;CLEAR UNIT11 SSEC
017564  012701  020062          E11231  MOV     #SSEC,R1        ;GET START SECTOR BASE ADR
017570  060501                          ADD     R5,R1           ;FIND ADR UUT START SECTOR (TEMP 1)
017572  011102                          MOV     (R1),R2         ;SAVE UUT STARTING SECTOR (TEMP 2)
017574  012703  020072                  MOV     #NSEC,R3        ,GET NEXT SECTOR BASE ADR
017600  060503                          ADD     R5,R3           ,FIND ADR UUT NEXT SECTOR (TEMP 3)
017602  011304                          MOV     (R3),R4         ,SAVE UUT NEXT SECTOR (TEMP 4)
017604  020237  002172          IFA231  CMP     R2,MINSEC       ,IF STARTING SECTOR < MIN. SECTOR
017610  103422                          BLO     ELA231          ,THEN
017612  010437  020106                  MOV     R4,CURSEC       ;SET CURRENT SECTOR=UUT NEXT SECTOR
017616  023737  020056  020104  IFG231  CMP     SCPSCT,INTLV    ;IF SECTOR PASS CNT< INTERLV
017624  103053                          BHIS    THF231          ,THEN BR TO THEN 'F',ELSE
017626  005737  020060          IFH231  TST     STSCFG          ;IF START SEC FLAG
017632  001405                          BEQ     ELH231          ,IS SET, THEN
017634  005037  020060                  CLR     STSCFG          ,CLEAR FLAG
017640  010204                          MOV     R2,R4           ,SET DRV NXT SEC= DRV START SEC
017642  010213                          MOV     R2,(R3)         ,SAVE DRV NXT SEC
017644  000426                          BR      IFC231          ,BR TO IF 'C'
017646  063704  020104          ELH231  ADD     INTLV,R4        ,NSEC=NSEC+INTERLV
017652  010413                          MOV     R4,(R3)         ,SAVE NEXT SEC
017654  000422                          BR      IFC231          ,BR TO IF 'C'
017656  013737  002172  020106  ELA231  MOV     MINSEC,CURSEC   ,SET CURRENT SECTOR = MIN  SECTOR
017664  013711  002172                  MOV     MINSEC,(R1)     ,SET UUT START SECTOR = MIN  SECTOR
017670  013702  002172                  MOV     MINSEC,R2       ;SET R2=MINSEC
017674  005037  020056                  CLR     SCPSCT          ;CLEAR SECTOR PASS COUNT
017700  023737  002172  002174  IFB231: CMP     MINSEC,MAXSEC   ,IF MAX. SECTOR NOT=MIN. SECTOR
017706  001443                          BEQ     ELB231          ,THEN
017710  010205                  THB231. MOV     R2,R5           ,GET UUT STARTING SECTOR
017712  063705  020104                  ADD     INTLV,R5        ,ADD SECTOR INTERLEAVE
017716  010513                          MOV     R5,(R3)         ,SAVE NEXT UUT NEXT SEC (TEMP 5)
017720  010504                          MOV     R5,R4           ;SAVE NEXT UUT NEXT SEC (TEMP 4)
017722  020437  002174          IFC231: CMP     R4,MAXSEC       ,IF NEXT SECTOR > MAX. SECTOR
017726  103432                          BLO     ELC231          ,THEN
017730  005211                          INC     (R1)            ,INCREMENT UUT STARTING SECTOR
017732  011102                          MOV     (R1),R2         ,SET UP NEW START SEC
017734  005237  020056                  INC     SCPSCT          ,INCR SECTOR PASS CNT
017740  020437  002174          IFD231: CMP     R4,MAXSEC       ,IF NXT SEC NOT = MAX SEC
017744  001417                          BEQ     ELD231          ,THEN
017746  020237  002174          IFF231: CMP     R2,MAXSEC       ,IF DRV START SEC > MAX SEC
017752  101411                          BLOS    ELF231          ,THEN
017754  012737  000001  020102  THF231: MOV     #1,UTSCDN       ,SET UUT SECTOR DONE
017762  004737  020110                  CALL    STSCDN          ,CALL MOD 2.3.1 A - SET DRIVE SECTOR DONE FLAG
017766  005011                          CLR     (R1)            ,CLEAR UUT STARTING SECTOR
017770  005037  020056                  CLR     SCPSCT          ,CLEAR SEC PASS CNT
```

```
5385  017774  000420                          BR      END231          ;BRANCH TO END GET SECTOR
5386  017776  010213                ELF231    MOV     R2,(R3)         ;SET DRV NXT SEC = DRV START SEC
5387  020000  010204                          MOV     R2,R4           ;SAVE  DRV NXT SEC
5388  020002  000415                          BR      END231          ;BR TO END
5389  020004  012737  000001 020060 ELD231    MOV     #1,STSCFG       ;SET START SEC FLAG
5390  020012  000411                          BR      END231          ;BR TO END
5391  020014  000410                ELC231.   BR      END231          ;BRANCH TO END GET SECTOR
5392  020016  012737  000001 020102 ELB231:   MOV     #1,UTSCDN       ;SET DRIVE SECTOR DONE FLAG
5393  020024  004737  020110                  CALL    STSCDN          ;CALL MOD 2.3.1.A - SET DRIVE SECTOR DONE FLAG
5394  020030  005037  020056                  CLR     SCPSCT          ;CLEAR SEC PASS CNT
5395  020034  005011                          CLR     (R1)            ;CLEAR UUT STARTING SECTOR
5396  020036  013737  020102 002300 END231    MOV     UTSCDN,SECDN
5397  020044  010437  020054                  MOV     R4,NXSCSA       ;
5398  020050  000240                          NOP                     ;
5399  020052  000207                          RTS     PC              ;RETURN TO MOD 2.3
5400                                ;MOD 2.3.1 ----- REGISTERS & TABLES ---------------------------------
5401  020054  000000                NXSCSA  0
5402  020056  000000                SCPSCT  0                       ;SEC PASS COUNT
5403  020060  000000                STSCFG: 0                       ;GET NEW STARTING SEC FLAG
5404  020062  000000                SSEC    0                       ;UUT STARTING SECTOR
5405  020064  000000                        0                       ;
5406  020066  000000                        0                       ;
5407  020070  000000                        0                       ;
5408  020072  000000                NSEC    0                       ;UUT NEXT SECTOR
5409  020074  000000                        0                       ;
5410  020076  000000                        0                       ;
5411  020100  000000                        0                       ;
5412  020102  000000                UTSCDN: 0                       ;UUT SECTOR DONE FLAG
5413  020104  000003                INTLV   3                       ;SECTOR INTERLEAVE
5414  020106  000000                CURSEC  0                       ;CURRENT SECTOR UUT
5415                                ;MOD 2.3.1 ----- END MODULE -----------------------------------------
5416
5417
5418
5419                                 SBTTL  MOD 2.3 1 A - SET SECTOR DONE
5420                                ;-------------------------------------------------------------------
5421
5422  020110  000240                STSCDN: NOP                     ;
5423  020112  032737  000001 002214          BIT     #1,UUT          ;IF DRIVE #1 DONE
5424  020120  001404                          BEQ     1$              ;THEN
5425  020122  052737  000002 015652          BIS     #2,BDVSCD       ;SET DRIVE #1 SEC DONE FLAG
5426  020130  000403                          BR      2$              ;BR TO END
5427  020132  052737  000001 015652 1$      BIS     #1,BDVSCD       ;SET DRIVE #0 SEC DONE FLAG
5428  020140  000207                2$      RTS     PC              ;RETURN
5429                                ;MOD 2.3.1.A ----- END MODULE ---------------------------------------
```

```
5431                                    SBTTL  MOD 2.3.2 - GET A TRACK
5432                                    ;-------------------------------------------------------------------
5433
5434  020142  013737  002170  020436  GETTRK: MOV     INDITK,MAXTRK   ;GET INSIDE DIA AS SET BY OP
5435  020150  013737  002166  020434          MOV     OTDITK,MINTRK   ,GET OUTSIDE DIA AS SET BY OP
5436  020156  005737  020454          IFH232  TST     INITTK          ;IF INITIALIZE TRK IS
5437  020162  001413                          BEQ     EIH232          ;SET, THEN
5438  020164  005037  020454                  CLR     INITTK          ;RESET INITIALIZE TRK FLG
5439  020170  012701  020444                  MOV     #TKTL,R1        ;GET START OF TRK TBL
5440  020174  005021                          CLR     (R1)+           ;SET  UNIT00
5441  020176  005021                          CLR     (R1)+           ;SET  UNIT01
5442  020200  005021                          CLR     (R1)+           ,SET  UNIT10
5443  020202  005011                          CLR     (R1)            ;SET  UNIT11
5444  020204  013737  020434  020442          MOV     MINTRK,CURTRK   ;SET MIN CURRENT TRK
5445  020212  013702  002214          EIH232  MOV     UUT,R2          ;GET UNIT UNDER TEST INDICATOR
5446  020216  006302                          ASL     R2              ,DOUBLE FOR ADDRESSING WORDS
5447  020220  005037  020432                  CLR     TRKDNF          ,CLEAR TRACK DONE FLAG
5448  020224  032737  002000  020440  IFA232  BIT     #2000,TRKINC    ,IF INCREMENT TRACK FLAG
5449  020232  001023                          BNE     IFG232          ,NOT SET, THEN (USE SELECTED TRK SEQ)
5450  020234  012701  020444                  MOV     #TKTL,R1        ,GET DRIVE TRACK TABLE LOCATOR BASE ADR
5451  020240  060201                          ADD     R2,R1           ,CAL  DRV. TRK. TAB  LOCATOR ADR
5452  020242  011102                          MOV     (R1),R2         ,GET DRV.TRK. TAB. LOCATOR
5453  020244  012703  035330                  MOV     #TRKTBL,R3      ,GET BEGIN TRACK TABLE ADR
5454  020250  060203                          ADD     R2,R3           ,CAL  TRACK TAB. ADR. THIS DRIVE
5455  020252  005202                          INC     R2              ,INCREMENT DRV. TRK. TAB  LOCATOR
5456  020254  010211                          MOV     R2,(R1)         ,SAVE DRV. TRK. TAB. LOCATOR
5457  020256  111337  020442                  MOVB    (R3),CURTRK     ,SAVE CURRENT TRACK
5458  020262  005203                          INC     R3              ,INCREMENT TRACK TAB. POINTER
5459  020264  105713                  IFF232  TSTB    (R3)            ,IF NEXT TRACK
5460  020266  002004                          BGE     ELF232          ,EQUALS -1
5461  020270  012737  000001  020432          MOV     #1,TRKDNF       ,THEN SET TRACK DONE FLAG
5462  020276  005011                          CLR     (R1)            ,RESET DRV  TRK  TAB  LOCATOR ADR
5463  020300  000445                  ELF232  BR      END232          ,BR TO END MOD
5464  020302  123737  020442  020436  IFG232. CMPB    CURTRK,MAXTRK   ,IF CURRENT TRK > OR = MAX TRK (0  D )
5465  020310  103403                          BLO     IFB232          ,THEN
5466  020312  013737  020434  020442          MOV     MINTRK,CURTRK   ,SET CURRENT TRK = MIN TRK
5467  020320  123737  020442  020434  IFB232  CMPB    CURTRK,MINTRK   ,IF CURRENT TRK > OR = MIN TRK (0 D )
5468  020326  103427                          BLO     ELB232          ,THEN
5469  020330  013701  020442                  MOV     CURTRK,R1       ,GET CURRENT TRACK
5470  020334  005201                          INC     R1              ,INCREMENT CURRENT TRACK
5471  020336  120137  020436          IFC232. CMPB    R1,MAXTRK       ,IF CURRENT TRK +1 < MAX TRK (1 D )
5472  020342  103001                          BHIS    IFD232          ,THEN
5473  020344  000406                          BR      EID232          ,BRANCH TO END IF 'D'
5474  020346  120137  020436  IFD232: CMPB    R1,MAXTRK       ,IF CURRENT TRK +1 = MAX TRK
5475  020352  001006                          BNE     IFE232          ,THEN
5476  020354  012737  000001  020432          MOV     #1,TRKDNF       ,SET TRK DONE FLAG
5477  020362  010137  020442  EID232. MOV     R1,CURTRK       ,SAVE CURRENT TRK +1 = CURRENT TRK
5478  020366  000412                          BR      END232          ,BR END OF MOD
5479  020370  123737  020436  020434  IFE232: CMPB    MAXTRK,MINTRK   ,IF TRK MAX = TRK MIN
5480  020376  001003                          BNE     ELB232          ;THEN
5481  020400  012737  000001  020432          MOV     #1,TRKDNF       ,SET TRK DONE FLAG
5482  020406  013737  020434  020442  ELB232: MOV     MINTRK,CURTRK   ,SET CURRENT TRK = MIN  TRK (0 D )
5483  020414  013737  020432  002276  END232: MOV     TRKDNF,TRKDN    ,SAVE TRACK DONE FLAG
5484  020422  000240                          NOP                     ,
5485  020424  005037  020440                  CLR     TRKINC          ,CLEAR TRK INCR FLAG
5486  020430  000207                          RTS     PC              ,
```

```
5487                             ;------------------------------------------------------------------------
5488 020432 000000              TRKDNF: .WORD  0               ;TRACK DONE FLAG
5489 020434 000000              MINTRK: .WORD  0               ;MINIMUM TRACK - 0 D
5490 020436 000000              MAXTRK: .WORD  0               ;MAXIMUM TRACK - 1 D
5491 020440 000000              TRKINC: .WORD  0               ;INCREMENT TRK FLAG
5492 020442 000000              CURTRK: .WORD  0               ;CURRENT TRACK
5493 020444 000000              TKTL    .WORD  0               ;DRV TRK TABLE LOCATOR
5494 020446 000000                      .WORD  0
5495 020450 000000                      .WORD  0
5496 020452 000000                      .WORD  0
5497 020454 000000              INITTK: .WORD  0               ;INITIALIZE TRK FLAG
5498                             ;MOD 2 3.2 ----- END MODULE ----------------------------------------
```

```
                                    SBTTL  MOD 2.3.3 - GET A DRIVE FUNCTION
                                    ;--------------------------------------------------------------
                                    ;
020456  005001                GTDVFN: CLR     R1              ;CLEAR REG #1
020460  013701  020610              MOV     DVTST,R1        ;GET DRIVE TEST
020464  032701  040000        IFA233: BIT     #40000,R1       ;IF NOT INITIALIZE
020470  001012                        BNE     IFB233          ;THEN
020472  042701  177700                BIC     #177700,R1      ;CLEAR TOP BYTE OF R1
020476  006301                        ASL     R1              ;FORMAT FUNCTION
020500  052701  000001                BIS     #1,R1           ;SET GO BIT
020504  020127  000005        IFE233: CMP     R1,#5           ;IF WRT FUNCT
020510  001002                        BNE     IFB233          ;THEN
020512  053701  002224                BIS     DELDAT,R1       ;SET DEL DAT WRT (IF SET)
020516  005737  002152        IFB233: TST     RXXX            ;IF DRIVE IS RXXX
020522  001411                        BEQ     IFD233          ;THEN
020524  032737  000002  002214  IFC233: BIT     #2,UUT          ;IF SIDE #1 IS SELECTED
020532  001403                        BEQ     ELC233          ;THEN
020534  052701  001000                BIS     #1000,R1        ;SET SIDE #1 BIT
020540  000402                        BR      IFD233          ;BRANCH TO IF 'D'
020542  042701  001000        ELC233: BIC     #1000,R1        ;SET FOR SIDE #0
020546  032737  000001  002214  IFD233: BIT     #1,UUT          ;IF UNIT UNDER TEST IS
020554  001403                        BEQ     ELD233          ;DRIVE #1
020556  052701  000020                BIS     #20,R1          ;THEN SET DRIVE #1 SELECT BIT
020562  000402                        BR      EID233          ;BRANCH TO IF 'D'
020564  042701  000020        ELD233: BIC     #20,R1          ;ELSE CLEAR DRIVE #1 SELECT BIT
020570  053701  002222        EID233: BIS     DEN,R1          ;SET DENSITY BIT
020574  052701  000100                BIS     #100,R1         ;SET INTERRUPT BIT
020600  010137  017526                MOV     R1,DRVFN        ;PASS UP FUNCTION WORD
020604  000240                        NOP                     ;
020606  000207                END233  RTS     PC              ;RETURN
                                    ;--------------------------------------------------------------
020610  000000                DVTST   0                       ;DRIVE TEST WORD
                                    ;MOD 2 3 3 ----- END MODULE ----------------------------------------
```

```
5534                                    .SBTTL  MOD 2.3 4 - OUTPUT DRIVE FUNCTION
5535                                    ;---------------------------------------------------------------
5536
5537  020612  000240                    OTDVFN: NOP
5538  020614  013701  021252                    MOV     CSADR,R1        ;GET STATUS REG ADR
5539  020620  062701  000002                    ADD     #2,R1           ;ADD 2 TO ADR
5540  020624  010137  021250                    MOV     R1,DBADR        ;SAVE AS DATA ADDRESS
5541  020630  012737  000040  021550            MOV     #DNBIT,RDYWD    ;READY TEST WD          (PASS TO 2 3 4 1)
5542  020636  013737  017524  021240            MOV     WDOT,WRDS       ;WORD FOR OUTPUT        (PASS TO 2 3 4 1)
5543  020644  013737  021252  021242            MOV     CSADR,ADRS      ;ADDRESS OF OUTPUT      (PASS TO 2 3 4 1)
5544  020652  004737  021260                    JSR     PC,OUTSWD       ;OUTPUT FUNCTION WD (FW) DO 2 3 4 1)
5545  020656  000240                            NOP                     ;
5546  020660  032737  040000  017524  IFA234: BIT     #40000,WDOT     ;IF FUNCTION IS
5547  020666  001001                            BNE     ELA234          ;NOT AN "INITIALIZE" (FW BIT#14=0)
5548  020670  000402                            BR      THA234          ;THEN 'A'
5549  020672  000137  021234          ELA234: JMP     END234          ;ENDIF 'A' -DONE
5550  020676  032737  000010  017524  THA234: BIT     #10,WDOT        ;THEN, IF FUNCTION IS
5551  020704  001043                            BNE     ELB234          ;"READ, WRITE, FILL, EMPTY" (FW BIT #3=0)
5552  020706  032737  000004  017524  IFH234: BIT     #4,WDOT         ;AND THEN IF FUNCTION IS
5553  020714  001050                            BNE     ELH234          ;"EMPTY, FILL" (FW BIT#2=0)
5554  020716  012737  000200  021550            MOV     #TRBIT,RDYWD    ;THEN SET OUTPUT READY TEST WORD (PASS TO 2 3 4 1)
5555  020724  013737  017522  021240            MOV     WDCT,WRDS       ;AND SET WORD FOR OUTPUT        (PASS TO 2 3 4 1)
5556  020732  013737  021250  021242            MOV     DBADR,ADRS      ;AND SET ADDRESS OF OUTPUT      (PASS TO 2 3 4 1)
5557  020740  004737  021260                    JSR     PC,OUTSWD       ;OUTPUT BASE ADDRESS WORD       DO 2.3 4.1
5558  020744  032737  000002  017524  IFK234: BIT     #2,WDOT         ;IF "FILL" (FW BIT#1=0)
5559  020752  001004                            BNE     ELK234          ;THEN
5560  020754  012737  035562  021240            MOV     #DATPAT,WRDS    ;SET DATA PATTERN ADR           (PASS TO 2.3.4 1)
5561  020762  000403                            BR      EIK234          ;BR TO END IF 'K'
5562  020764  012737  036162  021240  ELK234: MOV     #DATBUF,WRDS    ;SET DATA BUFFER ADR            (PASS TO 2.3.4 1)
5563  020772  012737  000200  021550  EIK234: MOV     #TRBIT,RDYWD    ;SET OUTPUT READY TEST WORD     (PASS TO 2.3 4 1)
5564  021000  013737  021250  021242            MOV     DBADR,ADRS      ;ADDRESS OF OUTPUT              (PASS TO 2 3 4 1)
5565  021006  004737  021260                    JSR     PC,OUTSWD       ;OUTPUT WORD COUNT WORD         DO 2.3.4 1
5566  021012  000445                            BR      EIH234          ;BRANCH TO END IF 'H'
5567  021014  000240                  ELB234: NOP                     ;
5568  021016  032737  000004  017524  IFC234: BIT     #4,WDOT         ;IF FUNCTION WORD IS
5569  021024  001466                            BEQ     ELC234          ;"WRITE D D" OR "READ E C" (FW BIT #2=1)
5570  021026  032737  000002  017524  IFD234: BIT     #2,WDOT         ;THEN, IF FUNCTION IS
5571  021034  001036                            BNE     ELD234          ;"WRITE D.D", THEN (FW BIT#1=0)
5572  021036  012737  000200  021550  ELH234: MOV     #TRBIT,RDYWD    ;SET OUTPUT READY TEST WORD
5573  021044  013737  021256  021240            MOV     SECADR,WRDS     ;MOVE TRACK AND SECTOR ADDRESS
5574  021052  042737  177700  021240            BIC     #177700,WRDS    ;FORMAT TO SECTOR ADDRESS
5575  021060  013737  021250  021242            MOV     DBADR,ADRS      ;ADDRESS OF OUTPUT
5576  021066  004737  021260                    JSR     PC,OUTSWD       ;OUTPUT SECTOR ADDRESS
5577  021072  013737  021254  021240            MOV     TRKADR,WRDS     ;MOVE TRACK AND SECTOR ADDRESS
5578  021100  042737  177600  021240            BIC     #177600,WRDS    ;FORMAT TRACK ADDRESS
5579  021106  012737  000200  021550            MOV     #TRBIT,RDYWD    ;SET OUTPUT READY TEST WORD
5580  021114  013737  021250  021242            MOV     DBADR,ADRS      ;ADDRESS OF OUTPUT
5581  021122  004737  021260                    JSR     PC,OUTSWD       ;OUTPUT TRACK ADDRESS
5582  021126  000440                  EIH234: BR      EIB234          ;ENDIF H -DONE
5583  021130  012737  000200  021550  ELD234 MOV     #TRBIT,RDYWD    ;SET READY WD TO TR MODE
5584  021136  012737  002312  021240            MOV     #XERUUT,WRDS    ;EXT ERR  CODE TABLE ADD
5585  021144  013737  021260  021242            MOV     DBADR,ADRS      ;ADDRESS OF OUTPUT, RXDB
```

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5587  021152  004737  021260                  JSR     PC,OUTSWD       ;O/P BASE ADD FOR ERR. CODE
5588  021156  000424                          BR      EIB234          ;DONE
5589  021160  000240                  ELC234. NOP                     ;
5590  021162  032737  000002  017524  IFE234: BIT     #2,WDOT         ;IF FUNCTION IS
5591  021170  001404                          BEQ     ELE234          ;"READ STATUS" (FW BIT#1=1)
5592  021172  012737  000001  021244  THE234: MOV     #1,ERSTAT       ;THEN-SET ERR STATUS FLAG
5593  021200  000413                          BR      EIB234          ;DONE
5594  021202  012737  000200  021550  ELE234. MOV     #TRBIT,RDYWD    ;SET OUTPUT READY TEST WD
5595  021210  013737  021246  021240          MOV     VALWD,WRDS      ;VALIDATION WORD
5596  021216  013737  021250  021242          MOV     DBADR,ADRS      ;ADDRESS OF OUTPUT, RXDB
5597  021224  004737  021260                  JSR     PC,OUTSWD       ;OUTPUT VALIDATION WORD
5598  021230  004737  021324          EIB234. CALL    WATCH           ;CALL MOD U.2  -WATCH DOG
5599  021234  000240                  END234: NOP                     ;
5600  021236  000207                          RTS     PC              ;RETURN TO MOD 2.3
5601                                  ;-----------------------------------------------------------------
5602  021240  000000                  WRDS    0                       ;MODULE 2.3.4.1 OUTPUT WORD
5603  021242  000000                  ADRS    0                       ;MODULE 2.3.4.1 OUTPUT ADDRESS
5604  021244  000000                  ERSTAT: 0                       ;MODULE 0.0 ERR STATUS READ FLAG
5605  021246  000111                  VALWD   111                     ;EXTERNAL, VALIDATION WD (SET DENS-ASCII "1")
5606  021250  000000                  DBADR   0                       ;RX DATA BUFFER ADDRESS
5607  021252  000000                  CSADR   0                       ;RX CONT/STATUS ADDRESS
5608  021254  000000                  TRKADR: 0                       ;TRACK ADDRESS
5609  021256  000000                  SECADR  0                       ;SECTOR ADDRESS
5610                                  ;MOD 2 3.4 ----- END MODULE -------------------------------------
5611
5612
5613
5614
5615                                   SBTTL  MOD     2 3 4 1 OUTPUT SINGLE WORD
5616                                  ;-----------------------------------------------------------------
5617
5618  021260  000240                  OUTSWD  NOP                     ;
5619  021262  013737  021252  021552          MOV     CSADR,CSRADR    ;SET C&S REG ADR
5620  021270  013737  021550  021550          MOV     RDYWD,RDYWD     ;OUTPUT READY WORD (PASS TO DELAY)
5621  021276  004737  021450                  JSR     PC,DELAY        ;DELAY FOR READY  DO DELAY
5622  021302  033777  021550  177742          BIT     RDYWD,@CSADR    ;IF READY,
5623  021310  001404                          BEQ     ED2341          ;THEN
5624  021312  000240                          NOP                     ;
5625  021314  013777  021240  177720          MOV     WRDS,@ADRS      ;MOV WORD TO ADDRESS
5626  021322  000207                  ED2341  RTS     PC              ;RETURN TO MOD 2 3 4
5627                                  ;MOD  2.3 4 1 ------- END MODULE ---------------------------------
```

```
                                        .SBTTL  MOD U.2.3.4  - WATCH DOG TIMER
                                        ;-------------------------------------------------------------
021324  005037  021446          WATCH:  CLR     DNFLAG          ,CLEAR DONE FLAG
021330                                  SETPRI  #PRI00          ;SET PROCESSOR PRI=0 - ALLOW INTERRUPTS
021336  013704  021442                  MOV     DX,R4           ;SET DELAY MULT
021342  013703  021444          BAU234: MOV     DLY,R3          ;SET DELAY
021346  005737  021446          IBU234: TST     DNFLAG          ;IF INTERRUPTS DONE FLAG
021352  001410                          BEQ     LBU234          ;IS SET, THEN
021354  032777  000040  177670  ICU234: BIT     #DNBIT,@CSADR   ;IF DONT BIT
021362  001023                          BNE     XU234           ;IS NOT SET, THEN
021364  012737  010000  002234          MOV     #BIT12,ERRTYP   ;SET INTERR, BUT NO DONE ERROR
021372  000417                          BR      XU234           ;BR TO MOD 'EXIT'
021374  005303                  LBU234: DEC     R3              ;DECREMENT DELAY COUNT
021376  001363                  UDU234: BNE     IBU234          ;DO UNIT DELAY COUNT=0
021400  005304                          DEC     R4              ;DECREMENT DELAY MULT
021402  001357                  UAU234: BNE     BAU234          ;DO UNTIL DELAY MULT=0
021404  032777  000040  177640  IEU234: BIT     #DNBIT,@CSADR   ;IF DONE BIT IS
021412  001404                          BEQ     LEU234          ;SET, THEN
021414  052737  020000  002234          BIS     #BIT13,ERRTYP   ;SET DONE, BUT NO INTERRUPT ERROR
021422  000403                          BR      XU234           ,BR TO MOD 'EXIT'
021424  052737  040000  002232  LEU234: BIS     #BIT14,SYSERR   ;SET T O.  ERROR
021432                          XU234.  SETPRI  #PRI07          ,SET PROCESSOR PRI=7 - NO INTERRUPTS
021440  000207                          RTS     PC              ;RETURN TO MOD 2 3 4
                                        ,-------------------------------------------------------------
021442  000010                  DX      10                      ,DELAY MULT
021444  100000                  DLY     100000                  ,DELAY
021446  000000                  DNFLAG  0                       ,DONE FLAG
                                        ,MOD U 2 3 4 ---- END MODULE ----------------------------------------

                                         SBTTL  MOD U 2 3/4 DELAY
                                        ,-------------------------------------------------------------
021450  000240                  DELAY   NOP                     ,
021452  023727  021550  000000  IFAU23: CMP     RDYWD,#0        ,IF READY WORD
021460  001430                          BEQ     XU23            ,EQUALS ZERO, THEN BR TO END IF 'A'
021462  013704  021544                  MOV     RYDX,R4         ,SET READY DELAY MULT
021466  013703  021546          BDAU23: MOV     RYDLY,R3        ,SET READY DELAY
021472  033777  021550  000052  BDBU23: BIT     RDYWD,@CSRADR   ,IF READY
021500  001020                          BNE     XU23            ,EQUAL TO "1" ,THEN BR TO END IF 'B'
021502  005303                          DEC     R3              ,ELSE DECREMENT DELAY
021504  001372                          BNE     BDBU23          ,DO UNTIL R3=0
021506  005304                          DEC     R4              ,DECREMENT DELAY MULT
021510  001366                          BNE     BDAU23          ,DO UNTIL R4=0
021512  052737  040000  002232          BIS     #40000,SYSERR   ;SET TIME OUT ERR
021520  017737  000026  002236          MOV     @CSRADR,CSRUUT  ;GET UUT C&S REG
021526  062737  000002  021552          ADD     #2,CSRADR       ,SET CSRADR TO DB REG
021534  017737  000012  002240          MOV     @CSRADR,ESRUUT  ,GET UUT E&S REG
021542  000207                  XU23:   RTS     PC              ,RETURN TO CALLING MOD
                                        ;-------------------------------------------------------------
021544  000020                  RYDX:   20                      ,READY MULTIPLIER
021546  100000                  RYDLY:  100000                  ,READY DELAY
021550  000000                  RDYWD:  0                       ,READY WORD - TEST FOR DEVICE READY
021552  000000                  CSRADR: 0                       ,C&S REG OF UNIT- WAITING FOR
                                        ;MOD U.2.3.4 ----- END MODULE ----------------------------------------
```

```
5685
5686                                    .SBTTL  MOD 2.4 - EVALUATE TEST RESULTS
5687                                    ;---------------------------------------------------------------------- - ----
5688
5689  021554  013737  021634  023414  EVTSTR: MOV     TSTEV,FUNEV     ,PASS TEST FUNCTION
5690  021562  000240                          NOP                     ;
5691  021564  004737  022432                  CALL    EVDVST          ;CALL MOD 2.4.2 - EVALUATE DRIVE STATE
5692  021570  013737  021634  025026          MOV     TSTEV,FNEV4     ;PASS TEST FUNCTION
5693  021576  004737  024702                  CALL    EVUTEC          ;CALL MOD 2.4 4 - EVAL UNIT ERR CODE
5694  021602  032737  020000  021634  IFA24:  BIT     #20000,TSTEV    ;IF DATA CK BIT
5695  021610  001402                          BEQ     EIA24           ;IS SET, THEN
5696  021612  004737  021636                  CALL    EVDATA          ;CALL MOD 2 4 1 - EVALUATE DATA
5697  021616  013737  021634  024146  EIA24:  MOV     TSTEV,TSTCK     ;PASS DRIVE TEST
5698  021624  004737  023556                  CALL    UPDVST          ,CALL MOD 2.4 3 UPDATE DRIVE STATISTICS
5699  021630  000240                          NOP                     ,
5700  021632  000207                          RTS     PC              ,
5701                                    ;-------------------------------------------------------------------------
5702  021634  000000                  TSTEV   0
5703                                    ,MOD 2 4 -----  END MODULE ---------------------------------------- ------
5704
```

```
                                SBTTL  MOD 2.4.1 - EVALUATE DATA
                                ;-------------------------------------------------------------------
021636 005037 022300        EVDATA: CLR     DAERCT          ;CLEAR DATA ERR COUNT
021642 005037 022272                CLR     SEEKCK          ;CLEAR SEEK CK
021646 012737 000001 022306         MOV     #1,PTHEAD       ,SET PRINT HEADER FLAG
021654 013701 002270                MOV     WDCNT,R1        ;SAVE WORD COUNT
021660 006301                       ASL     R1              ;
021662 162701 000001                SUB     #1,R1           ;SUBTRACT 2 TO GET CHECKSUM
021666 012702 035562                MOV     #DATPAT,R2      ;GET ADDRESS DATA SOURCE
021672 012703 036162                MOV     #DATBUF,R3      ;GET ADDRESS DATA BUFFER
021676 060102                       ADD     R1,R2           ;CAL. ADDR SOURCE CHECKSUM
021700 060103                       ADD     R1,R3           ;CAL. ADDR BUFFER CHECKSUM
021702 121213                IFA241: CMPB    (R2),(R3)       ;IF CHECK SUMS
021704 001407                       BEQ     ELA241          ;NOT= THEN
021706 032737 000002 015670  IF1241: BIT     #2,ERTSAV       ;IF CRC ERR
021714 001003                       BNE     ELA241          ;NOT SET,THEN
021716 052737 000004 002234         BIS     #4,ERRTYP       ;SET CHECKSUM ERR
021724 005037 022276        ELA241: CLR     BYTNUM          ;CLEAR BYTE NUMBER
021730 162701 000001                SUB     #1,R1           ;CAL. TOTAL BYTE COUNT-LAST TWO
021734 010137 022274                MOV     R1,BYTCNT       ;SAVE BYTE COUNT
021740 012701 035562        BDA241. MOV     #DATPAT,R1      ;SET TEMP#1=DATA SOURCE BEGIN ADR
021744 012702 036162                MOV     #DATBUF,R2      ;SET TEMP#2=DATA BUFFER BEGIN ADR
021750 063701 022276                ADD     BYTNUM,R1       ,CAL CURRENT BYTE ADDR (SOURCE)
021754 063702 022276                ADD     BYTNUM,R2       ;CAL CURRENT BYTE ADDR (BUFFER)
021760 121112                       CMPB    (R1),(R2)       ;IF SOURCE BYTE & BUFFER BYTE
021762 001502                       BEQ     ELB241          ,NOT EQUAL
021764 005237 022300                INC     DAERCT          ,INCREMENT DATA ERR COUNT
021770 052737 000010 002234         BIS     #10,ERRTYP      ,SET DATA ERR-ERR TYPE
021776 042737 000004 002234         BIC     #4,ERRTYP       ,CLR CK SUM ERR-ERR TYPE
022004 023727 022276 000002 IFC241  CMP     BYTNUM,#2       ,IF BYTE #0 OR #1
022012 002006                       BGE     IFE241          ,THEN
022014 005737 022276        IFD241: TST     BYTNUM          ,IF BYTE #0
022020 001003                       BNE     IFE241          ,THEN
022022 052737 000001 022272         BIS     #1,SEEKCK       ,SET SEEK ERR-ERR TYPE
022030 023727 022300 000012 IFE241  CMP     DAERCT,#12      ,IF OVER 10 DATA ERRORS
022036 103404                       BLO     THF241          ,THEN
022040 032737 000020 002164 IFF241: BIT     #20,SWREG       ,IF PRINT ONLY 10 DATA ERROR FLAG
022046 001047                       BNE     EIF241          ,IS NOT SET, THEN
022050 111137 022302        THF241: MOVB    (R1),DATASB
022054 111237 022304                MOVB    (R2),DATAWS
022060 005737 022306        IFM241. TST     PTHEAD          ,IF PRINT HEADER
022064 001420                       BEQ     EIM241          ,OK, THEN
022066 005037 022306                CLR     PTHEAD          ,CLEAR PRINT HEADER
022072                              PRINTB  #DMSG1,UNIT,TRACK,SECTOR
022126                      EIM241: PRINTB  #DMSG2,BYTNUM,<8,DATASB>,<8,DATAWS>
022166 000240               EIF241  NOP                     ,
022170 005237 022276        ELB241  INC     BYTNUM          ,INCREMENT BYTE #
022174 005337 022274                DEC     BYTCNT          ,DECREMENT BYTE COUNT
022200 005737 022274                TST     BYTCNT          ,DO UNTIL BYTE COUNT
022204 003265                       BGT     BDA241          ,EQUALS 0
022206 005737 022272        IFJ241  TST     SEEKCK          ,IF DISK SEEK ERR
022212 001413                       BEQ     END241          ,IS SET AND
022214 032737 000010 002234 IFK241  BIT     #10,ERRTYP      ,IF DATA ERR
022222 001007                       BNE     END241          ,NOT SET AND
022224 032737 000002 015670 IFL241  BIT     #2,ERTSAV       ,IF CRC ERR
```

```
5762  022232  001003                        BNE     END241          ;NOT SET
5763  022234  052737  000001  002234        BIS     #1,ERRTYP       ;THEN SET SEEK ERR
5764  022242  000240                END241  NOP                     ;
5765  022244  005037  015670                CLR     ERTSAV          ;CLEAR ERR TYP SAV
5766  022250  012705  036162                MOV     #DATBUF,R5      ;GET BEGIN OF DATA BUFFER
5767  022254  012704  000200                MOV     #128.,R4        ;SET WORD LENGTH OF TABLE
5768  022260  005025                BDB241  CLR     (R5)+           ;CLEAR WORD IN DATA BUFFER TABLE
5769  022262  005304                        DEC     R4              ;DECREMENT WORD COUNT
5770  022264  005704                        TST     R4              ;DO UNTIL
5771  022266  001374                EDB241  BNE     BDB241          ;ALL TABLE WORDS ZEROED
5772  022270  000207                        RTS     PC              ;RETURN
5773                                ;-------------------------------------------------------------------
5774  022272  000000                SEEKCK: 0                       ;SEEK CECK FLAG
5775  022274  000000                BYTCNT: 0                       ;BYTE COUNT
5776  022276  000000                BYTNUM: 0                       ;BYTE NUMBER
5777  022300  000000                DAERCT: 0                       ;DATA ERR COUNT
5778  022302  000000                DATASB: 0                       ;DATA SHOULD BE
5779  022304  000000                DATAWS: 0                       ;DATA WAS
5780  022306  000000                PTHEAD: 0                       ;PRINT HEADER FLAG
5781                                ;-------------------------------------------------------------------
5782  022310  047045  040445  052440  DMSG1:  .ASCIZ  /%N%A UNIT#%01%A TRK#%D3%A SEC#%D2%N%A BYTE#%S2%AGOOD%S6%ABAD/
5783  022405     045  022516  031523  DMSG2:  .ASCIZ  /%N%S3%D3%S2%B8%S2%B8/
5784                                          EVEN
5785                                ;MOD 2 4 1 ----- END MODULE ---------------------------------------
5786
```

```
5788                                    .SBTTL  MOD 2.4.2 - EVALUATE DRIVE STATE
5789                                    ;---------------------------------------------------------------------
5790
5791  022432  013705  002216            EVDVST: MOV     UUTADR,R5
5792  022436  013737  002236  023416            MOV     CSRUUT,CSREV    ,GET COMMAND & STATUS  LAST OP UUT
5793  022444  013737  002240  023420            MOV     ESRUUT,ESREV    ;GET ERROR STATUS LAST OP UUT
5794  022452  005037  002312                    CLR     XERUUT          ;CLEAR EXTENDED ERROR CODE LOCATION
5795  022456  032737  000040  023416  IFA242:  BIT     #40,CSREV       ,IF DONE NOT
5796  022464  001033                    BNE     IFB242          ;SET THEN
5797  022466  012715  040000                    MOV     #40000,(R5)     ;ISSUE PROG INIT TO UUT
5798  022472  000240                    NOP                     ;
5799  022474  013737  002216  021552            MOV     UUTADR,CSRADR   ,SET CSR ADR
5800  022502  012737  000040  021550            MOV     #DNBIT,RDYWD    ,SET DONE TEST
5801  022510  004737  021450                    CALL    DELAY           ,WAIT FOR TR
5802  022514  032715  000040            IFC242: BIT     #40,(R5)        ;IF DONE NOT
5803  022520  001005                    BNE     ELC242          ,SET THEN
5804  022522  052737  000010  002232            BIS     #10,SYSERR      ,SET NO DONE ON INT-SYS ERR
5805  022530  000137  023406                    JMP     END242          ,BR TO END MOD
5806  022534  113701  023414            ELC242. MOVB    FUNEV,R1        ;GET DRIVE FUNCTION
5807  022540  042701  177770                    BIC     #177770,R1      ;CLEAR ALL BUT FUNCTION
5808  022544  050137  002232                    BIS     R1,SYSERR       ,SET NO DONE ON FUNCTION-SYS ERR
5809  022550  000137  023406                    JMP     END242          ;BR TO END MOD
5810  022554  004737  023422            IFB242. CALL    EVDVRE          ,CALL MOD 2.4.2.1 EVALUATE DRIVE RESPONSE
5811  022560  005737  002232                    TST     SYSERR          ,IF SYS ERR
5812  022564  001463                    BEQ     IFG242          ,NOT=0 THEN
5813  022566  032737  000001  002214            BIT     #1,UUT          ,IFDRV#1 UNDER TST
5814  022574  001404                    BEQ     1$              ,THEN
5815  022576  012737  000020  023412            MOV     #20,EVCMD       ,SET CMD TO DRV#1
5816  022604  000402                    BR      2$              ,BR
5817  022606  005037  023412            1$      CLR     EVCMD           ,SET CMD TO DRV#0
5818  022612  052737  000013  023412    2$      BIS     #13,EVCMD       ,SET READ UUT ESR IN CMD
5819  022620  053737  002222  023412            BIS     DEN,EVCMD       ,SET DEN FOR CMD
5820  022626  013715  023412                    MOV     EVCMD,(R5)      ;READ UUT ESR
5821  022632  013737  002216  021552            MOV     UUTADR,CSRADR   ,SET CSR ADR
5822  022640  012737  000040  021550            MOV     #DNBIT,RDYWD    ;SET DONE BIT
5823  022646  004737  021450                    CALL    DELAY           ,CALL
5824  022652  032715  000040            IFX242  BIT     #40,(R5)        ;IF DONE BIT
5825  022656  001005                    BNE     IFD242          ,NOT SET THEN
5826  022660  052737  000200  002232            BIS     #200,SYSERR     ,SET NO DONE BIT (SECONDARY PROBLEM)
5827  022666  000137  023406                    JMP     END242          ,BK TO END
5828  022672  032715  100000            IFD242  BIT     #100000,(R5)    ,IF ERR BIT
5829  022676  001403                    BEQ     IFE242          ,SET
5830  022700  052737  100000  002234            BIS     #100000,ERRTYP  ;ERR BIT - ERR TYPE
5831  022706  013701  002216            IFE242. MOV     UUTADR,R1       ;GET UUT ADR
5832  022712  062701  000002                    ADD     #2,R1           ;CAL DBR ADR
5833  022716  032711  000200                    BIT     #200,(R1)       ;IF DRV RDY BIT
5834  022722  001102                    BNE     IFN242          ,EQUALS 0
5835  022724  052737  000040  002232            BIS     #40,SYSERR      ;SET DRIVE NOT RDY-SYS ERR
5836  022732  000661                    BR      IFS242          ,BR TO END IF 'E'
5837  022734  032737  002021  023420  IFG242  BIT     #2021,ESREV     ,IF ANY ESR ERR BIT SET
5838  022742  001410                    BEQ     IFH242          ;THEN
5839  022744  032737  100000  023416  IFI242  BIT     #100000,CSREV   ,IF UUT ERR BIT
5840  022752  001010                    BNE     IFJ242          ,NOT=1 THEN
5841  022754  052737  040000  002234            BIS     #40000,ERRTYP   ,SET MISSING ERR BIT
5842  022762  000450                    BR      IFL242          ,BR TO IF 'L'
5843  022764  032737  100000  023416  IFH242  BIT     #100000,CSREV   ,IF UUT CSR ERR BIT
```

```
5844  022772  001456                          BEQ     IFN242          ;EQUALS 1 THEN
5845  022774  013701  021634          IFJ242: MOV     TSTEV,R1        ;GET TEST FUNCTION
5846  023000  042701  177774                  BIC     #177774,R1      ,CLEAR ALL BUT TWO BOTTOM BITS
5847  023004  022701  000002                  CMP     #2,R1           ;IF WRITE FUNCTION
5848  023010  001004                          BNE     IFK242          ;THEN
5849  023012  052737  004000  002234          BIS     #4000,ERRTYP    ,SET WRITE ERR - ERR TYPE
5850  023020  000431                          BR      IFL242          ;BR TO IF 'L'
5851  023022  013701  021634          IFK242: MOV     TSTEV,R1        ,GET TEST FUNCTION
5852  023026  042701  177770                  BIC     #177770,R1      ;CLEAR ALL BUT FUNCTION
5853  023032  022701  000003                  CMP     #3,R1           ;IF READ FUNCTION
5854  023036  001004                          BNE     IFM242          ;THEN
5855  023040  052737  002000  002234          BIS     #2000,ERRTYP    ,SET READ ERR-ERR TYPE
5856  023046  000416                          BR      IFL242          ,BR TO IF 'L'
5857  023050  013701  021634          IFM242: MOV     TSTEV,R1        ,GET TEST FUNCTION
5858  023054  042701  177771                  BIC     #177771,R1      ,CLEAR BITS
5859  023060  032701  000006                  BIT     #6,R1           ,IF  FILL/EMPTY BUFFER
5860  023064  001004                          BNE     ELM242          ,THEN
5861  023066  052737  001000  002234          BIS     #1000,ERRTYP    ,SET FILL/EMPTY ERR-ERR TYP
5862  023074  000403                          BR      IFL242          ,BR TO IF 'L'
5863  023076  052737  000400  002234  ELM242: BIS     #400,ERRTYP     ,ELSE SET UNK ERR
5864  023104  032737  000001  023420  IFL242: BIT     #1,ESREV        ,IF CRC ERR (ESR)
5865  023112  001406                          BEQ     IFN242          ;THEN
5866  023114  042737  000001  002234          BIC     #1,ERRTYP       ,CLEAR ANY SEEK ERR
5867  023122  052737  000002  002234          BIS     #2,ERRTYP       ,SET CRC ERR
5868  023130  032737  006010  023420  IFN242: BIT     #6010,ESREV     ,IF ESR BIT#3,10,11 ARE
5869  023136  001404                          BEQ     IFF242          ,SET, THEN
5870  023140  052737  100000  002232          BIS     #100000,SYSERR  ,SET UNKNOWN ERR-SYS ERR
5871  023146  000453                          BR      IFS242          ,BR TO IF 'S'
5872  023150  013701  021634          IFF242: MOV     TSTEV,R1        ,GET TEST FUNCTION
5873  023154  032701  000002                  BIT     #2,R1           ,IF FUNCTION WAS
5874  023160  001425                          BEQ     IFR242          ,POSSIBLE READ OR WRITE
5875  023162  032701  000004                  BIT     #4,R1           ,BUT REALLY
5876  023166  001022                          BNE     IFR242          ,IS READ OR WRITE, THEN
5877  023170  005737  002224          IFO242: TST     DELDAT          ,IF DELETED DATA FLAG IS
5878  023174  001410                          BEQ     IFQ242          ,SET THEN
5879  023176  032737  000100  023420  IFP242: BIT     #100,ESREV      ;IF UUT ESR DD BIT
5880  023204  001013                          BNE     IFR242          ,NOT SET THEN
5881  023206  052737  000100  002234          BIS     #100,ERRTYP     ,SET MISSING DP MARK-ERR TYP
5882  023214  000407                          BR      IFR242          ,BR TO IF 'R'
5883  023216  032737  000100  023420  IFQ242: BIT     #100,ESREV      ;IF D.D. BIT IS
5884  023224  001403                          BEQ     IFR242          ,SET THEN
5885  023226  052737  000040  002234          BIS     #40,ERRTYP      ,SET UNEX DD BIT
5886  023234  032737  000020  023420  IFR242: BIT     #20,ESREV       ;IF DEN. ERR. (ESR)
5887  023242  001403                          BEQ     IFU242          ;THEN
5888  023244  052737  020000  002232          BIS     #20000,SYSERR   ;SET DEN. ERR-SYS ERR
5889  023252  005737  002222          IFU242: TST     DEN             ;IF DOUBLE DEN MODE IS
5890  023256  001407                          BEQ     IFS242          ;SET AND THEN
5891  023260  032737  000040  023420  IFV242: BIT     #40,ESREV       ,IF. UUT RESPONDS IN
5892  023266  001003                          BNE     IFS242          ;SINGLE DENSITY, THEN
5893  023270  052737  010000  002232          BIS     #10000,SYSERR   ;SET DRIVE DENSITY ERR-SYS ERR
5894  023276  032737  100000  023416  IFS242: BIT     #100000,CSREV   ;IF UUT ERR BIT
5895  023304  001440                          BEQ     END242          ,NOT=0 THEN
5896  023306  012737  000001  002310          MOV     #1,PRTECD       ;SET PRINT ERROR CODE FLAG
5897  023314  012737  000017  023412  THS242: MOV     #17,EVCMD       ,SET UUT EXTENDED ERROR CODE
5898  023322  063737  002222  023412          BIS     DEN,EVCMD       ,SET DEN FOR CMD
5899  023330  013715  023412                  MOV     EVCMD,(R5)      ,GET UUT EXT  ERROR CODE REGS
```

```
 5900  023334  013701  002216                    MOV     UUTADR,R1       ;GET UUT ADDR
 5901  023340  062701  000002                    ADD     #2,R1           ;CAL DATA ADR
 5902  023344  013737  002216  021552            MOV     UUTADR,CSRADR   ;SET CSR ADR
 5903  023352  012737  000200  021550            MOV     #TRBIT,RDYWD    ;SET "TR" BIT TEST
 5904  023360  004737  021450                    CALL    DELAY           ;CALL DELAY MODULE-WAIT FOR TR
 5905  023364  032715  000200          IFT242:   BIT     #200,(R5)       ,IF TR
 5906  023370  001004                    BNE     ELT242          ;NOT SET
 5907  023372  052737  040007  002232            BIS     #40007,SYSERR   ;THEN SET "TR" ERR ON FUNCTION
 5908  023400  000402                    BR      END242          ,BR TO END MOD
 5909  023402  012711  002312          ELT242:   MOV     #XERUUT,(R1)    ,SEND BASE ADDR FOR EXTEND ERR CODE
 5910  023406  000240                    END242:   NOP                     ,
 5911  023410  000207                    RTS     PC
 5912                                    ,-------------------------------------------------------------------
 5913  023412  000000                    EVCMD:    0                       ,CMD WORD USED IN THIS MOD
 5914  023414  000000                    FUNEV     0
 5915  023416  000000                    CSREV     0
 5916  023420  000000                    ESREV     0
 5917                                    ,MOD 2 4 2 ----- END MODULE ---------------------------------------
 5918
```

```
5920
5921                                    SBTTL  MOD 2.4.2.1 - EVALUATE DRIVE RESPONSE
5922                                    ;-----------------------------------------------------------------------
5923
5924  023422  013701  021634            EVDVRE: MOV     TSTEV,R1        ;GET TEST FUNCTION
5925  023426  042701  177771                    BIC     #177771,R1      ;CLEAR BITS
5926  023432  032701  000006                    BIT     #6,R1           ;IF NOT FILL/EMPTY BUFFER
5927  023436  001445                            BEQ     6$              ;THEN
5928  023440  005737  002152                    TST     RXXX            ;IF RXXX
5929  023444  001421                            BEQ     1$              ;AND
5930  023446  032737  000002  002214            BIT     #2,UUT          ;SIDE # SELECTED
5931  023454  001403                            BEQ     2$              ;THEN
5932  023456  012701  001000                    MOV     #1000,R1        ;SET R1 TO TEST SIDE #1 SELECT
5933  023462  000401                            BR      3$              ;BR TO TEST RESPONSE
5934  023464  005001                    2$      CLR     R1              ;SET R1 TO TEST SIDE #0 SELECT
5935  023466  013702  002240            3$      MOV     ESRUUT,R2       ;GET ESR UNIT UNDER TEST
5936  023472  042702  176777                    BIC     #176777,R2      ;CLEAR ALL BITS BUT SIDE SELECT
5937  023476  020102                            CMP     R1,R2           ;IF SIDE SELECT
5938  023500  001403                            BEQ     1$              ;NOT=SIDE RESPONDING THEN
5939  023502  052737  001000  002232            BIS     #1000,SYSERR    ;SET WRONG SIDE RESPONDING SYS ERR
5940  023510  032737  000001  002214  1$        BIT     #1,UUT          ;IF DRIVE #1 SELECTED
5941  023516  001403                            BEQ     4$              ;THEN
5942  023520  012701  000400                    MOV     #400,R1         ;SET R1 TO TEST DRIVE #1 SEL
5943  023524  000401                            BR      5$              ;BR TO TEST RESPONSE
5944  023526  005001                    4$      CLR     R1              ;SET R1 TO TEST DRIVE #0 SEL
5945  023530  013702  002240            5$      MOV     ESRUUT,R2       ;GET ESR UNIT UNDER TEST
5946  023534  042702  177377                    BIC     #177377,R2      ;CLEAR ALL BITS BUT DRIVE RESPONDING
5947  023540  020102                            CMP     R1,R2           ;
5948  023542  001403                            BEQ     6$              ;
5949  023544  052737  000400  002232            BIS     #400,SYSERR     ;SET WRONG DRIVE RESPONDING SYS ERR
5950  023552  000240                    6$      NOP                     ;
5951  023554  000207                            RTS     PC              ;
5952                                    ;MOD 2 4 2 1 ----- END MODULE ----------------------------------------
```

```
                                        .SBTTL  MOD 2.4.3 - UPDATE DRIVE STATISTICS
                                        ;-------------------------------------------------------------------
                                        
023556  000240                  UPDVST: NOP                     ;
023560  032737  000002  024126  1A243:  BIT     #2,ETSAV        ;IF ERRTYP SAVE
023566  001405                          BEQ     EA243           ;HAS CRC ERR BIT SET, THEN
023570  004737  024254                  CALL    UDCRST          ;CALL UPDATE CRC STATISTICS
023574  005037  024126                  CLR     ETSAV           ;CLEAR ERR TYPE SAVE
023600  000457                          BR      1G243           ;BR TO IF 'G'
023602  013737  002234  024126  EA243:  MOV     ERRTYP,ETSAV    ;SAVE ERR TYP --> ETSAV
023610  013737  002234  024134          MOV     ERRTYP,STERRG   ;GET ERR TYP --> STAT ERR REG
023616  005037  024136                  CLR     STCNTR          ;ZERO STAT COUNTER
023622  032737  000002  024134  1D243:  BIT     #2,STERRG       ;IF ERR IS
023630  001403                          BEQ     BF243           ;CRC, THEN
023632  042737  006002  024134          BIC     #6002,STERRG    ;CLEAR CRC, RD, & WRT ERR BITS OF STAT ERR REG
023640  000241                  BF243:  CLC                     ;CLEAR CARRY BIT
023642  006037  024134                  ROR     STERRG          ;ROTATE RIGHT STAT ERROR REG
023646  103026                  1B243   BCC     EB243           ;IF CARRY BIT SET, THEN
023650  013701  024136                  MOV     STCNTR,R1       ;GET STAT COUNTER
023654  006301                          ASL     R1              ;& DOUBLE FOR WORD ADDRESSING
023656  062701  024150                  ADD     #LTTAB,R1       ;CAL. CLASSIFICATION WORD-ADDRESS
023662  011137  024140                  MOV     (R1),CLASWD     ;GET CLASSIFICATION WORD
023666  011102                          MOV     (R1),R2         ;GET CLASSIFICATION WORD-TO FIND LOG OFFSET
023670  000302                          SWAB    R2              ;GET CLASSIFICATION WORD UPPER BYTE
023672  006302                          ASL     R2              ;--SHIFT LEFT TO GET LOG REG OFFSET (LAST 6 BITS)
023674  006302                          ASL     R2              ;--SHIFT LEFT AGAIN
023676  042702  177004                  BIC     #177004,R2      ;CLEAR UNWANTED BITS
023702  010237  024142                  MOV     R2,LOGOFF       ;SAVE ERROR LOG OFFSET
023706  005711                  1C243:  TST     (R1)            ;IF ERR TYP CLASSIFICATION WORD
023710  100403                          BMI     LC243           ;TYPE=SOFT, THEN
023712  004737  024426                  CALL    UDSFST          ;CALL UPDATE SOFT ERROR STATISTICS
023716  000402                          BR      EB243           ;BR TO END 'B'
023720  004737  024210          LC243:  CALL    UDHDST          ;CALL UPDATE HARD ERROR STATISTICS
023724  005237  024136          EB243:  INC     STCNTR          ;INCREMENT STAT COUNTER
023730  022737  000020  024136  UF243:  CMP     #16.,STCNTR     ;DO UNTIL ALL 16
023736  101340                          BHI     BF243           ;BITS ARE DONE
023740  013703  002312          1G243.  MOV     XERUUT,R3       ;GET EXTENDED ERROR CODE
023744  042703  177400                  BIC     #177400,R3      ;CLEAR UPPER BYTE
023750  005703                          TST     R3              ;IF EXTENDED ERROR CODE
023752  001410                          BEQ     1H243           ;NOT=0, THEN
023754  162703  000010                  SUB     #10,R3          ;ADJ ERROR CODE # FOR LOGGING
023760  012702  004672                  MOV     #ECLOG,R2       ;GET LOC OF ERR CODE LOG
023764  060302                          ADD     R3,R2           ;ADD ERR CODE TO LOC ERR CODE LOG
023766  063702  002220                  ADD     UUTOFF,R2       ;FIND LOC ERR REG THIS UNIT
023772  005212                          INC     (R2)            ;INCREMENT UNIT ERR REG
023774  013703  002234          1H243:  MOV     ERRTYP,R3       ;GET ERR TYPE
024000  042703  171774                  BIC     #171774,R3      ;CLEAR ALL ERRS BUT RD, WT, CRC, SEEK
024004  005703                          TST     R3              ;IF ONE OF THESE ERRORS
024006  001412                          BEQ     11243           ;THEN
024010  013702  002272                  MOV     TRACK,R2        ;GET TRACK ADR
024014  006302                          ASL     R2              ;DOUBLE TRACK ADR FOR WORD ADDRESSING
024016  006302                          ASL     R2              ;ADJ TRK
024020  006302                          ASL     R2              ;  FOR ADR.
024022  062702  005156                  ADD     #TKXX,R2        ;ADD TRACK LOG LOCATION
024026  063702  002220                  ADD     UUTOFF,R2       ;FIND LOC ERR REG THIS UNIT
024032  005212                          INC     (R2)            ;INCREMENT UNIT ERR REG
```

```
6010  024034  005737  024130          I1243:  TST     ERRSAV          ;IF ERR SAVE HAS
6011  024040  001023                          BNE     L1243           ;NO ERROR SET, THEN
6012  024042  005237  024132                  INC     ERSVCT          ;INCREMENT ERROR SAVE COUNTER
6013  024046  022737  000004  024132  IJ243:  CMP     #4,ERSVCT       ;IF ERROR SAVE COUNTER
6014  024054  101017                          BHI     E1243           ;NOT=4, THEN
6015  024056  012701  002244                  MOV     #SEEKRT,R1      ;SET BEGIN ADDRESS OF RETRY COUNTERS
6016  024062  012702  000011                  MOV     #11,R2          ;SET # OF RETRY COUNTERS
6017  024066  005021                  BK243:  CLR     (R1)+           ;CLEAR RETRY COUNTER
6018  024070  005302                          DEC     R2              ;DECREMENT RETRY COUNTER #
6019  024072  005702                  UK243:  TST     R2              ;DO UNTIL
6020  024074  001374                          BNE     BK243           ;ALL COUNTERS CLEARED
6021  024076  005037  024132                  CLR     ERSVCT          ;CLEAR ERROR SAVE COUNTER
6022  024102  005037  002242                  CLR     RETRY           ;CLEAR RETRY COUNTER
6023  024106  000402                          BR      E1243           ;BR TO END 'I'
6024  024110  005037  024132          L1243:  CLR     ERSVCT          ;CLEAR ERROR SAVE COUNT
6025  024114  013737  002234  024130  E1243:  MOV     ERRTYP,ERRSAV   ;SAVE ERROR TYPE FOR NEXT ERROR CHECK
6026  024122  000240                  END243: NOP                     ;
6027  024124  000207                          RTS     PC              ;RETURN
6028                                  ;-----------------------------------------------------------------
6029  024126  000000                  ETSAV:  0                       ;ERR TYPE SAVE
6030  024130  000000                  ERRSAV: 0                       ,ERR TYPE SAVE REG
6031  024132  000000                  ERSVCT: 0                       ;ERROR SAVE COUNTER-COUNTS # OF NO ERROR PASSES
6032  024134  000000                  STERRG: 0                       ;STAT ERR REG
6033  024136  000000                  STCNTR: 0                       ;STAT COUNTER
6034  024140  000000                  CLASWD: 0                       ;ERROR CLASSIFICATION WORD-FROM TABLE
6035  024142  000000                  LOGOFF: 0                       ;ERROR LOG OFFSET FROM #CKSML
6036  024144  000000                  RTOFF:  0                       ;RETRY COUNTER OFFSET FROM # SEEKRT
6037  024146  000000                  TSTCK:  0                       ;TEST WORD-USED TO CHECK TEST DONE
6038                                  ,MOD 2.4.3 ----- END MODULE ---------------------------------------
6039
6040                                  ;----- ERROR TYPE CLASSIFICATION & OFFSETS TABLE ---------------------
6041                                                                  ,TYPE/LOG-OFF/RT-OFF/CLASS   /BIT#
6042                                                                  ;----/-------/------/--------/---------
6043  024150  005001          ETTAB.  .WORD   005001                  ,SFT /SEEK   /SEEK  /SK-RTMSK/  0
6044  024152  006005                  .WORD   006005                  ,SFT /CRC    /CRC   /CRC      /  1
6045  024154  100407                  .WORD   100407                  ,HRD /CKSML  /  -   /HD       /  2
6046  024156  012106                  .WORD   012106                  ;SFT /DATA   /DATA  /DT-RTMSK/  3
6047  024160  154400                  .WORD   154400                  ;HRD /  -    /  -   /   -    /  4
6048  024162  113227                  .WORD   113227                  ;HRD /DDUNX  /DD    /HD       /  5
6049  024164  113227                  .WORD   113227                  ;HRD /DDMIS  /DD    /HD       /  6
6050  024166  154400                  .WORD   154400                  ;HRD /  -    /  -   /   -    /  7
6051  024170  154400                  .WORD   154400                  ,HRD /UNK    /  -   /   -    /  8
6052  024172  101407                  .WORD   101407                  ;HRD /FIL-EMP/  -   /HD       /  9
6053  024174  010164                  .WORD   010164                  ;SFT /RD     /RD    /RD-RTMSK/ 10
6054  024176  011202                  .WORD   011202                  ;SFT /WRT    /WT    /WT-RTMSK/ 11
6055  024200  103407                  .WORD   103407                  ;HRD /INTR-ND/  -   /HD       / 12
6056  024202  104407                  .WORD   104407                  ,HRD /D-NINTR/  -   /HD       / 13
6057  024204  102407                  .WORD   102407                  ;HRD /ER-NSET/  -   /HD       / 14
6058  024206  154407                  .WORD   154407                  ;HRD /ERR BIT/  -   /HD       /  15
6059                                  ;               !!!!!!
6060                                  ;               !!!!!!---(CLASSIFICATION (SEEK=1/CRC=5/DATA=6/WRITE=2/READ=4)
6061                                  ;               !!!!!----(RETRY COUNTER OFFSET
6062                                  ;               !!!------(LOG REGISTER OFFSET-(FROM CKSML ADDRESS)
6063                                  ;               !--------(TYPE (SOFT=0/HARD=1)
6064                                  ;-----------------------------------------------------------------
```

```
                                         .SBTTL  MOD 2.4.3.1 - UPDATE HARD ERROR STATISTICS
                                         ;------------------------------------------------------------

 024210  000240                          UDHOST: NOP                            ;
 024212  032737  000007  024140          IA2431: BIT     #7,CLASWD              ;IF ERROR CLASS WORD-
 024220  001011                                  BNE     LA2431                 ;CLASS=HD(7), THEN
 024222  013701  024142                          MOV     LOGOFF,R1              ;GET ERROR LOG OFFSET
 024226  062701  004442                          ADD     #CKSML,R1              ;ERR LOG ADR=ERR LOG OFF + CKSML ADR
 024232  063701  002220                          ADD     UUTOFF,R1              ;UUT ERR LOG ADR=UUT OFFSET + ERR LOG ADR
 024236  005211                                  INC     (R1)                   ;INCREMENT THE ERROR LOG
 024240  000240                                  NOP                            ;
 024242  000402                                  BR      EA2431                 ;BR TO END 'A'
 024244  000240                          LA2431: NOP                            ;
 024246  000240                                  NOP                            ;
 024250  000240                          EA2431: NOP                            ;
 024252  000207                          X2431:  RTS     PC                     ;RETURN
                                         ;MOD 2.4.3.1 ----- END MODULE ----------------------------------



                                         .SBTTL  MOD 2.4.3.2 - UPDATE CRC STATISTICS
                                         ;------------------------------------------------------------

 024254  000240                          UDCRST: NOP                            ;
 024256  032737  020000  024146          IA2432: BIT     #BIT13,TSTCK           ;IF TEST=DATA CHECK
 024264  001425                                  BEQ     LA2432                 ;BIT SET, THEN
 024266  032737  000010  002234          IB2432: BIT     #BIT03,ERRTYP          ;IF ERR TYPE=DATA ERR
 024274  001007                                  BNE     LB2432                 ;NOT SET, THEN
 024276  012737  000020  024142                  MOV     #20,LOGOFF             ;SET LOG OFFSET=CRC BAD LOG
 024304  012737  000006  024144                  MOV     #6,RTOFF               ;SET RETRY OFFSET=CRC ERR
 024312  000420                                  BR      IC2432                 ;BR TO 'C'
 024314  012737  000050  024142          LB2432: MOV     #50,LOGOFF             ;SET DATA LOG OFFSET
 024322  005037  024700                          CLR     RTMASK                 ;CLEAR RETRY MASK
 024326  012737  000012  024144                  MOV     #12,RTOFF              ;SET DUMMY DATA RETRY COUNTER OFFSET
 024334  004737  024566                          CALL    SFERLG                 ;CALL SOFT ERROR LOGGER
 024340  012737  000010  024142          LA2432: MOV     #10,LOGOFF             ;SET LOG OFFSET=CRC ERR LOG
 024346  012737  000006  024144                  MOV     #6,RTOFF               ;SET RETRY OFFSET=CRC ERR
 024354  032737  010000  024146          IC2432: BIT     #BIT12,TSTCK           ;IF READ AFTER WRITE (RAW)
 024362  001407                                  BEQ     LC2432                 ;BIT SET, THEN
 024364  012737  000020  024700                  MOV     #BIT04,RTMASK          ;SET RETRY MASK=CRC
 024372  052737  000002  024700                  BIS     #BIT1,RTMASK           ;SET RETRY MASK=WRITE
 024400  000406                                  BR      EC2432                 ;BR TO END 'C'
 024402  012737  000020  024700          LC2432: MOV     #BIT04,RTMASK          ;SET RETRY MASK=CRC
 024410  052737  000004  024700                  BIS     #BIT02,RTMASK          ;SET RETRY MASK=READ
 024416  000240                          EC2432: NOP                            ;
 024420  004737  024556                          CALL    SFERLG                 ;CALL SOFT ERROR LOGGER
 024424  000207                                  RETURN                         ;RETURN
                                         ;MOD 2.4.3.2 ----- END MODULE ----------------------------------
```

```
                                        SBTTL  MOD 2.4 3.3 - UPDATE SOFT ERROR STATISTICS
                                        ;-------------------------------------------------------------
                                        
024426  000240                  UDSFST: NOP                     ,
024430  013702  024140                  MOV     CLASWD,R2       ,PUT CLASSIFICATION WORD IN R1
024434  006202                          ASR     R2              ,  SHIFT WORD RIGHT
024436  006202                          ASR     R2              ,    3 TIMES TO GET
024440  006202                          ASR     R2              ;      RETRY COUNTER OFFSET (LAST 6 BITS)
024442  042702  177700                  BIC     #177700,R2      ,CLEAR TOP 10 BITS
024446  010237  024144                  MOV     R2,RTOFF        ;SET RETRY COUNTER OFFSET
024452  013702  024140          1A2433: MOV     CLASWD,R2       ;GET CLASSIFICATION WORD
024456  042702  177770                  BIC     #177770,R2      ,CLEAR ALL BIT ERROR CLASSIFICATION
024462  022702  000006                  CMP     #6,R2           ;IF ERROR
024466  001022                          BNE     LA2433          ,CLASS=DATA, THEN
024470  032737  010000  024146  1B2433  BIT     #BIT12,TSTCK    ;IF TEST WAS
024476  001404                          BEQ     LB2433          ,READ AFTER WRITE (RAW) BIT SET, THEN
024500  012737  000012  024700          MOV     #12,RTMASK      ,SET DATA & WRITE RETRY
024506  000403                          BR      EB2433          ,BR TO END IF 'B'
024510  012737  000014  024700  LB2433  MOV     #14,RTMASK      ,SET DATA & READ RETRY
024516  012737  000010  024144  EB2433  MOV     #10,RTOFF       ,SET DATA RT COUNTER OFFSET
024524  012737  000050  024142          MOV     #50,LOGOFF      ,SET DATA LOG OFFSET
024532  000405                          BR      EA2433          ;BR TO END 'A'
024534  010237  024700          LA2433: MOV     R2,RTMASK       ,ELSE-PUT CLASS INTO RETRY MASK
024540  162737  000050  024142          SUB     #50,LOGOFF      ,ADJ  LOG OFFSET SO THAT 'SEK' IS LOG BEGIN
024546  004737  024556          EA2433  CALL    SFERLG          ,CALL SOFT ERROR LOGGER
024552  000240                          NOP                     ,
024554  000207                  X2433   RTS     PC              ,RETURN
                                        ,MOD 2 4 3 3 ----- END MODULE ----------------------------------------
```

```
                                .SBTTL  MOD 2.4.U1 - SOFT ERROR LOGGER
                                ;---------------------------------------------------------------
                                
024556  000240                  SFERLG: NOP                     ;
024560  013701  024142                  MOV     LOGOFF,R1       ;GET ERR LOG OFFSET
024564  013702  024144                  MOV     RTOFF,R2        ;GET RETRY COUNTER OFFSET
024570  062702  002244                  ADD     #SEEKRT,R2      ;CAL. RETRY COUNTER ADR
024574  032737  000004  002164  IA24U1: BIT     #BIT02,SWREG    ;IF RETRY ON ERROR, LOG SOFT OR HD ERROR
024602  001412                  BEQ     LB24U1          ;SET (SFT SW REG), THEN
024604  021227  000012          IB24U1: CMP     (R2),#12        ;IF RETRY COUNTER
024610  103007                  BHIS    LB24U1          ;EQUALS < 10 ERRORS, THEN
024612  005212                  INC     (R2)            ;INCREMENT RETRY COUNTER
024614  053737  024700  002242        BIS     RTMASK,RETRY    ;SET RT FLAGS PER RT MASK
024622  005037  002306                CLR     HARDER          ;CLEAR HARD ERROR
024626  000413                  BR      EB24U1          ;BR TO END 'B'
024630  062701  004602          LB24U1  ADD     #HSEK,R1        ;HD ERR LOG ADR=HARD SEEK ADR+LOG OFFSET
024634  063701  002220                  ADD     UUTOFF,R1       ;UUT ERR LOG ADR=UUT OFFSET+LOG ADR
024640  005211                  INC     (R1)            ;INCREMENT UUT HARD ERROR LOG
024642  043737  024700  002242        BIC     RTMASK,RETRY    ;CLEAR RETRY FALGS USING RT MASK
024650  005012                  CLR     (R2)            ;CLEAR RETRY COUNTER
024652  005237  002306                INC     HARDER          ;SET HARD ERROR FLAG
024656  013701  024142          EB24U1  MOV     LOGOFF,R1       ;GET ERR LOG OFFSET
024662  062701  004512                  ADD     #SEK,R1         ;ERR LOG ADR=SEK LOG ADR+LOG OFFSET
024666  063701  002220                  ADD     UUTOFF,R1       ;UUT ERR LOG ADR=UUT OFFSET+LOG ADR
024672  005211                  INC     (R1)            ;INCREMENT UUT ERROR LOG
024674  000240                  X24U1.  NOP                     ;
024676  000207                          RTS     PC              ;RETURN
                                ;---------------------------------------------------------------
024700  000000                  RTMASK  0                       ;RETRY MASK
                                ;MOD 2 4 U1 ----- END MODULE ----------------------------------------
```

```
                                        .SBTTL  MOD 2.4.4 - EVALUATE UNIT ERROR CODE
                                        ;-------------------------------------------------------------------
024702  013701  002312        EVUTEC  MOV     XERUUT,R1       ;GET ERR CODE & SAVE
024706  042701  177400                BIC     #177400,R1      ;CLEAR TOP BYTE
024712  005701                IFA244: TST     R1              ;IF ERRCODE
024714  001443                        BEQ     END244          ;NOT=0, THEN
024716  006201                        ASR     R1              ;SHIFT ERR CODE FOR LOOK UP
024720  006201                        ASR     R1              ;AND ADDRESSING
024722  062701  025030                ADD     #ECCLAS,R1      ;CAL ERR TABLE CLASSIFICATION ADR
024726  011102                        MOV     (R1),R2         ;GET ERR CODE CLASSIFICATION WORD
024730  105702                IFB244  TSTB    R2              ;IF LOWER BYTE
024732  001003                        BNE     IFC244          ;EQUALS 0, THEN
024734  050237  002232                BIS     R2,SYSERR       ;SET ERR ONTO SYSERR
024740  000431                        BR      END244          ;BR TO END IF 'B'
024742  122702  000300        IFC244  CMPB    #300,R2         ;IF LOW BYTE
024746  001024                        BNE     ELC244          ,EQUALS 300, THEN
024750  022737  000003  025026 IFD244. CMP     #3,FNEV4        ,IF FUNCTION WAS
024756  001004                        BNE     IFE244          ;A READ, THEN
024760  052737  002000  002234        BIS     #2000,ERRTYP    ,SET READ ERR
024766  000416                        BR      END244          ,BR TO END IF 'B'
024770  022737  000002  025026 IFE244. CMP     #2,FNEV4        ;IF FUNCTION WAS
024776  001004                        BNE     ELE244          ,A WRITE, THEN
025000  052737  004000  002234        BIS     #4000,ERRTYP    ,SET WRITE ERROR
025006  000406                        BR      END244          ,BR TO END IF 'B'
025010  052737  040000  002234 ELE244: BIS     #40000,ERRTYP   ,SET UNK ERROR
025016  000402                        BR      END244          ,BR TO END IF 'B'
025020  050237  002234        ELC244: BIS     R2,ERRTYP       ,SET CLASSIFIED ERROR ONTO ERRTYP
025024  000207                END244: RTS     PC              ,RETURN
                                        ;-------------------------------------------------------------------
025026  000000                FNEV4:  0                       ,FUNCTION FOR EVALUATION
                                        ;-------------------------------------------------------------------
025030  000000                ECCLAS: .WORD   0               ,ERR CODE # 00  ---> NOT USED (NO ERROR)
025032  000001                        .WORD   1               ,ERR CODE # 10  ---> SEEK
025034  000001                        .WORD   1               ,ERR CODE # 20  ---> SEEK
025036  000000                        .WORD   0               ,ERR CODE # 30  ---> NOT ASSIGNED
025040  004000                        .WORD   4000            ,ERR CODE # 40  ---> SYS ERR
025042  000001                        .WORD   1               ,ERR CODE # 50  ---> SEEK
025044  002000                        .WORD   2000            ,ERR CODE # 60  ---> SELF DIAG ERR
025046  000300                        .WORD   300             ;ERR CODE # 70  ---> READ OR WRITE ERR
025050  004000                        .WORD   4000            ,ERR CODE # 100 ---> SYS ERR
025052  000300                        .WORD   300             ;ERR CODE # 110 ---> READ OR WRITE ERR
025054  000300                        .WORD   300             ;ERR CODE # 120 ---> READ OR WRITE ERR
025056  000300                        .WORD   300             ;ERR CODE # 130 ---> READ OR WRITE ERR
025060  000002                        .WORD   2               ;ERR CODE # 140 ---> CRC ERR
025062  000001                        .WORD   1               ;ERR CODE # 150 ---> SEEK ERR
025064  000300                        .WORD   300             ;ERR CODE # 160 ---> READ OR WRITE ERR
025066  000300                        .WORD   300             ;ERR CODE # 170 ---> READ OR WRITE ERR
025070  000002                        .WORD   2               ;ERR CODE # 200 ---> CRC ERR
025072  000000                        .WORD   0               ;ERR CODE # 210 ---> NOT ASSIGNED
025074  002000                        .WORD   2000            ;ERR CODE # 220 ---> SELF DIAG ERR
025076  004000                        .WORD   4000            ,ERR CODE # 230 ---> SYS ERR
025100  020000                        .WORD   20000           ;ERR CODE # 240 ---> DENSITY ERR
025102  020000                        .WORD   20000           ,ERR CODE # 250 ---> DENSITY ERR
025104  000000                        .WORD   0               ,ERR CODE # 260 ---> NOT ASSIGNED
                                ,MOD 2.4.4 ----- END MODULE ----------------------------------------------
```

```
6233
6234                                    .SBTTL  MOD 2.5 - OUTPUT ERROR TYPE
6235                                    ;---------------------------------------------------------------------
6236
6237  025106  013737  002234  030044  OTERTP. MOV     ERRTYP,ERRREG   ;SET ERROR TYPE FOR PRINT OUT
6238  025114  000240                  NOP             ;
6239  025116  013701  002234          MOV     ERRTYP,R1       ;GET ERROR TYPE
6240  025122  005002                  CLR     R2              ;CLEAR ERROR # COUNT
6241  025124  000240                  BDA25:  NOP             ;
6242  025126  032701  000001          IFA25:  BIT     #1,R1           ;IF BIT #1
6243  025132  001405                  BEQ     ELA25           ;EQUALS 1, THEN
6244  025134  010204                  MOV     R2,R4           ;SAVE ERROR # COUNT
6245  025136  006304                  ASL     R4              ;DOUBLE ERR # COUNT FOR ADDRESSING
6246  025140  062704  025760          ADD     #ET1,R4         ;SET ADDR FOR ERR MSG PRINT
6247  025144  000407                  BR      THA25           ;BR TO THEN 'A'
6248  025146  000241          ELA25   CLC                     ;CLEAR CARRY BIT
6249  025150  006201                  ASR     R1              ;SHIFT ERR TYPE RIGHT
6250  025152  005202                  INC     R2              ;INCREMENT ERROR # COUNT
6251  025154  022702  000017          CMP     #17,R2          ;DO UNTIL ERROR # COUNT
6252  025160  001361                  BNE     BDA25           ;EQUALS 15, THEN
6253  025162  000464                  BR      EIA25           ;BR TO END IF 'A'
6254  025164  005003          THA25   CLR     R3              ;CLEAR R3
6255  025166  010205                  MOV     R2,R5           ;GET ERR#
6256  025170  062705  026020          ADD     #ETCLAS,R5      ;CAL  ERR# CLASSIFICATION ADR
6257  025174  111503                  MOVB    (R5),R3         ;GET ERR# CLASSIFICATION
6258  025176  032703  000001          IFB25   BIT     #1,R3           ;IF SOFT ERR
6259  025202  001413                  BEQ     IFC25           ;CLASS, THEN
6260  025204  005737  002306          TST     HARDER          ;IF HARD ERR
6261  025210  001013                  BNE     ELB25           ;NOT SET, THEN
6262  025212  010237  025224          MOV     R2,SFTE1+2      ;SET ERR #
6263  025216  011437  025226          MOV     (R4),SFTE1+4    ;SET ERR MSG
6264  025222                  SFTE1   ERRSOFT 0,0             ;SOFT ERROR
6265  025230  000416                  BR      EIC25           ;
6266  025232  032703  000002          IFC25   BIT     #2,R3           ;IF HARD ERR
6267  025236  001413                  BEQ     EIC25           ;CLASS, THEN
6268  025240  052702  000040          ELB25   BIS     #40,R2          ;SET HARD ERROR #
6269  025244  010237  025256          MOV     R2,HDTE1+2      ;SET ERR #
6270  025250  011437  025260          MOV     (R4),HDTE1+4    ;SET ERR MSG
6271  025254                  HDTE1:  ERRHRD  0,0             ;HARD ERROR
6272  025262  005237  002306          INC     HARDER          ;SET HARD ERROR FLAG
6273  025266  013737  002234  030044  EIC25:  MOV     ERRTYP,ERRREG   ;SET ERR TYPE FOR PRINT OUT
6274  025274  004737  027644          CALL    PRTERR          ;CALL U.P ERR - PRINT ERR INFO
6275  025300  013737  002234  015670          MOV     ERRTYP,ERTSAV   ;SAVE ERR TYP FOR DATA CK
6276  025306  005037  002234          CLR     ERRTYP          ;CLEAR DEVICE ERR
6277  025312  004737  030274          CALL    XERPRT          ;CALL MOD U PRT B - PRINT ERR CODE
6278  025316  005737  002306          IFD25   TST     HARDER          ;IF NOT A
6279  025322  001002                  BNE     ELD25           ;HARDER, THEN
6280  025324  004737  026040          CALL    PTRTY           ;CALL 2 5 1 - PRINT RETRY #
6281  025330  005037  002306          ELD25:  CLR     HARDER          ;CLEAR HARD ERROR FLAG
6282  025334  000240                  EIA25   NOP             ;
6283  025336  000207                  RTS     PC              ;RETURN
6284                                    ;---------------------------------------------------------------------
```

```
6286                                    ;-----------------------------------------------------------------------
6287  025340  051440  042505  020113    ERT1:    .ASCIZ  / SEEK ERR/
6288  025352  041440  041522  042440    ERT2.    .ASCIZ  / CRC ERR/
6289  025363     040  045503  051440    ERT3:    .ASCIZ  / CK SUM ERR/
6290  025377     040  040504  040524    ERT4:    .ASCIZ  / DATA ERR/
6291  025411     040  047125  051501    ERT5:    .ASCIZ  / UNASSG ERR/
6292  025425     040  042504  027114    ERT6:    .ASCIZ  / DEL. DATA UNEXPECTED ERR/
6293  025457     040  042504  027114    ERT7:    .ASCIZ  / DEL. DATA MISSING ERR/
6294  025506  052440  040516  051523    ERT8:    .ASCIZ  / UNASSG ERR/
6295  025522  052440  045516  042440    ERT9     .ASCIZ  / UNK ERR/
6296  025533     040  044506  046114    ERT10:   .ASCIZ  / FILL OR EMPTY BUFFER ERR/
6297  025565     040  042522  042101    ERT11:    ASCIZ  / READ ERR/
6298  025577     040  051127  052111    ERT12:   .ASCIZ  / WRITE ERR/
6299  025612  044440  052116  051105    ERT13:   .ASCIZ  / INTERRUPT BUT NO DONE BIT ERR/
6300  025651     040  047504  042516    ERT14:   .ASCIZ  / DONE BIT BUT NO INTERRUPT ERR/
6301  025710  042440  051122  051117    ERT15:   .ASCIZ  / ERROR, BUT NO ERR BIT SET/
6302  025743     040  051105  020122    ERT16    .ASCIZ  / ERR BIT SET/
6303                                             .EVEN
6304  025760  025340                    ET1       WORD   ERT1
6305  025762  025352                              WORD   ERT2
6306  025764  025363                              WORD   ERT3
6307  025766  025377                              WORD   ERT4
6308  025770  025411                             .WORD   ERT5
6309  025772  025425                              WORD   ERT6
6310  025774  025457                              WORD   ERT7
6311  025776  025506                              WORD   ERT8
6312  026000  025522                              WORD   ERT9
6313  026002  025533                              WORD   ERT10
6314  026004  025565                              WORD   ERT11
6315  026006  025577                              WORD   ERT12
6316  026010  025612                             .WORD   ERT13
6317  026012  025651                              WORD   ERT14
6318  026014  025710                              WORD   ERT15
6319  026016  025743                              WORD   ERT16
6320                                    ;-----------------------------------------------------------------------
6321                                                    ;ERROR                  - TYPE - ERR#
6322                                                    ;-----                  ------------
6323  026020     001  ETCLAS   .BYTE   1              ;SEEK                   - SOFT - 0 -32
6324  026021     001             BYTE   1              ;CRC                    - SOFT - 1 -33
6325  026022     002             BYTE   2              ;CKSUM                  - HARD -   -34
6326  026023     001             BYTE   1              ;DATA                   - SOFT - 3 -35
6327  026024     000             BYTE   0              ;UNASSIGNED             -
6328  026025     002             BYTE   2              ;DEL  DATA UNEX         - HARD -   -37
6329  026026     002             BYTE   2              ;DEL. DATA MISSING      - HARD -   -38
6330  026027     000             BYTE   0              ;UNASSIGNED             -
6331  026030     002             BYTE   2              ;UNK ERR                - HARD -   -40
6332  026031     002             BYTE   2              ;FILL/EMPTY BUFFER      - HARD -   -41
6333  026032     001             BYTE   1              ;READ                   - SOFT - 10-42
6334  026033     001             BYTE   1              ;WRITE                  - SOFT - 11-43
6335  026034     002             BYTE   2              ;INTER-BUT NO DONE      - HARD -   -44
6336  026035     002             BYTE   2              ;DONE-BUT NO INTER      - HARD -   -45
6337  026036     002             BYTE   2              ;ERR-BUT NO ERR BIT     - HARD -   -46
6338  026037     002             BYTE   2              ;ERR BIT SET            - HARD -   -47
6339                               EVEN
6340                                    ;MOD 2.5 ----- END MODULE ---------------------------------------------
6341
```

```
                                .SBTTL  MOD 2 5 1 - PRINT RETRY
                                ;---------------------------------------------------------------
                                PTRTY.  NOP                     ;
026040  000240                  IFA251: TST     RETRY           ;IF RETRY
026042  005737  002242                  BEQ     END251          ;NOT=0, THEN
026046  001510                  IFB251: BIT     #1,RETRY        ;IF RETRY
026050  032737  000001  002242          BEQ     IFC251          ;IS SEEK, THEN
026056  001405                          MOV     SEEKRT,R1       ;SET SEEK RT COUNT
026060  013701  002244                  MOV     #MSKRT,R2       ;SET SEEK RT MSG
026064  012702  026272                  BR      EIB251          ;BR TO END IF 'B'
026070  000466                  IFC251: BIT     #2,RETRY        ;IF RETRY
026072  032737  000002  002242          BEQ     IFE251          ;IS WRT, THEN
026100  001427                  IFD251  BIT     #30,RETRY       ;IF RETRY
026102  032737  000030  002242          BEQ     ELD251          ;IS DATA OR CRC , THEN
026110  001416                  IFG251  BIT     #10,RETRY       ;IF RETRY
026112  032737  000010  002242          BEQ     ELG251          ;IS DATA, THEN
026120  001405                          MOV     DATART,R1       ;SET DATA RT COUNT
026122  013701  002254                  MOV     #MDWTRT,R2      ;SET DATA WRT MSG
026126  012702  026316                  BR      EIB251          ;BR TO END IF 'B'
026132  000445                  ELG251  MOV     CRCERT,R1       ;SET CRC RETRY COUNT
026134  013701  002252                  MOV     #MCWTRT,R2      ;SET CRC WRT MSG
026140  012702  026452                  BR      EIB251          ;BR TO END IF 'B'
026144  000440                  ELD251  MOV     WRTRT,R1        ;SET WRT RT COUNT
026146  013701  002264                  MOV     #MWTRT,R2       ;SET WRT RT MSG
026152  012702  026350                  BR      EIB251          ;BR TO END IF 'B'
026156  000433                  IFE251. BIT     #4,RETRY        ;IF RETRY
026160  032737  000004  002242          BEQ     END251          ;IS READ, THEN
026166  001440                  IFF251  BIT     #30,RETRY       ;IF RETRY
026170  032737  000030  002242          BEQ     ELF251          ;IS DATA OR CRC, THEN
026176  001416                  IFH251  BIT     #10,RETRY       ;IF RETRY
026200  032737  000010  002242          BEQ     ELH251          ;IS DATA, THEN
026206  001405                          MOV     DATART,R1       ;SET DATA RT COUNT
026210  013701  002254                  MOV     #MDRDRT,R2      ;SET DATA READ RT MSG
026214  012702  026375                  BR      EIB251          ;BR TO END IF 'B'
026220  000412                  ELH251  MOV     CRCERT,R1       ;SET CRC RETRY COUNT
026222  013701  002252                  MOV     #MCRDRT,R2      ;SET CRC READ MSG
026226  012702  026503                  BR      EIB251          ;BR TO END IF 'B'
026232  000405                  ELF251: MOV     READRT,R1       ;SET READ RT COUNT
026234  013701  002262                  MOV     #MRDRT,R2       ;SET READ RT MSG
026240  012702  026426                  NOP                     ;
026244  000240                  EIB251: PRINTB  R2,R1           ;PRINT RETRY # & TYPE
026246                                  NOP                     ;
026266  000240                  END251: RTS     PC              ;RETURN
026270  000207                  ;---------------------------------------------------------------
026272                          MSKRT:  .ASCIZ  /%A SEEK RETRY#%D2%N/
026316                          MDWTRT: .ASCIZ  /%A DATA WRITE RETRY#%D2%N/
026350                          MWTRT:  .ASCIZ  /%A WRITE RETRY#%D2%N/
026375                          MDRDRT: .ASCIZ  /%A DATA READ RETRY#%D2%N/
026426                          MRDRT:  .ASCIZ  /%A READ RETRY#%D2%N/
026452                          MCWTRT: .ASCIZ  /%A CRC WRITE RETRY#%D2%N/
026503                          MCRDRT: .ASCIZ  /%A CRC READ RETRY#%D2%N/
026534                                  .EVEN
                                ;MOD 2 5.1 ----- END MODULE -----------------------------------------
```

```
6400                                    SBTTL  MOD 2.6 - SET DRIVES DONE
6401                                    ;------------------------------------------------------------ -----
6402
6403  026534  000240                    STDVDN  NOP                     ;
6404  026536  005737  015660            IFA26   TST     DVDNCK          ;IF DRV DONE CK
6405  026542  001430                            BEQ     END26           ;IS SET, THEN
6406  026544  000240                            NOP                     ;
6407  026546  005037  015660                    CLR     DVDNCK          ;CLEAR DRV DONE CK
6408  026552  032737  000001  002214    IFB26   BIT     #1,UUT          ;IF DRV#1 DONE
6409  026560  001404                            BEQ     ELB26           ;THEN
6410  026562  052737  000002  015650            BIS     #2,BTHDRV       ;SET DRV#1 DONE FLAG
6411  026570  000403                            BR      EIB26           ;BR TO END
6412  026572  052737  000001  015650    ELB26   BIS     #1,BTHDRV       ;SET DRV#0 DONE FLAG
6413  026600  005001                    EIB26.  CLR     R1              ;CLEAR TEMP DRV DONE REG
6414  026602  013703  002214                    MOV     UUT,R3          ;GET UNIT UNDER TEST
6415  026606  000261                            SEC                     ;SET CARRY BIT
6416  026610  006101                    BDA26   ROL     R1              ;MOVE DRV BIT
6417  026612  005303                            DEC     R3              ;DECREMENT UNIT UNDER TEST
6418  026614  005703                            TST     R3              ;DO UNTIL UNIT UNDER TST
6419  026616  002374                    DUA26   BGE     BDA26           ;EQUALS -1
6420  026620  050137  015662                    BIS     R1,DRVDN        ;THEN SET THIS DRV DONE
6421  026624  000207                    END26   RTS     PC              ;RETURN
6422                                    ;MOD 2 6    ----END MODULE----------------------------------------
```

```
                                 SBTTL  MOD 3.0 - OUTPUT EXERCISE COMPLETE
                                ;-------------------------------------------------------------- - -
026626  000240                 OTEXCM: NOP
026630  023737  002212  002210         CMP     SUT,SDD          ;IF ALL SCHEDULED
026636  001003                         BNE     END30            ;DRIVE DONE
026640  012737  000001  010244         MOV     #1,EXCMP         ;SET EXERCISE COMPLETE
026646  000207                 END30   RTS     PC               ;RETURN
                                ;MOD 3 0 ----- END MODULE ------------------------------------- ----- --
```

```
                                        .SBTTL  MOD 4.0 - OUTPUT SYSTEM ERROR
                                        ;-------------------------------------------------------------
026650 000240                   OTSYER. NOP                     ;
026652 013701 002232                    MOV     SYSERR,R1       ;GET SYSTEM ERR
026656 000241                           CLC                     ;CLEAR CARRY BIT
026660 006201                           ASR     R1              ;SHIFT
026662 000241                           CLC                     ;
026664 006201                           ASR     R1              ;       FUNCTION
026666 006201                           ASR     R1              ;            OUT
026670 005002                           CLR     R2              ;CLEAR ERR #  COUNT
026672 000240                   BDA40:  NOP                     ;
026674 032701 000001            IFA40   BIT     #1,R1           ;IF BIT #1
026700 001405                           BEQ     ELA40           ;EQUALS 1, THEN
026702 010204                           MOV     R2,R4           ;SAVE ERROR # COUNT
026704 006304                           ASL     R4              ;DOUBLE ERR # COUNT FOR ADDRESSING
026706 062704 027574                    ADD     #SE1,R4         ;SET ADDR FOR ERR MSG PRINT
026712 000406                           BR      THA40           ;BR TO THEN 'A'
026714 006201                   ELA40   ASR     R1              ;SHIFT ERR TYPE RIGHT
026716 005202                           INC     R2              ;INCREMENT ERROR # COUNT
026720 022702 000017                    CMP     #17,R2          ;DO UNTIL ERR # COUNT
026724 001362                           BNE     BDA40           ;EQUALS 15, THEN
026726 000447                           BR      EIA40           ;BR TO END IF 'A'
026730 010205                   THA40:  MOV     R2,R5           ;GET ERR#
026732 062705 027626                    ADD     #ESCLAS,R5      ;CAL  ERR# CLASSIFICATION ADR
026736 111503                           MOVB    (R5),R3         ;GET ERR# CLASSIFICATION
026740 032703 000002            IFB40   BIT     #2,R3           ;IF DEVICE FATAL
026744 001413                           BEQ     IFC40           ;ERROR, THEN
026746 010205                           MOV     R2,R5           ;GET ERR#
026750 052705 000100                    BIS     #100,R5         ;SET ERR CLASS=SYS
026754 010537 026766                    MOV     R5,DVFER1+2     ;SET ERR#
026760 011437 026770                    MOV     (R4),DVFER1+4   ;SET ERR MSG
026764                          DVFER1: ERRDF   0,0             ;
026772 000415                           BR      EIC40           ;BR TO END IF 'C'
026774 032703 000004            IFC40:  BIT     #4,R3           ;IF SYSTEM FATAL
027000 001412                           BEQ     EIC40           ;ERROR, THEN
027002 010205                           MOV     R2,R5           ;GET ERR#
027004 052705 000200                    BIS     #200,R5         ;SET ERR CLASS=SYS
027010 010537 027022                    MOV     R5,SYFER1+2     ;SET ERR#
027014 011437 027024                    MOV     (R4),SYFER1+4   ;SET ERR MSG
027020                          SYFER1. ERRSF   0,0             ;
027026 000240                   EIC40.  NOP                     ;
027030 013737 002232 030044             MOV     SYSERR,ERRREG   ;SET SYS ERR FOR PRINT OUT
027036 004737 027644                    CALL    PRTERR          ;CALL U P ERR - PRINT ERR INFO
027042 004737 030274                    CALL    XERPRT          ;CALL MOD U PRT B - PRINT ERROR CODE
027046 000240                   EIA40.  NOP                     ;
027050 005037 002232                    CLR     SYSERR          ;CLEAR SYS ERRORS
027054 000207                   END40.  RTS     PC
                                        ;-------------------------------------------------------------
```

```
6483
6484                                    ;-----------------------------------------------------------------------
6485  027056  047040  020117  047504  SYSE4:   .ASCIZ  / NO DONE BIT ON INITIALIZE/
6486  027111     040  047516  042040  SYSE5:   .ASCIZ  / NO DONE BIT ON FUNCTION/
6487  027142  047040  020117  051104  SYSE6:   .ASCIZ  / NO DRIVE READY BIT/
6488  027166  047040  020117  044523  SYSE7:   .ASCIZ  / NO SIDE READY BIT/
6489  027211     040  047516  042040  SYSE8:   .ASCIZ  / NO DONE BIT AFTER READ STATUS/
6490  027250  053440  047522  043516  SYSE9:    ASCIZ  / WRONG DRIVE RESPONDING/
6491  027300  053440  047522  043516  SYSE10:  .ASCIZ  / WRONG SIDE RESPONDING/
6492  027327     040  047125  051525  SYSE11.  .ASCIZ  / UNUSED/
6493  027337     040  047125  051525  SYSE12:  .ASCIZ  / UNUSED/
6494  027347     040  044504  045523  SYSE13:  .ASCIZ  / DISKETTE WRONG DENSITY ERR/
6495  027403     040  042504  051516  SYSE14:  .ASCIZ  / DENSITY ERR/
6496  027420  052040  046511  020105  SYSE15:  .ASCIZ  / TIME OUT ON "TR" OR "DONE" BIT/
6497  027460  052440  041516  040514  SYSE16:  .ASCIZ  / UNCLASSIFIED SYSTEM ERROR/
6498  027513     045  022516  043101  FUNCT.   .ASCIZ  /%N%AFUNCTION CODE: %03/
6499  027541     045  022516  051501  ERRORS   .ASCIZ  /%N%ASYSTEM ERROR REG=%B%N/
6500          027574                          .EVEN
6501  027574  027056                  SE1     .WORD   SYSE4
6502  027576  027111                          .WORD   SYSE5
6503  027600  027142                          .WORD   SYSE6
6504  027602  027166                          .WORD   SYSE7
6505  027604  027211                          WORD    SYSE8
6506  027606  027250                          .WORD   SYSE9
6507  027610  027300                          .WORD   SYSE10
6508  027612  027327                          .WORD   SYSE11
6509  027614  027337                          .WORD   SYSE12
6510  027616  027347                          .WORD   SYSE13
6511  027620  027403                          .WORD   SYSE14
6512  027622  027420                          .WORD   SYSE15
6513  027624  027460                          .WORD   SYSE16
6514                                    ,-----------------------------------------------------------------------
6515                                                    ,ERROR                  - CLASS     -ERR#
6516                                                    ,-----                  -------     -----
6517  027626     004  ESCLAS   BYTE    4               ,NO DONE ON INIT        - SYS FATAL - 128
6518  027627     002           .BYTE   2               ,NO DONE ON FUNCTION    - DEV FATAL -  65
6519  027630     002           .BYTE   2               ,NO DRIVE RDY           - DEV FATAL -  66
6520  027631     002           .BYTE   2               ;NO SIDE RDY            - DEV FATAL -  67
6521  027632     004           .BYTE   4               ,NO DONE AFTER RD STA   - DEV FATAL -  68
6522  027633     004           BYTE    4               ;WRG DRV RESPOND        - SYS FATAL - 133
6523  027634     000           BYTE    0               ,WRG SIDE RESPOND       - SYS FATAL - 134
6524  027635     000           BYTE    0               ,UNUSED                 - 0
6525  027636     002           BYTE    2               ;UNUSED                 - 0
6526  027637     002           BYTE    2               ,DISKETT WRG DEN        - DEV FATAL -  73
6527  027640     004           BYTE    4               ,DENSITY ERR            - DEV FATAL -  74
6528  027641     004           BYTE    4               ,T O  ON "TR" OR "DONE" - SYS FATAL - 139
6529  027642     004           BYTE    4               ,SYS ERR                - SYS FATAL - 140
6530          027644           EVEN
6531                                    ,MOD 4 0 ----- END MODULE ---------------------- ------------------
```

```
                                        SBTTL  MOD U PRT.ERR - PRINT ERRORS
                                        ;-------------------------------------------------------------------
                                        PRTERR: PRINTB  #IDENT1,UNIT,CSRUUT,ESRUUT,WDOT,
027644
027704  005737  002310                  IFAUP:  TST     PRTECD          ;IF ERR CODE FLAG
027710  001452                                  BEQ     ENDUP           ;SET, THEN
027712                                          PRINTX  #XER1,<B,XERUUT>,<B,WC>,<B,CTK0>,<B,CTK1>
027762                                          PRINTX  #XER2,<B,TTRK>,<B,TSEC>,<B,SFTSTS>,<B,BTRK>
030032  005037  002310                          CLR     PRTECD          ;CLEAR ERR CODE FLAG
030036  005037  030044                  ENDUP:  CLR     ERRREG          ;CLEAR ERR REGISTER
030042  000207                                  RTS     PC              ;RETURN
                                        ;-------------------------------------------------------------------
030044  000000                          ERRREG: 0                       ;
                                        ;-------------------------------------------------------------------
030046  040445  052440  044516          IDENT1: .ASCIZ  /%A UNIT#%01%A RXCSR=%0%A RXESR=%0%A CMD=%0%N/
030123     045  020101  051105          XER1:   .ASCIZ  /%A ERCD=%03%A WC=%03%A CTRK0=%D2%A. CTRK1=%D2%A./
030204  040445  052040  051124          XER2:   .ASCIZ  /%A TTRK=%D2%A. TSEC=%D2%A. SFTSTAT=%03%A BTRK=%D2%A %N/
        030274                                  EVEN
                                        ;MOD U.PRT.ERR ----- END MODULE ------------------------------------
```

```
                                    SBTTL  MOD U PRT.EC - PRINT UNIT ERROR CODE
                                    ;-------------------------------------------------------------
030274  105737  002312    XERPRT: TSTB    XERUUT          ;IF ERROR
030300  001425                    BEQ     ENDXER          ;NOT=0, THEN
030302  013701  002312            MOV     XERUUT,R1       ;SAVE EXTENDED ERR CODE IN TEMP #1
030306  042701  177400            BIC     #177400,R1      ;CLR TOP BYTE
030312  006201                    ASR     R1              ;FORMAT E.C.
030314  006201                    ASR     R1              ;FORMAT E.C. FOR ADR
030316  062701  030356            ADD     #ECTAB-2,R1     ;FIND ADR OF ERROR MSG
030322  011137  030356            MOV     (R1),EXMSG      ;SET ADR OF ERROR MSG FOR PRINT
030326  000240                    NOP                     ;
030330                            PRINTX  EXMSG           ;PRINT UNIT CODE ERROR MSG
030350  105037  002312            CLRB    XERUUT          ;CLEAR ERROR CODE
030354  000207            ENDXER: RTS     PC              ;RETURN
                                    ;-------------------------------------------------------------
030356  000000            EXMSG   0                       ;MSG ADR FOR PRINT
                                    ;-------------------------------------------------------------
030360  030432            ECTAB.  .WORD   EC1
030362  030514                    .WORD   EC2
030364  030576                    .WORD   EC3
030366  030633                    .WORD   EC4
030370  030714                    .WORD   EC5
030372  031005                    .WORD   EC6
030374  031044                    .WORD   EC7
030376  031142                    .WORD   EC10
030400  031236                    .WORD   EC11
030402  031326                    .WORD   EC12
030404  031375                    .WORD   EC13
030406  031500                    .WORD   EC14
030410  031602                    .WORD   EC15
030412  031706                    WORD    EC16
030414  031752                    .WORD   EC17
030416  032025                    .WORD   EC20
030420  032104                    .WORD   EC21
030422  032141                    .WORD   EC22
030424  032227                    .WORD   EC23
030426  032264                    .WORD   EC24
030430  032313                    .WORD   EC25
                                ;-------------------------------------------------------------
```

```
6599                                    ;-----------------------------------------------------------------------
6600  030432  040445  020040  037040    EC1:    .ASCIZ  /%A   >DRIVE 0 FAILED TO SEE HOME ON INITIALIZE.%N/
6601  030514  040445  020040  037040    EC2:    .ASCIZ  /%A   >DRIVE 1 FAILED TO SEE HOME ON INITIALIZE.%N/
6602  030576  040445  020040  037040    EC3:    .ASCIZ  /%A   >UNASSIGNED ERR CODE.%N/
6603  030633     045  020101  020040    EC4:    .ASCIZ  /%A   >TRIED TO ACCESS A TRACK GREATER THAN 76.%N/
6604  030714  040445  020040  037040    EC5:    .ASCIZ  /%A   >HOME WAS FOUND BEFORE DESIRED TRACK WAS REACHED.%N/
6605  031005     045  020101  020040    EC6:    .ASCIZ  /%A   >SELF DIAGNOSTIC ERROR.%N/
6606  031044  040445  020040  037040    EC7:    .ASCIZ  /%A   >DESIRED SECTOR NOT FOUND AFTER LOOKING AT 52 HEADERS.%N/
6607  031142  040445  020040  037040    EC10:   .ASCIZ  /%A   >WRITE FUNCTION ATTEMPTED ON A WRITE PROTECTED DISK.%N/
6608  031236  040445  020040  037040    EC11:   .ASCIZ  /%A   >MORE THAN 40 MICROSECONDS AND NO SEPCLOCK SEEN.%N/
6609  031326  040445  020040  037040    EC12:   .ASCIZ  /%A   >A PREAMBLE COULD NOT BE FOUND.%N/
6610  031375     045  020101  020040    EC13:   .ASCIZ  /%A   >PREAMBLE FOUND BUT NO ID MARK FOUND WITHIN ALLOWABLE TIME %N/
6611  031500  040445  020040  037040    EC14:   .ASCIZ  /%A   >CRC ERROR ON WHAT APPEARED TO BE A HEADER.  ERROR NOT SET %N/
6612  031602  040445  020040  037040    EC15:   .ASCIZ  /%A   >TRACK ADDRESS OF GOOD HEADER DOES NOT COMPARE WITH DESIRED %N/
6613  031706  040445  020040  037040    EC16:   .ASCIZ  /%A   >TOO MANY TRIES FOR AN IDAM.%N/
6614  031752  040445  020040  037040    EC17:   .ASCIZ  /%A   >DATA AM NOT FOUND IN ALLOTED TIME.%N/
6615  032025     045  020101  020040    EC20:   .ASCIZ  /%A   >CRC ERROR ON READING SECTOR FROM DISK.%N/
6616  032104  040445  020040  037040    EC21:   .ASCIZ  /%A   >UNASSIGNED ERR CODE.%N/
6617  032141     045  020101  020040    EC22:   .ASCIZ  /%A   >R-W ELECTRONICS FAILED MAINTENANCE MODE TEST %N/
6618  032227     045  020101  020040    EC23:   .ASCIZ  /%A   >WORD COUNT OVERFLOW.%N/
6619  032264  040445  020040  037040    EC24:   .ASCIZ  /%A   >DENSITY ERROR.%N/
6620  032313     045  020101  020040    EC25:   .ASCIZ  /%A   >WRONG KEY WORD FOR SET DENSITY COMMAND %N/
6621                                    ;-----------------------------------------------------------------------
6622          032374                            .EVEN
```

```
                                        .SBTTL  MOD U INTR. 1 - INTERRUPT HANDLER #0
                                        ;-------------------------------------------------------------------
032374  000240                        INTH0   NOP                     ;
032376  013737  002226  032460                MOV     U0ADR,INCSAD    ;SET UNIT #0 ADDRESS
032404  004737  032430                        CALL    SVUTRG          ;CALL MOD U INTR U - SAVE UNIT REG
032410  000002                        RTI                             ;
                                        ;MOD U INTR 1 ----- END MODULE -----------------------------------------------


                                        .SBTTL  MOD U. INTR. 2 - INTERRUPT HANDLER #1
                                        ;-------------------------------------------------------------------
032412  000240                        INTH1   NOP                     ;
032414  013737  002230  032460                MOV     U1ADR,INCSAD    ;SET UNIT #1 ADDRESS
032422  004737  032430                        CALL    SVUTRG          ;CALL MOD U INTR U - SAVE UNIT REG
032426  000002                        RTI                             ;
                                        ;MOD U INTR 2 ----- END MODULE -----------------------------------------------


                                         SBTTL  MOD U. INTR U - SAVE UNIT REG
                                        ;-------------------------------------------------------------------
032430  000240                        SVUTRG: NOP                     ;
032432  012737  000001  021446                MOV     #1,DNFLAG       ;SET DONE FLAG
032440  013701  032460                        MOV     INCSAD,R1       ;SAVE UUT ADDRESS
032444  012137  002236                        MOV     (R1)+,CSRUUT    ;SAVE UUT CSR
032450  011137  002240                        MOV     (R1),ESRUUT     ;SAVE UUT ESR
032454  000240                        NOP                             ;
032456  000207                        RTS     PC                      ;RETURN
                                        ;-------------------------------------------------------------------
032460  000000                        INCSAD  0                       ;INTERRUPTING UNIT CSR ADDRESS
                                        ;MOD U I U ----- END MODULE -----------------------------------------------


                                         EVEN
```

```
 6663                                    TITLE PARAMETER CODING
 6674
 6675                                    SBTTL  HARDWARE PARAMETER CODING SECTION
 6711
 6712                                   ;++
 6713                                   ; THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
 6714                                   ; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES   THE
 6715                                   ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
 6716                                   ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES   THE
 6717                                   ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
 6718                                   ; WITH THE OPERATOR
 6719                                   ;--
 6720
 6721  032462                                   BGNHRD
 6722
 6723  032464                                   GPRMA   MSG1,0,0,0,177777,YES
 6724  032474                                   GPRMA   MSG2,2,0,0,177777,YES
 6725  032504                                   GPRMD   MSG3,4,0,177777,0 ,1 ,YES
 6726  032516                                   GPRMD   MSG4,6,0,177777,0 ,1 ,YES
 6727
 6728  032530                                   EXIT    HRD
 6729
 6735  032532                                   ENDHRD
 6736                                   ;-----------------------------------------------------------------------
 6737  032532  054122  040440  042104  MSG1:    .ASCIZ  /RX ADDRESS/
 6738  032545     126  041505  047524  MSG2:    .ASCIZ  /VECTOR ADDRESS/
 6739  032564  051104  053111  020105  MSG3:    .ASCIZ  /DRIVE #/
 6740  032574  054105  040520  051516  MSG4:    .ASCIZ  /EXPANSION-TYPE <CR>/
 6741                                   ;-----------------------------------------------------------------------
 6742                                            EVEN
 6749
```

```
                        SBTTL  SOFTWARE PARAMETER CODING SECTION

                        ;++
                        ; THE SOFTWARE 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.
                        ;--

032620                          BGNSFT

032622                          GPRML   MSG6,2,1,YES
032630                          XFERF   1$
032632                          GPRML   MSG7,2,2,YES
032640                  1$      GPRMD   MSG8,4,0,177777,0,6,YES
032652                          GPRMD   MSG11,6,0,177777,0,6,YES
032664                          GPRMD   MSG14,10,0,177777,0,6,YES
032676                          GPRML   MSG15,12,1,YES
032704                          GPRML   MSG16,12,2,YES
032712                          GPRML   MSG17,2,100,YES
032720                          XFERF   4$
032722                          GPRML   MSG18,12,4,YES
032730                          GPRML   MSG19,12,10,YES
032736                          GPRML   MSG20,12,20,YES
032744                          GPRML   MSG21,12,40,YES
032752                  4$      GPRML   MSG22,2,200,YES
032760                          XFERF   5$
032762                          GPRMD   MSG23,14,0,177777,0,76,YES
032774                          GPRMD   MSG24,16,0,177777,0,76.,YES
033006                  5$      GPRML   MSG25,2,400,YES
033014                          XFERF   6$
033016                          GPRMD   MSG26,20,0,177777,1,26,YES
033030                          GPRMD   MSG27,22,0,177777,1,26,YES
033042                  6$      GPRML   MSG5,0,177777,YES
033050                          EXIT    SFT


                          EVEN

033052                          ENDSFT
```

```
6802                                    ;-----------------------------------------------------------------------
6803            000015                          CR==15                  ;CARRIAGE RETURN
6804            000012                          LF==12                  ;LINE FEED
6805  033052    052506  052524  042522  MSG5:   .ASCIZ  /FUTURE EXPANSION TYPE <CR> /
6806  033106    042524  052123  051440  MSG6:   .ASCIZ  /TEST SETUP HELP /
6807  033127       105  042530  041522  MSG7:   .ASCII  /EXERCISE OPTIONS/<CR><LF>
6808  033151       040  020040  020060          .ASCII  /   0 = WRITE-READ-DATA CK & READ-DATA CK/<CR><LF>
6809  033223       040  020040  020061           ASCII  /   1 = WRITE ONLY/<CR><LF>
6810  033246    020040  031040  036440          .ASCII  /   2 = WRITE-READ/<CR><LF>
6811  033271       040  020040  020063           ASCII  /   3 = WRITE-READ-DATA CHECK/<CR><LF>
6812  033327       040  020040  020064           ASCII  /   4 = READ-DATA CHECK ONLY/<CR><LF>
6813  033364    020040  032440  036440           ASCII  /   5 = READ ONLY (CRC CHECK)/<CR><LF>
6814  033422    020040  033040  036440           ASCII  /   6 = WRITE-READ-DATA CHECK ON ALTERNATE DRIVES/<CR><LF>
6815  033504    040504  040524  050040           ASCII  /DATA PATTERN OPTIONS/<CR><LF>
6816  033532    020040  030040  036440           ASCII  /   0 = RANDOM/<CR><LF>
6817  033561       040  020040  020061           ASCII  /   1 = ZEROS/<CR><LF>
6818  033567       040  020040  020062           ASCII  /   2 = ONES/<CR><LF>
6819  033604    020040  031440  036440          .ASCII  /   3 = FLOATING ZERO/<CR><LF>
6820  033632    020040  032040  036440          .ASCII  /   4 = FLOATING ONE/<CR><LF>
6821  033657       040  020040  020065           ASCII  /   5 = 125/<CR><LF>
6822  033673       040  020040  020066           ASCII  /   6 = 333/<CR><LF>
6823  033707       124  040522  045503          .ASCII  /TRACK SEQUENCE OPTIONS/<CR><LF>
6824  033737       040  020040  020060           ASCII  /   0 = RANDOM/<CR><LF>
6825  033756    020040  030440  036440          .ASCII  /   1 = INCREMENT 0. D /<CR><LF>
6826  034005       040  020040  020062          .ASCII  /   2 = DECREMENT 1. D. /<CR><LF>
6827  034034    020040  031440  036440          .ASCII  /   3 = INCREMENT 0. D. -DECREMENT 1 D /<CR><LF>
6828  034102    020040  032040  036440          .ASCII  /   4 = BOUNCE BETWEEN 1. D.  & 0 D /<CR><LF>
6829  034145       040  020040  020065          .ASCII  /   5 = BOUNCE BETWEEN INCR  0 D  & DECR.  1 D /<CR><LF>
6830  034224    020040  033040  036440          .ASCII  /   6 = BOUNCE BETWEEN 0. D.  & DECR  1 D /<CR><LF>
6831  034275       011  027117  027104          .ASCII  /       0. D.  = OUTSIDE DIA  & 1 D  = INSIDE DIA /<CR><LF>
6832  034350    054524  042520  021040          .ASCIZ  /TYPE "CR" TO CONTINUE/
6833  034376    054105  051105  044503  MSG8:   .ASCIZ  /EXERCISE # (0-6)/
6834  034417       104  052101  020101  MSG11:  .ASCIZ  /DATA PATTERN # (0-6)/
6835  034444    051124  041501  020113  MSG14:  .ASCIZ  /TRACK SEQUENCE # (0-6)/
6836  034473       111  020123  042524  MSG15:  .ASCIZ  /IS TEST TO RUN IN DOUBLE DENSITY /
6837  034535       111  020123  042524  MSG16:  .ASCIZ  /IS TEST TO RUN IN DELETED DATA MODE /
6838  034602    047101  020131  051120  MSG17:  .ASCIZ  /ANY PROGRAM CONTROL FLAGS /
6839  034635       040  020040  042522  MSG18:  .ASCIZ  /   RETRY ON ERROR, LOG SOFT & HARD ERRORS /
6840  034710    020040  061040  041505  MSG19:  .ASCIZ  /   RECALIBRATE ON SEEK ERRORS /
6841  034747       040  020040  061120  MSG20:  .ASCIZ  /   PRINT ONLY 10 DATA ERRORS & CONTINUE /
6842  035020    020040  041440  042514  MSG21:  .ASCIZ  /   CLEAR STATISTICAL TABLES BEFORE NEXT PASS /
6843  035076    047515  044504  054506  MSG22:  .ASCIZ  /MODIFY TRACK ADDRESS LIMITS /
6844  035133       040  020040  052517  MSG23:  .ASCIZ  /   OUTER DIAMETER ADR # /
6845  035164    020040  044440  047116  MSG24:  .ASCIZ  /   INNER DIAMETER ADR # /
6846  035215       115  042117  043111  MSG25:  .ASCIZ  /MODIFY SECTOR ADDRESS LIMITS /
6847  035253       040  020040  044515  MSG26:  .ASCIZ  /   MIN  SECTOR ADR # /
6848  035301       040  020040  040515  MSG27:  .ASCIZ  /   MAX  SECTOR ADR # /
6849                                    ;-----------------------------------------------------------------------
6850            035330                          EVEN
```

```
                                ;------------------------------------------------------------------------
       035330  000232           TRKTBL: .REPT   154             ;TRACK TABLE
                                        .BYTE   000
                                        .ENDM
       035562  000400           DATPAT   REPT   256             ;DATA PATTERN
                                         BYTE   000
                                         ENDM
       036162  000400           DATBUF  .REPT   256             ,DATA BUFFER
                                         BYTE   000
                                         ENDM

                                ,-------------     -----------------------------------------------------
       036562  000000           PATCH   0                       ,PATCH AREA
               037164            = +400
                                ,------------------------------------------------------------------------




       037164                           LASTAD
  (3)  037164                   L$LAST
       037164                           ENDMOD
```

```
 6879                                   .SBTTL  DIAGNOSTIC SUPERVISOR -- LOW CORE SET UP
17750  067760  000000                    .WORD   0               ;SPACE FOR USER POOL POINTER
17751  067762  000000                    .WORD   0               ;SIZE
17752  067764  000000                     WORD   0               ;CHECKSUM (NOT CURRENTLY USED)
17753  067766  000000                     WORD   0               ;SIZE OF H.W  PTAB  ALLOCATION
17754          067772                   END SUPV= +2
17755          000200                    END 200
```

```
ABOFLA  037510 G    6978#   8356    8397    8398*   8406    8449    8744*  10782   11923*  12190*  12315*  13364*  13935*
ABOPAS  037426 G    6961#   8350    8745*  11847*  11922*
ABORT   002206      3314#   3951*   4231*   4242    4254    4393*
ABO.FM  041770      8387    8460#
ADRS    021242      5543*   5556*   5564*   5575*   5580*   5585*   5596*   5603#   5625*
ADVTRK  015656      4940*   4961*   4964    4973*   4995#
AFSI    037216 G    6934#
ALLOC   060130      9828   11706   15070#
APT ER  041120      8166#  12198   12313
ASSEMB= 000010      3018
ASAAV   043766      8834    9036#
ASAAW   044002      8845    9037#
ASAAX   044014      8935    9038#
ASAAY   044022      8946    9040#
ASAAZ   044036      8964    9042#
ASABA   044046      8972    9044#
BAU234  021342      5635#   5645
BDAU23  021466      5666#   5672
BDA00   010152      4249#   4263
BDA121  011124      4405#   4449
BDA133  015076      4888#   4890
BDA241  021740      5727#   5756
BDA25   025124      6241#   6252
BDA26   026610      6416#   6419
BDAA0   026672      6443#   6453
BDBU23  021472      5667#   5670
BDB00   010042      4230#   4265
BDB20   015226      4916    4921#   4983
BDB241  022260      5768#   5771
BDVSCD  015652      4907*   4958    4960*   4993#   5425*   5427*
BF243   023640      5967    5969#   5989
BGN.SU= 037164      6883#   6918
BINMSG  056440     13223   13619#
BIT0  = 000001 G    3213#   3244#
BIT00 = 000001 G    3213#   3233#   3244
BIT01 = 000002 G    3213#   3232#   3243
BIT02 = 000004 G    3213#   3231#   3242    5022    5253    6109    6151
BIT03 = 000010 G    3213#   3230#   3241    5258    6092
BIT04 = 000020 G    3213#   3229#   3240    6105    6108
BIT05 = 000040 G    3213#   3239
BIT06 = 000100 G    3213#   3227#   3238
BIT07 = 000200 G    3213#   3226#   3237
BIT08 = 000400 G    3213#   3225#   3236
BIT09 = 001000 G    3213#   3224#   3235
BIT1  = 000002 G    3213#   3243#   6106
BIT10 = 002000 G    3213#   3223#
BIT11 = 004000 G    3213#   3222#
BIT12 = 010000 G    3213#   3221#   5640    6103    6129
BIT13 = 020000 G    3213#   3220#   5648    6090
BIT14 = 040000 G    3213#   3219#   5650
BIT15 = 000040 G    3213#   3218#   3228#
BIT2  = 000004 G    3213#   3242#
BIT3  = 000010 G    3213#   3241#
BIT4  = 000020 G    3213#   3240#   4496
BIT5  = 000040 G    3213#   3239#
BIT6  = 000100 G    3213#   3238#
```

```
BIT7   = 000200 G    3213#  3237#
BIT8   = 000400 G    3213#  3236#  4486
BIT9   = 001000 G    3213#  3235#  4501
BK243    024066      6017#  6020
BLD.MM   044652      7832   9802#
BLOCK    062264     16163  16172#
BRONPT   013666      4613*  4621*  4627#
BRONTK   014332      4747*  4754*  4755#  4866
BTHDRV   015650      4906*  4931   4933   4934*  4948*  4992#  6410*  6412*
BTRK     002321      3399#  6541
BUFERL   004452      3882#
BYTCNT   022274      5726*  5754*  5755   5775#
BYTNUM   022276      5724*  5729   5730   5736   5738   5751   5753*  5776#
BSARB    046254     10358  10360#
BSARF    046166     10251  10266#
CALLPC=  000022     17140# 17367* 17396
CALLPS=  000024     17141# 17375* 17395
CALLSP=  000026     17142# 17370* 17394
CALLTC=  000030     17143# 17368* 17376
CAL.CL   064652     17135# 17159* 17178  17185  17193  17212  17220
CAL.TI   064710 G    8100  17158#
CHKLUP   046270    10719# 11546  11555  11571  11613  12222
CHKSTR   060472    15432# 15809  15893  16032
CHKTTY   056560     8448  10781  13929#
CHK.MA   044430     7362   8373   8876   8903   8931   8943   9536#  11788  11873
CHK.PC   051560    11591  11611* 11942#
CHK.SW   040620     7714#  7772   8825
CHRCNT   060012    13777* 14382* 14818#
CH.FLA   044136     8752   8758*  8759   8840*  9059#
CH.PAS   044154     8747   9068#
CKDVAV   011102     4356*  4380*  4401#
CKSML    004442     3714   3881#  4886   6073
CKSMRT   002246     3330#
CLASWD   024140     5975*  6034#  6070   6119   6125
CLEAR.   045552     9987#  10087  10142  10238  10332
CLKACC   037424 G   6960#  11849  17315* 17340*
CLKBFR   064654    17136# 17323* 17338* 17341*
CLKCNT   037422 G   6959#  9403*  17323  17341
CLKJUM   065260 G   8093   17224  17235#
CLKRES   066262 G   8791   11756  17221  17300#
CLKSER   066416 G  11745   17337#
CLKSON   037462 G   6975#  8786   8788*  11734  11743*  11754*  17737
CLK.SE   044232     9387#  11747  17188
CLRSTA   015064     4590*  4885#
CLR.MA   044506     8914   8917   9588#  11857  11880  11905
CNSCLC   017512     5246*  5247   5287   5289*  5294   5300   5319#
CNTKLC   017514     5242*  5243   5283*  5293   5299   5320#
CNVT     062730    13578  16627# 17045
COMMAN   037234 G   6941#  7546   7549*  8168*  8170   11484  11486*  12183  12185
COMMTA   062644    16029  16326#
CONTCL   066342 G  11738  17316#  17741
CONTRL   010040     4229#
CR     = 000015 G   6803#  6807   6808   6809   6810   6811   6812   6813   6814   6815   6816   6817   6818
                    6819   6820   6821   6822   6823   6824   6825   6826   6827   6828   6829   6830   6831
CRC      004522     3887#
CRCBAD   004532     3888#
```

```
CRCBRT  002250          3331#
CRCERT  002252          3332#   6364    6379
CRLF    056642          13164   13356   13469   14010#  14080   14599   14604   14610   14616
CSADR   021252          5265*   5301*   5538    5543    5607#   5619    5622    5638    5646
CSEC    017472          5231    5244    5310#
CSRADR  021552          4334*   4344*   4372*   4420*   4503*   4511*   5619*   5667    5674    5675*   5676    5682#   5799*
                        5821*   5902*
CSREV   023416          5792*   5795    5839    5843    5894    5915#
CSRUUT  002236          3326#   4237*   5674*   5792    6537    6650*
CTK0    002314          3394#   6540
CTK1    002315          3395#   6540
CTRK    017502          5225    5240    5314#
CURR.S  037172 G        6926#   11553*
CURR.T  037174 G        6927#   8363    8408*   8828    10240*  10252
CURSEC  020106          5247*   5287*   5289    5350*   5362*   5414#
CURTRK  020442          5243*   5283    5444*   5457*   5464    5466*   5467    5469    5477*   5482*   5492#
CVSTUT  002532          3628#   4914*
CVUNIT  002526          3605    3607    3613    3621#   4144*
CVUTST  002426          3603#   4145*
C$AAD   051532          11596   11936#
C$AAE   051544          11937#
C$AAK   052542          12209   12247#
C$AAL   052706          12359#
C$ABRT= 000021          3018#
C$ADR = 000020          3018#   6264    6271    6464    6472
C$AU  = 000054          3018#   4217
C$BRK = 000022          3018#
C$BSEG= 000004          3018#   4249    4921
C$BSUB= 000002          3018#
C$BUFF= 000030          3018#
C$CEFG= 000046          3018#
C$CLEA= 000012          3018#   4120
C$CLP1= 000006          3018#   4259
C$CVEC= 000036          3018#
C$DCLN= 000044          3018#   3952    4257
C$DODU= 000053          3018#   4564
C$DRPT= 000024          3018#   4266
C$DU  = 000055          3018#   4182
C$EDIT= 000002          3018#   3061
C$ERDF= 000002          3018#   6464
C$ERHR= 000003          3018#   6271
C$ERSF= 000001          3018#   6472
C$ERSO= 000004          3018#   6264
C$ESCA= 000010          3018#
C$ESEG= 000005          3018#   4260    4982
C$ESUB= 000003          3018#
C$ETST= 000001          3018#   4268
C$EXIT= 000032          3018#   3969    4104
C$GMAN= 000043          3018#   4489
C$GPHR= 000042          3018#   3946
C$GPRI= 000040          3018#
C$GTIM= 000052          3018#
C$INIT= 000011          3018#   3989
C$INLP= 000020          3018#   5017    5248
C$KWOF= 000035          3018#
C$KWON= 000034          3018#
```

```
C$LOOP= 000100          3018#
C$MAN1= 000051          3018#   4487
C$MSG = 000023          3018#   3493
C$PNTB= 000014          3018#   4142    4151    4392    4539    5750    5751    6385    6537
C$PNTF= 000017          3018#   3950    4069    4071
C$PNTS= 000016          3018#   3807    3820
C$PNTX= 000015          3018#   6540    6541    6568
C$POIN= 000040          3018#
C$Q10 = 000377          3018#
C$RDBU= 000007          3018#
C$REFG= 000050          3018#   3929    3935
C$REQT= 000045          3018#
C$RESE= 000033          3018#   4332
C$REV1= 000002          3018#   3061
C$RPT = 000025          3018#   3744
C$SEFG= 000047          3018#
C$SPR1= 000041          3018#   5633    5651
C$SVEC= 000037          3018#   3953    3957
C$TPR1= 000013          3018#
C$UNBU= 000031          3018#
C$WTM = 000026          3018#
C$WTU = 000027          3018#
DAERCT  022300          5709*   5733*   5741    5777#
DARDRT  002256          3334#
DATA    004562          3891#
DATART  002254          3333#   6361    6376
DATASB  022302          5745*   5751    5778#
DATAWS  022304          5746*   5751    5779#
DATA0   013724          4628    4638#
DATA1   013742          4629    4646#
DATBUF  036162          5562    5716    5728    5766    6859#
DATBYT  014152          4638*   4646*   4652*   4664*   4669*   4674*   4678*   4683*   4689*   4701    4702    4713#
DATPAT  035562          4622    4625    5292    5560    5715    5727    6856#
DAWTRT  002260          3335#
DBADR   021250          5540*   5556    5564    5575    5580    5585    5596    5606#
DDERCT  002266          3338#
DECMSG  056454          13233   13621#
DELAY   021450          4335*   4345*   4373*   4422*   4505*   4514*   5621    5662#   5801*   5823*   5904*
DELDAT  002224          3321#   4312*   4314*   4950    4952*   4954*   5512    5877
DEN     002222          3320#   4318*   4320*   5525    5819    5889    5898
DEVDAT  002204  G       3310#
DEV.CO  037176  G       6928#   11783*
DFPTBL  002140  G       3099#
DIAGMC= 000000          3018
DIAG.T  037516  G       6983#   7773*   7775*   8033*   8343*   8382    8414    8416*   8417    8418*   8426    8435    8765*
                        8832    8923    9859*   9989*   9990*   9991*   9998*   10003*  10089*  10090*  10137*  10141*  10241*
                        10245*  10246*  10247*  10255*  10256*  10333*  10334*  10722   10724*  10725*  10726   10728   10730
                        10732   10734   10736*  10737   11542   11543   11544   11550*  11551   11558*  11559*  11562*  11569
                        11582*  11584*  11585*  11586   11587*  11589   11592   11602   11623   11625   11636*  11659   11661
                        11671*  11674   11728*  11729*  11782*  11794   11900*  11906*  11908*  11909   11919   12130*  12161
                        12162   12202*  12203*  12204   12211   12213*  12214*  12215*  12223*  12224*  17362*  17363*  17368*
                        17376   17380   17382   17391*  17392*
DLDTER  004572          3892#
DLY     021444          5635    5655#
DMSG1   022310          5750    5782#
DMSG2   022405          5751    5783#
```

```
DNBIT = 000040 G        3286#  4333   4336   4343   4346   4368   4371   4374   4421   4512   5541   5638   5646
                        5800   5822
DNFLAG  021446          5632*  5636   5656#  6648*
DPDVD   067126 G       12752  16677  17440  17521#  17642
DPMUL   067014 G       12650  17415  17460#
DRIVEN  011424          4415*  4418*  4458#
DRVDN   015662          4909*  4933*  4944   4955*  4997#  6420*
DRVFN   017526          5264   5298   5325#  5527*
DRVTST  017520          49<<*  4968   5270   5290   5296   5322#
DUA00   010216          4?..#
DUA121  011376          4447#
DUA26   026616          6419#
DUB00   010224          4264#
DUB20   015606          4980#
DUC20   015212          4918#
DUMSG1  007710          4151   4164#
DUMSG2  007751          4142   4165#
DUNIT.  037432 G        6963#  7838*  7848   8410   8810*  8815*  8888   8915   8968   11784  11901
DVC.FT  052512         12238#  12245
DVDNCK  015660          4908*  4996#  5035*  5041*  6404   6407*
DVFER1  026764          6462*  6463*  6464#
DVTST   020610          5262*  5295*  5296*  5504   5531#
DX      021442          5634   5654#
DSARG   053416         12637  12676#
DSARH   053434         12662  12678#
DSARI   056202         13359  13525#
DSARJ   056206         13408  13526#
DSARK   056224         13457  13528#
DSARL   056242         13463  13529#
DSARM   056252         13476  13530#
EA243   023602          5959   5963#
EA2431  024250          6077   6080#
EA2433  024546          6136   6139#
EB24U1  024656          6158   6165#
EB243   023724          5971   5985    5987#
EB2433  024516          6132   6134#
ECCLAS  025030          6185   6208#
ECLOG   004672          3725   3900#   5995
ECTAB   030360          6565   6576#
EC1     030432          6576   6600#
EC10    031142          6583   6607#
EC11    031236          6584   6608#
EC12    031326          6585   6609#
EC13    031375          6586   6610#
EC14    031500          6587   6611#
EC15    031602          6588   6612#
EC16    031706          6589   6613#
EC17    031752          6590   6614#
EC2     030514          6577   6601#
EC20    032025          6591   6615#
EC21    032104          6592   6616#
EC22    032141          6593   6617#
EC23    032227          6594   6618#
EC24    032264          6595   6619#
EC2432  024416          6107   6110#
EC25    032313          6596   6620#
```

```
EC3     030576            6578    6602#
EC4     030633            6579    6603#
EC5     030714            6580    6604#
EC6     031005            6581    6605#
EC7     031044            6582    6606#
ED8241  022266            5771#
EDC20   015622            4920    4984#
ED1211  012050            4521    4523    4525    4527    4529#
ED2341  021322            5623    5626#
EF.COM= 000036 G          3213#   3251#   3929
EF.NEW= 000035 G          3213#   3252#
EF.PWR= 000034 G          3213#   3253#
EF.RES= 000037 G          3213#   3250#   3935
EF.STA= 000040 G          3213#   3249#
EF01  = 000001 G          3213#   3270#
EF02  = 000002 G          3213#   3269#
EF03  = 000003 G          3213#   3268#
EF04  = 000004 G          3213#   3267#
EF05  = 000005 G          3213#   3266#
EF06  = 000006 G          3213#   3265#
EF07  = 000007 G          3213#   3264#
EF08  = 000010 G          3213#   3263#
EF09  = 000011 G          3213#   3262#
EF10  = 000012 G          3213#   3261#
EF11  = 000013 G          3213#   3260#
EF12  = 000014 G          3213#   3259#
EF13  = 000015 G          3213#   3258#
EF14  = 000016 G          3213#   3257#
EF15  = 000017 G          3213#   3256#
EF16  = 000020 G          3213#   3255#
EG1211  011662            4498    4500    4502#
EIA11   007002            4001    4005    4015#
EIA11   010342            4305    4307#
EIA12   010624            4341    4351    4358#
EIA121  011362            4407    4440    4442    4444#
EIA23   016762            5218    5220#
EIA24   021616            5695    5697#
EIA25   025334            6253    6282#
EIA40   027046            6454    6477#
EIB11   010404            4313    4315#
EIB121  011214            4416    4419#
EIB20   015570            4957    4963    4975#
EIB23   017060            5230    5240#
EIB234  021230            5582    5588    5593    5598#
EIB261  026246            6354    6363    6366    6369    6378    6381    6385#
EIB26   026600            6411    6413#
EIC11   006774            4010    4014#
EIC11   010432            4319    4321#
EIC121  011336            4426    4430    4438#
EIC20   015320            4930    4935#
EIC25   025266            6265    6267    6273#
EIC40   027026            6466    6467    6473#
EID23   017234            5261    5268#
EID232  020362            5473    5477#
EID233  020570            5523    5525#
EIE12   011034            4385    4389#
```

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EIE21    016354         5089     5091#
EIE22    016666         5182     5192     5195#
EIE23    017336         5285     5287#
EIF11    007246         4026     4029     4035     4038     4049     4052     4057     4060#
EIF20    015366         4939     4944#
EIF21    016330         5019     5028     5042     5045     5049     5051     5056     5059     5064     5080     5083     5085#
EIF241   022166         5744     5752#
EIH20    015444         4953     4955#
EIH232   020212         5437     5445#
EIH234   021126         5566     5582#
EI121    016324         5070     5076     5084#
EI1231   017564         5336     5342#
EIJ23    017402         5250     5269     5291     5295#
EIK234   020772         5561     5563#
EIM20    015604         4977     4979#
EIM241   022126         5748     5751#
EI243    024114         6014     6023     6025#
ELA10    010272         4282     4284#
ELA11    010334         4303     4306#
ELA12    010512         4337     4342#
ELA20    015206         4913     4917#
ELA231   017656         5349     5362#
ELA234   020672         5547     5549#
ELA241   021724         5720     5722     5724#
ELA25    025146         6243     6248#
ELA40    026714         6445     6450#
ELB11    010400         4311     4314#
ELB12    010572         4347     4352#
ELB121   011202         4413     4417#
ELB20    015510         4926     4964#
ELB22    016560         5175     5178#
ELB231   020016         5367     5392#
ELB232   020406         5468     5480     5482#
ELB234   021014         5551     5567#
ELB241   022170         5732     5753#
ELB25    025240         6261     6268#
ELB26    026672         6409     6412#
ELC11    010426         4317     4320#
ELC22    016606         5180     5183#
ELC231   020014         5373     5391#
ELC233   020642         5516     5519#
ELC234   021160         5569     5589#
ELC242   022534         5803     5806#
ELC244   025020         6192     6203#
ELD11    007322         4012     4071#
ELD00    010206         4252     4255     4259#
ELD21    016060         5037     5039     5043#
ELD22    016630         5185     5188#
ELD231   020004         5378     5389#
ELD233   020664         5521     5524#
ELD234   021130         5571     5583#
ELD25    025330         6279     6281#
ELD251   026146         6358     6367#
ELE12    011014         4369     4386#
ELE22    016656         5190     5193#
ELE23    017332         5278     5280     5286#
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ELE234  021202            5591    5594#
ELE244  025010            6198    6201#
ELF12   010772            4375    4382#
ELF20   015346            4938    4940#
ELF231  017776            5380    5386#
ELF232  020300            5460    5463#
ELF251  026234            6373    6382#
ELG11   007044            4023    4027#
ELG12   011076            4391    4394#
ELG21   016144            5053    5057#
ELG251  026134            6360    6364#
ELH11   007110            4032    4036#
ELH12   010642            4359    4362#
ELH20   015436            4951    4954#
ELH231  017646            5354    5359#
ELH234  021036            5553    5572#
ELH251  026222            6375    6379#
ELI11   007300            4041    4069#
ELJ21   016272            5072    5077#
ELK11   007170            4046    4050#
ELK20   015156            4903    4911#
ELK234  020764            5559    5562#
ELL11   007232            4054    4058#
ELL20   015502            4959    4962#
ELM242  023076            5860    5863#
ELN21   016112            5047    5050#
ELT242  023402            5906    5909#
EMT.TR  037514 G          6980#   7776#   9993    9994    11637#
ENDCVT  002524            3610    3612    3616    3619#
END11   007350            4068    4070    4073#
ENDLD   014146            4705    4710#
ENDRPT  003036            3743#
ENDST   006326            3903#   4887
ENDTKS  015040            4745    4863    4867#
ENDUP   030036            6539    6543#
ENDXER  030354            6560    6570#
END.OF  045540            9850    9943#
END.SU= 067772            8042#   8107    17754#
END00   010236            4258    4267#
END121  011410            4448    4450#
END13   013600            4588    4592#
END131  014106            4641    4659    4677    4692    4695#
END133  015106            4892#
END20   016636            4949    4981    4986#
END22   016710            5200#
END231  020036            5385    5388    5390    5391    5396#
END232  020414            5463    5478    5483#
END233  020606            5529#
END234  021234            5549    5599#
END241  022242            5758    5760    5762    5764#
END242  023406            5805    5809    5827    5895    5908    5910#
END243  024122            6026#
END244  026024            6182    6190    6196    6200    6202    6204#
END251  026270            6349    6371    6387#
END26   026624            6405    6421#
END30   026646            6428    6430#
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END40   027054          6479#
ENVIRO  037236 G        6942#   7544    7550*   7552    7554*   7770    7828    8006    8090    8795    8823    8978    8980
                        12177   12189*  12309
EOP.CH  066440 G        8079    8756    8986    17348#
EOP.FM  042004          8433    8462#
EOP.IN  044150          7651*   7655*   8424    8427    9064#
ERRFOR  052764          12157   12381#
ERRHAN  051564          6899    12116#
ERRORS  027541          6499#
ERRREG  030044          6237*   6273*   6474*   6543*   6546#
ERRSAV  024130          6010    6025*   6030#
ERRTYP  002234          3325#   4236*   4976    5640*   5648*   5723*   5734*   5735*   5759    5763*   5830*   5841*   5849*
                        5855*   5861*   5863*   5866*   5867*   5881*   5885*   5963    5964    5999    6025    6092    6195*
                        6199*   6201*   6203*   6237    6239    6273    6275    6276*
ERR.MR  052522          12240#  12245
ERR.MU  037166 G        6924#   8167*
ERR.SF  052526          12242#  12246
ERR1FO  053050          12167   12386#
ERSTAT  021244          5592*   5604#
ERSVCT  024132          6012*   6013    6021*   6024*   6031#
ERTSAV  015670          4910*   5000#   5721    5761    5765*   6275*
ERT1    025340          6287#   6304
ERT10   025533          6296#   6313
ERT11   025565          6297#   6314
ERT12   025577          6298#   6315
ERT13   025612          6299#   6316
ERT14   025651          6300#   6317
ERT15   025710          6301#   6318
ERT16   025743          6302#   6319
ERT2    025352          6288#   6305
ERT3    025363          6289#   6306
ERT4    025377          6290#   6307
ERT5    025411          6291#   6308
ERT6    025425          6292#   6309
ERT7    025457          6293#   6310
ERT8    025506          6294#   6311
ERT9    025522          6295#   6312
ESCLAS  027626          6456    6517#
ESC.PC  051556          11627   11630*  11941#
ESREV   023420          5793*   5837    5864    5868    5879    5883    5886    5891    5916#
ESRUUT  002240          3327#   4238*   5676*   5793    5935    5945    6537    6651*
ETCLAS  026020          6256    6323#
ETSAV   024126          5958    5961*   5963*   6029#
ETTAB   024150          5974    6043#
ET1     026760          6246    6304#
EVCMD   023412          5815*   5817*   5818*   5819*   5820    5897*   5898*   5899    5913#
EVDATA  021636          5696*   5709#
EVDWRE  023422          5810*   5924#
EVDVST  022432          5691*   5791#
EVTSTR  021654          4969*   5689#
EVUTEC  024702          5693*   6179#
EV.COU  037170 G        6925#   11487*  12123*
EXADR   016362          5013*   5086    5095#
EXADTB  016372          5011    5100#
EXCMP   010244          4230*   4262    4271#   6429*
EXMCP   015646          4905*   4941    4943*   4956*   4991#
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EXMSG   030356          6566#   6568    6573#
EXN     015642          4922#   4989#   5009
EX1     016412          5101    5112#
EX2     016422          5102    5116#
EX3     016436          5103    5122#
EX4     016452          5104    5128#
EX5     016462          5105    5132#
EX6     016472          5106    5136#
EX7     016506          5100    5107    5142#
FCKMSG  013377          4489    4560#
FILL    057310          14019   14170   14251   14259   14372#
FILL.C  000204 G        6906#   14374
FIN     006524          3930    3945    3953#
FIRST   010310          4287#   4290#   4585
FLAGS   037230 G        6939#   7641#   7642    7645#   8858    8861#   8863#   8960    8966#   10248   10720   11605   11646
                        11649   11654   11663   11669   11813   11883   11898   12118   12151   12207   17082
FLAGS1  037232 G        6940#   7998    8446    10779
FLAGTA  062462          15889   16265   16312#
FLAG.I  044216          7641    9078#
FLA.SE  062430          16259   16283#
FLG.MA  044156          7639    9070#
FLOATO  013752          4630    4652#
FLOAT1  014020          4631    4669#
FNEW4   025026          5692#   6193    6197    6206#
FORMCK  011440          4464#   4489    4490    4492#
FORM.T  053060          12156#  12157#  12158#  12159#  12160#  12161#  12162#  12163#  12164   12166#  12167#  12168#  12170
                        12301#  12302#  12303#  12304#  12305#  12306#  12307   12392#
FREE    060366          11725   15202#
FUNCT   027513          6498#
FUNEV   023414          5689#   5806    5914#
FSAU  = 000015          3018#   4193    4217
FSBGN = 000040          3018#   3044    3144    3206    3466    3645    3698    3706    3927    3969    4095    4104    4130
                        4159    4193    4201    4225    4249    4268    4921    6721    6728    6763    6788    6877
FSCLEA= 000007          3018#   4095    4120
FSDU  = 000016          3018#   4130    4182
FSEND = 000041          3018#   3044    3144    3206    3493    3645    3698    3744    3969    3989    4104    4120    4159
                        4182    4201    4217    4225    4260    4268    4982    6728    6735    6788    6799    6877
FSHARD= 000004          3018#   6721    6728    6735    6766    6774    6780    6784    6788
FSHW  = 000013          3018#   3099    3112
FSINIT= 000006          3018#   3927    3989
FSJMP = 000050          3018#   3969    4104    4159    4201    6728    6788
FSMOD = 000000          3018#   3044    3144    3206    3645    3698    6877
FSMSG = 000011          3018#   3466    3493
FSPWR = 000017          3018#
FSRPT = 000012          3018#   3706    3744
FSSEG = 000003          3018#   4249    4260    4921    4982
FSSOFT= 000005          3018#   6763    6766    6774    6780    6784    6788    6799
FSSRV = 000010          3018#
FSSUB = 000002          3018#
FSSW  = 000014          3018#   3122    3142
FSTEST= 000001          3018#   4225    4268
GARBAG  060014          14941#  15088
GETCHR  056520          13843#  13932   14582
GETCMN  062104          16027#  16159
GETPAR  053576          7723    7730    8068    8952    9811    9919    11843   13160#
GETSEC  017530          5288#   5332#
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GETSWI  061100          15799#  16170
GETTRK  020142           5282*   5434#
GETTST  015672           4923*   5008#
GET.TW  060650          15571#  15855   15875
GTDRV   016526           4962*   5171#
GTDVFN  020456           5263*   5297*   5503#
GTEX    013474           4285    4574#
GTEXCD  010312           4279    4301#
GTSYEX  010246           4241*   4278#
GTSYS   010436           4283    4332#
GTTK    014266           4743    4746#
G$EXCP= 000400           3018#
G$HILI= 000002           3018#
G$LOLI= 000001           3018#
G$NO  = 000000           3018#
G$OFFS= 000400           3018#   4489    6723    6724    6725    6726    6765    6767    6768    6769    6770    6771    6772
                         6773    6775    6776    6777    6778    6779    6781    6782    6783    6785    6786    6787
G$OFSI= 000376           3018#   4489    6723    6724    6725    6726    6765    6767    6768    6769    6770    6771    6772
                         6773    6775    6776    6777    6778    6779    6781    6782    6783    6785    6786    6787
G$PRMA= 000001           3018#   6723    6724
G$PRMD= 000002           3018#   6725    6726    6768    6769    6770    6781    6782    6785    6786
G$PRML= 000000           3018#   4489    6765    6767    6771    6772    6773    6775    6776    6777    6778    6779    6783
                         6787
G$RADA= 000140           3018#
G$RADB= 000000           3018#
G$RADD= 000040           3018#   6781    6782    6785    6786
G$RADF= 000200           3018#
G$RADL= 000120           3018#   4489    6765    6767    6771    6772    6773    6775    6776    6777    6778    6779    6783
                         6787
G$RADO= 000020           3018#   6723    6724    6725    6726    6768    6769    6770
G$RADT= 000100           3018#
G$XFER= 000004           3018#   6728    6766    6774    6780    6784    6788
G$YES = 000010           3018#   4489    6723    6724    6725    6726    6765    6767    6768    6769    6770    6771    6772
                         6773    6775    6776    6777    6778    6779    6781    6782    6783    6785    6786    6787
HARDER  002306           3346#   6157*   6164*   6260    6272*   6278    6281*
HCORED  043726           6933    8065    9027#
HCOREQ  043636           6932    8064    9016#
HCORET  037452 G         6970#   8014*   8055*   8066    8080    8082    8087    8101    8103    8104    8108    8789    8962
                        11619   11736   11740   11751   17739
HCRC    004612           3894#
HCRCBD  004622           3895#
HC.ADR  037222 G         6936#   8013
HC.DEF  037214 G         6933#
HC.DIA  037212 G         6932#
HDATA   004652           3898#
HDD     004662           3899#
HDTE1   025254           6269*   6270*   6271#
HELP  = 000000           2998#   3005    3009    3035    3053    3063    3083    3106    3135    3149#   3196    3287    3401
                         3409    3430    3440    3448    3468    3478    3484    3506    3513    3519    3526    3532    3539
                         3548    3556    3563    3570    3651#   3905    3959    3971    4097    4106    4153    4168    4195
                         4203    6666#   6730    6743    6790    6868
HERTZ.  043576           9006#   9020
HOLDSP= 000020          17139#  17383
HRD     004632           3896#
HSEK    004602           3893#   6159
HWRT    004642           3897#
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HW.ADR  037220 G    6935#   8033    8043
HSARB   063256     16646   16697#
IA1211  011456      4471    4473#
IA24U1  024574      6151#
IA243   023560      5958#
IA2431  024212      6070#
IA2432  024256      6090#
IA2433  024452      6125#
IBU234  021346      5636#   5643
IB1211  011466      4475#
IB24U1  024604      6153#
IB243   023646      5971#
IB2432  024266      6092#
IB2433  024470      6129#
ICU234  021354      5638#
IC1211  011512      4474    4480#
IC243   023706      5982#
IC2432  024354      6096    6103#
ID      015060      4308*   4583*   4737    4876#
IDCOMP  014716      4844#
IDENT1  030046      6537    6548#
ID1211  011550      4485    4487#
ID243   023622      5966#
IEU234  021404      5646#
IE1211  011570      4490#
IFA11   006706      3997#
IFAUP   027704      6538#
IFAU23  021452      5663#
IFA00   010126      4242#
IFA10   010256      4281#
IFA11   010314      4302#
IFA12   010460      4336#
IFA121  011126      4406#
IFA20   015162      4912#   4919
IFA21   015734      5015    5018    5020#
IFA22   016530      5172#
IFA23   016726      5213#
IFA231  017604      5348#
IFA232  020224      5448#
IFA233  020464      5505#
IFA234  020660      5546#
IFA24   021602      5694#
IFA241  021702      5719#
IFA242  022456      5795#
IFA244  024712      6181#
IFA25   025126      6242#
IFA251  026042      6348#
IFA26   026536      6404#
IFA40   026674      6444#
IFB11   006726      3998    4002#
IFB00   010134      4244#
IFB12   010540      4346#
IFB121  011154      4412#
IFB13   013546      4585#
IFB20   015250      4925#
IFB21   015752      5021    5024#
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IFB22   016540          5174#
IFB23   017020          5222    5229#
IFB231  017700          5366#
IFB232  020320          5465    5467#
IFB233  020516          5506    5511    5513#
IFB242  022554          5796    5810#
IFB244  024730          6187#
IFB25   025176          6258#
IFB251  026050          6350#
IFB26   026552          6408#
IFB40   026740          6458#
IFC11   006742          4003    4006#
IFC00   010144          4243    4247#
IFC11   010406          4316#
IFC12   010650          4357    4361    4363#
IFC121  011262          4424    4427#
IFC13   013554          4587#
IFC20   015264          4922#
IFC21   015774          5025    5029#
IFC22   016566          5177    5179#
IFC23   017126          5249    5251#
IFC231  017722          5358    5361    5372#
IFC232  020336          5471#
IFC233  020524          5515#
IFC234  021016          5568#
IFC241  022004          5736#
IFC242  022514          5802#
IFC244  024742          6188    6191#
IFC25   025232          6259    6266#
IFC251  026072          6351    6355#
IFC40   026774          6459    6466#
IFD11   006762          4007    4011#
IFD00   010160          4251#
IFD12   010660          4364    4366#
IFD121  011302          4428    4431#
IFD21   016026          5036#
IFD22   016610          5173    5184#
IFD23   017144          5255#
IFD231  017740          5377#
IFD232  020346          5472    5474#
IFD233  020546          5514    5518    5520#
IFD234  021026          5570#
IFD241  022014          5738#
IFD242  022672          5825    5828#
IFD244  024750          6193#
IFD25   025316          6278#
IFD251  026102          6357#
IFE11   007004          4016#
IFE00   010172          4254#
IFE12   010670          4368#
IFE121  011310          4433#
IFE21   016344          5088#
IFE22   016636          5187    5189#
IFE23   017266          5273    5275    5277#
IFE232  020370          5475    5479#
IFE233  020504          5510#
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IFE234  021162          5590#
IFE241  022030          5737    5739    5741#
IFE242  022706          5829    5831#
IFE244  024770          6194    6197#
IFE251  026160          6356    6370#
IFF11   007012          4018#
IFF12   010726          4374#
IFF121  011320          4435#
IFF20   015334          4937#
IFF21   015726          5017#
IFF23   017274          5279#
IFF231  017746          5379#
IFF232  020264          5459#
IFF241  022040          5743#
IFF242  023150          5869    5872#
IFF251  026170          6372#
IFG11   007020          4021#
IFG12   011042          4365    4367    4381    4390#
IFG121  011350          4432    4434    4436    4441#
IFG20   015354          4941#
IFG21   016122          5030    5032    5052#
IFG23   017242          5252    5254    5270#
IFG231  017616          5351#
IFG232  020302          5449    5464#
IFG242  022734          5812    5837#
IFG251  026112          6359#
IFH11   007062          4020    4030#
IFH12   010630          4359#
IFH121  011242          4423#
IFH20   015422          4942    4950#
IFH21   016160          5023    5060#
IFH23   017356          5276    5290#
IFH231  017626          5353#
IFH232  020156          5436#
IFH234  020706          5552#
IFH242  022764          5838    5843#
IFH251  026200          6374#
IFI11   007126          4017    4039#
IFI20   015276          4929    4931#
IFI21   016202          5061    5063    5065#
IFI23   016764          5221#
IFI231  017542          5335#
IFI241  021706          5721#
IFI242  022744          5839#
IFJ11   007136          4042#
IFJ21   016236          5066    5071#
IFJ23   017120          5248#
IFJ241  022206          5757#
IFJ242  022774          5840    5845#
IFK11   007146          4045#
IFK20   015112          4902#
IFK21   016002          5031#
IFK234  020744          5558#
IFK241  022214          5759#
IFK242  023022          5848    5851#
IFL11   007206          4044    4053#
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IFL20   015460          4932    4958#
IFL21   015714          5014#
IFL241  022224          5761#
IFL242  023104          5842    5850    5856    5862    5864#
IFM20   015572          4976#
IFM21   016062          5044#
IFM241  022060          5747#
IFM242  023050          5854    5857#
IFN21   016072          5046#
IFN242  023130          5834    5844    5865    5868#
IFO21   016304          5079#
IFO242  023170          5877#
IFP242  023176          5879#
IFQ242  023216          5878    5883#
IFR242  023234          5874    5876    5880    5882    5884    5886#
IFS242  023276          5836    5871    5890    5892    5894#
IFT242  023364          5905#
IFU242  023252          5887    5889#
IFV242  023260          5891#
IFX242  022652          5824#
IF1211  011610          4494#
IG1211  011626          4495    4497#
IG243   023740          5962    5990#
IH1211  011700          4506#
IH243   023774          5993    5999#
II1211  011762          4516#
II243   024034          6002    6010#
IJ1211  011772          4518#
IJ243   024046          6013#
INCSAD  032460          6627*   6637*   6649    6655#
INCTRK  015654          4964*   4972*   4994#   5279    5281
INDITK  002170          3131#   4308    4583    5434
ININIT  037442 G        6964#   10088*  10775   11635*  11780
INIT    006330          3929#
INITER  006474          3934    3950#
INITIA  056470          13712#
INITL   010242          4232*   4270#   4902    4974*   5014    5229    5335
INITTK  020454          4904*   5436    5438*   5497#
INIT.M  044554          7831    8803    8827    9631#
INIT.R  037256 G        6952#   10003   11638
INMSG2  007366          4069    4082#
INMSG3  007434          4071    4083#
INPUTA  067416          7560    13360   14576#
INTCMD  011422          4414*   4417*   4419    4457#
INTER   004502          3885#
INTER1  006622          3950    3986#
INTER2  012116          4339    4387    4545#
INTER3  012214          4349    4383    4546#
INTER4  012314          4392    4547#
INTFOR  062714          12302   12378#
INTHD   032374          3953    6626#
INTHI   032412          3957    6636#
INTLV   020104          5351    5359    5369    5413#
INVAL.  043522          7592    8817    8994#
INVINT  052552          6896    12299#
INV.SW  040554          7576    7671#
```

```
IN.SUF  045524            9833    9940#
ITCSRD  011426            4402*   4419*   4420    4459#   4502*   4503    4511    4516    4518
ITDBRD  011430            4404*   4423    4427    4435    4460#   4475    4480    4508*
ITDROP  013454            4439*   4530*   4563#
ITER1   013146            4520    4557#
ITER2   013244            4522    4558#
ITER3   013340            4425    4559#
ITMSG   012112            4339*   4349*   4383*   4387*   4425*   4429*   4437*   4477*   4482*   4509*   4520*   4522*   4524*
                          4526*   4528*   4539    4542#
ITMSG1  012343            4429    4548#
ITMSG2  012402            4437    4549#
ITMSG3  012440            4477    4550#
ITMSG4  012526            4524    4551#
ITMSG5  012610            4552#
ITMSG6  012646            4482    4553#
ITMSG7  012735            4526    4554#
ITMSG8  013003            4528    4555#
ITMSG9  013067            4509    4556#
ITPRNT  012062            4340*   4350*   4384*   4388*   4438*   4478*   4483*   4510*   4529*   4538#
I$AU  = 000041            3018#   4193#   4217#
I$CLN = 000041            3018#   4095#   4104    4120#
I$OU  = 000041            3018#   4130#   4182#
I$HRD = 000041            6721#   6735#
I$INIT= 000041            3018#   3927#   3969    3989#
I$MOD = 000041            3018#   3044#   3144#   3206#   3645#   3698#   6877#
I$MSG = 000041            3018#   3466#   3493#
I$PHR = 000041            3018#
I$RPT = 000041            3018#   3706#   3744#
I$SEG = 000041            3018#   4225    4249#   4260#   4921#   4982#
I$SFT = 000041            6763#   6799#
I$SRV = 000041            3018#
I$SUB = 000041            3018#   4225
I$TST = 000041            3018#   4225#   4268#
J$JMP = 000167            3018#   4159    4201
KBPTR   037274  G         6955#   14449   14455*  14456   14578   16892*
KBUF    037276  G         6956#   13358   13575   13589   14454*  14457*  14621   16149   16179   17084   17087
LA2431  024244            6071    6078#
LA2432  024340            6091    6101#
LA2433  024534            6128    6137#
LBU234  021374            5637    5642#
LB1211  011642            4479    4486#
LB24U1  024630            6152    6154    6159#
LB2432  024314            6093    6097#
LB2433  024510            6130    6133#
LC243   023720            5983    5986#
LC2432  024402            6104    6108#
LD1211  012042            4488    4528#
LEU234  021424            5647    5650#
LE1211  012032            4491    4526#
LF    = 000012  G         6804#   6807    6808    6809    6810    6811    6812    6813    6814    6815    6816    6817    6818
                          6819    6820    6821    6822    6823    6824    6825    6826    6827    6828    6829    6830    6831
LH1211  012022            4507    4524#
LINECT  003272            3712*   3723*   3737*   3777    3793*   3794    3798#
LINES   003274            3716*   3727*   3740*   3794    3799#
LINE.F  037512  G         6979#   8084*   8086*   9401
LINTYP  003276            3728*   3741*   3778    3800#
```

```
L11211  012012            4517    4522#
L1243   024110            6011    6024#
LOAD    014110            4639    4657    4675    4690    4701#
LOAD.F  044152            8106#   8741    8844#   9066#
LOGMSG  056462           13238   13622#
LOGOFF  024142            5981#   6035#   6072    6094#   6097#   6101#   6135#   6138#   6148    6165
LPBFR   037272 G          6954#   8104#   8105#  14798#
LPCNTR  037270 G          6953#   8103#  14711   14717#  14794
LPT.AD  043614            9011#   9023
LPT.RE  043610            9009#   9022
LSI.RE  043604            9007#   9021
LUP     064556           16897   17076   17082#
LUP AD  051562           11547#  11556#  11572#  11574   11575   11614#  11705   11711   11719#  11724   11794#  11805   11806#
                         11810   11943#
L$APT   002036 G          3061#
L$AU    010032 G          3061    4193#
L$AUT   002074 G          3061#
L$CCP   002106 G          3061#
L$CLEA  007514 G          3061    4095#
L$CO    002032 G          3061#
L$DEPO  002011 G          3061#
L$DESC  002102 G          3061#
L$DEVP  002064 G          3061#
L$DISP  002134 G          3061    3081#
L$DR    002200 G          3061    3310#
L$DRCT  002070 G          3061#
L$DRS   002072 G          3061#
L$DRST  002204 G          3061    3310#
L$DTP   002040 G          3061#
L$DU    007522 G          3061    4130#
L$DUT   002076 G          3061#
L$DVTY  002322 G          3061    3429#
L$EF    002056 G          3061#
L$EFLG  002034 G          3061#
L$EXP1  002042 G          3061#
L$EXP2  002044 G          3061#
L$EXP3  002046 G          3061#
L$HARD  032464 G          3061    6721#
L$HPCP  002016 G          3061#
L$HPTP  002022 G          3061#
L$HW    002140 G          3061    3099#
L$ICP   002104 G          3061#
L$INIT  006330 G          3061    3927#
L$LADP  002026 G          3061#
L$LAST  037164 G          3061    6876#
L$MREV  002060 G          3061#
L$NAME  002000 G          3061#
L$REPP  002066 G          3061#
L$REV   002010 G          3061#
L$RPT   002602 G          3061    3706#
L$SOFT  032622 G          3061    6763#
L$SPC   002062 G          3061#
L$SPCP  002020 G          3061#
L$SPTP  002024 G          3061#
L$STA   002030 G          3061#
L$SW    002152 G          3061    3122#
```

```
LSTIML  002014 G      3061#
LSTIMU  002054 G      3061#
LSTIM1  002052 G      3061#
LSTSTI  002100 G      3061#
LSUNIT  002012 G      3061#   3933    3944
L.CLK.  043562        9001#   9017
L10000  002150        3099    3112#
L10001  002176        3122    3142#
L10002  002330        3493#
L10003  003040        3744#
L10004  006672        3969    3989#
L10005  007520        4104    4120#
L10006  010030        4159    4182#
L10007  010036        4201    4217#
L10010  010240        4268#
L10011  032532        6721    6728    6735#
L10012  033052        6763    6788    6799#
MAJ.IN  037246 G      6948#  11678*  11695*  17173*  17259   17291
MAJ.LO  064656       17137#  17210   17259*  17283*  17290*  17291*  17292
MAJ.US  037250 G      6949#  11889   17292*
MAN.TI  001244        8097    8129#
MAP16   067364 G      9481    9540    9592   17633#
MASK.B  046266        9480    9485    9490    9539    9544    9591    9596   10365#
MASK.W  046264        9479    9482    9538    9541    9590    9593   10363#
MAXSEC  002174        3133#   5366    5372    5377    5379
MAXTRK  020436        5434*   5464    5471    5474    5479    5490#
MCRDRT  026503        6380    6395#
MCWTRT  026452        6365    6394#
MDRDRT  026375        6377    6392#
MDWTRT  026316        6362    6390#
MEM.SI  043624        9013#   9024
MINSEC  002172        3132#   5348    5362    5363    5364    5366
MINTRK  020434        5435*   5444    5466    5467    5479    5482    5489#
MIN.IN  037242 G      6946#  11679*  11696*  17174*  17260   17263   17288
MIN.US  037244 G      6947#  11891   17289*
MOOR    066726 G      8428   17424#
MRDRT   026426        6383    6393#
MSG.RD  037210 G      6931#
MSG.TY  037164 G      6923#   8169*   8172*   8982*
MSG1    032532        6723    6737#
MSG11   034417        6769    6834#
MSG14   034444        6770    6835#
MSG15   034473        6771    6836#
MSG16   034535        6772    6837#
MSG17   034602        6773    6838#
MSG18   034635        6775    6839#
MSG19   034710        6776    6840#
MSG2    032545        6724    6738#
MSG20   034747        6777    6841#
MSG21   035020        6778    6842#
MSG22   035076        6779    6843#
MSG23   035133        6781    6844#
MSG24   035164        6782    6845#
MSG25   035215        6783    6846#
MSG26   035253        6785    6847#
MSG27   035301        6786    6848#
```

```
MSG3    032564            6725    6739#
MSG4    032574            6726    6740#
MSG5    033052            6787    6805#
MSG6    033106            6765    6806#
MSG7    033127            6767    6807#
MSG8    034376            6768    6833#
MSKRT   026272            6353    6389#
MUL     066662 G          8039    9402    9820   17407#
MUTRT   026350            6368    6391#
NEWPRI  066406 G          8005   11687   17177   17209   17329#
NEWTRK  014776            4772    4782    4805    4822    4837    4856    4858#
NEXTAR  062646           16478#  16890   16971   17031
NOERL   004462            3883#
NO.CLK  043552            8998#
NO.FLA  062442           16263   16285#
NO.LPT  057760           14713   14737#
NO.PTA  043756            8754    9034#
NR      = 000001          3310#
NSEC    020072            5345    5408#
NUMBIN  053104           12603#  13397   13428   15578   15590   15842   15941   16927   16950   17019
NUML A  053252           12636   12641#
NUML NO 037226 G          6938#   8092
NUML UN 037634            7356#   7612    8411    8969
NUNITS  046242            9805   10358#
NXSCSA  020054            5397*   5401#
NXTFOR  062722           16537#  16894   16898   16906
OCTMSG  056446           13228   13620#
OD      015056            4307*   4582*   4735    4739    4875#
ODCOMP  014730            4845    4847#
ONEFIL= 000001            1898#   3039    3145    3146    3159    3647    3648    3661    6676
OTDITK  002166            3130#   4307    4582    5226    5237    5435
OTDWFN  020612            5266*   5302*   5537#
OTERTP  025106            4978*   6237#
OTEXCM  026626            4261*   6426#
OTSYER  026650            4253*   6435#
OUTSWD  021260            5544    5557    5565    5576    5581    5587    5597    5618#
OSAPTS= 000001            3018#   3051#   3061
OSAU    = 000001          3018#   3051#   3061
OSBGNR= 000001            3018#   3051#   3061
OSBGNS= 000001            3018#   3051#   3061
OSDU    = 000001          3018#   3051#   3061
OSENDA= 000001            3018#   3051#   3061
OSPOIN= 000001            3018#   3051#   3061
OSPWR   = 000001          3051#
O.ODT   = ******  U       6912
PAR     003330            3760*   3777*   3785*   3807    3810#
PARSES  062156            7566   16146#
PAR.LA  056144           13215   13512#
PASS.C  037200 G          6929#   8417*
PAT     014154            4577*   4615    4617*   4618    4714#
PATCH   036662            6864#
PAT125  014026            4632    4674#
PAT333  014052            4633    4683#
PG      013730            4639#   4642    4647
PLOC    006616            3946*   3983#   3996
PREPT1  003302            3762*   3779*   3789*   3806#
```

```
PREPT2  003332           3755#   3782#   3819#
PRESCK  014742           4848    4850#
PRESTK  015050           4732#   4734#   4766    4776    4829    4850    4865#   4872#
PRIDXX  003506           3715    3834#
PRIDO1  003554           3834    3856#
PRIDO2  003603           3835    3857#
PRIDO3  003632           3836    3858#
PRIDO4  003661           3837    3859#
PRIDO5  003710           3838    3860#
PRIDO6  003737           3839    3861#
PRIDO7  003766           3840    3862#
PRIDO8  004015           3841    3863#
PRIDO9  004044           3842    3864#
PRID10  004073           3843    3865#
PRID11  004122           3844    3866#
PRID12  004151           3845    3867#
PRID13  004200           3846    3868#
PRID14  004227           3847    3869#
PRID15  004256           3848    3870#
PRID16  004305           3849    3871#
PRID17  004334           3850    3872#
PRID18  004363           3851    3873#
PRID19  004412           3852    3874#
PRINTC  067770          14727   14793#
PRINTF  063276           8391    8439   10254   11657   12165   12171   12308   16874#
PRIO0 = 000000 G         3213#   3281#   5633
PRIO1 = 000040 G         3213#   3280#
PRIO2 = 000100 G         3213#   3279#
PRIO3 = 000140 G         3213#   3278#
PRIO4 = 000200 G         3213#   3277#
PRIO5 = 000240 G         3213#   3276#
PRIO6 = 000300 G         3213#   3275#
PRIO7 = 000340 G         3213#   3274#   3953    3957    5651
PRNTST  067660          14707#  17085
PRNUM   003300           3713#   3724#   3738#   3775    3801#
PRO.CM  044130           8345    8746#   8837#   9053#
PRTDAT  003144           3717#   3730#   3742#   3774#
PRTECD  002310           3347#   5896#   6538    6542#
PRTERR  027644           6274#   6475#   6537#
PRTHDR  003046           3710#   3721#   3735#   3752#
PRT1    003140           3708#   3719#   3733#   3754    3768#
PRT2    003142           3709#   3720#   3734#   3761    3769#
PTAB.S  037460 G         6967#   8041#   8802    8826    9822#   9844
PTDAT1  003426           3788    3826#
PTEC    003363           3719    3824#
PTECM   003456           3726    3728    3828#
PTHEAD  022306           5711#   5747    5749#   5780#
PTRTY   026040           6280#   6347#
PTTK    003410           3733    3825#
PTTKM   003471           3741    3829#
PTUNT1  003436           3709    3720    3734    3827#
PT19SP  003354           3708    3823#
PUTCHR  066474          12121   13347   13571   13773#  14016   14018   14250   14258   14266   14268   14275   14277   14284
                        14286   14293   14295   14302   14378   17092
PWR.FA  067620 G         6897    8740   17718#
PWR.FL  037254 G         6951#   8358    8380    8399    8403   10086#  10093   17727#
```

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PWR MS  067746          17735   17747#
PWR SA  067742          17722#  17726   17745#
PWR UP  067744          17719   17721#  17725#  17746#
P.CLK.  043570           9003#   9018
RANDAT  014062           4634    4688#   4693
RANGEN  002332           3577#   4688    4842
RANUM   002424           3592#   3597#   4689    4843#   4844    4847    4850    4852
RAN1    002420           3578    3584#   3589    3595#
RAN2    002422           3579    3586    3591#   3596#
RD      004542           3889#
RDYWD   021550           4333#   4343#   4371#   4421#   4504#   4512#   5541#   5554#   5563#   5572#   5579#   5583#   5594#
                         5620#   5622    5663    5667    5681#   5800#   5922#   5903#
READRT  002262           3336#   6382
READ.P  064660 G        17146#  17161
REFCMD  011420           4456#   4484#   4486#   4493#   4496#   4501#   4502
REFDRV  011442           4443#   4470#
REFORM  011416           4401#   4441    4450#   4455#
REGBAC  067350 G        17381   17400   17610#
REGMSK  002200 G         3310#
REGSAV  067334 G        11639   12212   17379   17589#
REPORT  002602           3707#
REQN.P  037240 G         6943#   7586#   8748
REQN.T  044132           7623#   8369    9055#
RESTAR  002204           3313#   3931#   3937#
RESTK   015666           4935#   4936#   4946#   4947#   4999#   5221    5223    5228#
RETRY   002242           3328#   4233#   5020    5060    5062    5065    5068#   5071    5074#   5081#   5251    5255    5268#
                         6022#   6156#   6162#   6348    6350    6355    6357    6359    6370    6372    6374
RE.SET  040722           7769#   7855    8801
RSTACK  066610 G        10785   11920   11925   12192   12218   12317   17390#  17743
RTMASK  024700           6098#   6105#   6106#   6108#   6109#   6131#   6133#   6137#   6156    6162    6172#
RTOFF   024144           6036#   6095#   6099#   6102#   6124#   6134#   6149
RXXX    002152           3124#   4016    4358    4363    4431    4497    5213    5513    5928
RYDLY   021546           5666    5680#
RYDX    021544           4513#   4515#   5665    5679#
SAVEDO= 041120           7993#   8133
SCPSCT  020056           5351    5365#   5376#   5384#   5394#   5402#
SCSYEX  015110           4250#   4901#
SDO     002210           3315#   4150#   4234#   4944#   6427
SEARCH  060616          15453   15466#
SECADR  021256           5300#   5304    5573    5609#
SECON   002300           3343#   5029    5227#   5277    5396#
SECTOR  002274           3341#   5304#   5750
SEEK    017516           5260#   5267#   5284#   5286#   5321#
SEEKCK  022272           5710#   5740#   5757    5774#
SEEKRT  002244           3329#   6015    6150    6352
SEGSTA  037464 G         6976#   9992#  11560#  11563#  11564   11567   11569#  11577#  11580   11584   11587
SEK     004512           3886#   6166
SEQUEN  015062           4580#   4746#   4748    4750#   4751    4877#
SEQ1    014370           4756    4766#   4791
SEQ2    014424           4757    4776#   4789
SEQ3    014460           4758    4786#
SEQ4    014476           4759    4795#
SEQ5    014544           4760    4809#
SEQ6    014626           4761    4827#
SEQ7    014702           4762    4841#   4846    4849    4851
SETUP   006376           3936    3938#
```

```
SET.MA  044342          7847   7850   8887   8890   9476#  11865  15606  15814
SE1     027574          6448   6501#
SFERLG  024556          6100#  6111#  6139#  6147#
SFERR   015664          4911#  4985#  4998#
SFPTBL  002152 G        3122#
SFTE1   025222          6262#  6263#  6264#
SFTSTS  002320          3398#  6541
SHIFT   067446 G       13322  13485  17645  17651#
SPEC.U  044056          7613#  8768   9047#
SPV.SE  000400          7996#  8743
SSEC    020062          5337   5342   5404#
STARTC  066336 G       11749  17194  17314#
STCNTR  024136          5965#  5972   5987#  5988   6033#
STDVDN  026534          4927#  6403#
STERRG  024134          5964#  5966   5968#  5970#  6032#
STKSEQ  014156          4584#  4731#
STRCHR  057350         14448#  14591  14609  14628  16914  16931  16935  16954  16981  17055  17071
STRT.T  044134          7774#  8354   8409#  8764#  8828#  9057#
STSCDN  020110          5382#  5393#  5422#
STSCFG  020060          5353   5355#  5389#  5403#
STSTPA  013602          4579#  4613#
ST.SET  040766          7548   7826#  8770
SUM     014150          4614#  4701#  4706   4707#  4708   4712#
SUNIT.  044140          7837#  7845   8807   8885   8912   8941   9061#
SUPERV  042022          6905   6909   6934   8732#  8737   17356
SUPFLA  037430 G        6962#  8000#  8739#  13939#  14011  14157  14709  16880
SUPV.T  037602 G        6986#  8366   8736#  8737#  8738#  10091  10143  10257  10335  10784  11640  11924  12191
                       12217  12316  17376  17378  17397  17399  17742
SUP PR  040540          7559   7668#
SUT     002212          3316#  3932#  4024#  4027#  4033#  4036#  4047#  4050#  4055#  4058#  4149#  4360#  4362#
                        4366   4389#  4390   4406   4470   4912   5179   5189   6427
SUTCV   002530          3604#  3609#  3611#  3615#  3617#  3622#  4146   4148
SUTORP  007706          4146#  4148#  4149   4150   4162#  4563#
SUTPOS  011436          4353#  4376#  4406   4444#  4463#  4470   4563
SUTPTR  015644          3628   4240#  4912   4917#  4918   4945#  4984#  4990#
SVCGBL= 000000          3018#  3027#  3061   3081   3099   3122   3310   3429   3706   3927   4095   4130   4193
                        6721   6763   6876#
SVCMAN  046456          6898  11477#
SVCINS= 177777          3018#  3024#  3061   3081   3099   3122   3310   3429   3493   3744   3807   3820   3929
                        3930   3935   3936   3946   3947   3950   3952   3953   3957   3969   3989   4069   4071
                        4104   4120   4142   4151   4159   4182   4201   4217   4249   4257   4259   4260   4266
                        4268   4332   4392   4487   4488   4489   4539   4564   4921   4982   5017   5018   5248
                        5249   5633   5651   5750   5751   6264   6271   6385   6464   6472   6537   6540   6541
                        6568   6721   6723   6724   6725   6726   6728   6735   6763   6765   6766   6767   6768
                        6769   6770   6771   6772   6773   6774   6775   6776   6777   6778   6779   6780   6781
                        6782   6783   6784   6785   6786   6787   6788   6799   6876
SVCSUB= 177777          3018#  3026#
SVCTAG= 177777          3018#  3028#  3112   3142   3493   3744   3989   4120   4182   4217   4260   4268   4489
                        4982   6735   6799
SVCTST= 177777          3018#  3025#  4225
SVUTRG  032430          6628#  6638#  6647#
SWCMAN  043750          7718   9032#
SWITCH  062622         15805  16340#
SWREG   002164          3129#  4264   4281   4302   4310   4316   4473   4587   4589#  5022   5253   5258   5743
                        6151
SW.ADR  037224 G        6937#  8028
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SW PTR  043734          9029#  9033
SYFER1  027020          6470#  6471#  6472#
SYSERR  002232          3324#  4235#  4244   4247   4251   4506   4744#  4980   5650#  5673#  5804#  5808#  5811
                        5826#  5835#  5870#  5888#  5893#  5907#  5939#  5949#  6189#  6436   6474   6478#
SYSE10  027300          6491#  6507
SYSE11  027327          6492#  6508
SYSE12  027337          6493#  6509
SYSE13  027347          6494#  6510
SYSE14  027403          6495#  6511
SYSE15  027420          6496#  6512
SYSE16  027460          6497#  6513
SYSE4   027056          6485#  6501
SYSE5   027111          6486#  6502
SYSE6   027142          6487#  6503
SYSE7   027166          6488#  6504
SYSE8   027211          6489#  6505
SYSE9   027250          6490#  6506
SYS.FT  052502         12236#  12245
S%LSYM= 010000          3018#  3112#  3142#  3493#  3744#  3989#  4120#  4182#  4217#  4249#  4268#  4489#  4921#
                        6735#  6799#
TARGET  015046          4733#  4735#  4768#  4770#  4778#  4780#  4797#  4800#  4804#  4814#  4818#  4821#  4831#
                        4834#  4836#  4852#  4855#  4861   4862   4865   4871#
TBPRCT  016366          5027#  5031   5034#  5052   5054#  5057#  5082#  5084#  5097#
TERMI   064646         16926  16949  17018  17116#
TERMLI  062450         15577  15589  15841  15940  16306#
TERMTA  056432         13396  13427  13615#
TEST.M  044070          7632#  8371   9051#
THA234  020676          5548   5550#
THA25   025164          6247   6254#
THA40   026730          6449   6455#
THB231  017710          5368#
THC13   013572          4586   4590#
THDOO   010166          4245   4248   4253#
THD23   017174          5259   5262#
THE00   010200          4246   4256#
THE22   016646          5183   5191#
THE234  021172          5592#
THF231  017754          5352   5381#
THF241  022050          5742   5745#
THS242  023314          5897#
TIMFLG  037420 G        6958#  11667#  11680#  17172#  17278   17293
TIM.CO  037252 G        6950#  11892   17236#  17239#  17242#
TIM.OP  053056         11677#  11694#  11887   12391#
TITLEX  002110          3061   3069#
TKTBPT  015042          4731#  4859#  4860   4869#
TKTL    020444          5439   5450   5493#
TKXX    005156          3739   3901#  6007
TOO.MA  056412         13505  13613#
TRACK   002272          3340#  5303#  5750   6003
TRBIT = 000200 G        3285#  4504   5554   5563   5572   5579   5583   5594   5903
TRKADR  021264          5299#  5303   5577   5608#
TRKCNT  015044          4740#  4741#  4742#  4802#  4853#  4870#
TRKON   002276          3342#  5038   5040#  5483#
TRKONF  020432          5447#  5461#  5476#  5481#  5483   5488#
TRKINC  020440          5281#  5448   5485#  5491#
TRKSEQ  002162          3128#  4580   4746
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TSAVCT  016370          5069#   5075#   5077#   5079    5098#
TSEC    002317          3397#   6541
TST     015640          4924#   4925    4928    4937    4965    4970    4988#
TSTCK   024146          5697#   6037#   6090    6103    6129
TSTEV   021634          4968#   5689    5692    5694    5697    5702#   5845    5851    5857    5872    5924
TSTN    002156          3126#   4922
TSTPAT  002160          3127#   4577
TSTPTR  016360          5016#   5024    5026#   5033#   5048#   5050#   5055#   5058#   5067#   5073#   5078#   5085    5090#
                        5094#
TSTSUT  016712          5176#   5178#   5179    5186#   5188#   5189    5202#
TSTWD   016364          4924    5036    5044    5046    5087#   5096#
TST.AB  046400          10774#  11488   12124
TST.TO  040602          7620    7675#
TTRK    002316          3396#   6541
TYPEC   057006          13944   14166   14242#  14589   14598   14623   14630
TYPEPC  052702          12352#
TYPFLA  062324          8859    16256#
TYPLIN  056704          7621    8001    8749    9834    9851    9910    11597   12210   12638   12663   13409   13458   13506
                        14079#  14714   16180   16258   17736
TYPNUM  056266          8854    8940    9855    9914    13328   13568#
TYPSTR  056724          8947    13329   13591   14082   14155#  14581   16647   17088
TYP.ER  052532          12135   12244#
TY.UNI  045544          9909    9945#
T$ARGC= 000001          3061#   3807#   3820#   3950#   4069#   4071#   4142#   4151#   4392#   4539#   5750#   5751#   6385#
                        6537#   6540#   6541#   6568#
T$CODE= 001004          4489#   6723#   6724#   6725#   6726#   6728#   6765#   6766#   6767#   6768#   6769#   6770#   6771#
                        6772#   6773#   6774#   6775#   6776#   6777#   6778#   6779#   6780#   6781#   6782#   6783#   6784#
                        6785#   6786#   6787#   6788#
T$ERCO= 000021          6264#   6271#   6464#   6472#
T$ERRN= 000000          3018#   6264#   6271#   6464#   6472#
T$EXCP= 000000          6723#   6724#   6725#   6726#   6768#   6769#   6770#   6781#   6782#   6785#   6786#
T$FLAG= 000041          3969#   4104#   4159#   4201#   6728#   6788#
T$HILI= 000032          6723#   6724#   6725#   6726#   6768#   6769#   6770#   6781#   6782#   6785#   6786#
T$LOLI= 000001          6723#   6724#   6725#   6726#   6768#   6769#   6770#   6781#   6782#   6785#   6786#
T$LSYM= 010000          3018#   3112    3142    3493    3744    3969    4120    4182    4217    4268    6735    6799
T$NEST= 177777          3018#   3044#   3099#   3112#   3122#   3142#   3144#   3206#   3466#   3493#   3645#   3698#   3706#
                        3744#   3927#   3989#   4095#   4120#   4130#   4182#   4193#   4217#   4225#   4249#   4260#   4268#
                        4921#   4982#   6721#   6728    6735#   6763#   6766    6774    6780    6784    6788    6799#   6877#
T$NSK0= 000000          3044#   3144    3206#   3645    3698#   6877
T$NSK1= 000005          3099#   3112    3122#   3142    3466#   3493    3706#   3744    3927#   3989    4095#   4120    4130#
                        4182    4193#   4217    4225#   4268    4921#   4982    6721#   6728    6735    6763#   6766    6774
                        6780    6784    6788    6799
T$NSK2= 000003          4249#   4260
T$SAVL= 177777          3018#
T$SEGL= 177777          3018#   4249#   4260#   4921#   4982#
T$SEK0= 010001          4249#   4260    4921#   4982
T$SUBN= 000000          3018#   4225#
T$TAGL= 177777          3018#
T$TAGN= 010013          3018#   3099#   3122#   3466#   3706#   3927#   4095#   4130#   4193#   4225#   6721#   6763#
T$TEMP= 000000          3081#   3112#   3142#   3144#   3493#   3645#   3744#   3969#   3989#   4104#   4120#   4159#   4182#
                        4201#   4217#   4260#   4268#   4489#   4982#   6723#   6724#   6725#   6726#   6728#   6735#   6765#
                        6767#   6768#   6769#   6770#   6771#   6772#   6773#   6775#   6776#   6777#   6778#   6779#   6781#
                        6782#   6783#   6785#   6786#   6787#   6788#   6799#   6877#
T$TEST= 000001          3018#   4225#
T$TSTM= 177777          3018#   3493    3744    3807    3820    3929    3935    3946    3950    3952    3953    3957    3969
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                    3989    4069    4071    4104    4120    4142    4151    4182    4217    4249    4257    4259    4260
                    4266    4268    4332    4392    4487    4489    4539    4564    4921    4982    5017    5248    5633
                    5651    5750    5751    6264    6271    6385    6464    6472    6537    6540    6541    6568
T$TSTS= 000001      3018#   4225#
T$$AU = 010007      4193#   4201    4217
T$$CLE= 010005      4095#   4104    4120
T$$OU = 010006      4130#   4159    4182
T$$HAR= 010011      6721#   6728    6735
T$$HW = 010000      3099#   3112
T$$INI= 010004      3927#   3969    3989
T$$MSG= 010002      3466#   3493
T$$RPT= 010003      3706#   3744
T$$SEG= 010001      4249#   4260#   4921#   4982#
T$$SOF= 010012      6763#   6788    6799
T$$SW = 010001      3122#   3142
T$$TES= 010010      4225#   4268
T1      010040 G    3081    4225#
UAU2J4  021402      5645#
UDCRST  024254      5960*   6089#
UDHOST  024210      5986*   6069#
UDSFST  024426      5984*   6118#
UDU2J4  021376      5643#
UF243   023730      5988#
UKINT   004472      3884#
UK243   024072      6019#
UNIT    006620      3639*   3938*   3943*   3944    3946    3984#   3997    4065    4071    5199*   5750    6537
UNITDP  007704      4132*   4134*   4136    4142    4151    4161#
UNITN   012114      4338*   4348*   4382*   4386*   4411*   4539    4543#
UNITST  002600      3635*   3642#   4915
UNIT.D  037202 G    6930#   8047*
UNI.MA  044060      7599*   7607*   7611    8812    8815    8874    8901    8929    9049#
UNPKHP  006674      3948    3994#
UNT     007[illegible]4     3995*   4014*   4045    4053    4076#
UNTCD   011434      4354*   4378*   4408    4412    4433    4446*   4462#   4494    4499    4564
UNTCNT  011432      4352*   4377*   4445*   4447    4461#
UNTCOD  007352      4025*   4028*   4034*   4037*   4048*   4051*   4056*   4059*   4062    4075#
UPDVST  023556      5698*   5957#
USER.P  037444 G    6965#   8107*   8847    8849    9633    9823    9841    11703   11713   11720
USER.T  037446 G    6966#   8119*   9645
UTCNT   003044      3747#   3757*   3764*   3784*   3791*
UTSCDN  020102      5332*   5381*   5392*   5396    5412#
UTTST   003042      3746#   3756*   3758    3760    3763*   3783*   3786    3790*
UT00    007356      3638    3756    3783    3939*   4061    4077#   4135    4338    4348    4410    5198
UT01    007360      3940*   4078#
UT10    007362      3941*   4079#   4382    4386
UT11    007364      3942*   4080#
UUT     002214      3317#   4915*   4935    4946    5172    5174    5181*   5184    5191*   5193*   5195    5215    5333
                    5423    5445    5515    5520    5813    5930    5940    6408    6414
UUTADR  002216      3318#   5217*   5219*   5265    5301    5791    5799    5821    5831    5900    5902
UUTOFF  002220      3319#   3637*   5197*   5212    5997    6008    6074    6160    6167
UOADR   002226      3322#   3999*   4002    4334    4336    4342*   4344    4346    4355    5219    6627
UOVECT  002302      3344#   3953    4000*
U1ADR   002230      3323#   4006    4008*   4011    4368    4370*   4372    4374    4379    5217    6637
U1VECT  002304      3345#   3954    3957    4009*
VALID.  037704      7541#   8771
VALWD   021246      5595    5605#
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VAL LA  040524          7622   7659#
VAL SW  044170          7572   9073#
WATCH   021324          5598#  5632#
WC      002313          3393#  6540
WDCNT   002270          3339#  4304#  4306#  4623   5211   5712
WDCT    017522          5211#  5323#  5555
WDOT    017524          5264#  5298#  5324#  5542   5546   5550   5552   5558   5568   5570   5590   6537
WIDTH   053452         12657  12728#  13583
WRDS    021240          5542#  5555#  5560#  5562#  5573#  5574#  5577#  5578#  5584#  5595#  5602#  5625
WRT     004552          3890#
WRTRT   002264          3337#  6367
XDVTST  016714          4966#  5211#
XEQDIA  066474 G        8367  10092  10144  10258  10336  17365#
XEQSUB  066462 G       11675  11910  12205  17361#
XEQ.CL  046204          8402  10331#
XEQ.CM  043514          8868   8959   8985   8987#
XEQ.IN  045666          8344  10085#
XEQ.LA  041756          8407   8443   8445   8450   8452#
XEQ.OP  045760          8866   8884   8911  10136#
XEQ.PR  041160          8340#  8976
XEQ.TE  046024          8378  10235#
XERPRT  030274          6277#  6476#  6559#
XERUUT  002312          3392#  4239#  5584   5794#  5909   5990   6179   6540   6559   6561   6569#
XER1    030123          6540   6549#
XER2    030204          6541   6550#
XID     015054          4736#  4737#  4740   4766   4780   4781#  4800   4809   4818   4819#  4827   4831   4832#
                        4844   4874#
XOD     015052          4738#  4739#  4741   4770   4771#  4776   4797   4809   4814   4815#  4827   4829   4834
                        4847   4873#
XPG     013760          4653#  4670
XTIME   065346 G       11688  17206  17258#
XTIMEN  066172         17169  17249  17277#
XTIMST  065370         17167  17248#  17249#  17266#
XU23    021542          5664   5668   5677#
XU234   021432          5639   5641   5649   5651#
XXDP.D  043534          8062   8077   8996#
XXPG    014034          4675#  4679   4684
XSALWA= 000000          3018#  6728   6788
XSFALS= 000040          3018#  6766   6774   6780   6784
XSOFFS= 000400          3018#  6728   6766   6774   6780   6784   6788
XSTRUE= 000020          3018#
X1211   012060          4472   4476   4481   4519   4531#
X24U1   024674          6169#
X2431   024252          6081#
X2433   024564          6141#
$BREG   044230          8734#  9083#
$ENDAD  066446 G        6901  17351#
$SAV2   067512 G        7357   7827   9988  15572  17676#
$SAV3   067526 G        9632  14243  16147  16257  17682#
$SAV4   067544 G       12604  12729  13161  14577  15203  15433  15800  16628  16875  17689#
$SAV5   067564 G        7542   7997   8341   9803  14942  15071  17697#
.       = 067770        3041#  3310#  3830#  3875#  3881#  3882#  3883#  3884#  3885#  3886#  3887#  3888#  3889#
                        3890#  3891#  3892#  3893#  3894#  3895#  3896#  3897#  3898#  3899#  3900#  3901#  3969
                        4084#  4104   4159   4201   4627   4755   6396#  6500#  6530#  6551#  6622#  6728   6766
                        6774   6780   6784   6788   6850#  6865#  6883   6888#  6892   6895#  6904#  6918#  6952#
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14818#  16287#  16698#  17748#  17754
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BERROR	21#	3018#					
BGNAU	25#	3018#	4193				
BGNCLN	33#	3018#	4095				
BGNDU	41#	3018#	4130				
BGNHRD	49#	3018#	6721				
BGNHW	60#	3018#	3099				
BGNINI	71#	3018#	3927				
BGNMOD	79#	3018#	3044	3206	3698		
BGNMSG	92#	3018#	3466				
BGNRPT	100#	3018#	3706				
BGNSEG	108#	3018#	4249	4921			
BGNSFT	117#	3018#	6763				
BGNSRV	128#	3018#					
BGNSUB	136#	3018#					
BGNSW	160#	3018#	3122				
BGNTST	171#	3018#	4225				
BNCOMP	201#	3018#	3936	3947	4488	5018	5249
BNERRO	205#	3018#					
BREAK	209#	3018#					
BRESET	213#	3018#	4332				
BUFFER	217#	3018#					
CKLOOP	223#	3018#	4259				
CLKOFF	227#	3018#					
CLKON	231#	3018#					
CLREF	240#	3018#					
CLRVEC	245#	3018#					
COMMEN	250#	3018#					
DEVREG	266#	3018#	3310				
DEVTYP	281#	3018#	3429				
DISPAT	286#	3018#	3081				
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DODU	304#	3018#	4564				
DORPT	309#	3018#	4266				
ENDAU	313#	3018#	4217				
ENDCLN	325#	3018#	4120				
ENDCOM	337#	3018#					
ENDDU	353#	3018#	4182				
ENDHRD	365#	3018#	6735				
ENDHW	377#	3018#	3112				
ENDINI	387#	3018#	3989				
ENDMOD	399#	3018#	3144	3645	6877		
ENDMSG	412#	3018#	3493				
ENDRPT	424#	3018#	3744				
ENDSEG	436#	3018#	4260	4982			
ENDSFT	450#	3018#	6799				
ENDSRV	462#	3018#					
ENDSUB	478#	3018#					
ENDSW	496#	3018#	3142				
ENDTST	506#	3018#	4268				
EQUALS	524#	3018#	32138				
ERRDF	598#	3018#	6464				
ERRHRD	602#	3018#	6271				
ERRSF	606#	3018#	6472				
ERRSOF	610#	3018#	6264				

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FEQUAL    6848  3018#
GETPRI    7008  3018#
GETTIM    7058  3018#
GMANIA    7108  3018#
GMANID    7198  3018#
GMANIL    7288  3018#  4489
GPHARD    7378  3018#  3946
GPRMA     7438  3018#  6723   6724
GPRMD     7668  3018#  6725   6726   6768   6769   6770   6781   6782   6785   6786
GPRML     7888  3018#  4489#  6765   6767   6771   6772   6773   6775   6776   6777   6778   6779   6783   6787
HEADER    8058  3018#  3061
INLOOP    8138  3018#  5017   5248
IOSETU    8178  3018#
IOSTAR    8258  3018#
LASTAD    8338  3018#  6876
MANUAL    8398  3018#  4487
MSBYTE   16328  3018#  3061#
MSCHEC   18308  3018#  3969#  4104#  4159#  4201#  6728#  6788#
MSCKID   16588  3018#  3061#
MSCOUN   17708  3018#  3807#  3820#  3950#  4069#  4071#  4142#  4151#  4392#  4539#  5750#  5751#  6385#  6537#
         65408  6541#  6568#
MSDATA   15198  3018#  3061#  3429#
MSDECR   17338  3018#  3112#  3142#  3144#  3493#  3645#  3744#  3989#  4120#  4182#  4217#  4260#  4268#  4982#
         67358  6799#  6877#
MSDEFA   18828  3018#  4489#  6723#  6724#  6725#  6726#  6765#  6767#  6768#  6769#  6770#  6771#  6772#  6773#
         67758  6776#  6777#  6778#  6779#  6781#  6782#  6783#  6785#  6786#  6787#
MSENDE   17788  3018#  3112#  3142#  3144#  3493#  3645#  3744#  3989#  4120#  4182#  4217#  4260#  4268#  4982#
         67358  6799#  6877#
MSERRI   13198  3018#  6264#  6271#  6464#  6472#
MSESCA   16388  3018#
MSESCS   16428  3018#
MSEXCP   18138  3018#  6723#  6724#  6725#  6726#  6768#  6769#  6770#  6781#  6782#  6785#  6786#
MSEXIT   16468  3018#  3969#  4104#  4159#  4201#  6728#  6788#
MSEXSE   16548  3018#  3969#  4104#  4159#  4201#  6728#  6788#
MSEXTJ   16508  3018#  3969#  4104#  4159#  4201#  6728#  6788#
MSGEN    17428  3018#  3061#  3081#  3099#  3112#  3122#  3142#  3310#  3429#  3466#  3493#  3706#  3744#  3927#
         39898  4095#  4120#  4130#  4182#  4193#  4217#  4225#  4260#  4268#  4489#  4982#  6721#  6735#  6763#
         67998  6876#
MSGENB   16808  3018#  4489#
MSGETS   17398  3018#  3112#  3142#  3144#  3493#  3645#  3744#  3989#  4120#  4182#  4217#  4260#  4268#  4982#
         67228  6735#  6766#  6774#  6780#  6784#  6788#  6799#  6877#
MSGETT   15248  3018#  3969#  4104#  4159#  4201#  6728#  6766#  6774#  6780#  6784#  6788#
MSGNGB   15498  3018#  3044#  3061#  3081#  3099#  3122#  3206#  3310#  3429#  3466#  3698#  3706#  3927#  4095#
         41308  4193#  6721#  6763#  6876#
MSGNIN   17638  3018#  3061#  3081#  3099#  3122#  3310#  3429#  3493#  3744#  3807#  3820#  3929#  3930#  3935#
         39368  3946#  3947#  3950#  3952#  3953#  3957#  3969#  3989#  4069#  4071#  4104#  4120#  4142#  4151#
         41598  4182#  4201#  4217#  4249#  4257#  4259#  4260#  4266#  4268#  4332#  4392#  4487#  4488#  4489#
         45398  4564#  4921#  4982#  5017#  5018#  5248#  5249#  5633#  5651#  5750#  5751#  6264#  6271#  6385#
         64648  6472#  6637#  6640#  6641#  6568#  6721#  6723#  6724#  6725#  6726#  6728#  6735#  6763#  6765#
         67668  6767#  6768#  6769#  6770#  6771#  6772#  6773#  6774#  6775#  6776#  6777#  6778#  6779#  6780#
         67818  6782#  6783#  6784#  6785#  6786#  6787#  6788#  6799#  6876#
MSGNLS   15568  3018#  4260#  4489#  4982#
MSGNSU   15458  3018#
MSGNTA   15378  3018#  3112#  3142#  3493#  3744#  3989#  4120#  4182#  4217#  4268#  6735#  6799#
```

MSGNTE	1541#	3018#	4225#												
MSHAPT	1421#	3018#	3061#												
MSHWAP	1476#	3018#	3061#												
MSINCR	1730#	3018#	3044#	3099#	3122#	3206#	3466#	3493#	3698#	3706#	3744#	3807#	3820#	3927#	3929#
	3935#	3946#	3950#	3952#	3953#	3957#	3969#	3989#	4069#	4071#	4095#	4104#	4120#	4130#	4142#
	4151#	4182#	4193#	4217#	4225#	4249#	4257#	4259#	4260#	4266#	4268#	4332#	4392#	4487#	4489#
	4539#	4564#	4921#	4982#	5017#	5248#	5633#	5651#	5750#	5751#	6264#	6271#	6385#	6464#	6472#
	6537#	6540#	6541#	6568#	6721#	6763#									
MSIOSE	1381#	3018#													
MSLDRO	1584#	3018#	3929#	3935#	3946#	4564#	5633#	5651#							
MSMASK	1352#	3018#	3310#												
MSMCHI	38	3018#													
MSMCLO	1294#	3018#													
MSMSK1	1358#	3018#	3310#												
MSPOP	1528#	3018#	3112#	3142#	3144#	3493#	3645#	3744#	3989#	4120#	4182#	4217#	4260#	4268#	4982#
	6735#	6799#	6877#												
MSPRIN	1306#	3018#	3807#	3820#	3950#	4069#	4071#	4142#	4151#	4392#	4539#	5750#	5751#	6385#	6537#
	6540#	6541#	6568#												
MSPUSH	1301#	3018#	3044#	3099#	3122#	3206#	3466#	3698#	3706#	3927#	4095#	4130#	4193#	4225#	4249#
	4921#	6721#	6763#												
MSPUT	1604#	3018#	3807#	3820#	3950#	3953#	3957#	4069#	4071#	4142#	4151#	4392#	4539#	5750#	5751#
	6385#	6537#	6540#	6541#	6568#										
MSPUT1	1613#	3018#	3807#	3820#	3950#	3953#	3957#	4069#	4071#	4142#	4151#	4392#	4539#	5750#	5751#
	6385#	6537#	6540#	6541#	6568#										
MSRADI	1781#	3018#	4489#	6723#	6724#	6725#	6726#	6765#	6767#	6768#	6769#	6770#	6771#	6772#	6773#
	6775#	6776#	6777#	6778#	6779#	6781#	6782#	6783#	6785#	6786#	6787#				
MSRNRO	1594#	3018#	3946#												
MSSETS	1736#	3018#	3044#	3099#	3122#	3206#	3466#	3698#	3706#	3927#	4095#	4130#	4193#	4225#	4249#
	4921#	6721#	6763#												
MSSTAR	1415#	3018#													
MSSVC	1575#	3018#	3493#	3744#	3807#	3820#	3929#	3935#	3946#	3950#	3952#	3953#	3957#	3969#	3989#
	4069#	4071#	4104#	4120#	4142#	4151#	4159#	4182#	4201#	4217#	4249#	4257#	4259#	4260#	4266#
	4268#	4332#	4392#	4487#	4489#	4539#	4564#	4921#	4982#	5017#	5248#	5633#	5651#	5750#	5751#
	6385#	6537#	6540#	6541#	6568#	6728#	6788#								
MSTLAB	1571#	3018#	3493#	3744#	3807#	3820#	3929#	3935#	3946#	3950#	3952#	3953#	3957#	3969#	3989#
	4069#	4071#	4104#	4120#	4142#	4151#	4182#	4217#	4249#	4257#	4259#	4260#	4266#	4268#	4332#
	4392#	4487#	4489#	4539#	4564#	4921#	4982#	5017#	5248#	5633#	5651#	5750#	5751#	6264#	6271#
	6385#	6464#	6472#	6537#	6540#	6541#	6568#								
MSTSTL	1563#	3018#	3493#	3744#	3807#	3820#	3929#	3935#	3946#	3950#	3952#	3953#	3957#	3969#	3989#
	4069#	4071#	4104#	4120#	4142#	4151#	4182#	4217#	4249#	4257#	4259#	4260#	4266#	4268#	4332#
	4392#	4487#	4489#	4539#	4564#	4921#	4982#	5017#	5248#	5633#	5651#	5750#	5751#	6264#	6271#
	6385#	6464#	6472#	6537#	6540#	6541#	6568#								
MSWORD	1626#	3018#	3061#	3081#	3310#	3969#	4104#	4159#	4201#	4489#	6264#	6271#	6464#	6472#	6723#
	6724#	6725#	6726#	6728#	6765#	6766#	6767#	6768#	6769#	6770#	6771#	6772#	6773#	6774#	6775#
	6776#	6777#	6778#	6779#	6780#	6781#	6782#	6783#	6784#	6785#	6786#	6787#	6788#		
MSXFER	1363#	3018#	6728#	6766#	6774#	6780#	6784#	6788#							
POINTE	843#	3018#	3051												
PRINTB	896#	3018#	4142	4151	4392	4539	5750	5751	6385	6537					
PRINTF	936#	3018#	3950	4069	4071										
PRINTS	976#	3018#	3807	3820											
PRINTX	1016#	3018#	6540	6541	6568										
READBU	1066#	3018#													
READEF	1060#	3018#	3929	3935											
REQTIM	1065#	3018#													
SETEF	1070#	3018#													
SETPRI	1075#	3018#	5633	5651											

```
SETVEC   1080#   3018#   3953    3957
SLASH    1086#   3018#
STARS    1100#   3018#
SVC      1114#   3017#   3018
TRAPPR   1262#   3018#
UNBUFF   1267#   3018#
WAITMS   1272#   3018#
WAITUS   1277#   3018#
XFER     1282#   3018#   3969#   4104#   4159#   4201#   6728#   6788#
XFERF    1286#   3018#   6766    6774    6780    6784
XFERT    1290#   3018#


  ABS   067770     000


 ERRORS DETECTED:  0

 CZRXDA.BIN,CZRXDA.SEQ/NL BEX/CRF=CZRXDA.SML,CZRXDA P11,DOCTOR P11
 RUN-TIME:  29 34 4 SECONDS
 RUN-TIME RATIO: 295/68=4 2
 CORE USED:  20K  (39 PAGES)
```