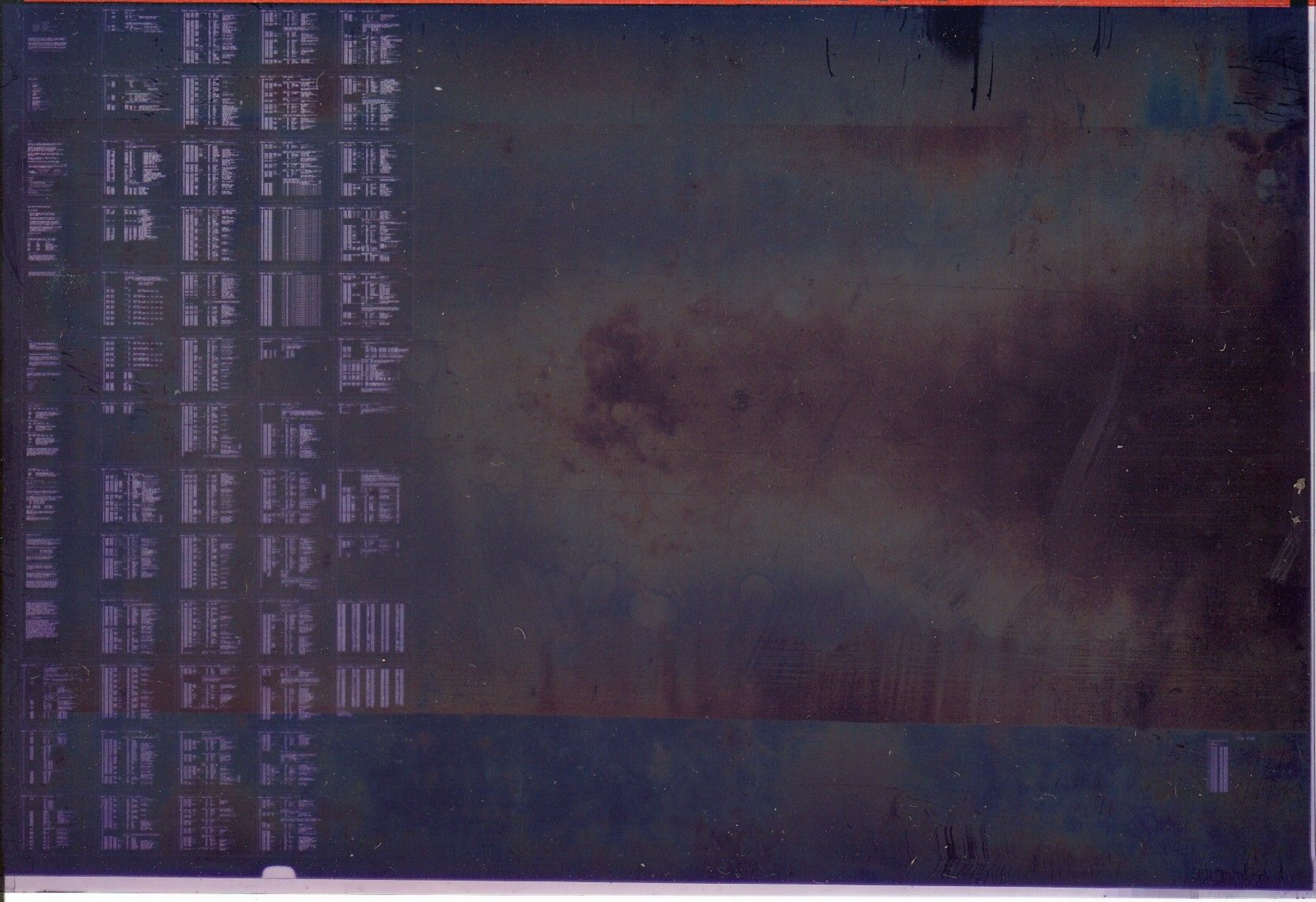
DRV11-J DIAG TST PRT 2 CVDRDBO AH-F761B-MC FICHE 1 OF 1



IDENTIFICATION

PRODUCT CODE: AC-F759B-MC

PRODUCT NAME: CVDRDB0 DRV11J DIAG TST PRT2

DATE CREATED: 17-FEB-82

MAINTAINER: DIAGNOSTIC ENGINEERING

TABLE OF CONTENTS

1.0 ABSTRACT

THE DRV11-J IS A GENERAL PURPOSE PARALLEL INTERFACE FOR THE LSI-11 BUS. IT HAS A BASIC CONFIGURATION OF 64 TRI-STATE IN/OUT LINES DIVIDED INTO FOUR GROUPS OF 16 BIT WORDS.

THERE ARE TWO 4K DIAGNOSTICS FOR THE DRV11-J OPTION. THE DRV11-J DIAGNOSTIC TEST PART 1 OF 2 CONTAINS A SERIES OF TESTS WITHOUT DRV11J INTERRUPTS DESIGNED TO TEST ALL LOGIC FUNCTIONS AND DATA PATHS MADE ACCESSIBLE WITH THE LOOPBACK CABLE INSERTED INTO THE DRV11-J I/O CONNECTORS.

THE DRV11-J DIAGNOSTIC PART 2 OF 2 IS A SERIES OF TESTS WITH DRV11J INTERRUPTS DESIGNED TO TEST ALL LOGIC AND DATA PATHS MADE ACCESSIBLE WITH THE LOOPBACK CABLE INSERTED INTO THE I/O CONNECTORS.

THE DRV11-J IS CONTAINED ON A DOUBLE HEIGHT MODULE. THE MODULE CONTAINS TWO 50 PIN CONNECTORS FOR INTERFACING TO EXTERNAL USER DEVICES.

FOR DIAGNOSTIC TESTING,THE DRV11-J CABLE(BC05W-02) MUST BE INSTALLED WITH 1/2 TWIST BETWEEN THE 50 PIN CONNECTORS.

```
**************************************************************************
*                                                                  ;;GPA  *
* NOTE: THIS DIAGNOSTIC HAS BEEN MODIFIED TO RUN IN KXT11 (SBC 11/21)  *
* BASED SYSTEMS.  THE PROGRAM WILL AUTOMATICALLY ADJUST ITSELF TO RUN  *
* IN THE APPROPRIATE ENVIRONMENT AS FOLLOWS:                           *
*                                                                      *
*              LSI-11, 11/2, AND 11/23        SBC 11/21               *
*              -----------------------        ---------               *
* CSR RANGE:       160010 TO 177760        174000 TO 177760           *
* PROGRAMMABLE...                                                      *
* ...VECTOR RANGE:    0000 TO 1774             000 TO 374              *
*                                                             ;;GPA    *
**************************************************************************
```

2.0 REQUIREMENTS

2.1 EQUIPMENT

1. PDP11/03,11/23 COMPUTER OR LSI-11 PROCESSOR WITH A MINIMUM OF 4K MEMORY.
2. SERIAL LINE INTERFACE AND CONSOLE TERMINAL
3. DRV11-J OPTION WITH A BC05W-02 CABLE

2.2 STORAGE

THE PROGRAM USES THE LOWER 4K OF MEMORY.

3.0 LOADING PROCEDURE

USE STANDARD PROCEDURE FOR PDP-11 ABSOLUTE

BINARY FORMATTED PAPERTAPES OR XXDP MEDIA
(FILES WITH .BIC OR .BIN EXTENSIONS ONLY).

4.0 STARTING PROCEDURE

1. MAKE SURE THE DRV11-J CABLE IS INSERTED WITH 1/2 A TWIST ON THE I/O CONNECTORS OF THE DRV11-J OPTION. THIS WILL CONNECT PORT A TO PORT C AND CONNECT PORT B TO PORT D.

2. MAKE SURE THE DEVICE BUS ADDRESSES AGREE WITH THE DEFAULT VALUES DEFINED IN SECTION 7.1. IF NOT,CHANGE LOCATION(S) AS DESIRED VIA THE 'ADDRESS/' ODT COMMAND.

3. THE PROGRAM SHOULD ALWAYS BE STARTED AT 200. STARTING AT 200(200G OR .R CVDRDB UNDER XXDP+),THE PROGRAM INITIALIZES ITSELF,PRINTS ITS ID(FIRST TIME ONLY) AND THEN PRINTS THAT THE DRV11-J CABLE IS REQUIRED(FIRST TIME ONLY) AND THEN PRINTS: SWR=XXXXXX NEW=

   WHERE XXXXXX REPRESENTS THE CURRENT VALUE OF THE SOFTWARE SWITCH REGISTER. IF NO CHANGES ARE REQUIRED IN THE SWITCH REGISTER THEN JUST HIT CARRIAGE RETURN.
   IF CHANGES ARE REQUIRED,THEN A NEW VALUE MAY BE TYPED FOLLOWED BY A CARRIAGE RETURN.
   REFER TO SECTION 5.0 FOR SWITCH REGISTER OPTIONS.

5.0 SOFTWARE SWITCH REGISTER

5.1 OPTIONS

THE PROGRAM SWITCH DEFAULT MODE IS SWR = 000000
IF USING A VIDEO TERMINAL ,BIT 15 = 1(HALT ON ERROR), MAY BE HELPFUL IN KEEPING THE ERROR ON THE SCREEN.

SWITCH	OCTAL	FUNCTION
SW15=1	100000	HALT ON ERROR
SW14=1	040000	LOOP ON TEST
SW13=1	020000	INHIBIT ERROR TYPEOUTS
SW12=1	010000	INHIBIT ILLEGAL VECTOR RETURN ROUTINES
SW11=1	004000	INHIBIT ITERATIONS
SW09=1	001000	LOOP ON ERROR
SW08=1	C004XX	LOOP ON TEST IN SWR <7-0>

* SW12 EXPLANATION

  SW12 = 1 WILL STORE THE REGULAR TRAP (PC+2,HALT) IN LOCATIONS 204-1774 FOR THE VECTOR TESTING. ON ILLEGAL VECTOR ERRORS,THIS WILL AID THE USER TO DETERMINE THE LOCATION OF THE ILLEGAL VECTOR. THE LOOPING CAPABILITIES THAT ARE NORMALLY PROVIDED BY ILLEGAL VECTOR SERVICE ROUTINES WHEN SW12=0 WILL NO LONGER BE AVAILABLE WHEN SW12 = 1.

```
IF USING SW12=1 TO TRACK DOWN THE ILLEGAL VECTOR,THE
USER SHOULD RESTART AT ADDRESS 200 WITH SW12=0 TO
OBTAIN LOOPING CAPABILITIES AFTER ERROR OCCURS.
VECTOR AREA 0-200 WILL ALWAYS HAVE ILLEGAL VECTOR ROUTINES
WHEN VECTOR TESTING (0-200) IN ORDER TO PRESERVE PROGRAM.
```

SEQ 0005

* WARNING:

PLEASE USE "CTRL AND G" KEYS AND WAIT FOR THE "CTRL G" TO BE ECHOED BEFORE ATTEMPTING TO HALT THE CPU OR TO STOP TESTING OR THE PROGRAM MAY NOT BE RESTARTABLE.
PROGRAM RELOCATION FOR LOCATIONS 0-200 TAKES PLACE DURING THE VECTOR TESTING OF 0-200. THE NORMAL CONTENTS OF 0-200 MAY NOT GET RESTORED IF THE CPU IS HALTED AND RELOAD OF THE PROGRAM MAY BE NECESSARY.

1. THE SOFTWARE SWITCH REGISTER 'SWREG' (LOC. 176) CAN BE CHANGED BY USING THE ODT FACILITIES.

2. THE SOFTWARE SWITCH REGISTER CAN BE CHANGED UNDER PROGRAM CONTROL BY TYPING THE 'CONTROL & G' KEYS. THIS KEYBOARD OPERATION WILL PRINT OUT THE CURRENT CONTENTS AND ACCEPT NEW OCTAL SWITCH REGISTER DATA TERMINATED WITH A CARRIAGE RETURN.

3. ONCE THE ODT MODE HAS BEEN ENTERED BECAUSE OF AN ERROR CONDITION WITH BIT15 SET (HALT ON ERROR), STEP #2 ABOVE IS OF NO VALUE, SO RESORT TO STEP #1 TO ALTER THE SOFTWARE SWITCH REGISTER IF DESIRED BEFORE TYPING 'P' (CONTINUE).

6.0 ERROR REPORTING

6.1 ERROR COMMENT

ALL ERRORS ARE ACCOMPANIED WITH AN ENGLISH LANGUAGE DESCRIPTIVE COMMENT AS TO THE TYPE OF FAILURE. FURTHER QUALIFICATION OF THE ERROR CAN BE OBTAINED IF NEEDED FROM THE COMMENT AT THE ERROR PC OR FROM THE TEST ITSELF.

6.2 ERROR DATA

6.2.1 ERROR TITLE TYPE A

1. REG READ/WRITE ER
2. IRR REG ER
3. ACR REG ER
4. IMR REG ER
5. ISR REG ER

6. CHIP STAT ER

7. MULTIPLE INTERRUPTS RECEIVED

8. INTERRUPT TEST ERROR

ERRPC	TSTNUM	BUSADR	VAM	ADDR	EXPCT	RCVD
XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX

ERRPC	LISTING ADDRESS WHERE THE ERROR WAS DETECTED
TSTNUM	TEST NUMBER WHERE THE ERROR OCCURRED
BUSADR	DRV11J BUS REG ADDRESS OF CONCERNED OPERATION
VAM	VALUE STORED INTO VECTOR ADDRESS MEMORY INDICATING BYTE COUNT AND LEVEL.
ADDR	VECTOR ADDRESS
EXPCT	DATA THAT WAS EXPECTED
RCVD	DATA THAT WAS RECEIVED

6.2.2 ERROR TITLE TYPE B

1. ILLEGAL INTERRUPT RECEIVED

ERRPC	TSTNUM	BUSADR	VAM	ADDR
XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX

ERRPC	ADDRESS WHERE THE ERROR WAS DETECTED
TSTNUM	TEST NUMBER WHERE THE ERROR OCCURRED
BUSADR	DRV11J BUS ADDRESS
VAM	VALUE OF VECTOR ADDRESS MEMORY AT TIME OF ILLEGAL INTERRUPT.
ADDR	VECTOR ADDRESS

6.2.3 ERROR TITLE TYPE C

1. ILLEGAL VECTOR MEM ADDR ER

ERRPC	TSTNUM	TESTPC	BUSADR	VAM	ADDR
XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX

ERRPC	ADDRESS WHERE ERROR WAS DETECTED
TSTNUM	TEST NUMBER WHERE THE ERROR OCCURED
TESTPC	ADDRESS OF TEST THAT WAS RUNNING WHEN DRV11J VECTORED TO THE WRONG ADDRESS.
BUSADR	BUS ADDRESS OF CONCERNED OPERATION
VAM	VALUE OF VECTOR ADDRESS MEMORY BYTE COUNT AND LEVEL.
ADDR	CORRECT VECTOR ADDRESS

6.2.4 ERROR TYPE D

THIS ERROR IS ONLY FOUND WHEN RUNNING THE VECTOR ADDRESS UNIQUENESS TESTS. THE VECTOR MEMORY IS PRESET TO PERFORM 64 INTERRUPTS. INTERRUPT SERVICE ROUTINES ARE STORED FROM VECTORS 300 TO 674. THE ROUTINES WILL STORE THE VALUE OF THE VECTOR ADDRESS WHERE THEY CAME FROM IN A BUFFER TO COMPARE AFTER ALL INTERRUPTS TAKE PLACE. THE BUFFER SHOULD THEN HAVE ADDRESS VALUES IN CONSECUTIVE ORDER STARTING WITH VECTOR VALUE 300 AND ENDING WITH VECTOR VALUE 674.

```
1. VECT ADDR MEM ER
   ERRPC  TSTNUM  BUSADR  EXPCT   RCVD
   XXXXXX XXXXXX  XXXXXX  XXXXXX  XXXXXX

   ERRPC         ADDRESS WHERE ERROR WAS DETECTED
   TSTNUM        TEST NUMBER WHERE ERROR OCCURRED
   BUSADR        STARTUP BUS ADDRESS BEFORE VECTOR UNIQUENESS
   EXPCT         ,, 'S IS THE EXPECTED VECTOR ADDRESS
   RCVD          VECTOR ADDRESS VALUE STORED IN BUFFER
```

7.0 MISCELLANEOUS

7.1 DRV11-J BUS ADDRESS MODIFICATION

MODIFY LOCATION 'SBASE'(ADDR:2244) IF BASE BUS ADDRESS IS NOT 164160.

7.2 XXDP/APT NOTES

THIS DIAGNOSTIC DOES SUPPORT ACT AND APT ENVIRONMENTS.

7.. POWER FAIL

A POWER FAILURE WILL CAUSE A RESTART MESSAGE ON POWER UP AT WHICH TIME THE PROGRAM IS RESTARTED (ONLY ON SYSTEMS WITH NON-VOLATILE MEMORY AND WITH APPROPRIATE HARDWARE).

7.4 MULTIPLE DRV11J INTERFACE TESTING

THIS PROGRAM DOES NOT "AUTO-SIZE" THE NUMBER OF DRV11J'S CONNECTED. THIS DIAGNOSTIC WILL TEST SEQUENTIALLY UP TO 4 DRV11J INTERFACES WITH CONTIGUOUS BUS ADDRESSES. THIS IS ACCOMPLISHED BY THE USER SETTING UP LOCATION 'SDEVM" (ADDR:2246) WITH A BIT MAP INDICATING WHAT INTERFACES ARE TO BE TESTED.
I.E. BIT0= 1 SAYS TEST 1ST DRV11J,
BIT1= 1 SAYS TEST 1ST DRV11J
BIT2= 1 SAYS TEST 2ND DRV11J
BIT3= 1 SAYS TEST 3RD DRV11J

```
1ST UNIT = STARTING CSRA        164160  $DEVM = 1
2ND UNIT = STARTING CSRA        164140  $DEVM = 3
3RD UNIT = STARTING CSRA        164120  $DEVM = 7
4TH UNIT = STARTING CSRA        164100  $DEVM = 17
```

7.5 RESTRICTIONS

ALWAYS TYPE "CTRL G" AND WAIT FOR ECHO OF CHARACTERS BEFORE HALTING THE CPU OTHERWISE PORTIONS OF THE PROGRAM MAY NOT GET RESTORED. FOR MORE INFORMATION REFER TO SECTION 5.2.

8.0 EXECUTION TIME

EXECUTION TIME WILL BE LESS THAN 30 SECONDS PER DRV11J UNIT CONNECTED. AN "END PASS" MESSAGE INDICATES ALL TESTS HAVE COMPLETED ON ALL SELECTED UNITS.

9.0 PROGRAM TEST DESCRIPTIONS

GENERAL

THIS DIAGNOSTIC CONTAINS A SERIES OF INDEPENDENT TESTS DESIGNED
TO TEST LOGIC FUNCTIONS AND DATA PATHS OF THE DRV11J OPTION.
TESTING IS ACCOMPLISHED WITH THE AID OF THE
DRV11J LOOP BACK CABLE PROVIDED FOR DIAGNOSTIC TESTING.
A COMPLETE LIST OF TESTS IS AVAILABLE IN THE TABLE OF CONTENTS
AT THE BEGINNING OF THE LISTING. THE COMMENT FIELD WITHIN
EACH TEST CAN BE BENEFICIAL IN TEST UNDERSTANDING.

REFERENCES ARE MADE IN THE LISTING TO THE TWO INTERRUPT
CONTROL CHIPS USED ON THE DRV11J AS GROUP1 AND GROUP2.

GROUP1 CHIP	CSRA = CONTROL FOR GROUP 1
	CSRB = DATA FOR GROUP1
GROUP2 CHIP	CSRC = CONTROL FOR GROUP2
	CSRD = DATA FOR GROUP2

9.1 TEST 1 - TEST CHIP INTERRUPT,GROUP1,GROUP2

THIS TEST WILL CHECK THE ABILITY OF EACH INTERRUPT
CONTROL CHIP TO INTERRUPT TO COMMON VECTOR 300.
THIS TEST WILL ALSO CLEAR THE HIGHEST PRIORITY
ISR BITS WITH TEST VARIATIONS OF IRR AND
IMR BITS.

9.2 TEST 2 - TEST ACR/ISR INTERRUPT,GROUP 1,GROUP 2

THIS TEST WILL TEST THE ABILITY OF BOTH GROUPS
TO INTERRUPT TO COMMON VECTOR 300 AND THE ABILITY
OF THE ACR(AUTOCLEAR REGISTER TO CLEAR THE ISR
AFTER BEING SET AND MASKED BY COMBINATIONS OF IRR BITS
AND IMR BITS.

9.3 TEST 3 - TEST VECTOR ADDR MEM,LEV 0-7,BY0-3,(204-1774),GRPS 1,2

THIS TEST WILL CHECK BOTH GROUPS,ONE AT A TIME,TO VECTOR
FROM ADDRESS 204 TO ADDRESS 1774 FOR LEVELS 0-7 AND
FOR BYTE COUNTS 1-4.THE BYTE COUNT NUMBER WILL INDICATE
THE NUMBER OF INTERRUPTS AT A GIVEN ADDRESS.
THE IRR,IMR AND ACR REGISTERS WILL ALL BE EXERCISED
AND CHECKED TO INSURE PROPER VECTORING.

9.4 TEST 4 - TEST VECTOR ADDR MEM,LEV 0-7,BY0-3,(0-200),GRPS 1,2

THIS TEST WILL CHECK BOTH GROUPS,ONE AT A TIME, TO VECTOR
FROM ADDRESS 0-200 FOR LEVELS 0-7 AND FOR BYTE COUNTS 1-4.
TESTS ARE DONE TO INSURE THAT INTERRUPTS ONLY TAKE PLACE
WHEN EVERYTHING IS READY. THE CHIP BEING ARMED,INTERRUPT
ENABLE IS SET AND THE PROPER IMR AND IRR BITS ARE SET.
AFTER THE INTERRUPTS CHECK TO INSURE THAT THE INTERRUPTS
GENERATED MATCH THE BYTE COUNT AND THAT THE PROPER
ISR BITS WERE SET AND THE PROPER IRR BITS WERE CLEARED.

9.5 TEST 5 - TEST VECTOR ADDR UNIQUENESS IN FIXED MODE FOR GROUPS 1,2

THIS TEST WILL CHECK THE FIXED PRIORITY OF THE TWO
INTERRUPT CONTROL CHIPS AS WELL AS THE ADDRESSING
CAPABILITY OF THE VECTOR ADDRESS MEMORY.
THE AUTOCLEAR REGISTER(ACR) IS USED TO CLEAR OUT THE
ISR BITS AFTER 4 INTERRUPTS PER LEVEL HAS TAKEN PLACE.
CLEARING THE ISR REGISTER WILL THEN ALLOW THE NEXT LEVEL
OF PRIORITY TO INITIATE 4 INTERRUPTS.
THE VECTOR MEMORY IS PRESET TO PERFORM 64 UNIQUE INTERRUPTS.
INTERRUPT SERVICE ROUTINES ARE STORED FROM VECTORS
300-674. EACH INTERRUPT SERVICE ROUTINE UPON INTERRUPT
ENTRY WILL STORE THE ADDRESS OF ITS VECTOR
IN A BUFFER FOR A COMPARE AFTER 64 INTERRUPTS TAKE PLACE.
THE BUFFER SHOULD THEN HAVE ADDRESS VALUES IN CONSECUTIVE
ORDER STARTING WITH VECTOR VALUE 300 AND ENDING WITH
VECTOR VALUE 674.

9.6 TEST 6 - TEST VECTOR ADDRESS UNIQUENESS,ROTATING PRIORITY
FOR BOTH GROUPS 1,2

THIS TEST WILL CHECK THE ROTATING PRIORITY OF EACH
OF THE TWO INTERRUPT CONTROL CHIPS AS WELL AS THE ADDRESSING
CAPABILITY OF THE VECTOR ADDRESS MEMORY.
THE VECTOR ADDRESS MEMORY IS PRESET FOR 64 UNIQUE INTERRUPTS.
INTERRUPT SERVICE ROUTINES ARE STORED FROM VECTORS 300-674.
ALL IRR BITS ARE SET AND ALL IMR BITS ARE CLEARED.
AFTER THE FIRST FOUR INTERRUPTS FROM IRR0 TAKES PLACE,
THE ISR0 BIT WILL SET AND IRR0 BIT WILL CLEAR.
TO PROVE ROTATION OF PRIORITY,THE ISR0 BIT IS CLEARED
AND THE IRR0 BIT IS SET AGAIN IN ORDER TO PROVE THAT
IRR1 WILL NOW BE CONSIDERED THE HIGHEST PRIORITY AND
IRR0 THE LOWEST PRIORITY. THIS FLOW IS REPEATED FOR
ALL LEVELS OF GROUP 1(0-7). THEN GROUP 2 IS TESTED
IN THE SAME MANNER FOR LEVELS 0-7. EACH INTERRUPT
SERVICE ROUTINE UPON ACCESS FROM AN INTERRUPT WILL STORE
THE ADDRESS OF THE VECTOR WHERE THE ROUTINE RESIDES IN
A BUFFER. AFTER ALL 64 INTERRUPTS TAKE PLACE(4 AT A TIME
FOR EACH LEVEL)THE BUFFER WILL BE CHECKED FOR CONSECUTIVE
VECTOR VALUES OF 300-674. THIS WILL INSURE THAT PROPER
VECTOR ADDDRESSING AND ROTATION OF PRIORITIES WAS
COMPLETED.

10.0 LISTING

```
                                ;;GPA   .HEADER ^/CVDRDA DRV11J DIAG TST PRT2 /,1979,^/BILL HEAVEY/
                                .TITLE  CVDRDB DRV11J DIAG TST PRT2
                                ;*COPYRIGHT (C) 1979
                                ;*DIGITAL EQUIPMENT CORP.
                                ;*MAYNARD, MASS. 01754
                                ;*
                                ;*PROGRAM BY BILL HEAVEY
                                ;*
                                ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                                ;*PACKAGE (MAINDEC-11-DZQAC-C5), JAN, 1981.
                                ;*
000001                          $TN=1
160000                          $SWR=160000     ;;HALT ON ERROR, LOOP ON TEST, INHIBIT ERROR TYPOUT
                                ;* EDITED TO PERMIT DRV'S TO RUN ON FALCON (KXT11).              ;;GPA
                                ;*              G. PASQUANTONIO, JULY '81                      ;;GPA
                                ;*
165400                          $SWR=165400
000001                          $TN=1
                                .SBTTL  OPERATIONAL SWITCH SETTINGS
                                ;*
                                ;*      SWITCH                  USE
                                ;*      ------          --------------------
                                ;*        15            HALT ON ERROR
                                ;*        14            LOOP ON TEST
                                ;*        13            INHIBIT ERROR TYPEOUTS
                                ;*        11            INHIBIT ITERATIONS
                                ;*         9            LOOP ON ERROR
                                ;*         8            LOOP ON TEST IN SWR<7:0>
                                .SBTTL  BASIC DEFINITIONS

                                ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
001100                          STACK=  1100
                                .EQUIV  EMT,ERROR       ;;BASIC DEFINITION OF ERROR CALL
                                .EQUIV  IOT,SCOPE       ;;BASIC DEFINITION OF SCOPE CALL

                                ;*MISCELLANEOUS DEFINITIONS
000011                          HT=     11              ;;CODE FOR HORIZONTAL TAB
000012                          LF=     12              ;;CODE FOR LINE FEED
000015                          CR=     15              ;;CODE FOR CARRIAGE RETURN
000200                          CRLF=   200             ;;CODE FOR CARRIAGE RETURN-LINE FEED
177776                          PS=     177776          ;;PROCESSOR STATUS WORD
                                .EQUIV  PS,PSW
177774                          STKLMT= 177774          ;;STACK LIMIT REGISTER
177772                          PIRQ=   177772          ;;PROGRAM INTERRUPT REQUEST REGISTER
177570                          DSWR=   177570          ;;HARDWARE SWITCH REGISTER
177570                          DDISP=  177570          ;;HARDWARE DISPLAY REGISTER

                                ;*GENERAL PURPOSE REGISTER DEFINITIONS
000000                          R0=     %0              ;;GENERAL REGISTER
000001                          R1=     %1              ;;GENERAL REGISTER
000002                          R2=     %2              ;;GENERAL REGISTER
000003                          R3=     %3              ;;GENERAL REGISTER
000004                          R4=     %4              ;;GENERAL REGISTER
000005                          R5=     %5              ;;GENERAL REGISTER
000006                          R6=     %6              ;;GENERAL REGISTER
000007                          R7=     %7              ;;GENERAL REGISTER
```

```
(1)  000006                  SP=     %6              ;;STACK POINTER
(1)  000007                  PC=     %7              ;;PROGRAM COUNTER
(1)
(1)                          ;*PRIORITY LEVEL DEFINITIONS
(1)  000000                  PR0=    0               ;;PRIORITY LEVEL 0
(1)  000040                  PR1=    40              ;;PRIORITY LEVEL 1
(1)  000100                  PR2=    100             ;;PRIORITY LEVEL 2
(1)  000140                  PR3=    140             ;;PRIORITY LEVEL 3
(1)  000200                  PR4=    200             ;;PRIORITY LEVEL 4
(1)  000240                  PR5=    240             ;;PRIORITY LEVEL 5
(1)  000300                  PR6=    300             ;;PRIORITY LEVEL 6
(1)  000340                  PR7=    340             ;;PRIORITY LEVEL 7
(1)
(1)                          ;*''SWITCH REGISTER'' SWITCH DEFINITIONS
(1)  100000                  SW15=   100000
(1)  040000                  SW14=   40000
(1)  020000                  SW13=   20000
(1)  010000                  SW12=   10000
(1)  004000                  SW11=   4000
(1)  002000                  SW10=   2000
(1)  001000                  SW09=   1000
(1)  000400                  SW08=   400
(1)  000200                  SW07=   200
(1)  000100                  SW06=   100
(1)  000040                  SW05=   40
(1)  000020                  SW04=   20
(1)  000010                  SW03=   10
(1)  000004                  SW02=   4
(1)  000002                  SW01=   2
(1)  000001                  SW00=   1
(1)                          .EQUIV  SW09,SW9
(1)                          .EQUIV  SW08,SW8
(1)                          .EQUIV  SW07,SW7
(1)                          .EQUIV  SW06,SW6
(1)                          .EQUIV  SW05,SW5
(1)                          .EQUIV  SW04,SW4
(1)                          .EQUIV  SW03,SW3
(1)                          .EQUIV  SW02,SW2
(1)                          .EQUIV  SW01,SW1
(1)                          .EQUIV  SW00,SW0
(1)
(1)                          ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
(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)            .EQUIV  BIT09,BIT9
(1)            .EQUIV  BIT08,BIT8
(1)            .EQUIV  BIT07,BIT7
(1)            .EQUIV  BIT06,BIT6
(1)            .EQUIV  BIT05,BIT5
(1)            .EQUIV  BIT04,BIT4
(1)            .EQUIV  BIT03,BIT3
(1)            .EQUIV  BIT02,BIT2
(1)            .EQUIV  BIT01,BIT1
(1)            .EQUIV  BIT00,BIT0
(1)
(1)            ;*BASIC "CPU" TRAP VECTOR ADDRESSES
(1)   000004   ERRVEC= 4                ;;TIME OUT AND OTHER ERRORS
(1)   000010   RESVEC= 10               ;;RESERVED AND ILLEGAL INSTRUCTIONS
(1)   000014   TBITVEC=14               ;;"T" BIT
(1)   000014   TRTVEC= 14               ;;TRACE TRAP
(1)   000014   BPTVEC= 14               ;;BREAKPOINT TRAP (BPT)
(1)   000020   IOTVEC= 20               ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
(1)   000024   PWRVEC= 24               ;;POWER FAIL
(1)   000030   EMTVEC= 30               ;;EMULATOR TRAP (EMT) **ERROR**
(1)   000034   TRAPVEC=34               ;;"TRAP" TRAP
(1)   000060   TKVEC=  60               ;;TTY KEYBOARD VECTOR
(1)   000064   TPVEC=  64               ;;TTY PRINTER VECTOR
(1)   000240   PIRQVEC=240              ;;PROGRAM INTERRUPT REQUEST VECTOR
 20   164160   ABASE=  164160           ;BASE ADDRESS
 21   000001   ADEVM=  1                ;DEFAULT TO ONE DRV11J
 22   100000   RDY=    BIT15
 23   000400   DIR=    BIT8
 24   001000   IE=     BIT9
 25
 26            ;CHIP COMMAND SUMMARY
 27   000020   CIRMR=  20               ;CLEAR IRR AND IMR
 28   000030   CSIRMR= 30               ;CLEAR SINGLE IRR AND IMR BIT
 29
 30   000040   CIMR=   40               ;CLEAR IMR
 31   000050   CSIMR=  50               ;CLEAR SINGLE IMR BIT
 32   000060   SIMR=   60               ;SET ALL IMR BITS
 33   000070   SSIMR=  70               ;SET SINGLE IMR BITS
 34
 35   000100   CIRR=   100              ;CLEAR IRR
 36   000110   CSIRR=  110              ;CLEAR SINGLE IRR BITS
 37   000120   SIRR=   120              ;SET ALL IRR BITS
 38   000130   SSIRR=  130              ;SET SINGLE IRR BITS
 39
 40   000140   CHPISR= 140              ;CLEAR HIGHEST PRIORITY ISR BIT
 41   000160   CISR=   160              ;CLEAR ISR
 42   000170   CSISR=  170              ;CLEAR SINGLE ISR BIT
 43
 44   000200   LMD04=  200              ;LOAD MODE BITS M0-M4
 45   000240   LMD57=  240              ;LOAD MODE BITS M5-M7
 46
 47            ;CHIP MODE BIT PRESELECTION
 48   000240   MISR=   240
 49   000244   MIMR=   244
```

```
                        000250                  MIRR=   250
                        000254                  MACR=   254
                                                ;CHIP WRITE PRESELECTION
                        000300                  PACR=   300             ;PRESELECT AUTO CLEAR REG. FOR WRITING
                        000260                  PIMR=   260             ;PRESELECT IMR REG. FOR WRITING
                        000340                  PVMA=   340             ;PRESELECT VECTOR MEMORY ADDRESS
                                                .SBTTL  TRAP CATCHER
(1)
(1)                     000000                          .=0
(1)                                             ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
(1)                                             ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
(1)                                             ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
(1)                     000174                  .=174
(1)  000174  000000                             DISPREG: .WORD  0               ;;SOFTWARE DISPLAY REGISTER
(1)  000176  000000                             SWREG:   .WORD  0               ;;SOFTWARE SWITCH REGISTER
(1)                                             .SBTTL  STARTING ADDRESS(ES)
(1)  000200  000137  002476                             JMP     @#START ;;JUMP TO STARTING ADDRESS OF PROGRAM
                        000100                  .=100
                000100  000104  000200  000002         .WORD   104,200,2       ;IF 'B EVENT' ON Q BUS IS CONNECTED
                                                                                ;IGNORE IT'S INTERRUPT - JUST DO A RTI
```

```
                                .SBTTL  ACT11 HOOKS

                                ;;*****************************************************************
                                ;HOOKS REQUIRED BY ACT11
        000106                          $SVPC=.                 ;SAVE PC
        000046                          .=46
000046  010760                          $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
        000052                          .=52
000052  000000                          .WORD   0               ;;2)SET LOC.52 TO ZERO
        000106                          .=$SVPC                 ;; RESTORE PC
        002000                          .=2000

                                                                ;LONGEST TEST TIME
                                                                ;1ST PASS RUN TIME
                                                                ;ADDITIONAL RUN TIME

                                .SBTTL  APT PARAMETER BLOCK

                                ;;*****************************************************************
                                ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
                                ;;*****************************************************************
        002000                          .$X=.   ;;SAVE CURRENT LOCATION
        000024                          .=24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
000024  000200                          200     ;;FOR APT START UP
        000044                          .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
000044  002000                          $APTHDR ;;POINT TO APT HEADER BLOCK
        002000                          .=.$X   ;;RESET LOCATION COUNTER
                                ;;*****************************************************************
                                ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
                                ;INTERFACE SPEC.

002000                          $APTHD:
002000  000000                  $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
002002  002170                  $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
002004  000014                  $TSTM:  .WORD   12.     ;;RUN TIM OF LONGEST TEST
002006  000036                  $PASTM: .WORD   30.     ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
002010  000036                  $UNITM: .WORD   30.     ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
002012  000031                          .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
```

```
                                .SBTTL  COMMON TAGS

                                ;;**********************************************************************
                                ;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
                                ;*USED IN THE PROGRAM.

                        002100          .=2100
002100                  $CMTAG:                         ;;START OF COMMON TAGS
002100  000000                  .WORD   0
002102  000             $TSTNM: .BYTE   0               ;;CONTAINS THE TEST NUMBER
002103  000             $ERFLG: .BYTE   0               ;;CONTAINS ERROR FLAG
002104  000000          $ICNT:  .WORD   0               ;;CONTAINS SUBTEST ITERATION COUNT
002106  000000          $LPADR: .WORD   0               ;;CONTAINS SCOPE LOOP ADDRESS
002110  000000          $LPERR: .WORD   0               ;;CONTAINS SCOPE RETURN FOR ERRORS
002112  000000          $ERTTL: .WORD   0               ;;CONTAINS TOTAL ERRORS DETECTED
002114  000             $ITEMB: .BYTE   0               ;;CONTAINS ITEM CONTROL BYTE
002115  001             $ERMAX: .BYTE   1               ;;CONTAINS MAX. ERRORS PER TEST
002116  000000          $ERRPC: .WORD   0               ;;CONTAINS PC OF LAST ERROR INSTRUCTION
002120  000000          $GDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'GOOD' DATA
002122  000000          $BDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'BAD' DATA
002124  000000          $GDDAT: .WORD   0               ;;CONTAINS 'GOOD' DATA
002126  000000          $BDDAT: .WORD   0               ;;CONTAINS 'BAD' DATA
002130  000000                  .WORD   0               ;;RESERVED--NOT TO BE USED
002132  000000                  .WORD   0
002134  000             $AUTOB: .BYTE   0               ;;AUTOMATIC MODE INDICATOR
002135  000             $INTAG: .BYTE   0               ;;INTERRUPT MODE INDICATOR
002136  000000                  .WORD   0
002140  177570          SWR:    .WORD   DSWR            ;;ADDRESS OF SWITCH REGISTER
002142  177570          DISPLAY: .WORD  DDISP           ;;ADDRESS OF DISPLAY REGISTER
002144  177560          $TKS:   177560                  ;;TTY KBD STATUS
002146  177562          $TKB:   177562                  ;;TTY KBD BUFFER
00215C  177564          $TPS:   177564                  ;;TTY PRINTER STATUS REG. ADDRESS
002152  177566          $TPB:   177566                  ;;TTY PRINTER BUFFER REG. ADDRESS
002154  000             $NULL:  .BYTE   0               ;;CONTAINS NULL CHARACTER FOR FILLS
002155  002             $FILLS: .BYTE   2               ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
002156  012             $FILLC: .BYTE   12              ;;INSERT FILL CHARS. AFTER A "LINE FEED"
002157  000             $TPFLG: .BYTE   0               ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
002160  000000          $TIMES: 0                       ;;MAX. NUMBER OF ITERATIONS
002162  000000          $ESCAPE:0                       ;;ESCAPE ON ERROR ADDRESS
002164  077             $QUES:  .ASCII  /?/             ;;QUESTION MARK
002165  015             $CRLF:  .ASCII  <15>            ;;CARRIAGE RETURN
002166  000012          $LF:    .ASCIZ  <12>            ;;LINE FEED
                                ;;**********************************************************************
                                .SBTTL  APT MAILBOX-ETABLE

                                ;;**********************************************************************
                                .EVEN
002170                  $MAIL:                          ;;APT MAILBOX
002170  000000          $MSGTY: .WORD   AMSGTY          ;;MESSAGE TYPE CODE
002172  000000          $FATAL: .WORD   AFATAL          ;;FATAL ERROR NUMBER
002174  000000          $TESTN: .WORD   ATESTN          ;;TEST NUMBER
002176  000000          $PASS:  .WORD   APASS           ;;PASS COUNT
002200  000000          $DEVCT: .WORD   ADEVCT          ;;DEVICE COUNT
002202  000000          $UNIT:  .WORD   AUNIT           ;;I/O UNIT NUMBER
002204  000000          $MSGAD: .WORD   AMSGAD          ;;MESSAGE ADDRESS
002206  000000          $MSGLG: .WORD   AMSGLG          ;;MESSAGE LENGTH
```

```
(2)  002210                          $ETABLE:                ;;APT ENVIRONMENT TABLE
(2)  002210      000                 $ENV:    .BYTE  AENV    ;;ENVIRONMENT BYTE
(2)  002211      000                 $ENVM:   .BYTE  AENVM   ;;ENVIRONMENT MODE BITS
(2)  002212  000000                  $SWREG:  .WORD  ASWREG  ;;APT SWITCH REGISTER
(2)  002214  000000                  $USWR:   .WORD  AUSWR   ;;USER SWITCHES
(2)  002216  000000                  $CPUOP:  .WORD  ACPUOP  ;;CPU TYPE,OPTIONS
(2)                                  ;*                      BITS 15-11=CPU TYPE
(2)                                  ;*                              11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
(2)                                  ;*                              11/70=06,PDQ=07,Q=10
(2)                                  ;*                      BIT 10=REAL TIME CLOCK
(2)                                  ;*                      BIT  9=FLOATING POINT PROCESSOR
(2)                                  ;*                      BIT  8=MEMORY MANAGEMENT
(2)  002220      000                 $MAMS1:  .BYTE  AMAMS1  ;;HIGH ADDRESS,M.S. BYTE
(2)  002221      000                 $MTYP1:  .BYTE  AMTYP1  ;;MEM. TYPE,BLK#1
(2)                                  ;*                      MEM.TYPE BYTE    --  (HIGH BYTE)
(2)                                  ;*                              900 NSEC CORE=001
(2)                                  ;*                              300 NSEC BIPOLAR=002
(2)                                  ;*                              500 NSEC MOS=003
(2)  002222  000000                  $MADR1:  .WORD  AMADR1  ;;HIGH ADDRESS,BLK#1
(2)                                  ;*                        MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF ''TYPE'' ABOVE
(2)  002224      000                 $MAMS2:  .BYTE  AMAMS2  ;;HIGH ADDRESS,M.S. BYTE
(2)  002225      000                 $MTYP2:  .BYTE  AMTYP2  ;;MEM.TYPE,BLK#2
(2)  002226  000000                  $MADR2:  .WORD  AMADR2  ;;MEM.LAST ADDRESS,BLK#2
(2)  002230      000                 $MAMS3:  .BYTE  AMAMS3  ;;HIGH ADDRESS,M.S.BYTE
(2)  002231      000                 $MTYP3:  .BYTE  AMTYP3  ;;MEM.TYPE,BLK#3
(2)  002232  000000                  $MADR3:  .WORD  AMADR3  ;;MEM.LAST ADDRESS,BLK#3
(2)  002234      000                 $MAMS4:  .BYTE  AMAMS4  ;;HIGH ADDRESS,M.S.BYTE
(2)  002235      000                 $MTYP4:  .BYTE  AMTYP4  ;;MEM.TYPE,BLK#4
(2)  002236  000000                  $MADR4:  .WORD  AMADR4  ;;MEM.LAST ADDRESS,BLK#4
(2)  002240  000000                  $VECT1:  .WORD  AVECT1  ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
(2)  002242  000000                  $VECT2:  .WORD  AVECT2  ;;INTERRUPT VECTOR#2BUS PRIORITY#2
(2)  002244  164160                  $BASE:   .WORD  ABASE   ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
(2)  002246  000001                  $DEVM:   .WORD  ADEVM   ;;DEVICE MAP
(2)  002250  000000                  $CDW1:   .WORD  ACDW1   ;;CONTROLLER DESCRIPTION WORD#1
(2)  002252                          $ETEND:
(2)                                  .MEXIT
```

```
(1)                                     .SBTTL  ERROR POI .TER TABLE
(1)
(1)                                     ;*THIS TABLE CONT .NS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
(1)                                     ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
(1)                                     ;*LOCATION $ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
(1)                                     ;*NOTE1:        IF $ITEMB IS 0 THE ONLY PERTINENT DATA IS ($ERRPC).
(1)                                     ;*NOTE2:        EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:
(1)
(1)                                     ;*      EM              ;;POINTS TO THE ERROR MESSAGE
(1)                                     ;*      DH              ;;POINTS TO THE DATA HEADER
(1)                                     ;*      DT              ;;POINTS TO THE DATA
(1)                                     ;*      DF              ;;POINTS TO THE DATA FORMAT
(1)
(1)
(1)  002252                             $ERRTB:
 70                                     ;ERROR  1
 71  002252  016101                             EM1             ;REG TIMEOUT ER
 72  002254  016416                             DH1             ;ERRPC  TSTNUM  BUSADR  EXPCT   RCVD
 73  002256  016666                             DT1             ;$ERRPC TSTNUM  $BDADR  $GDDAT  $BDDAT
 74  002260  000000                             0
 75
 76                                     ;ERROR  2
 77  002262  016120                             EM2     ;REG READ/WRITE ER
 78  002264  016463                             DH2     ;ERRPC  TSTNUM  BUSADR  VAM     ADDR    EXPCT   RCVD
 79  002266  016702                             DT2     ;$ERRPC TSTNUM  $BDADR  VECVAL  VECLOC  $GDDAT  $BDDAT
 80  002270  000000                             0
 81
 82                                     ;ERROR  3
 83  002272  016142                             EM3     ;IRR REG ER
 84  002274  016463                             DH2     ;ERRPC  TSTNUM  BUSADR  VAM     ADDR    EXPCT   RCVD
 85  002276  016702                             DT2     ;$ERRPC TSTNUM  $BDADR  VECVAL  VECLOC  $GDDAT  $BDDAT
 86  002300  000000                             0
 87
 88                                     ;ERROR  4
 89  002302  016155                             EM4     ;ACR REG ER
 90  002304  016463                             DH2     ;ERRPC  TSTNUM  BUSADR  VAM     ADDR    EXPCT   RCVD
 91  002306  016702                             DT2     ;$ERRPC TSTNUM  $BDADR  VECVAL  VECLOC  $GDDAT  $BDDAT
 92  002310  000000                             0
 93
 94                                     ;ERROR  5
 95  002312  016170                             EM5     ;IMR REG ERROR
 96  002314  016463                             DH2     ;ERRPC  TSTNUM  BUSADR  VAM     ADDR    EXPCT   RCVD
 97  002316  016702                             DT2     ;$ERRPC TSTNUM  $BDADR  VECVAL  VECLOC  $GDDAT  $BDDAT
 98  002320  000000                             0
 99
100                                     ;ERROR  6
101  002322  016203                             EM6     ;ISR REG ERROR
102  002324  016463                             DH2     ;ERRPC  TSTNUM  BUSADR  VAM     ADDR    EXPCT   RCVD
103  002326  016702                             DT2     ;$ERRPC TSTNUM  $BDADR  VECVAL  VECLOC  $GDDAT  $BDDAT
104  002330  000000                             0
105
106                                     ;ERROR  7
107  002332  016375                             EM14    ;VECTOR ADDR MEM ER
108  002334  016416                             DH1     ;ERRPC  TSTNUM  BUSADR  EXPCT   RCVD
109  002336  016666                             DT1     ;$ERRPC TSTNUM  $BDADR  $GDDAT  $BDDAT
110  002340  000000                             0
```

```
                                ;ERROR  10
002342  016251                          EM10    ;CHIP STAT ER
002344  016463                          DH2     ;ERRPC  TSTNUM  BUSADR  VAM     ADDR    EXPCT   RCVD
002346  016702                          DT2     ;$ERRPC TSTNUM  $BDADR  VECVAL  VECLOC  $GDDAT  $BDDAT
002350  000000                          0

                                ;ERROR  11
002352  016266                          EM11    ;ILLEGAL INTERRUPT  RECEIVED
002354  016550                          DH3     ;ERRPC  TSTNUM  BUSADR  VAM     ADDR
002356  016722                          DT3     ;$ERRPC TSTNUM  $BDADR  VECVAL  VECLOC
002360  000000                          0

                                ;ERROR  12
002362  016316                          EM12    ;INTERRUPT TEST ERROR
002364  016463                          DH2     ;ERRPC  TSTNUM  BUSADR  VAM     ADDR    EXPCT   RCVD
002366  016702                          DT2     ;$ERRPC TSTNUM  $BDADR  VECVAL  VECLOC  $GDDAT  $BDDAT
002370  000000                          0

                                ;ERROR  13      ;MULTIPLE INTERRUPTS RECEIVED
002372  016343                          EM13    ;MULTIPLE INTERRUPTS RECEIVED
002374  016463                          DH2     ;ERRPC  TSTNUM  BUSADR  VAM     ADDR    EXPCT   RCVD
002376  016702                          DT2     ;$ERRPC TSTNUM  $BDADR  VECVAL  VECLOC  $GDDAT  $BDDAT
002400  000000                          0

                                ;ERROR  14
002402  016216                          EM7     ;ILLEGAL VECTOR ADDR MEM ERROR
002404  016615                          DH4     ;ERRPC  TSTNUM  TESTPC  BUSADR  VAM     ADDR
002406  016736                          DT4     ;$ERRPC TSTNUM  $GDADR  $BDADR  VECVAL  VECLOC
002410  000000                          0


                                ; BUS REGISTER ADDRESS POINTERS


002412  164160                  DRCSA:  ABASE
002414  164162                  DRDBA:  ABASE+2
002416  164164                  DRCSB:  ABASE+4
002420  164166                  DRDBB:  ABASE+6
002422  164170                  DRCSC:  ABASE+10
002424  164172                  DRDBC:  ABASE+12
002426  164174                  DRCSD:  ABASE+14
002430  164176                  DRDBD:  ABASE+16


                                ;COMMON PROGRAM LOCATION(S)

002432  000000                  TSTNUM: 0               ;CONTAINS TEST NUMBER ON ERROR
002434  000001                  DMAP:   1
002436  000000                  INTFLG: .WORD   0
002440  000000                  XXDP:   .WORD   0
002442  000000                  IMRLOC: .WORD   0
002444  000000                  ISRLOC: .WORD   0
002446  000000                  IRRLOC: .WORD   0
002450  000000                  ACRLOC: .WORD   0
002452  000000                  VECLOC: .WORD   0
```

```
  167  002454  000000          VECPAT: .WORD   0
  168  002456  000000          VECVAL: .WORD   0
  169  002460  000000          SWRSAV: .WORD   0
  170  002462  000000          GRPCNT: .WORD   0
  171  002464  000000          BDSAV:  .WORD   0
  172  002466  000000          LVLCNT: .WORD   0
  173  002470  000000          BYCNT:  .WORD   0
  174  002472  000000          BYNUM:  .WORD   0
  175  002474  000000          LVLSAV: .WORD   0
```

```
                                                .SBTTL  PROGRAM START
002476                                  START:
(1)                                     .SBTTL  INITIALIZE THE COMMON TAGS
(1)                                     ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
(1)   002476  012706  002100                    MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
(1)   002502  005026                            CLR     (R6)+           ;;CLEAR MEMORY LOCATION
(1)   002504  022706  002140                    CMP     #SWR,R6 ;;DONE?
(1)   002510  001374                            BNE     .-6             ;;LOOP BACK IF NO
(1)   002512  012706  002100                    MOV     #2100,SP                ;;SETUP THE STACK POINTER
(1)                                     ;;INITIALIZE A FEW VECTORS
(1)   002516  012737  014462  000020            MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
(1)   002524  012737  000340  000022            MOV     #340,@#IOTVEC+2 ;;LEVEL 7
(1)   002532  012737  014134  000030            MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
(1)   002540  012737  000340  000032            MOV     #340,@#EMTVEC+2 ;;LEVEL 7
(1)   002546  012737  015732  000034            MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
(1)   002554  012737  000340  000036            MOV     #340,@#TRAPVEC+2;LEVEL 7
(1)   002562  012737  015526  000024            MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
(1)   002570  012737  000340  000026            MOV     #340,@#PWRVEC+2 ;;LEVEL 7
(1)   002576  005037  002160                    CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
(1)   002602  005037  002162                    CLR     $ESCAPE         ;;CLEAR THE ESCAPE ON ERROR ADDRESS
(1)   002606  112737  000001  002115            MOVB    #1,$ERMAX       ;;ALLOW ONE ERROR PER TEST
(1)   002614  012737  002614  002106            MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
(1)   002622  012737  002622  002110            MOV     #.,$LPERR       ;;SETUP THE ERROR LOOP ADDRESS
(2)                                     ;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
(2)                                     ;;EQUAL TO A "-1", SETUP FOR A SOFTWARE SWITCH REGISTER.
(2)   002630  013746  000004                    MOV     @#ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
(2)   002634  012737  002670  000004            MOV     #64$,@#ERRVEC   ;;SET UP ERROR VECTOR
(2)   002642  012737  177570  002140            MOV     #DSWR,SWR       ;;SETUP FOR A HARDWARE SWICH REGISTER
(2)   002650  012737  177570  002142            MOV     #DDISP,DISPLAY  ;;AND A HARDWARE DISPLAY REGISTER
(2)   002656  022777  177777  177254            CMP     #-1,@SWR        ;;TRY TO REFERENCE HARDWARE SWR
(2)   002664  001012                            BNE     66$             ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
(2)                                                                     ;;AND  THE HARDWARE SWR IS NOT = -1
(2)   002666  000403                            BR      65$             ;;BRANCH IF NO TIMEOUT
(2)   002670  012716  002676          64$:     MOV     #65$,(SP)       ;;SET UP FOR TRAP RETURN
(2)   002674  000002                            RTI
(2)   002676  012737  000176  002140  65$:     MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
(2)   002704  012737  000174  002142            MOV     #DISPREG,DISPLAY
(2)   002712  012637  000004          66$:     MOV     (SP)+,@#ERRVEC  ;;RESTORE ERROR VECTOR
(1)
(2)   002716  005037  002176                    CLR     $PASS           ;;CLEAR PASS COUNT
(2)   002722  132737  000200  002211            BITB    #APTSIZE,$ENVM  ;;TEST USER SIZE UNDER APT
(2)   002730  001403                            BEQ     67$             ;;YES,USE NON-APT SWITCH
(2)   002732  012737  002212  002140            MOV     #$SWREG,SWR     ;;NO,USE APT SWITCH REGISTER
(2)   002740                          67$:
180   002740  005037  002172                    CLR     $FATAL          ;CLEAR ERROR NUMBER
181   002744  005037  002170                    CLR     $MSGTYP         ;CLEAR MESSAGE TYPE
182   002750  005037  002174                    CLR     $TESTN          ;CLEAR TEST NUMBER
183   002754  004737  017360                    CALL    FALCON          ; CHECK FOR FALCON (KXT11)      ;;GPA
184   002760  001420                            BEQ     1000$           ; BR IF NOT KXT11 SYSTEM        ;;GPA
185   002762  042737  000040  000022            BIC     #40,@#22        ; FALCON, LOWER IOT...          ;;GPA
186   002770  042737  000040  000032            BIC     #40,@#32        ;...EMT...                      ;;GPA
187   002776  042737  000040  000036            BIC     #40,@#36        ;...AND TRAP TO LEVEL 6.        ;;GPA
188   003004  023727  002244  164160            CMP     $BASE,#ABASE    ; IS $BASE VIRGIN ??            ;;GPA
189   003012  001003                            BNE     1000$           ; BR IF NOT.                    ;;GPA
190   003014  012737  174160  002244            MOV     #174160,$BASE   ; YES, USE ENGINEERING DEFAULT  ;;GPA
191   003022                        1000$:                                                            ;;GPA
```

```
                                        ;CHECK OPERATING ENVIRONMENT
003022  005737  000042                      TST     @#42            ;ARE WE IN ACT/XXDP AUTO MODE?
003026  001410                              BEQ     1$              ;BRANCH IF NO
003030  023737  000042  000046              CMP     @#42,@#46       ;IS IT ACT AUTO MODE?
003036  001410                              BEQ     2$              ;BRANCH IF YES
003040  012737  177777  002440              MOV     #-1,XXDP        ;SET XXDP CHAIN MODE INDICATOR
003046  000404                              BR      2$
003050  123727  002210  000001  1$:         CMPB    $ENV,#1         ;ARE WE IN APT AUTO MODE?
003056  001003                              BNE     3$              ;BRANCH IF NO
003060  112737  000001  002134  2$:         MOVB    #1,$AUTOB       ;SET AUTO MODE INDICATOR

                                        ;PRINT TITLE IF NOT IN ACT OR APT AUTO MODE
003066  005227  177777          3$:         INC     #-1             ;FIRST TIME?
003072  001014                              BNE     5$              ;SKIP TITLE IF NO
003074  004537  011354                      JSR     R5,TOBUF        ;STORE 0-202 INTO BUFFER AREA
003100  005737  002134                      TST     $AUTOB          ;ARE WE IN AUTO MODE?
003104  001403                              BEQ     4$              ;BRANCH TO TITLE TYPEOUT IF NOT
003106  005737  002440                      TST     XXDP            ;IS THE AUTO MODE UNDER XXDP?
003112  001404                              BEQ     5$              ;SKIP TITLE IF NOT
003114  104401  016012          4$:         TYPE    ,TITLED         ;PRINT OUT THE TITLE
003120  104401  016054                      TYPE    ,TLCABL         ;PRINT DRV11J CABLE REQ'D

                                        ;GET THE VALUE IN THE SOFTWARE SWITCH REGISTER
003124  005737  002134          5$:         TST     $AUTOB          ;ARE WE IN AUTOMATIC MODE?
003130  001001                              BNE     START1          ;BRANCH IF YES
003132  104406                              GTSWR                   ;ASK FOR SWR INPUT FROM CONSOLE
003134  005037  002202          START1:     CLR     $UNIT           ;CLEAR UNIT NUMBER
003140  013737  002246  002434              MOV     $DEVM,DMAP      ;UP TO 4 DRV11J'S
003146  042737  177760  002434              BIC     #177760,DMAP    ;POSITION OF DRV11J'S
003154  013701  002244                      MOV     $BASE,R1        ;GET BASE ADDRESS
003160  010137  002412                      MOV     R1,DRCSA        ;MAKE BUS REG.POINTER = BASE
003164  032737  000001  002434              BIT     #1,DMAP         ;IS FIRST DRV11-J SELECTED
003172  001002                              BNE     NEXPAS          ;YES
003174  000137  010636                      JMP     NXDEV1          ;NO,ADVANCE BASE DRV11J ADDRESS
003200  012700  002412          NEXPAS:     MOV     #DRCSA,R0       ;SET UP REGISTER ADDRESS POINTERS
003204  010120                  NEXPA1:     MOV     R1,(R0)+        ;LOAD EM
003206  062701  000002                      ADD     #2,R1           ;
003212  022700  002432                      CMP     #DRDBD+2,R0     ;ALL DONE?
003216  001372                              BNE     NEXPA1          ;BR IF NOT
003220  004537  011524                      JSR     R5,TRPCAT       ;EXTEND TRAP CATCHER 204-1774
003224  012706  002100                      MOV     #2100,SP        ;ALWAYS RESET STACK
003230  013737  002202  002200              MOV     $UNIT,$DEVCT    ;LOAD APT COUNTER WITH UNIT #
003236  123727  002210  000001              CMPB    $ENV,#1         ;ARE WE IN APT MODE?
003244  001401                              BEQ     NEXPA2          ;BR IF YES,SKIP RESET
003246  000005                              RESET                   ;INITIALIZE
003250  106427  000340          NEXPA2:     MTPS    #PR7

```

```
                                ;;*****************************************************************
                                ;*TEST 1        TEST CHIP INTERRUPT ,GROUP 1,GROUP 2
                                ;;*****************************************************************
003254  000004                  TST1:   SCOPE
003256  013700  002412                  MOV     DRCSA,R0        ;START WITH GROUP 1
003262  013701  002416                  MOV     DRCSB,R1
003266  013702  002412                  MOV     DRCSA,R2        ;REGISTER IS COMMON FOR BOTH GROUPS
003272  012737  003344  002110          MOV     #111$,$LPERR    ;SET UP LOOP RETURN
003300  012737  000002  002462          MOV     #2,GRPCNT       ;COUNTER FOR BOTH GROUPS
003306  004537  011014          120$:   JSR     R5,CLRCSR       ;CLEAR ALL CSRS
003312  012703  012636                  MOV     #BGCHP3,R3      ;EXPECTED GDDAT FOR ISR,IMR
003316  012737  000050  002442          MOV     #CSIMR,IMRLOC   ;STORE CLEAR SINGLE IMR CODE
003324  004537  011074                  JSR     R5,CLRIRR       ;CLEAR IRR REGS
003330  012737  011644  000300          MOV     #INTSR1,300     ;STORE VECTOR ROUTINE
003336  012737  000340  000302          MOV     #340,302        ;STORE PSW
003344  005037  002436          111$:   CLR     INTFLG          ;CLEAR INT. FLAG
003350  012706  002100                  MOV     #2100,SP        ;INIT STACK IN CASE OF ILLEGAL INT. LOOP
003354  112710  000340                  MOVB    #PVMA,(R0)      ;PRESELECT VECTOR MEM ADDR
003360  112711  000060                  MOVB    #60,(R1)        ;WRITE VECTOR 300,BY0,LV0
003364  010037  002122                  MOV     R0,$BDADR       ;SAVE BUS ADDRESS
003370  112710  000060                  MOVB    #SIMR,(R0)      ;SET ALL IMR BITS
003374  113710  002442                  MOVB    IMRLOC,(R0)     ;CLEAR MASK ON SINGLE BIT
003400  112710  000202                  MOVB    #202,(R0)       ;LMD04 - COMMON VECTOR
003404  106427  000000                  MTPS    #PR0
003410  112712  000241                  MOVB    #241,(R2)       ;USED IN TEST OF GROUP 2
                                                                ;ARM GROUP 1 TO PASS
                                                                ;ENABLE TO GROUP 2.
003414  112710  000241                  MOVB    #241,(R0)       ;LMD57 - ARM THE CHIP
003420  005737  002436                  TST     INTFLG          ;CHECK FOR INTERRUPTS
003424  001401                          BEQ     1$
003426  104011                          ERROR   11              ;ERROR,ILLEGAL INTERRUPT
003430  005037  002436          1$:     CLR     INTFLG          ;RESET INT. COUNTER
003434  112710  000120                  MOVB    #SIRR,(R0)      ;SET ALL IRR BITS
003440  106427  000340                  MTPS    #PR7
003444  005737  002436                  TST     INTFLG          ;CHECK FOR NO INTERRUPTS
003450  001401                          BEQ     2$
003452  104011                          ERROR   11              ;ILLEGAL INTERRUPTS
003454  005037  002436          2$:     CLR     INTFLG          ;CLEAR INT. COUNTER
003460  106427  000000                  MTPS    #PR0
003464  152762  000002  000001          BISB    #BIT1,1(R2)     ;SET I/E,EXPECT INTERRUPT
003472  012737  000001  002124          MOV     #1,$GDDAT       ;EXPECT ONE INTERRUPT
003500  013737  002436  002126          MOV     INTFLG,$BDDAT   ;SHOULD HAVE ONE INTERRUPT
003506  023737  002124  002126          CMP     $GDDAT,$BDDAT
003514  001401                          BEQ     3$
003516  104012                          ERROR   12              ;INTERRUPT TEST ERROR
003520  106427  000340          3$:     MTPS    #PR7
003524  012737  101710  002124          MOV     #101710,$GDDAT  ;RDY,DIR,I/E, CHIP - 31X
003532  010237  002122                  MOV     R2,$BDADR       ;CSRA ADDRESS
003536  011237  002126                  MOV     (R2),$BDDAT
003542  042737  000007  002126          BIC     #7,$BDDAT       ;CLEAR UNDEFINED BITS
003550  023737  002124  002126          CMP     $GDDAT,$BDDAT
003556  001401                          BEQ     4$
003560  104002                          ERROR   2               ;CSRA REG ERROR
003562  010137  002122          4$:     MOV     R1,$BDADR       ;READY TO READ ISR REG.
003566  005037  002126                  CLR     $BDDAT          ;SET UP FOR BYTE READS
```

```
                                                        ;SET UP FOR BYTE EXPECTED
                                                        ;EXPECTED DATA
                                                        ;LOAD MODE TO READ ISR
                                                        ;ISR ERROR
                                                        ;STORE EXPECTED
                                                        ;LOAD MODE FOR IMR
                                                        ;IMR ERROR
                                                        ;EXPECTED IRR
                                                        ;LOAD MODE BITS FOR IRR
                                                        ;IRR ERROR
                                                        ;ACR ERROR
                                                        ;CLEAR HIGHEST PRIOR ISR
                                                        ;LOAD MODE TO READ ISR
                                                        ;ISR REG ERROR
                                                        ;RDY,DIR,I/E, CHIP - 31X
                                                        ;CSRA ADDRESS
                                                        ;CLEAR UNDEFINED BITS
                                                        ;CSRA REG ERROR
                                                        ;RDY,DIR, CHIP - 31X
                                                        ;CLEAR I/E
                                                        ;READ CSRA
                                                        ;CLEAR UNDEFINED BITS
                                                        ;CSRA REG ERROR
                                                        ;GET NEXT ISR,IMR EXPECTED RESULTS
                                                        ;CHECK FOR END
                                                        ;INCREMENT MASK BIT TO CLEAR
                                                        ;TEST NEXT ISR BIT
                                                        ;TESTED BOTH GROUPS?
                                                        ;;BR IF DONE
                                                        ;SETUP FOR GROUP 2
                                                        ;CSRC = CONTROL GROUP 2
                                                        ;CSRD = DATA    GROUP 2
```

```
 349  004116  000137  003306                    JMP     120$            ;DO GROUP 2
 35C
 351
 352                                    ;;*******************************************************************
 (3)                                    ;*TEST 2        TEST ACR/ISR INTERRUPT ,GROUP 1,GROUP 2
 (3)                                    ;;*******************************************************************
 (2)  004122  000004                    TST2:   SCOPE
 353  004124  013700  002412                    MOV     DRCSA,R0
 354  004130  013701  002416                    MOV     DRCSB,R1
 355  004134  013702  002412                    MOV     DRCSA,R2
 356  004140  012737  004212  002110            MOV     #111$,$LPERR    ;SET UP LOOP RETURN
 357  004146  012737  000002  002462            MOV     #2,GRPCNT       ;DO TWO GROUPS
 358  004154  004537  011014            120$:   JSR     R5,CLRCSR       ;CLEAR ALL CSRS
 359  004160  012703  012636                    MOV     #BGCHP3,R3      ;EXPECTED GDDAT FOR ISR
 360  004164  012737  000050  002442            MOV     #CSIMR,IMRLOC   ;STORE CLEAR SINGLE IMR CODE
 361  004172  004537  011074                    JSR     R5,CLRIRR       ;CLEAR IRR REGS
 362  004176  012737  011644  000300            MOV     #INTSR1,300     ;STORE VECTOR ROUTINE
 363  004204  012737  000340  000302            MOV     #340,302        ;STORE PSW
 364  004212  005037  002436            111$:   CLR     INTFLG          ;CLEAR INT. FLAG
 365  004216  012706  002100                    MOV     #2100,SP        ;INIT STACK IN CASE OF ILLEGAL INT. LOOP
 366  004222  042712  001000                    BIC     #BIT9,(R2)      ;CLEAR INTERRUPT ENABLE
 367  004226  112712  000242                    MOVB    #242,(R2)       ;CLEAR MASTER MASK GP1
 368  004232  112710  000242                    MOVB    #242,(R0)       ;CLEAR MASTER MASK GP1,GP2
 369  004236  112710  000300                    MOVB    #PACR,(R0)      ;PRESELECT ACR FOR WRITING
 370  004242  111311                            MOVB    (R3),(R1)       ;NEXT BIT INTO ACR
 371  004244  112710  000340                    MOVB    #PVMA,(R0)      ;PRESELECT VECTOR MEM ADDR
 372  004250  112711  000060                    MOVB    #60,(R1)        ;WRITE VECTOR 300,BY0,LV0
 373  004254  010037  002122                    MOV     R0,$BDADR       ;STORE BUS ADDRESS
 374  004260  112710  000060                    MOVB    #SIMR,(R0)      ;SET ALL IMR BITS
 375  004264  113710  002442                    MOVB    IMRLOC,(R0)     ;CLEAR MASK ON SINGLE BIT
 376  004270  112710  000202                    MOVB    #202,(R0)       ;LMD04 - COMMON VECTOR
 377  004274  106427  000000                    MTPS    #PR0
 378  004300  152762  000002  000001            BISB    #BIT1,1(R2)     ;SET I/E,NO INTERRUPT
 379  004306  005737  002436                    TST     INTFLG          ;CHECK FOR INTERRUPTS
 380  004312  001401                            BEQ     1$
 381  004314  104011                            ERROR   11              ;ERROR,ILLEGAL INTERRUPT
 382  004316  005037  002436            1$:     CLR     INTFLG          ;RESET INT. COUNTER
 383  004322  112710  000120                    MOVB    #SIRR,(R0)      ;SET ALL IRR BITS
 384  004326  106427  000340                    MTPS    #PR7
 385  004332  005737  002436                    TST     INTFLG          ;CHECK FOR NO INTERRUPTS
 386  004336  001401                            BEQ     2$
 387  004340  104011                            ERROR   11              ;ILLEGAL INTERRUPTS
 388  004342  005037  002436            2$:     CLR     INTFLG          ;CLEAR INT. COUNTER
 389  004346  106427  000000                    MTPS    #PR0
 390  004352  112712  000241                    MOVB    #241,(R2)       ;USED IN TEST OF GROUP 2
 391                                                                    ;ARM GROUP 1 CHIP TO PASS
 392                                                                    ;ENABLE TO GROUP 2 CHIP.
 393  004356  112710  000241                    MOVB    #241,(R0)       ;ARM THE CHIP
 394  004362  012737  000001  002124            MOV     #1,$GDDAT       ;EXPECT ONE INTERRUPT
 395  004370  013737  002436  002126            MOV     INTFLG,$BDDAT   ;SHOULD HAVE ONE INTERRUPT
 396  004376  023737  002124  002126            CMP     $GDDAT,$BDDAT
 397  004404  001401                            BEQ     3$
 398  004406  104012                            ERROR   12              ;INTERRUPT TEST ERROR
 399  004410  106427  000340            3$:     MTPS    #PR7
 400  004414  010137  002122            4$:     MOV     R1,$BDADR       ;READY TO READ ISR REG.
 401  004420  005037  002126                    CLR     $BDDAT          ;SET UP FOR BYTE READS
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  402  004424  005037  002124                    CLR     $GDDAT          ;SET UP FOR BYTE EXPECTED
  403  004430  112710  000240                    MOVB    #MISR,(R0)      ;LOAD MODE TO READ ISR
  404  004434  111137  002126                    MOVB    (R1),$BDDAT
  405  004440  023737  002124  002126            CMP     $GDDAT,$BDDAT   ;ACR SHOULD CLEAR ISR
  406  004446  001401                           BEQ     5$
  407  004450  104006                           ERROR   6               ;ISR ERROR
  408  004452  116337  000001  002124  5$:      MOVB    1(R3),$GDDAT    ;STORE EXPECTED
  409  004460  112710  000244                    MOVB    #MIMR,(R0)      ;LOAD MODE FOR IMR
  410  004464  111137  002126                    MOVB    (R1),$BDDAT
  411  004470  023737  002124  002126            CMP     $GDDAT,$BDDAT
  412  004476  001401                           BEQ     6$
  413  004500  104005                           ERROR   5               ;IMR ERROR
  414  004502  116337  000001  002124  6$:      MOVB    1(R3),$GDDAT    ;EXPECTED IRR
  415  004510  112710  000250                    MOVB    #MIRR,(R0)      ;LOAD MODE BITS FOR IRR
  416  004514  111137  002126                    MOVB    (R1),$BDDAT
  417  004520  023737  002124  002126            CMP     $GDDAT,$BDDAT
  418  004526  001401                           BEQ     7$
  419  004530  104003                           ERROR   3               ;IRR ERROR
  420  004532  111337  002124          7$:      MOVB    (R3),$GDDAT     ;EXPECTED ACR
  421  004536  112710  000254                    MOVB    #MACR,(R0)
  422  004542  111137  002126                    MOVB    (R1),$BDDAT
  423  004546  023737  002124  002126            CMP     $GDDAT,$BDDAT
  424  004554  001401                           BEQ     10$
  425  004556  104004                           ERROR   4               ;ACR ERROR
  426  004560  005723                  10$:      TST     (R3)+           ;GET NEXT ISR,IMR,IRR EXPECTED RESULTS
  427  004562  020327  012656                    CMP     R3,#EDCHP3      ;CHECK FOR END
  428  004566  001404                           BEQ     11$             ;DONE WITH GROUP TEST
  429  004570  005237  002442                    INC     IMRLOC          ;INCREMENT MASK BIT TO CLEAR
  430  004574  000137  004212                    JMP     111$            ;TEST NEXT ISR BIT
  431  004600  005337  002462          11$:      DEC     GRPCNT          ;TESTED BOTH GROUPS?
  432  004604  001406                           BEQ     TST3            ;;BR IF DONE
  433  004606  013700  002422                    MOV     DRCSC,R0        ;SETUP FOR GROUP 2
  434  004612  013701  002426                    MOV     DRCSD,R1        ;CSRC = CONTROL GROUP 2
  435                                                                    ;CSRD = DATA    GROUP 2
  436  004616  000137  004154                    JMP     120$            ;DO GROUP 2
  437
  438
  439
  440                                  ;;*****************************************************************************
  (3)                                  ;*TEST 3        TEST VECTOR ADDR MEM,LEV 0-7,BY0-3,(204-1774),GRPS 1,2
  (3)                                  ;;*****************************************************************************
  (2)  004622  000004                  TST3:   SCOPE
  441  004624  013700  002412                    MOV     DRCSA,R0
  442  004630  013701  002416                    MOV     DRCSB,R1
  443  004634  013702  002412                    MOV     DRCSA,R2
  444  004640  012737  000002  002462            MOV     #2,GRPCNT       ;DO TWO GROUPS
  445  004646  012737  000001  002472  120$:     MOV     #1,BYNUM        ;INIT FOR BYTE COUNT 0
  446  004654  004537  011014                    JSR     R5,CLRCSR       ;CLEAR ALL CSRS
  447  004660  012737  000340  002456            MOV     #PVMA,VECVAL    ;START VECTOR LEVEL 0,BYTE COUNT 0
  448  004666  012704  012636          121$:     MOV     #BGCHP3,R4      ;EXPECTED ISR,IMR PATTERN
  449  004672  012737  000010  002466            MOV     #8.,LVLCNT      ;COUNTER FOR 0-7 LEVELS
  450  004700  012737  000050  002442            MOV     #CSIMR,IMRLOC   ;STORE SINGLE IMR CODE
  451  004706  012737  000130  002446            MOV     #SSIRR,IRRLOC   ;STORE SINGLE IRR CODE
  452  004714  012737  000170  002444            MOV     #CSISR,ISRLOC   ;STORE CLEAR SINGLE ISR CODE
  453  004722  004537  011524                    JSR     R5,TRPCAT       ;RESTORE TRAP CATCHER
  454  004726  012737  004742  002110            MOV     #112$,$LPERR    ;STORE SCOPE LOOP
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                                                                ;START AT VECTOR 204
004734  012737  000204  002452  111$:   MOV     #204,VECLOC
004742  106427  000340        112$:   MTPS    #340
004746  012706  002100                MOV     #2100,SP        ;INIT STACK IN CASE OF ILLEGAL INT. LOOP
004752  042712  001000                BIC     #BIT9,(R2)      ;CLEAR INTERRUPT ENABLE
004756  004537  011074                JSR     R5,CLRIRR       ;CLEAR IRR REGS
004762  112712  000241                MOVB    #241,(R2)       ;USED IN TEST OF GROUP 2
                                                                ;ARM GROUP 1 CHIP TO PASS
                                                                ;ENABLE TO GROUP2
004766  013703  002452                MOV     VECLOC,R3       ;GET VECTOR
004772  010337  002454                MOV     R3,VECPAT
004776  006037  002454                ROR     VECPAT          ;ROTATE VECTOR ADDR TWO RIGHT
005002  006037  002454                ROR     VECPAT          ;TO WRITE VECTOR MEM ADDR.
005006  012713  011700                MOV     #INTBY4,(R3)    ;STORE VECTOR ROUTINE
005012  012763  000340  000002        MOV     #340,2(R3)      ;STORE PSW
005020  005037  002436                CLR     INTFLG          ;CLEAR INT. FLAG
005024  013737  002472  002470        MOV     BYNUM,BYCNT     ;BYTE COUNTS OF 0-3
005032  113710  002456                MOVB    VECVAL,(R0)     ;PRESELECT VECTOR MEM ADDR
005036  113711  002454        113$:   MOVB    VECPAT,(R1)     ;WRITE VECTOR
005042  005337  002470                DEC     BYCNT           ;DONE WITH BYTE COUNT VALUE
005046  001373                        BNE     113$            ;NO,LOAD VECTOR FOR NEXT BYTE COUNT
005050  010037  002122                MOV     R0,$BDADR       ;SAVE BUS ADDRESS
005054  112710  000060                MOVB    #SIMR,(R0)      ;SET ALL IMR BITS
005060  113710  002442                MOVB    IMRLOC,(R0)     ;CLEAR MASK ON SINGLE BIT
005064  106427  000000                MTPS    #PR0
005070  112710  000241                MOVB    #241,(R0)       ;LMD57 - ARM THE CHIP
005074  005737  002436                TST     INTFLG          ;CHECK FOR INTERRUPTS
005100  001401                        BEQ     1$
005102  104011                        ERROR   11              ;ERROR,ILLEGAL INTERRUPT
005104  005037  002436        1$:     CLR     INTFLG          ;RESET INT. COUNTER
005110  113710  002446                MOVB    IRRLOC,(R0)     ;SET SINGLE IRR BIT
005114  106427  000340                MTPS    #PR7
005120  005737  002436                TST     INTFLG          ;CHECK FOR NO INTERRUPTS
005124  001401                        BEQ     2$
005126  104011                        ERROR   11              ;ILLEGAL INTERRUPTS
005130  005037  002436        2$:     CLR     INTFLG          ;CLEAR INT. COUNTER
005134  106427  000000                MTPS    #PR0
005140  152762  000002  000001        BISB    #BIT1,1(R2)     ;SET I/E,EXPECT INTERRUPT
005146  013737  002472  002124        MOV     BYNUM,$GDDAT    ;EXPECT 1 TO 4 INTERRUPTS
                                                                ;BASED ON BYTE COUNT VALUE
005154  013737  002436  002126        MOV     INTFLG,$BDDAT   ;SHOULD HAVE 1 TO 4 INTERRUPTS
                                                                ;BASED ON BYTE COUNT VALUE
005162  023737  002124  002126        CMP     $GDDAT,$BDDAT
005170  001401                        BEQ     3$
005172  104012                        ERROR   12              ;INTERRUPT TEST ERROR
005174  106427  000340        3$:     MTPS    #PR7
005200  010137  002122        4$:     MOV     R1,$BDADR       ;READY TO READ ISR REG.
005204  005037  002126                CLR     $BDDAT          ;SET UP FOR BYTE READS
005210  005037  002124                CLR     $GDDAT          ;SET UP FOR BYTE EXPECTED
005214  111437  002124                MOVB    (R4),$GDDAT     ;EXPECTED DATA
005220  112710  000240                MOVB    #MISR,(R0)      ;LOAD MODE TO READ ISR
005224  111137  002126                MOVB    (R1),$BDDAT
005230  023737  002124  002126        CMP     $GDDAT,$BDDAT
005236  001401                        BEQ     5$
005240  104006                        ERROR   6               ;ISR ERROR
005242  116437  000001  002124  5$:   MOVB    1(R4),$GDDAT    ;STORE EXPECTED
005250  112710  000244                MOVB    #MIMR,(R0)      ;LOAD MODE FOR IMR
```

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                                                MOVB    (R1),$BDDAT
                                                CMP     $GDDAT,$BDDAT
                                                BEQ     6$
                                                ERROR   5               ;IMR ERROR
                                        6$:     CLR     $GDDAT
                                                MOVB    #MIRR,(R0)      ;LOAD MODE BITS FOR IRR
                                                MOVB    (R1),$BDDAT
                                                CMP     $GDDAT,$BDDAT
                                                BEQ     7$
                                                ERROR   3               ;IRR ERROR
                                        7$:     CLR     $GDDAT
                                                MOVB    #MACR,(R0)
                                                MOVB    (R1),$BDDAT
                                                CMP     $GDDAT,$BDDAT
                                                BEQ     10$
                                                ERROR   4               ;ACR ERROR
                                        10$:    CLR     $GDDAT
                                                MOVB    ISRLOC,(R0)     ;CLEAR SINGLE ISR BIT
                                                MOVB    #MISR,(R0)      ;LOAD MODE TO READ ISR
                                                MOVB    (R1),$BDDAT
                                                CMP     $GDDAT,$BDDAT
                                                BEQ     11$
                                                ERROR   6               ;ISR REG ERROR
                                        11$:    JSR     R5,RESTRP       ;RESTORE VECTOR JUST TESTED
                                                TST     KXTFLAG         ; KXT11 ??              ;;GPA
                                                BEQ     100$            ; BR IF NOT             ;;GPA
                                                CMP     #400,VECLOC     ; YES, FINISHED 204-374 ??      ;;GPA
                                                403                     ; SKIP NEXT TO FIND OUT         ;;GPA
                                        100$:                                                   ;;GPA
                                                CMP     #2000,VECLOC    ;FINISHED?
                                                BEQ     12$             ;FINISHED VECTORS 204-1774?
                                                JMP     112$            ;TEST NEXT VECTOR ADDR
                                        12$:    TST     (R4)+           ;INDEX EXPECTED ISR AND IMR PATTERN
                                                INC     IMRLOC          ;STORE CLEAR FOR NEXT MASK BIT
                                                INC     IRRLOC          ;STORE SET FOR NEXT IRR BIT
                                                INC     ISRLOC          ;STORE CLEAR FOR NEXT ISR BIT
                                                INC     VECVAL          ;SETUP TO TEST NEXT VECTOR LEVEL
                                                DEC     LVLCNT          ;FINISHED LEVELS 0-7
                                                BEQ     13$             ;YES,CHECK BYTE COUNT END
                                                JMP     111$            ;NO,DO NEXT LEVEL
                                        13$:    INC     BYNUM           ;INDEX BYTE COUNT
                                                CKSWR                   ;LOOK FOR SWITCH CHANGE REQUEST
                                                CMP     #400,VECVAL     ;FINISHED  ALL BYTE COUNTS 0-3
                                                BEQ     14$             ;FINISHED TWO GROUPS?
                                                JMP     121$            ;DO NEXT BYTE COUNT FOR
                                                                        ;LEVELS 0-7
                                        14$:    DEC     GRPCNT          ;FINISHED TWO GROUPS?
                                                BEQ     TST4            ;;BR IF DONE
                                                MOV     DRCSC,R0        ;CSRC = CONTROL GROUP 2
                                                MOV     DRCSD,R1        ;CSRD = DATA    GROUP 2
                                                JMP     120$            ;DO GROUP 2 FOR BYTE COUNTS 0-3
                                                                        ;AND LEVELS 0-7 FOR EACH BYTE COUNT.


                                        ;;*******************************************************************
                                        ;*TEST 4         TEST VECTOR ADDR MEM,LVLS 0-7,BY0-3,(0-200)GRPS 1,2
(3)
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(3)
(2) 005536 000004                  TST4:   SCOPE
566 005540 013700 002412                   MOV     DRCSA,R0
567 005544 013701 002416                   MOV     DRCSB,R1
568 005550 013702 002412                   MOV     DRCSA,R2
569 005554 012737 000002 002462            MOV     #2,GRPCNT       ;DO TWO GROUPS
570 005562 012737 000001 002472  120$:     MOV     #1,BYNUM        ;INIT FOR FIRST BYTE COUNT
571 005570 004537 011014                   JSR     R5,CLRCSR       ;CLEAR ALL CSRS
572 005574 012737 000340 002456            MOV     #PVMA,VECVAL    ;START VECTOR LEVEL 0,BYTE COUNT 0
573 005602 012704 012636         121$:     MOV     #BGCHP3,R4      ;ISR,IMR PATTERN
574 005606 012737 000010 002466            MOV     #8.,LVLCNT      ;START LEVEL COUNT 0-7
575 005614 012737 000050 002442            MOV     #CSIMR,IMRLOC   ;STORE CLEAR SINGLE IMR BIT CODE
576 005622 012737 000130 002446            MOV     #SSIRR,IRRLOC   ;STORE SET SINGLE IRR BIT CODE
577 005630 012737 005642 002110            MOV     #112$,$LPERR    ;LOOP RETURN
578 005636 005037 002452         111$:     CLR     VECLOC          ;START AT VECTOR 0
579 005642 106427 000340         112$:     MTPS    #340            ;
580 005646 012706 002100                   MOV     #2100,SP        ;INIT STACK IN CASE OF ILLEGAL INT. LOOP
581 005652 042712 001000                   BIC     #BIT9,(R2)      ;CLEAR INTERRUPT ENABLE
582 005656 004537 011074                   JSR     R5,CLRIRR       ;CLEAR IRR REGS
583 005662 112712 000241                   MOVB    #241,(R2)       ;USED IN TEST OF GROUP 2
584                                                                ;ARM GROUP 1 CHIP TO PASS
585                                                                ;ENABLE TO GROUP 2.
586 005666 013703 002452                   MOV     VECLOC,R3       ;GET VECTOR
587 005672 004537 012024                   JSR     R5,CAT200       ;STORE TRAP CATCHER FOR 0-200
588 005676 010337 002454                   MOV     R3,VECPAT
589 005702 006037 002454                   ROR     VECPAT          ;ROTATE VECTOR ADDR TWO RIGHT
590 005706 006037 002454                   ROR     VECPAT          ;TO WRITE VECTOR MEM ADDR.
591 005712 012713 012124                   MOV     #INTSR3,(R3)    ;STORE VECTOR ROUTINE
592 005716 012763 000340 000002            MOV     #340,2(R3)      ;STORE PSW
593 005724 005037 002436                   CLR     INTFLG          ;CLEAR INT. FLAG
594 005730 013737 002472 002470            MOV     BYNUM,BYCNT     ;BYTE COUNT OF 0 TO 3
595                                                                ;FOR 1 TO 4 VECTORS.
596 005736 113710 002456                   MOVB    VECVAL,(R0)     ;PRESELECT VECTOR MEM ADDR
597 005742 113711 002454         113$:     MOVB    VECPAT,(R1)     ;WRITE VECTOR
598 005746 005337 002470                   DEC     BYCNT           ;DO 1 TO 4 VECTORS
599 005752 001373                          BNE     113$            ;WRITE VECTORS BASED ON BYTE COUNT
600 005754 010037 002122                   MOV     R0,$BDADR       ;SAVE BUS ADDRESS
601 005760 112710 000060                   MOVB    #SIMR,(R0)      ;SET ALL IMR BITS
602 005764 113710 002442                   MOVB    IMRLOC,(R0)     ;CLEAR MASK ON SINGLE BIT
603 005770 106427 000000                   MTPS    #PR0
604 005774 112710 000241                   MOVB    #241,(R0)       ;LMD57 - ARM THE CHIP
605 006000 005737 002436                   TST     INTFLG          ;CHECK FOR INTERRUPTS
606 006004 001405                          BEQ     1$
607 006006 004537 011374                   JSR     R5,FRMBUF       ;RESTORE 0-202
608 006012 104011                          ERROR   11              ;ERROR,ILLEGAL INTERRUPT
609 006014 004537 012024                   JSR     R5,CAT200       ;RESTORE TRAP CATCHER
610 006020 005037 002436         1$:       CLR     INTFLG          ;RESET INT. COUNTER
611 006024 113710 002446                   MOVB    IRRLOC,(R0)     ;SET SINGLE IRR BIT
612 006030 106427 000340                   MTPS    #PR7
613 006034 005737 002436                   TST     INTFLG          ;CHECK FOR NO INTERRUPTS
614 006040 001405                          BEQ     2$
615 006042 004537 011374                   JSR     R5,FRMBUF       ;RESTORE 0-202
616 006046 104011                          ERROR   11              ;ILLEGAL INTERRUPTS
617 006050 004537 012024                   JSR     R5,CAT200       ;RESTORE TRAP CATCHER
618 006054 005037 002436         2$:       CLR     INTFLG          ;CLEAR INT. COUNTER
619 006060 106427 000000                   MTPS    #PR0
```

```
                                        BISB    #BIT1,1(R2)     ;SET I/E,EXPECT INTERRUPT
                                        MOV     BYNUM,$GDDAT    ;EXPECT NUMBER OF INTERRUPTS
                                                                ;EQUAL TO BYTE COUNT.
                                        MOV     INTFLG,$BDDAT   ;SHOULD HAVE NUMBER OF INTERRUPTS
                                                                ;EQUAL TO BYTE COUNT.
                                        CMP     $GDDAT,$BDDAT
                                        BEQ     3$
                                        JSR     R5,FRMBUF       ;RESTORE 0-202
                                        ERROR   12              ;INTERRUPT TEST ERROR
                                        JSR     R5,CAT200       ;RESTORE TRAP CATCHER SUB
                                3$:     MTPS    #PR7
                                4$:     MOV     R1,$BDADR       ;READY TO READ ISR REG.
                                        CLR     $BDDAT          ;SET UP FOR BYTE READS
                                        CLR     $GDDAT          ;SET UP FOR BYTE EXPECTED
                                        MOVB    (R4),$GDDAT     ;EXPECTED DATA
                                        MOVB    #MISR,(R0)      ;LOAD MODE TO READ ISR
                                        MOVB    (R1),$BDDAT
                                        CMP     $GDDAT,$BDDAT
                                        BEQ     5$
                                        JSR     R5,FRMBUF       ;RESTORE 0-200
                                        ERROR   6               ;ISR ERROR
                                        JSR     R5,CAT200       ;RESTORE TRAP CATCHER
                                5$:     MOVB    1(R4),$GDDAT    ;STORE EXPECTED
                                        MOVB    #MIMR,(R0)      ;LOAD MODE FOR IMR
                                        MOVB    (R1),$BDDAT
                                        CMP     $GDDAT,$BDDAT
                                        BEQ     6$
                                        JSR     R5,FRMBUF       ;RESTORE 0-202
                                        ERROR   5               ;IMR ERROR
                                        JSR     R5,CAT200       ;RESTORE CATCHER
                                6$:     CLR     $GDDAT
                                        MOVB    #MIRR,(R0)      ;LOAD MODE BITS FOR IRR
                                        MOVB    (R1),$BDDAT
                                        CMP     $GDDAT,$BDDAT
                                        BEQ     7$
                                        JSR     R5,FRMBUF       ;RESTORE 0-202
                                        ERROR   3               ;IRR ERROR
                                        JSR     R5,CAT200       ;RESTORE TRAP CATCHER
                                7$:     CLR     $GDDAT
                                        MOVB    #MACR,(R0)
                                        MOVB    (R1),$BDDAT
                                        CMP     $GDDAT,$BDDAT
                                        BEQ     10$
                                        JSR     R5,FRMBUF       ;RESTORE 0-202
                                        ERROR   4               ;ACR ERROR
                                        JSR     R5,CAT200       ;RESTORE TRAP CATCHER
                                10$:    CLR     $GDDAT
                                        MOVB    #CISR,(R0)      ;CLEAR ISR
                                        MOVB    #MISR,(R0)      ;LOAD MODE TO READ ISR
                                        MOVB    (R1),$BDDAT
                                        CMP     $GDDAT,$BDDAT
                                        BEQ     11$
                                        JSR     R5,FRMBUF       ;RESTORE 0-202
                                        ERROR   6               ;ISR REG ERROR
                                        JSR     R5,CAT200       ;RESTORE TRAP CATCHER
                                11$:    JSR     R5,RES200       ;RESTORE VECTOR JUST TESTED
```

```
 676  006410  004537  011374            JSR     R5,FRMBUF       ;RESTORE 0-200 TO SYSMAC CONTROL
 677  006414  022737  000204  002452    CMP     #204,VECLOC     ;FINISHED?
 678  006422  001402                    BEQ     12$
 679  006424  000137  005642            JMP     112$            ;TEST NEXT VECTOR ADDR
 680  006430  005724                12$: TST     (R4)+           ;INDEX EXPECTED ISR AND IMR PATTERN
 681  006432  005237  002442            INC     IMRLOC          ;STORE CLEAR NEXT IMR BIT
 682  006436  005237  002446            INC     IRRLOC          ;STORE SET NEXT IRR BIT
 683  006442  005237  002456            INC     VECVAL          ;SETUP TO TEST NEXT VECTOR LEVEL
 684  006446  005337  002466            DEC     LVLCNT          ;FINISHED LEVELS 0-7?
 685  006452  001402                    BEQ     13$             ;YES,CHECK BYTE COUNT END
 686  006454  000137  005636            JMP     111$            ;NO,DO NEXT LEVEL,SAME BYTE COUNT
 687  006460  005237  002472        13$: INC     BYNUM           ;INDEX BYTE COUNT
 688  006464  104407                    CKSWR                   ;LOOK FOR SWITCH CHANGE
 689  006466  022737  000400  002456    CMP     #400,VECVAL     ;FINISHED ALL FOUR BYTE COUNTS
 690  006474  001402                    BEQ     14$             ;YES,FINISHED GROUP
 691  006476  000137  005602            JMP     121$            ;NO,DO NEXT BYTE COUNT WITH
 692                                                            ;LEVELS 0-7.
 693  006502  005337  002462        14$: DEC     GRPCNT          ;FINISHED BOTH GROUP 1 AND GROUP 2?
 694  006506  001406                    BEQ     15$             ;YES,BOTH GROUPS TESTED
 695  006510  013700  002422            MOV     DRCSC,R0        ;NO,TEST GROUP 2
 696                                                            ;CSRC = CONTROL GROUP 2
 697  006514  013701  002426            MOV     DRCSD,R1        ;CSRD = DATA    GROUP 2
 698  006520  000137  005562            JMP     120$            ;RETURN AND TEST GROUP2
 699                                                            ;FOR BYTE COUNTS 0-3 AND
 700                                                            ;LEVELS 0-7 FOR EACH BYTE COUNT.
 701  006524  004537  011374        15$: JSR     R5,FRMBUF       ;RESTORE 0-202,EXIT TEST
 702
 703
 704                             ;;*****************************************************************
 (3)                             ;*TEST 5        TEST VECTOR ADDR UNIQUENESS IN FIXED MODE FOR GRPS 1,2
 (3)                             ;;*****************************************************************
 (2)  006530  000004            TST5:   SCOPE
 705                                                            ;BYTE COUNT = 4
 706                                                            ;LEVELS = 0-7
 707  006532  004537  011014            JSR     R5,CLRCSR       ;CLEAR ALL CSRS
 708  006536  004537  011334            JSR     R5,CLRBF        ;CLEAR VECTOR BUFFER AREA
 709  006542  004537  011524            JSR     R5,TRPCAT       ;RESTORE TRAP CATCHER
 710  006546  004537  011300            JSR     R5,STRVEC       ;STORE VECTOR AREA 300-674
 711                                                            ;WITH INT. SERV ROUTINES
 712  006552  012737  000377  002456    MOV     #377,VECVAL     ;VECTOR MEM  FINAL VALUE
 713  006560  004537  011074            JSR     R5,CLRIRR       ;CLEAR IRR REGS
 714  006564  012704  017160            MOV     #VBUF,R4        ;VECTOR ADDRESS BUFFER
 715  006570  004537  011132            JSR     R5,VECFIL       ;FILL VECTOR MEMORY FOR GROUPS 1,2
 716                                                            ;WITH VECTORS 300-674
 717  006574  012705  012210            MOV     #SETVEC,R5      ; R5 POINTS TO COMMON HANDLER   ;;GPA
 718  006600  013700  002412            MOV     DRCSA,R0        ;GROUP 1 CSR
 719  006604  013701  002422            MOV     DRCSC,R1        ;GROUP 2 CSR
 720  006610  013702  002416            MOV     DRCSB,R2
 721  006614  013703  002426            MOV     DRCSD,R3
 722  006620  010037  002122            MOV     R0,$BDADR       ;STORE BUS ADDRESS
 723  006624  112710  000300            MOVB    #PACR,(R0)      ;PRESELECT GP1 ACR FOR WRITING
 724  006630  112712  000377            MOVB    #377,(R2)       ;SET ALL ACR BITS GP1
 725  006634  112710  000040            MOVB    #CIMR,(R0)      ;CLEAR ALL IMR BITS GP1
 726  006640  005037  002436            CLR     INTFLG          ;CLEAR INT. FLAG
 727  006644  106427  000000            MTPS    #PR0
 728  006650  112710  000120            MOVB    #SIRR,(R0)      ;SET ALL IRR BITS
```

```
                                                MOVB    #241,(R0)       ;LMD57 - ARM THE CHIP
                                                MTPS    #340
                                                TST     INTFLG          ;CHECK FOR NO INTERRUPTS
                                                BEQ     1$
                                                ERROR   11              ;ILLEGAL INTERRUPT
                                        1$:     CLR     INTFLG
                                                MOVB    #PACR,(R1)      ;PRESELECT GROUP2 FOR WRITING
                                                MOVB    #377,(R3)       ;ALL ACR BITS SET GP2
                                                MOVB    #CIMR,(R1)      ;CLEAR ALL IMR BITS GP2
                                                MTPS    #PR0
                                                MOVB    #SIRR,(R1)      ;SET ALL IRR BITS
                                                MOVB    #241,(R1)       ;LMD57 - ARM THE CHIP
                                                MTPS    #PR7
                                                TST     INTFLG          ;CHECK FOR NO INTERRUPTS
                                                BEQ     2$
                                                ERROR   11              ;ILLEGAL INTERRUPT
                                        2$:     CLR     INTFLG
                                                MTPS    #PR0
                                                BISB    #BIT1,1(R0)     ;SET INT. ENABLE,EXPECT INTERRUPTS
                                                MOV     #64.,$GDDAT     ;EXPECT 64 INTERRUPTS
                                                MOV     INTFLG,$BDDAT   ;SHOULD HAVE 64 INTERRUPTS
                                                MTPS    #PR7
                                                CMP     $GDDAT,$BDDAT
                                                BEQ     3$
                                                ERROR   12              ;INTERRUPT TEST ERROR
                                        3$:     MOV     #101710,$GDDAT  ;RDY,DIR,I/E,CHIP - 31X
                                                MOV     R0,$BDADR       ;CSRA
                                                MOV     (R0),$BDDAT
                                                BIC     #7,$BDDAT       ;CLEAR UNDEFINED BITS
                                                CMP     $GDDAT,$BDDAT
                                                BEQ     4$
                                                ERROR   2               ;CSRA REG ERROR
                                        4$:     MOV     #310,$GDDAT     ;STORE EXPECTED
                                                MOV     R1,$BDADR       ;CSRC
                                                MOV     (R1),$BDDAT     ;
                                                BIC     #7,$BDDAT       ;CLEAR UNDEFINED BITS
                                                CMP     $GDDAT,$BDDAT
                                                BEQ     5$
                                                ERROR   2               ;CSRC ERROR
                                        5$:     MOV     R2,$BDADR       ;CSRB ADDRESS
                                                CLR     $BDDAT
                                                CLR     $GDDAT
                                                MOVB    #MISR,(R0)      ;READ ISR
                                                MOVB    (R2),$BDDAT
                                                CMP     $GDDAT,$BDDAT
                                                BEQ     6$
                                                ERROR   6               ;ISR ERROR,GP1
                                        6$:     MOVB    #MIMR,(R0)      ;MODE BITS FOR IMR
                                                MOVB    (R2),$BDDAT
                                                CMP     $GDDAT,$BDDAT
                                                BEQ     7$
                                                ERROR   5               ;IMR ERROR,GP1
                                        7$:     MOVB    #MIRR,(R0)      ;MODE BITS FOR IRR
                                                MOVB    (R2),$BDDAT
                                                CMP     $GDDAT,$BDDAT
                                                BEQ     10$
```

```
                                ERROR   3               ;IRR ERROR
                        10$:    MOV     #377,$GDDAT     ;EXPECTED ACR
                                MOVB    #MACR,(R0)      ;READ ACR
                                MOVB    (R2),$BDDAT
                                CMP     $GDDAT,$BDDAT
                                BEQ     11$
                                ERROR   4               ;ACR ERROR
                        11$:    CLR     $GDDAT
                                CLR     $BDDAT
                                MOV     R3,$BDADR       ;CSRD ADDRESS
                                MOVB    #MISR,(R1)      ;READ ISR ,GP2
                                MOVB    (R3),$BDDAT
                                CMP     $GDDAT,$BDDAT
                                BEQ     12$
                                ERROR   6               ;ISR ERROR,GP1
                        12$:    MOVB    #MIMR,(R1)      ;READ IMR GP2
                                MOVB    (R3),$BDDAT
                                CMP     $GDDAT,$BDDAT
                                BEQ     13$
                                ERROR   5               ;IMR ERROR,GP2

                        13$:    MOVB    #MIRR,(R1)      ;READ IRR
                                MOVB    (R3),$BDDAT
                                CMP     $GDDAT,$BDDAT
                                BEQ     14$
                                ERROR   3               ;IRR ERROR,GP2
                        14$:    MOVB    #MACR,(R1)      ;READ ACR
                                MOV     #377,$GDDAT
                                MOVB    (R3),$BDDAT
                                CMP     $GDDAT,$BDDAT
                                BEQ     15$
                                ERROR   4               ;ACR ERROR,GP2
                        15$:    MOV     #64.,R2
                                MOV     #VBUF,R4        ;VECTOR BUFFER
                                MOV     #300,$GDDAT     ;START WITH FIRST VECTOR 300
                        16$:    MOV     R4,$BDADR       ;VECTOR BUFFER ADDRESS
                                MOV     (R4),$BDDAT
                                CMP     $GDDAT,$BDDAT
                                BEQ     17$             ;VECTORED PROPERLY
                                ERROR   7               ;VECTOR ADDR MEM ERROR
                        17$:    ADD     #4,$GDDAT
                                TST     KXTFLAG         ; KXT11 ??                      ;;GPA
                                BEQ     1000$           ; BR IF NOT                     ;;GPA
                                CMP     $GDDAT,#400     ; YES, REACHED VECTOR 400 ??    ;;GPA
                                BLO     1000$           ; NOT YET, CONTINUE             ;;GPA
                                MOV     #300,$GDDAT     ; YES, RESET EXPECTED TO 300    ;;GPA
                        1000$:                                                          ;;GPA
                                ADD     #2,R4           ;NEXT BUFFER ADDRESS
                                DEC     R2              ;COMPLETED 64 BUFFER CHECKS?
                                BNE     16$             ;CHECK NEXT VECTOR BUFFER LOCATION
                                                        ;THAT WAS STORED BY THE INTERRUPT
                                                        ;SERVICE ROUTINES.


                        ;;*******************************************************************
                        ;*TEST 6        TEST VECTOR ADDR UNIQUENESS IN ROTATING MODE FOR GRPS 1,2
                        ;;*******************************************************************
```

```
(2)  007476  000004                    TST6:   SCOPE
839                                                     ;BYTE COUNT = 4
840                                                     ;LEVELS = 0-7
841  007500  004537  011014                    JSR     R5,CLRCSR       ;CLEAR ALL CSRS
842  007504  004537  011334                    JSR     R5,CLRBF        ;CLEAR VECTOR BUFFER AREA
843  007510  004537  011524                    JSR     R5,TRPCAT       ;RESTORE TRAP CATCHER
844  007514  004537  011300                    JSR     R5,STRVEC       ;STORE VECTOR AREA 300-674
845                                                     ;WITH INT. SERV ROUTINES
846  007520  012737  000377  002456            MOV     #377,VECVAL     ;VECTOR MEM  FINAL VALUE
847  007526  004537  011074                    JSR     R5,CLRIRR       ;CLEAR IRR REGS
848  007532  012704  017160                    MOV     #VBUF,R4        ;VECTOR ADDRESS BUFFER
849  007536  004537  011132                    JSR     R5,VECFIL       ;FILL VECTOR MEMORY FOR GROUPS 1,2
850                                                     ;WITH VECTORS 300-674
851  007542  012705  012210                    MOV     #SETVEC,R5      ; R5 POINTS TO COMMON HANDLER.  ;;GPA
852  007546  013700  002412                    MOV     DRCSA,R0        ;GROUP 1 CSR
853  007552  013701  002422                    MOV     DRCSC,R1        ;GROUP 2 CSR
854  007556  013702  002416                    MOV     DRCSB,R2
855  007562  013703  002426                    MOV     DRCSD,R3
856  007566  010037  002122                    MOV     R0,$BDADR       ;STORE BUS ADDRESS
857  007572  012737  000010  002474            MOV     #8.,LVLSAV      ;COUNTER FOR 7 LEVELS
858  007600  112710  000201                    MOVB    #201,(R0)       ;ROTATING PRIORITY GROUP 1
859  007604  112710  000040                    MOVB    #CIMR,(R0)      ;CLEAR ALL IMR BITS GP1
860  007610  005037  002436                    CLR     INTFLG          ;CLEAR INT. FLAG
861  007614  106427  000000                    MTPS    #PR0
862  007620  112710  000120                    MOVB    #SIRR,(R0)      ;SET ALL IRR BITS
863  007624  112710  000241                    MOVB    #241,(R0)       ;LMD57 - ARM THE CHIP
864  007630  106427  000340                    MTPS    #340
865  007634  005737  002436                    TST     INTFLG          ;CHECK FOR NO INTERRUPTS
866  007640  001401                            BEQ     1$
867  007642  104011                            ERROR   11              ;ILLEGAL INTERRUPT
868  007644  005037  002436            1$:     CLR     INTFLG
869  007650  112711  000201                    MOVB    #201,(R1)       ;ROTATING PRIORITY FOR GROUP 2
870  007654  112711  000040                    MOVB    #CIMR,(R1)      ;CLEAR ALL IMR BITS GP2
871  007660  106427  000000                    MTPS    #PR0
872  007664  112711  000120                    MOVB    #SIRR,(R1)      ;SET ALL IRR BITS
873  007670  112711  000241                    MOVB    #241,(R1)       ;LMD57 - ARM THE CHIP
874  007674  106427  000340                    MTPS    #PR7
875  007700  005737  002436                    TST     INTFLG          ;CHECK FOR NO INTERRUPTS
876  007704  001401                            BEQ     2$
877  007706  104011                            ERROR   11              ;ILLEGAL INTERRUPT
878  007710  005037  002436            2$:     CLR     INTFLG
879  007714  106427  000000                    MTPS    #PR0
880  007720  152760  000002  000001            BISB    #BIT1,1(R0)     ;SET INT. ENABLE,EXPECT INTERRUPTS
881  007726  012737  000004  002124            MOV     #4,$GDDAT       ;EXPECT 4 INTERRUPTS
882  007734  013737  002436  002126            MOV     INTFLG,$BDDAT   ;SHOULD HAVE 4 INTERRUPTS
883  007742  106427  000340                    MTPS    #PR7
884  007746  023737  002124  002126            CMP     $GDDAT,$BDDAT
885  007754  001401                            BEQ     100$
886  007756  104012                            ERROR   12              ;INTERRUPT TEST ERROR
887  007760  112710  000140            100$:   MOVB    #CHPISR,(R0)    ;CLEAR HIGHEST PRIORITY ISR
888  007764  112710  000120                    MOVB    #SIRR,(R0)      ;SET ALL IRR BITS
889  007770  005337  002474                    DEC     LVLSAV          ;DONE 8 LEVELS,GROUP 1
890  007774  001345                            BNE     2$              ;DO NEXT LEVEL IN ROTATION
891  007776  112710  000100                    MOVB    #CIRR,(R0)      ;CLEAR IRR BITS GROUP 1
892  010002  012737  000010  002474            MOV     #8.,LVLSAV      ;DO 8 LEVELS,GROUP 2
893  010010  005037  002436            101$:   CLR     INTFLG          ;CLEAR INT FLAG
```

```
   894  010014  106427  000000                    MTPS    #PR0
   895  010020  012737  000004  002124            MOV     #4,$GDDAT
   896  010026  013737  002436  002126            MOV     INTFLG,$BDDAT   ;SHOULD HAVE FOUR INTERRUPTS
   897  010034  106427  000340                    MTPS    #PR7
   898  010040  023737  002124  002126            CMP     $GDDAT,$BDDAT
   899  010046  001401                            BEQ     102$
   900  010050  104012                            ERROR   12              ;INTERRUPT TEST ERROR
   901  010052  112711  000140          102$:     MOVB    #CHPISR,(R1)    ;CLEAR HIGHEST PRIORITY ISR
   902  010056  112711  000120                    MOVB    #SIRR,(R1)      ;SET ALL IRR BITS
   903  010062  005337  002474                    DEC     LVLSAV          ;DONE 8 LEVELS?
   904  010066  001350                            BNE     101$            ;DO NEXT LEVEL IN ROTATION,GP2
   905  010070  112711  000100                    MOVB    #CIRR,(R1)      ;CLEAR IRR BITS,GROUP 2
   906  010074  012737  101750  002124  3$:       MOV     #101750,$GDDAT  ;RDY,DIR,I/E,CHIP - 35X
   907  010102  010037  002122                    MOV     R0,$BDADR       ;CSRA
   908  010106  011037  002126                    MOV     (R0),$BDDAT
   909  010112  042737  000007  002126            BIC     #7,$BDDAT       ;CLEAR UNDEFINED BITS
   910  010120  023737  002124  002126            CMP     $GDDAT,$BDDAT
   911  010126  001401                            BEQ     4$
   912  010130  104002                            ERROR   2               ;CSRA REG ERROR
   913  010132  012737  000350  002124  4$:       MOV     #350,$GDDAT     ;STORE EXPECTED
   914  010140  010137  002122                    MOV     R1,$BDADR       ;CSRC
   915  010144  011137  002126                    MOV     (R1),$BDDAT     ;
   916  010150  042737  000007  002126            BIC     #7,$BDDAT       ;CLEAR UNDEFINED BITS
   917  010156  023737  002124  002126            CMP     $GDDAT,$BDDAT
   918  010164  001401                            BEQ     5$
   919  010166  104002                            ERROR   2               ;CSRC ERROR
   920  010170  010237  002122          5$:       MOV     R2,$BDADR       ;CSRB ADDRESS
   921  010174  005037  002126                    CLR     $BDDAT
   922  010200  005037  002124                    CLR     $GDDAT
   923  010204  112710  000240                    MOVB    #MISR,(R0)      ;READ ISR
   924  010210  111237  002126                    MOVB    (R2),$BDDAT
   925  010214  023737  002124  002126            CMP     $GDDAT,$BDDAT
   926  010222  001401                            BEQ     6$
   927  010224  104006                            ERROR   6               ;ISR ERROR,GP1
   928  010226  112710  000244          6$:       MOVB    #MIMR,(R0)      ;MODE BITS FOR IMR
   929  010232  111237  002126                    MOVB    (R2),$BDDAT
   930  010236  023737  002124  002126            CMP     $GDDAT,$BDDAT
   931  010244  001401                            BEQ     7$
   932  010246  104005                            ERROR   5               ;IMR ERROR,GP1
   933  010250  112710  000250          7$:       MOVB    #MIRR,(R0)      ;MODE BITS FOR IRR
   934  010254  111237  002126                    MOVB    (R2),$BDDAT
   935  010260  023737  002124  002126            CMP     $GDDAT,$BDDAT
   936  010266  001401                            BEQ     10$
   937  010270  104003                            ERROR   3               ;IRR ERROR
   938  010272  112710  000254          10$:      MOVB    #MACR,(R0)      ;READ ACR
   939  010276  111237  002126                    MOVB    (R2),$BDDAT
   940  010302  023737  002124  002126            CMP     $GDDAT,$BDDAT
   941  010310  001401                            BEQ     11$
   942  010312  104004                            ERROR   4               ;ACR ERROR
   943  010314  010337  002122          11$:      MOV     R3,$BDADR       ;CSRD ADDRESS
   944  010320  112711  000240                    MOVB    #MISR,(R1)      ;READ ISR ,GP2
   945  010324  111337  002126                    MOVB    (R3),$BDDAT
   946  010330  023737  002124  002126            CMP     $GDDAT,$BDDAT
   947  010336  001401                            BEQ     12$
   948  010340  104006                            ERROR   6               ;ISR ERROR,GP1
   949  010342  112711  000244          12$:      MOVB    #MIMR,(R1)      ;READ IMR GP2
```

```
  950  010346  111337  002126                  MOVB    (R3),$BDDAT
  951  010352  023737  002124  002126          CMP     $GDDAT,$BDDAT
  952  010360  001401                          BEQ     13$
  953  010362  104005                          ERROR   5               ;IMR ERROR,GP2
  954
  955  010364  112711  000250          13$:    MOVB    #MIRR,(R1)      ;READ IRR
  956  010370  111337  002126                  MOVB    (R3),$BDDAT
  957  010374  023737  002124  002126          CMP     $GDDAT,$BDDAT
  958  010402  001401                          BEQ     14$
  959  010404  104003                          ERROR   3               ;IRR ERROR,GP2
  960  010406  112711  000254          14$:    MOVB    #MACR,(R1)      ;READ ACR
  961  010412  111337  002126                  MOVB    (R3),$BDDAT
  962  010416  023737  002124  002126          CMP     $GDDAT,$BDDAT
  963  010424  001401                          BEQ     200$
  964  010426  104004                          ERROR   4               ;ACR ERROR,GP2
  965  010430  105010          200$:   CLRB    (R0)                    ;INIT GROUP 1 MODE BITS
  966  010432  105011                          CLRB    (R1)            ;INIT GROUP 2 MODE BITS
  967  010434  012737  101700  002124          MOV     #101700,$GDDAT  ;EXPECTED CSRA
  968  010442  010037  002122                  MOV     R0,$BDADR       ;CSRA
  969  010446  011037  002126                  MOV     (R0),$BDDAT
  970  010452  042737  000007  002126          BIC     #7,$BDDAT       ;CLEAR UNDEFINED BITS
  971  010460  023737  002124  002126          CMP     $GDDAT,$BDDAT
  972  010466  001401                          BEQ     201$
  973  010470  104002                          ERROR   2               ;CSRA REG ERROR
  974  010472  012737  000200  002124  201$:   MOV     #200,$GDDAT     ;STORE EXPECTED
  975  010500  010137  002122                  MOV     R1,$BDADR       ;CSRC
  976  010504  011137  002126                  MOV     (R1),$BDDAT     ;
  977  010510  042737  000007  002126          BIC     #7,$BDDAT       ;CLEAR UNDEFINED BITS
  978  010516  023737  002124  002126          CMP     $GDDAT,$BDDAT
  979  010524  001401                          BEQ     15$
  980  010526  104002                          ERROR   2               ;CSRC ERROR
  981  010530  012702  000100          15$:    MOV     #64.,R2
  982  010534  012704  017160                  MOV     #VBUF,R4        ;VECTOR BUFFER
  983  010540  012737  000300  002124          MOV     #300,$GDDAT     ;START WITH FIRST VECTOR 300
  984  010546  010437  002122          16$:    MOV     R4,$BDADR       ;VECTOR BUFFER ADDRESS
  985  010552  011437  002126                  MOV     (R4),$BDDAT
  986  010556  023737  002124  002126          CMP     $GDDAT,$BDDAT
  987  010564  001401                          BEQ     17$             ;VECTORED PROPERLY
  988  010566  104007                          ERROR   7               ;VECTOR ADDR MEM ERROR
  989  010570  062737  000004  002124  17$:    ADD     #4,$GDDAT
  990  010576  005737  017374                  TST     KXTFLAG         ; KXT11 ??                      ;;GPA
  991  010602  001407                          BEQ     1000$           ; BR IF NOT                     ;;GPA
  992  010604  023727  002124  000400          CMP     $GDDAT,#400     ; YES, REACHED VECTOR 400 ??    ;;GPA
  993  010612  103403                          BLO     1000$           ; NOT YET, CONTINUE             ;;GPA
  994  010614  012737  000300  002124          MOV     #300,$GDDAT     ; YES, RESET EXPECTED TO 300    ;;GPA
  995  010622                          1000$:                                                          ;;GPA
  996  010622  062704  000002                  ADD     #2,R4           ;NEXT BUFFER ADDRESS
  997  010626  005302                          DEC     R2              ;COMPLETED 64 BUFFER CHECKS?
  998  010630  001346                          BNE     16$             ;CHECK NEXT VECTOR BUFFER LOCATION
  999                                                                  ;THAT WAS STORED BY THE INTERRUPT
 1000                                                                  ;SERVICE ROUTINES.
 1001
 1002
 1003                          ;DON'T REPORT 'END OF PASS' UNTIL ALL SELECTED DRV11J'S HAVE BEEN TESTED.
 1004  010632  013701  002412  NXDEV:  MOV     DRCSA,R1                ;INIT TO SETUP DRV11J ADDRESS
 1005  010636  000241          NXDEV1: CLC                             ;CLEAR CARRY FOR DEVICE MAP
```

```
1006  010640  006037  002434                ROR     DMAP            ;LOOK FOR NEXT DRV11J
1007  010644  001412                       BEQ     $EOP            ;BR IF ALL TESTED
1008  010646  162701  000020               SUB     #20,R1          ;NEXT DRV11J STARTS -20 FROM PAST CSR
1009  010652  005237  002202               INC     $UNIT           ;UPDAT UNIT #
1010  010656  032737  000001  002434       BIT     #1,DMAP         ;IS UNIT SELECTED?
1011  010664  001764                       BEQ     NXDEV1          ;BR IF NOT
1012  010666  000137  003200               JMP     NEXPAS          ;TEST NEXT DRV11J
1013
1014                                  .SBTTL  END OF PASS ROUTINE
 (1)
 (2)                                  ;;*********************************************************************
 (1)                                  ;*INCREMENT THE PASS NUMBER ($PASS)
 (1)                                  ;*TYPE "END PASS #XXXXX" (WHERE XXXXX IS A DECIMAL NUMBER)
 (1)                                  ;*IF THERES A MONITOR GO TO IT
 (1)                                  ;*IF THERE ISN'T JUMP TO START1
 (1)
 (1)  010672                          $EOP:
 (2)  010672  000240                          NOP
 (1)  010674  005037  002102                  CLR     $TSTNM          ;;ZERO THE TEST NUMBER
 (1)  010700  005037  002160                  CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
 (1)  010704  005237  002176                  INC     $PASS           ;;INCREMENT THE PASS NUMBER
 (1)  010710  042737  100000  002176          BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
 (1)  010716  005327                          DEC     (PC)+           ;;LOOP?
 (1)  010720  000001                  $EOPCT: .WORD   1
 (1)  010722  003022                          BGT     $DOAGN          ;;YES
 (1)  010724  012737                          MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
 (1)  010726  000001                  $ENDCT: .WORD   1
 (1)  010730  010720                          $EOPCT
 (1)  010732  104401  010777                  TYPE    ,$ENDMG         ;;TYPE "END PASS #"
 (2)  010736  013746  002176                  MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
 (2)  010742  104405                          TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
 (1)  010744  104401  010774                  TYPE    ,$ENULL         ;;TYPE A NULL CHARACTER
 (1)  010750  013700  000042          $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
 (1)  010754  001405                          BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
 (1)  010756  000005                          RESET                   ;;CLEAR THE WORLD
 (1)  010760  004710                  $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
 (1)  010762  000240                          NOP                     ;;SAVE ROOM
 (1)  010764  000240                          NOP                     ;;FOR
 (1)  010766  000240                          NOP                     ;;ACT11
 (1)  010770                          $DOAGN:
 (1)  010770  000137                          JMP     @(PC)+          ;;RETURN
 (1)  010772  003134                  $RTNAD: .WORD   START1
 (1)  010774     377     377     000  $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
 (1)  010777     015  042412  042116  $ENDMG: .ASCIZ  <15><12>/END PASS #/
```

```
                        .SBTTL  PROGRAM SUBROUTINES


                        ;;*****************************************************************
                        ;CLEAR ALL CONTROL/STATUS REGISTERS
                        ;;*****************************************************************
011014  010046          CLRCSR: MOV     R0,-(SP)        ;SAVE R0
011016  106427  000340          MTPS    #PR7            ;PSW = 340
011022  012737  000340  002456  MOV     #PVMA,VECVAL    ;INIT VECTOR ADDR MEM = 340
011030  012737  000300  002452  MOV     #300,VECLOC     ;INIT VECTOR ADDR TO 300
011036  013700  002412          MOV     DRCSA,R0        ;START OF CSR ADDRESS
011042  005037  002124          CLR     $GDDAT          ;CLEAR EXPECTED
011046  005037  002126          CLR     $BDDAT          ;CLEAR REC'D
011052  005010                  CLR     (R0)            ;CLEAR CSRA;CHIP RESET GROUP 1
011054  105060  000005          CLRB    5(R0)           ;CLEAR HIGH BYTE CSRB
011060  005060  000010          CLR     10(R0)          ;CLEAR CSRC;CHIP RESET GROUP 2
011064  105060  000015          CLRB    15(R0)          ;CLEAR HIGH BYTE CSRD
011070    2600                  MOV     (SP)+,R0        ;RETURN R0
011072  000205                  RTS     R5


                        ;CLEAR IRP REGISTERS,GROUP 1,GROUP 2 WITH CHIP RESET
011074  010046          CLRIRR: MOV     R0,-(SP)
011076  013700  002412          MOV     DRCSA,R0        ;START OF CSR ADDRESS
011102  105060  000011          CLRB    11(R0)          ;CSRC TO INPUT MODE
011106  112760  000001  000001  MOVB    #BIT0,1(R0)     ;CSRA TO OUTPUT MODE
011114  005060  000002          CLR     2(R0)           ;CLEAR DBRA
011120  105010                  CLRB    (R0)            ;CHIP RESET OF GROUP1
011122  105060  000010          CLRB    10(R0)          ;CHIP RESET OF GROUP 2
011126  012600                  MOV     (SP)+,R0        ;RESTORE REGISTER
011130  000205                  RTS     R5              ;EXIT

                        ;ROUTINE TO FILL VECTOR MEMORY FOR VECTOR UNIQUENESS TEST
                        ;300-474        GROUP 1
                        ;500-674        GROUP 2
011132  013700  002412  VECFIL: MOV     DRCSA,R0        ;START GROUP 1
011136  013701  002416          MOV     DRCSB,R1
011142  012702  000002          MOV     #2,R2           ;TWO GROUPS
011146  012737  000060  002454  MOV     #60,VECPAT      ;VECTOR START 300
011154  012737  000370  002456  1$:     MOV     #370,VECVAL     ;START VECTOR LEVEL 0,BY4
011162  012737  000010  002466          MOV     #8.,LVLCNT      ;LEVELS 0-7
011170  113710  002456  2$:     MOVB    VECVAL,(R0)
011174  012737  000004  002470          MOV     #4,BYCNT        ;DO FOUR BYTE COUNTS
011202  113711  002454  3$:     MOVB    VECPAT,(R1)     ;WRITE VECTOR
011206  005237  002454          INC     VECPAT          ;SETUP FOR NEXT VECTOR
011212  005737  017374          TST     KXTFLAG         ; KXT11 ??                      ;;GPA
011216  001407                  BEQ     1000$           ; BR IF NOT                     ;;GPA
011220  023727  002454  000100  CMP     VECPAT,#100     ; YES, REACED VECTOR 400 ??     ;;GPA
011226  103403                  BLO     1000$           ; NOT YET, CONTINUE             ;;GPA
011230  012737  000060  002454  MOV     #60,VECPAT      ; YES, WRAP-AROUND TO 300 AGAIN ;;GPA
                                                        ; WE'LL END UP WITH 300-374...  ;;GPA
                                                        ;...REPLICATED 4 TIMES.         ;;GPA
011236                  1000$:                                                          ;;GPA
011236  005337  002470          DEC     BYCNT           ;DONE FOUR BYTE COUNTS?
011242  001357                  BNE     3$              ;DO NEXT VECTOR
011244  005337  002466  4$:     DEC     LVLCNT          ;DONE ALL LEVELS IN GROUP?
```

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1072  011250  001403                        BEQ     5$
1073  011252  005237  002456                INC     VECVAL          ;INC NEXT LEVEL
1074  011256  000744                        BR      2$              ;DO NEXT LEVEL
1075  011260  005302                5$:     DEC     R2              ;DONE BOTH GROUPS?
1076  011262  001405                        BEQ     6$              ;DONE,EXIT
1077  011264  013700  002422                MOV     DRCSC,R0        ;DO GROUP 2
1078  011270  013701  002426                MOV     DRCSD,R1
1079  011274  000727                        BR      1$
1080  011276  000205                6$:     RTS     R5              ;EXIT
1081
1082                                  ;ROUTINE TO STORE VECTOR AREA 300-674 WITH INTERRUPT SERVICE
1083  011300  012700  000300        STRVEC: MOV     #300,R0         ;START AT VECTOR 300
1084  011304  012701  012236                MOV     #INT0,R1        ;FIRST SERVICE ROUTINE
1085  011310  012702  000100                MOV     #64.,R2         ;STORE 64 SERVICE ROUTINES
1086  011314  010120                1$:     MOV     R1,(R0)+
1087  011316  012720  000340                MOV     #340,(R0)+
1088                                  ;;GPA   ADD     #6,R1           ;SETUP FOR NEXT VECTOR STORAGE
1089  011322  062701  000004                ADD     #4,R1           ; SETUP NEXT VETOR.             ;;GPA
1090  011326  005302                        DEC     R2              ;DONE WITH 64 VECTOR ROUTINES?
1091  011330  001371                        BNE     1$
1092  011332  000205                        RTS     R5              ;EXIT
1093
1094                                  ;ROUTINE TO CLEAR VECTOR BUFFER
1095  011334  012700  017160        CLRBF:  MOV     #VBUF,R0        ;VECTOR BUFFER START
1096  011340  012701  000100                MOV     #64.,R1
1097  011344  005020                1$:     CLR     (R0)+
1098  011346  005301                        DEC     R1
1099  011350  001375                        BNE     1$
1100  011352  000205                        RTS     R5
1101
1102                                  ;ROUTINE TO STORE 0-202 INTO BUFFER AREA TO ALLOW
1103                                  ;VECTOR TESTS TO 0-200.
1104  011354  005000                TOBUF:  CLR     R0
1105  011356  012701  016754                MOV     #DBUF,R1        ;BUFFER START
1106  011362  012021                1$:     MOV     (R0)+,(R1)+     ;STORE 0-202 INTO BUFFER
1107  011364  022700  000204                CMP     #204,R0         ;FINISHED?
1108  011370  001374                        BNE     1$              ;NO
1109  011372  000205                        RTS     R5              ;RETURN
1110
1111                                  ;STORE BUFFER AREA INTO LOCATIONS 0-202
1112                                  ;AFTER VECTOR TESTS
1113  011374  010046                FRMBUF: MOV     R0,-(SP)        ;SAVE R0
1114  011376  010146                        MOV     R1,-(SP)
1115  011400  005000                        CLR     R0
1116  011402  012701  016754                MOV     #DBUF,R1        ;BUFFER START
1117  011406  012120                1$:     MOV     (R1)+,(R0)+     ;STORE BUFFER INTO LOCS 0-202
1118  011410  022700  000204                CMP     #204,R0         ;FINISHED?
1119  011414  001374                        BNE     1$              ;NO
1120  011416  013777  002460  170514        MOV     SWRSAV,@SWR     ;STORE LOCATION 176,SOFT SWR
1121  011424  012601                        MOV     (SP)+,R1        ;RESTORE R1
1122  011426  012600                        MOV     (SP)+,R0        ;RESTORE R0
1123  011430  000205                        RTS     R5              ;RETURN
1124
1125                                  ;RESTORE VECTOR JUST TESTED TO ORIGINAL TRAP FOR 204-1774
1126  011432  022737  000001  002210 RESTRP: CMP     #1,$ENV         ;CHECK FOR APT
1127  011440  001421                        BEQ     1$              ;YES,BRANCH
```

```
1128  011442  032777  010000  170470          BIT     #SW12,@SWR      ;CHECK TYPE OF TRAP RETURN
1129  011450  001412                          BEQ     10$             ;RESTORE ILLEGAL VECTOR ROUTINE
1130  011452  062737  000002  002452          ADD     #2,VECLOC       ;RESTORE TRAP
1131  011460  013723  002452                  MOV     VECLOC,(R3)+    ;TO VECTOR
1132  011464  005013                          CLR     (R3)            ;RESTORE HALT
1133  011466  062737  000002  002452          ADD     #2,VECLOC       ;SETUP FOR NEXT
1134  011474  000412                          BR      2$              ;RETURN
1135  011476  012723  011752          10$:    MOV     #TRPALL,(R3)+   ;RESTORE ILLEGAL TRAP ROUTINE
1136  011502  000402                          BR      11$             ;RESTORE PSW
1137  011504  012723  011734          1$:     MOV     #TRPOUT,(R3)+   ;RESTORE APT SUB TRAP
1138                                                                  ;IF ON APT
1139  011510  012713  000340          11$:    MOV     #340,(R3)       ;RESTORE PSW SAVE
1140  011514  062737  000004  002452          ADD     #4,VECLOC       ;UPDATE FOR NEXT VECTOR
1141  011522  000205                  2$:     RTS     R5              ;RETURN
1142
1143                                  ;ROUTINE TO SET UP TRAP CATCHER 204-1774 IN STANDALONE MODE OR
1144                                  ;A COMMON VECTOR ROUTINE SETUP UNDER APT.
1145                                  ;VECTOR ROUTINE IS USED ONLY IN AN APT ENVIRONMENT AND WILL STORE
1146                                  ;A COMMON SUBROUTINE IN VECTOR AREA 204-1774.
1147
1148  011524  010046                  TRPCAT: MOV     R0,-(SP)        ;SAVE R0
1149  011526  010146                          MOV     R1,-(SP)
1150  011530  022737  000001  002210          CMP     #1,$ENV         ;CHECK FOR APT
1151  011536  001426                          BEQ     APTVEC          ;YES,SET UP TRAPS FOR APT
1152  011540  012700  000204                  MOV     #204,R0         ;START CATCHER AT 204
1153  011544  032777  010000  170366          BIT     #SW12,@SWR      ;TEST IF SW12 IS SET
1154  011552  001010                          BNE     1$              ;YES,BR AND STORE REGULAR TRAP
1155                                                                  ;CATCHER(.+2,HALT) IN LOCATIONS
1156                                                                  ;204-1774
1157  011554  012720  011752          11$:    MOV     #TRPALL,(R0)+   ;NO,PLACE ILLEGAL VECTOR RETURN
1158  011560  012720  000340                  MOV     #340,(R0)+      ;ROUTINES IN LOCATIONS 204-1774
1159  011564  022700  002000                  CMP     #2000,R0        ;STORED ALL VECTORS?
1160  011570  001371                          BNE     11$
1161  011572  000421                          BR      ENDTRP          ;RETURN AFTER VECTOR STORAGE
1162  011574  010001                  1$:     MOV     R0,R1           ;DRV11J CAN VECTOR 0-1774
1163  011576  005721                          TST     (R1)+
1164  011600  010120                          MOV     R1,(R0)+
1165  011602  005020                          CLR     (R0)+
1166  011604  022701  001776                  CMP     #1776,R1        ;CHECK FOR VECTOR END
1167  011610  001371                          BNE     1$
1168  011612  000411                          BR      ENDTRP          ;RETURN IN STAND ALONE MODE
1169  011614  012701  000204          APTVEC: MOV     #204,R1         ;STARTING VECTOR ADDRESS
1170  011620  012721  011734          1$:     MOV     #TRPOUT,(R1)+   ;ILL INTERRUPT ROUTINE
1171  011624  012721  000340                  MOV     #340,(R1)+      ;PSW NEXT
1172  011630  022701  002000                  CMP     #2000,R1        ;DONE?
1173  011634  001371                          BNE     1$              ;DO NEXT VECTOR
1174  011636  012601                  ENDTRP: MOV     (SP)+,R1
1175  011640  012600                          MOV     (SP)+,R0
1176  011642  000205                          RTS     R5              ;EXIT
1177
1178                                  ;INTERRUPT SERVICE ROUTINE USED TO VERIFY INTERRUPTS 204-1774
1179  011644  005237  002436          INTSR1: INC     INTFLG          ;COUNT INTERRUPT
1180  011650  012737  000001  002124          MOV     #1,$GDDAT       ;STORE EXPECTED
1181  011656  013737  002436  002126          MOV     INTFLG,$BDDAT   ;SAVE INT. COUNT
1182  011664  023737  002124  002126          CMP     $GDDAT,$BDDAT   ;SHOULD BE ONE INTERRUPT
1183  011672  001401                          BEQ     1$
```

```
1184  011674  104013                          ERROR   13              ;MULTIPLE INTERRUPTS RECEIVED
1185  011676  000002                  1$:     RTI                     ;RETURN FROM INT.
1186
1187                                  ;INTERRUPT SERVICE ROUTINE USED TO VERIFY INTERRUPTS 204-1774
1188                                  ;FOR A BYTE COUNT OF 1 TO 4 VECTORS IN VECTOR ADDR MEMORY.
1189  011700  005237  002436          INTBY4: INC     INTFLG          ;COUNT INTERRUPT
1190  011704  013737  002472  002124          MOV     BYNUM,$GDDAT    ;STORE EXPECTED
1191  011712  013737  002436  002126          MOV     INTFLG,$BDDAT   ;SAVE INT. COUNT
1192  011720  023737  002124  002126          CMP     $GDDAT,$BDDAT   ;INTERRUPTS SHOULD NOT EXCEED BYTE COUNT
1193  011726  002001                          BGE     1$
1194  011730  104013                          ERROR   13              ;MULTIPLE INTERRUPTS RECEIVED
1195                                                                  ;MORE INTERRUPTS THAN BYTE COUNT
1196  011732  000002                  1$:     RTI                     ;RETURN FROM INT.
1197
1198                                  ;COMMON ILLEGAL VECTOR RETURN ROUTINE FOR APT MODE.
1199  011734  011637  002120          TRPOUT: MOV     (SP),$GDADR     ;SAVE ADDRESS OF TEST
1200  011740  004537  011374                  JSR     R5,FRMBUF       ;RETURN LOCATIONS 0-202
1201  011744  104014                          ERROR   14              ;ILLEGAL VECTOR ADDR MEM ERROR
1202  011746  000000                          HALT                    ;CANNOT CONTINUE
1203  011750  000000                          HALT                    ;CANNOT CONTINUE
1204
1205                                  ;COMMON ILLEGAL VECTOR RETURN ROUTINE FOR VECTOR AREA
1206                                  ;204-1774
1207  011752  011637  002120          TRPALL: MOV     (SP),$GDADR     ;SAVE PC OF TEST
1208  011756  104014                          ERROR   14              ;ILLEGAL VECTOR ADDR MEM ERROR
1209  011760  000002                          RTI                     ;RETURN
1210
1211                                  ;RESTORE VECTOR JUST TESTED TO ERROR SUBROUTINE FOR 0-202
1212  011762  022737  000001  002210  RES200: CMP     #1,$ENV         ;CHECK FOR APT
1213  011770  001405                          BEQ     1$              ;YES,BRANCH
1214  011772  012723  012170                  MOV     #TRP200,(R3)+   ;ERROR TRAP SUB. FOR 0-200
1215  011776  012713  000340                  MOV     #340,(R3)       ;PSW
1216  012002  000404                          BR      2$              ;RETURN
1217  012004  012723  011734          1$:     MOV     #TRPOUT,(R3)+   ;RESTORE APT SUB TRAP
1218                                                                  ;IF ON APT
1219  012010  012713  000340                  MOV     #340,(R3)       ;RESTORE PSW SAVE
1220  012014  062737  000004  002452  2$:     ADD     #4,VECLOC       ;UPDATE FOR NEXT VECTOR
1221  012022  000205                          RTS     R5              ;RETURN
1222
1223                                  ;ROUTINE TO SET UP TRAP SUBROUTINE 0-200 IN STANDALONE MODE OR
1224                                  ;A COMMON ERROR VECTOR ROUTINE SETUP UNDER APT.
1225
1226  012024  010046                  CAT200: MOV     R0,-(SP)        ;SAVE R0
1227  012026  017737  170106  002460          MOV     @SWR,SWRSAV     ;SAVE LOCATION 176,SOFT SWR
1228  012034  022737  000001  002210          CMP     #1,$ENV         ;CHECK FOR APT
1229  012042  001411                          BEQ     APT200          ;YES,SET UP TRAPS FOR APT
1230  012044  005000                          CLR     R0              ;START CATCHER SUB AT 0
1231  012046  012720  012170          1$:     MOV     #TRP200,(R0)+   ;STORE VECTOR TRAP SUBROUTINE
1232  012052  012720  000340                  MOV     #340,(R0)+      ;PSW
1233  012056  022700  000204                  CMP     #204,R0         ;FINISHED 0-202
1234  012062  001371                          BNE     1$
1235  012064  000410                          BR      END200          ;RETURN IN STAND ALONE MODE
1236  012066  005000                  APT200: CLR     R0              ;START AT VECTOR 0
1237  012070  012720  011734          1$:     MOV     #TRPOUT,(R0)+   ;VECTOR ERROR ROUTINE
1238  012074  012720  000340                  MOV     #340,(R0)+      ;PSW NEXT
1239  012100  022700  000204                  CMP     #204,R0         ;DONE?
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```
1240  012104  001371                        BNE     1$              ;DO NEXT VECTOR
1241  012106  012600                END200: MOV     (SP)+,R0
1242  012110  012713  012124              MOV     #INTSR3,(R3)    ;STORE VECTOR ROUTINE
1243  012114  012763  000340  000002       MOV     #340,2(R3)      ;STORE PSW
1244  012122  000205                        RTS     R5              ;EXIT
1245
1246
1247                                ;INTERRUPT SERVICE ROUTINE USED TO VERIFY INTERRUPTS 0-200,BYTE COUNT 0-3
1248                                ;FOR BYTE COUNTS OF 1 TO 4 VECTORS IN VECTOR ADDRESS MEMORY.
1249  012124  005237  002436       INTSR3: INC     INTFLG          ;COUNT INTERRUPT
1250  012130  013737  002472  002124       MOV     BYNUM,$GDDAT    ;STORE EXPECTED
1251  012136  013737  002436  002126       MOV     INTFLG,$BDDAT   ;SAVE INT. COUNT
1252  012144  023737  002124  002126       CMP     $GDDAT,$BDDAT   ;INTERRUPTS SHOULD NOT EXCEED BYTE COUNT
1253  012152  002005                        BGE     1$
1254  012154  004537  011374               JSR     R5,FRMBUF       ;RESTORE 0-202 BEFORE ERROR
1255  012160  104013                        ERROR   13              ;MULTIPLE INTERRUPTS RECEIVED
1256                                                                ;MORE INTERRUPTS THAN BYTE COUNT
1257  012162  004537  012024               JSR     R5,CAT200       ;RESTORE VECTOR SUBROUTINES
1258  012166  000002                1$:     RTI                     ;RETURN FROM INT.
1259
1260                                ;COMMON ILLEGAL VECTOR ERROR RETURN ROUTINE FOR 0-200
1261  012170  011637  002120       TRP200: MOV     (SP),$GDADR     ;SAVE PC OF TEST
1262  012174  004537  011374               JSR     R5,FRMBUF       ;RETURN LOC 0-200
1263  012200  104014                        ERROR   14              ;ILLEGAL VECTOR ADDR MEM ERROR
1264  012202  004537  012024               JSR     R5,CAT200       ;RESTORE VECTOR SUBROUTINES FOR PROCEED
1265  012206  000002                        RTI                     ;RETURN
1266
1267                                ;VECTOR SERVICE ROUTINE FOR VECTOR UNIQUENESS TEST
1268                                ;SETVEC:        MOV     (R5)+,(R4)+     ;STORE VALUE IN BUFFER  ;;GPA
1269  012210  017624  000000       SETVEC: MOV     @(SP),(R4)+     ; STORE VECTOR NUMBER IN BUFFER ;;GPA
1270  012214  005726                        TST     (SP)+           ;RESTORE STACK FOR RTI
1271  012216  005237  002436               INC     INTFLG          ;COUNT INTERRUPT
1272  012222  022737  000100  002436       CMP     #64.,INTFLG
1273  012230  002001                        BGE     1$              ;64 EXPECTED INTERRUPTS?
1274  012232  104013                        ERROR   13              ;ERROR ,MORE THAN 64 INTERRUPTS
1275  012234  000002                1$:     RTI                     ;RETURN FOR NEXT INTERRUPT
1276
1277                                ;INTERRUPT SERVICE ROUTINES THAT ARE STORED FROM 300-674
1278                                ;IN THE VECTOR UNIQUENESS TEST.
1279                                ; R5 POINTS TO "SETVEC:" DURING TESTS 5 AND 6, AND CALLS        ;;GPA
1280                                ; CHANGED FROM "JSR R5,SETVEC" TO "JSR PC,(R5)" TO CONSERVE     ;;GPA
1281                                ; SPACE AND REMAIN UNDER 4KW TOTAL PROGRAM SIZE.                ;;GPA
1282  012236  004715                INT0:   JSR     PC,(R5) ;STORE 300 INTO VBUF,TO BE              ;;GPA
1283  012240  000300                        300             ;CHECKED AFTER ALL INTERRUPTS.
1284  012242  004715                INT1:   JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1285  012244  000304                        304
1286  012246  004715                INT2:   JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1287  012250  000310                        310
1288  012252  004715                INT3:   JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1289  012254  000314                        314
1290  012256  004715                INT4:   JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1291  012260  000320                        320
1292  012262  004715                INT5:   JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1293  012264  000324                        324
1294  012266  004715                INT6:   JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1295  012270  000330                        330
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1296  012272  004715          INT7:   JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1297  012274  000334                  334
1298  012276  004715          INT8:   JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1299  012300  000340                  340
1300  012302  004715          INT9:   JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1301  012304  000344                  344
1302  012306  004715          INT10:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1303  012310  000350                  350
1304  012312  004715          INT11:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1305  012314  000354                  354
1306  012316  004715          INT12:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1307  012320  000360                  360
1308  012322  004715          INT13:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1309  012324  000364                  364
1310  012326  004715          INT14:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1311  012330  000370                  370
1312  012332  004715          INT15:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1313  012334  000374                  374
1314  012336  004715          INT16:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1315  012340  000400                  400
1316  012342  004715          INT17:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1317  012344  000404                  404
1318  012346  004715          INT18:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1319  012350  000410                  410
1320  012352  004715          INT19:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1321  012354  000414                  414
1322  012356  004715          INT20:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1323  012360  000420                  420
1324  012362  004715          INT21:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1325  012364  000424                  424
1326  012366  004715          INT22:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1327  012370  000430                  430
1328  012372  004715          INT23:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1329  012374  000434                  434
1330  012376  004715          INT24:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1331  012400  000440                  440
1332  012402  004715          INT25:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1333  012404  000444                  444
1334  012406  004715          INT26:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1335  012410  000450                  450
1336  012412  004715          INT27:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1337  012414  000454                  454
1338  012416  004715          INT28:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1339  012420  000460                  460
1340  012422  004715          INT29:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1341  012424  000464                  464
1342  012426  004715          INT30:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1343  012430  000470                  470
1344  012432  004715          INT31:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1345  012434  000474                  474
1346  012436  004715          INT32:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1347  012440  000500                  500
1348  012442  004715          INT33:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1349  012444  000504                  504
1350  012446  004715          INT34:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1351  012450  000510                  510
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1352  012452  004715          INT35:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1353  012454  000514                  514
1354  012456  004715          INT36:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1355  012460  000520                  520
1356  012462  004715          INT37:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1357  012464  000524                  524
1358  012466  004715          INT38:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1359  012470  000530                  530
1360  012472  004715          INT39:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1361  012474  000534                  534
1362  012476  004715          INT40:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1363  012500  000540                  540
1364  012502  004715          INT41:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1365  012504  000544                  544
1366  012506  004715          INT42:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1367  012510  000550                  550
1368  012512  004715          INT43:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1369  012514  000554                  554
1370  012516  004715          INT44:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1371  012520  000560                  560
1372  012522  004715          INT45:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1373  012524  000564                  564
1374  012526  004715          INT46:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1375  012530  000570                  570
1376  012532  004715          INT47:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1377  012534  000574                  574
1378  012536  004715          INT48:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1379  012540  000600                  600
1380  012542  004715          INT49:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1381  012544  000604                  604
1382  012546  004715          INT50:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1383  012550  000610                  610
1384  012552  004715          INT51:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1385  012554  000614                  614
1386  012556  004715          INT52:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1387  012560  000620                  620
1388  012562  004715          INT53:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1389  012564  000624                  624
1390  012566  004715          INT54:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1391  012570  000630                  630
1392  012572  004715          INT55:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1393  012574  000634                  634
1394  012576  004715          INT56:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1395  012600  000640                  640
1396  012602  004715          INT57:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1397  012604  000644                  644
1398  012606  004715          INT58:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1399  012610  000650                  650
1400  012612  004715          INT59:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1401  012614  000654                  654
1402  012616  004715          INT60:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1403  012620  000660                  660
1404  012622  004715          INT61:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1405  012624  000664                  664
1406  012626  004715          INT62:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
1407  012630  000670                  670
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 1408  012632  004715                  INT63:  JSR     PC,(R5) ;VECTOR UNIQUENESS TEST, INT. SERV RTN  ;;GPA
 1409  012634  000674                          674
 1410
 1411                                  .SBTTL  PATTERNS FOR REGISTER R/W
 1412                                  ;
 1413                                  ;PATTERNS USED FOR LOADING/READING REGISTERS
 1414                                  ;ISR    INTERRUPT SERVICE REGISTER
 1415                                  ;IRR    INTERRUPT REQUEST REGISTER
 1416                                  ;IMR    INTERRUPT MASK    REGISTER
 1417                                  ;
 1418  012636     001     376           BGCHP3: .BYTE   1,376
 1419  012640     002     375                   .BYTE   2,375
 1420  012642     004     373                   .BYTE   4,373
 1421  012644     010     367                   .BYTE   10,367
 1422  012646     020     357                   .BYTE   20,357
 1423  012650     040     337                   .BYTE   40,337
 1424  012652     100     277                   .BYTE   100,277
 1425  012654     200     177                   .BYTE   200,177
 1426  012656  000000                  EDCHP3: 000000
 1427
 1428
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```
                                .SBTTL  SYSMAC ROUTINES

                        .SBTTL  TYPE ROUTINE

                        ;;*****************************************************************
                        ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
                        ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
                        ;*NOTE1:         $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
                        ;*NOTE2:         $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
                        ;*NOTE3:         $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
                        ;*
                        ;*CALL:
                        ;*1) USING A TRAP INSTRUCTION
                        ;*       TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
                        ;*OR
                        ;*       TYPE
                        ;*       MESADR
                        ;*

012660  105737  002157  $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
012664  100002          1$:     BPL     1$              ;;BR IF YES
012666  000000                  HALT                    ;;HALT HERE IF NO TERMINAL
012670  000430                  BR      3$              ;;LEAVE
012672  010046                  MOV     R0,-(SP)        ;;SAVE R0
012674  017600  000002          MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
012700  122737  000001  002210  CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
012706  001011                  BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
012710  132737  000100  002211  BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
012716  001405                  BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
012720  010037  012730          MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
012724  004737  013222          JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
012730  000000          61$:    .WORD   0               ;;MESSAGE ADDRESS
012732  132737  000040  002211  62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
012740  001003                  BNE     60$             ;;YES,SKIP TYPE OUT
012742  112046          2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
012744  001005                  BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
012746  005726                  TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
012750  012600          60$:    MOV     (SP)+,R0        ;;RESTORE R0
012752  062716  000002  3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
012756  000002                  RTI                     ;;RETURN
012760  122716  000011  4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
012764  001430                  BEQ     8$
012766  122716  000200          CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
012772  001006                  BNE     5$
012774  005726                  TST     (SP)+           ;;POP  <CR><LF> EQUIV
012776  104401                  TYPE                    ;;TYPE A CR AND LF
013000  002165                  $CRLF
013002  105037  013210          CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
013006  000755                  BR      2$              ;;GET NEXT CHARACTER
013010  004737  013072  5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
013014  123726  002156  6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
013020  001350                  BNE     2$              ;;IF NO GO GET NEXT CHAR.
013022  013746  002154          MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
                                                        ;;AND THE NULL CHAR.
013026  105366  000001  7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
013032  002770                  BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
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(1)  013034  004737  013072            JSR     PC,$TYPEC       ;;GO TYPE A NULL
(1)  013040  105337  013210            DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
(1)  013044  000770                    BR      7$              ;;LOOP
(1)
(1)                                ;HORIZONTAL TAB PROCESSOR
(1)
(1)  013046  112716  000040       8$:  MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
(1)  013052  004737  013072       9$:  JSR     PC,$TYPEC       ;;TYPE A SPACE
(1)  013056  132737  000007  013210    BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
(1)  013064  001372                    BNE     9$              ;;TAB STOP
(1)  013066  005726                    TST     (SP)+           ;;POP SPACE OFF STACK
(1)  013070  000724                    BR      2$              ;;GET NEXT CHARACTER
(1)  013072                        $TYPEC:
(1)  013072  105777  167046            TSTB    @$TKS           ;;CHAR IN KYBD BUFFER?          ;MJD001
(1)  013076  100022                    BPL     10$             ;;BR IF NOT                     ;MJD001
(1)  013100  017746  167042            MOV     @$TKB,-(SP)     ;;GET CHAR                      ;MJD001
(1)  013104  042716  177600            BIC     #177600,(SP)    ;;STRIP EXTRANEOUS BITS         ;MJD001
(1)  013110  122716  000023            CMPB    #$XOFF,(SP)     ;;WAS CHAR XOFF                 ;MJD001
(1)  013114  001012                    BNE     102$            ;;BR IF NOT                     ;MJD001
(1)  013116                        101$:                                                       ;MJD001
(1)  013116  105777  167022            TSTB    @$TKS           ;;WAIT FOR CHAR                 ;MJD001
(1)  013122  100375                    BPL     101$                                            ;MJD001
(1)  013124  117716  167016            MOVB    @$TKB,(SP)      ;;GET CHAR                      ;MJD001
(1)  013130  042716  177600            BIC     #177600,(SP)    ;;STRIP IT                      ;MJD001
(1)  013134  122716  000021            CMPB    #$XON,(SP)      ;;WAS IT XON?                   ;MJD001
(1)  013140  001366                    BNE     101$            ;;BR IF NOT                     ;MJD001
(1)  013142                        102$:                                                       ;MJD001
(1)  013142  005726                    TST     (SP)+           ;;FIX STACK                     ;MJD001
(1)  013144                        10$:                                                        ;MJD001
(1)  013144  105777  167000            TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
(1)  013150  100375                    BPL     10$                                             ;MJD001
(1)  013152  116677  000002  166772    MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
(1)  013160  122766  000015  000002    CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
(1)  013166  001003                    BNE     1$              ;;BRANCH IF NO
(1)  013170  105037  013210            CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
(1)  013174  000406                    BR      $TYPEX          ;;EXIT
(1)  013176  122766  000012  000002  1$:  CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
(1)  013204  001402                    BEQ     $TYPEX          ;;BRANCH IF YES
(1)  013206  105227                    INCB    (PC)+           ;;COUNT THE CHARACTER
(1)  013210  000000            $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
(1)  013212  000207            $TYPEX: RTS     PC
(1)
1433                               .SBTTL  APT COMMUNICATIONS ROUTINE
(1)
(2)                                ;;**************************************************************************
(1)  013214  112737  000001  013460  $ATY1:  MOVB    #1,$FFLG        ;;TO REPORT FATAL ERROR
(1)  013222  112737  000001  013456  $ATY3:  MOVB    #1,$MFLG        ;;TO TYPE A MESSAGE
(1)  013230  000403                    BR      $ATYC
(1)  013232  112737  000001  013460  $ATY4:  MOVB    #1,$FFLG        ;;TO ONLY REPORT FATAL ERROR
(1)  013240                        $ATYC:
(3)  013240  010046                    MOV     R0,-(SP)        ;;PUSH R0 ON STACK
(3)  013242  010146                    MOV     R1,-(SP)        ;;PUSH R1 ON STACK
(1)  013244  105737  013456            TSTB    $MFLG           ;;SHOULD TYPE A MESSAGE?
(1)  013250  001450                    BEQ     5$              ;;IF NOT:  BR
(1)  013252  122737  000001  002210    CMPB    #APTENV,$ENV    ;;OPERATING UNDER APT?
(1)  013260  001031                    BNE     3$              ;;IF NOT:  BR
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(1)  013262  132737  000100  002211          BITB    #APTSPOOL,$ENVM ;;SHOULD SPOOL MESSAGES?
(1)  013270  001425                          BEQ     3$              ;;IF NOT:  BR
(1)  013272  017600  000004                  MOV     @4(SP),R0       ;;GET MESSAGE ADDR.
(1)  013276  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
(1)  013304  005737  002170          1$:     TST     $MSGTYPE        ;;SEE IF DONE W/ LAST XMISSION?
(1)  013310  001375                          BNE     1$              ;;IF NOT:  WAIT
(1)  013312  010037  002204                  MOV     R0,$MSGAD       ;;PUT ADDR IN MAILBOX
(1)  013316  105720                  2$:     TSTB    (R0)+           ;;FIND END OF MESSAGE
(1)  013320  001376                          BNE     2$
(1)  013322  163700  002204                  SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
(1)  013326  006200                          ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
(1)  013330  010037  002206                  MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
(1)  013334  012737  000004  002170          MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
(1)  013342  000413                          BR      5$
(1)  013344  017637  000004  013370  3$:     MOV     @4(SP),4$       ;;PUT MSG ADDR IN JSR LINKAGE
(1)  013352  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
(3)  013360  013746  177776                  MOV     177776,-(SP)    ;;PUSH 177776 ON STACK
(1)  013364  004737  012660                  JSR     PC,$TYPE        ;;CALL TYPE MACRO
(1)  013370  000000                  4$:     .WORD   0
(1)  013372                          5$:
(1)  013372  105737  013460          10$:    TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
(1)  013376  001416                          BEQ     12$             ;;IF NOT:  BR
(1)  013400  005737  002210                  TST     $ENV            ;;RUNNING UNDER APT?
(1)  013404  001413                          BEQ     12$             ;;IF NOT:  BR
(1)  013406  005737  002170          11$:    TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
(1)  013412  001375                          BNE     11$             ;;IF NOT:  WAIT
(1)  013414  017637  000004  002172          MOV     @4(SP),$FATAL   ;;GET ERROR #
(1)  013422  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
(1)  013430  005237  002170                  INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
(1)  013434  105037  013460          12$:    CLRB    $FFLG           ;;CLEAR FATAL FLAG
(1)  013440  105037  013457                  CLRB    $LFLG           ;;CLEAR LOG FLAG
(1)  013444  105037  013456                  CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
(3)  013450  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
(3)  013452  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
(1)  013454  000207                          RTS     PC              ;;RETURN
(1)  013456     000          $MFLG:  .BYTE   0               ;;MESSG. FLAG
(1)  013457     000          $LFLG:  .BYTE   0               ;;LOG FLAG
(1)  013460     000          $FFLG:  .BYTE   0               ;;FATAL FLAG
(1)          013462                  .EVEN
(1)          000200          APTSIZE=200
(1)          000001          APTENV=001
(1)          000100          APTSPOOL=100
(1)          000040          APTCSUP=040
1434                         .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
(1)
(2)                          ;;******************************************************************
(1)                          ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
(1)                          ;*OCTAL (ASCII) NUMBER AND TYPE IT.
(1)                          ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
(1)                          ;*CALL:
(1)                          ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
(1)                          ;*      TYPOS                   ;;CALL FOR TYPEOUT
(1)                          ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
(1)                          ;*      .BYTE   M               ;;M=1 OR 0
(1)                          ;*                                      ;;1=TYPE LEADING ZEROS
(1)                          ;*                                      ;;0=SUPPRESS LEADING ZEROS
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```
(1)                                     ;*
(1)                                     ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
(1)                                     ;*$TYPOS OR $TYPOC
(1)                                     ;*CALL:
(1)                                     ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
(1)                                     ;*      TYPON                   ;;CALL FOR TYPEOUT
(1)                                     ;*
(1)                                     ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
(1)                                     ;*CALL:
(1)                                     ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
(1)                                     ;*      TYPOC                   ;;CALL FOR TYPEOUT
(1)
(1)  013462  017646  000000          $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
(1)  013466  116637  000001  013705          MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
(1)  013474  112637  013707                  MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
(1)  013500  062716  000002                  ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
(1)  013504  000406                          BR      $TYPON
(1)  013506  112737  000001  013705  $TYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
(1)  013514  112737  000006  013707          MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
(1)  013522  112737  000005  013704  $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
(1)  013530  010346                          MOV     R3,-(SP)        ;;SAVE R3
(1)  013532  010446                          MOV     R4,-(SP)        ;;SAVE R4
(1)  013534  010546                          MOV     R5,-(SP)        ;;SAVE R5
(1)  013536  113704  013707                  MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
(1)  013542  005404                          NEG     R4
(1)  013544  062704  000006                  ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
(1)  013550  110437  013706                  MOVB    R4,$OMODE       ;;SAVE IT FOR USE
(1)  013554  113704  013705                  MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
(1)  013560  016605  000012                  MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
(1)  013564  005003                          CLR     R3              ;;CLEAR THE OUTPUT WORD
(1)  013566  006105                  1$:     ROL     R5              ;;ROTATE MSB INTO "C"
(1)  013570  000404                          BR      3$              ;;GO DO MSB
(1)  013572  006105                  2$:     ROL     R5              ;;FORM THIS DIGIT
(1)  013574  006105                          ROL     R5
(1)  013576  006105                          ROL     R5
(1)  013600  010503                          MOV     R5,R3
(1)  013602  006103                  3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
(1)  013604  105337  013706                  DECB    $OMODE          ;;TYPE THIS DIGIT?
(1)  013610  100016                          BPL     7$              ;;BR IF NO
(1)  013612  042703  177770                  BIC     #177770,R3      ;;GET RID OF JUNK
(1)  013616  001002                          BNE     4$              ;;TEST FOR 0
(1)  013620  005704                          TST     R4              ;;SUPPRESS THIS 0?
(1)  013622  001403                          BEQ     5$              ;;BR IF YES
(1)  013624  005204                  4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
(1)  013626  052703  000060                  BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
(1)  013632  052703  000040          5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
(1)  013636  110337  013702                  MOVB    R3,8$           ;;SAVE FOR TYPING
(1)  013642  104401  013702                  TYPE    ,8$             ;;GO TYPE THIS DIGIT
(1)  013646  105337  013704  7$:     DECB    $OCNT           ;;COUNT BY 1
(1)  013652  003347                          BGT     2$              ;;BR IF MORE TO DO
(1)  013654  002402                          BLT     6$              ;;BR IF DONE
(1)  013656  005204                          INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
(1)  013660  000744                          BR      2$              ;;GO DO THE LAST DIGIT
(1)  013662  012605                  6$:     MOV     (SP)+,R5        ;;RESTORE R5
(1)  013664  012604                          MOV     (SP)+,R4        ;;RESTORE R4
(1)  013666  012603                          MOV     (SP)+,R3        ;;RESTORE R3
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  (1)  013670  016666  000002  000004          MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
  (1)  013676  012616                          MOV     (SP)+,(SP)
  (1)  013700  000002                          RTI                     ;;RETURN
  (1)  013702     000                8$:       .BYTE   0               ;;STORAGE FOR ASCII DIGIT
  (1)  013703     000                          .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
  (1)  013704     000                $OCNT:    .BYTE   0               ;;OCTAL DIGIT COUNTER
  (1)  013705     000                $OFILL:   .BYTE   0               ;;ZERO FILL SWITCH
  (1)  013706  000000                $OMODE:   .WORD   0               ;;NUMBER OF DIGITS TO TYPE
 1435                                .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
  (1)
  (2)                                ;;**********************************************************************
  (1)                                ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
  (1)                                ;*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
  (1)                                ;*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
  (1)                                ;*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
  (1)                                ;*REPLACED WITH SPACES.
  (1)                                ;*CALL:
  (1)                                ;*      MOV     NUM,-(SP)       ;;PUT THE BINARY NUMBER ON THE STACK
  (1)                                ;*      TYPDS                   ;;GO TO THE ROUTINE
  (1)
  (1)  013710                        $TYPDS:
  (3)  013710  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
  (3)  013712  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
  (3)  013714  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
  (3)  013716  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
  (3)  013720  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
  (1)  013722  012746  020200                  MOV     #20200,-(SP)    ;;SET BLANK SWITCH AND SIGN
  (1)  013726  016605  000020                  MOV     20(SP),R5       ;;GET THE INPUT NUMBER
  (1)  013732  100004                          BPL     1$              ;;BR IF INPUT IS POS.
  (1)  013734  005405                          NEG     R5              ;;MAKE THE BINARY NUMBER POS.
  (1)  013736  112766  000055  000001          MOVB    #'-,1(SP)       ;;MAKE THE ASCII NUMBER NEG.
  (1)  013744  005000                1$:       CLR     R0              ;;ZERO THE CONSTANTS INDEX
  (1)  013746  012703  014124                  MOV     #$DBLK,R3       ;;SETUP THE OUTPUT POINTER
  (1)  013752  112723  000040                  MOVB    #' ,(R3)+       ;;SET THE FIRST CHARACTER TO A BLANK
  (1)  013756  005002                2$:       CLR     R2              ;;CLEAR THE BCD NUMBER
  (1)  013760  016001  014114                  MOV     $DTBL(R0),R1    ;;GET THE CONSTANT
  (1)  013764  160105                3$:       SUB     R1,R5           ;;FORM THIS BCD DIGIT
  (1)  013766  002402                          BLT     4$              ;;BR IF DONE
  (1)  013770  005202                          INC     R2              ;;INCREASE THE BCD DIGIT BY 1
  (1)  013772  000774                          BR      3$
  (1)  013774  060105                4$:       ADD     R1,R5           ;;ADD BACK THE CONSTANT
  (1)  013776  005702                          TST     R2              ;;CHECK IF BCD DIGIT=0
  (1)  014000  001002                          BNE     5$              ;;FALL THROUGH IF 0
  (1)  014002  105716                          TSTB    (SP)            ;;STILL DOING LEADING 0'S?
  (1)  014004  100407                          BMI     7$              ;;BR IF YES
  (1)  014006  106316                5$:       ASLB    (SP)            ;;MSD?
  (1)  014010  103003                          BCC     6$              ;;BR IF NO
  (1)  014012  116663  000001  177777          MOVB    1(SP),-1(R3)    ;;YES--SET THE SIGN
  (1)  014020  052702  000060        6$:       BIS     #'0,R2          ;;MAKE THE BCD DIGIT ASCII
  (1)  014024  052702  000040        7$:       BIS     #' ,R2          ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
  (1)  014030  110223                          MOVB    R2,(R3)+        ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
  (1)  014032  005720                          TST     (R0)+           ;;JUST INCREMENTING
  (1)  014034  020027  000010                  CMP     R0,#10          ;;CHECK THE TABLE INDEX
  (1)  014040  002746                          BLT     2$              ;;GO DO THE NEXT DIGIT
  (1)  014042  003002                          BGT     8$              ;;GO TO EXIT
  (1)  014044  010502                          MOV     R5,R2           ;;GET THE LSD
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(1)  014046  000764                        @R      6$              ;;GO CHANGE TO ASCII
(1)  014050  105726                  8$:   TSTB    (SP)+           ;;WAS THE LSD THE FIRST NON-ZERO?
(1)  014052  100003                        BPL     9$              ;;BR IF NO
(1)  014054  116663  177777  177776        MOVB    -1(SP),-2(R3)   ;;YES--SET THE SIGN FOR TYPING
(1)  014062  105013                  9$:   CLRB    (R3)            ;;SET THE TERMINATOR
(3)  014064  012605                        MOV     (SP)+,R5        ;;POP STACK INTO R5
(3)  014066  012603                        MOV     (SP)+,R3        ;;POP STACK INTO R3
(3)  014070  012602                        MOV     (SP)+,R2        ;;POP STACK INTO R2
(3)  014072  012601                        MOV     (SP)+,R1        ;;POP STACK INTO R1
(3)  014074  012600                        MOV     (SP)+,R0        ;;POP STACK INTO R0
(1)  014076  104401  014124                TYPE    ,$DBLK          ;;NOW TYPE THE NUMBER
(1)  014102  016666  000002  000004        MOV     2(SP),4(SP)     ;;ADJUST THE STACK
(1)  014110  012616                        MOV     (SP)+,(SP)
(1)  014112  000002                        RTI                     ;;RETURN TO USER
(1)  014114  023420                  $DTBL: 10000.
(1)  014116  001750                        1000.
(1)  014120  000144                        100.
(1)  014122  000012                        10.
(1)  014124  000004                  $DBLK: .BLKW   4
1436                                 .SBTTL  ERROR HANDLER ROUTINE
(1)
(2)                                  ;;**********************************************************************
(1)                                  ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
(1)                                  ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
(1)                                  ;*AND GO TO SWRCK ON ERROR
(1)                                  ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
(1)                                  ;*SW15=1        HALT ON ERROR
(1)                                  ;*SW13=1        INHIBIT ERROR TYPEOUTS
(1)                                  ;*SW09=1        LOOP ON ERROR
(1)                                  ;*CALL
(1)                                  ;*      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER
(1)
(1)  014134                          $ERROR:
(1)  014134  104407                        CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
(2)  014136  104407                        CKSWR           ;GO LOOK FOR SWR CHANGE
(1)  014140  105237  002103          7$:   INCB    $ERFLG          ;;SET THE ERROR FLAG
(1)  014144  001775                        BEQ     7$              ;;DON'T LET THE FLAG GO TO ZERO
(1)  014146  013777  002102  165766        MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
(1)  014154  005237  002112                INC     $ERTTL          ;;INC THE ERROR COUNT
(1)  014160  011637  002116                MOV     (SP),$ERRPC     ;;GET ADDRESS OF ERROR INSTRUCTION
(1)  014164  162737  000002  002116        SUB     #2,$ERRPC
(1)  014172  117737  165720  002114        MOVB    @$ERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
(1)  014200  032777  020000  165732        BIT     #BIT13,@SWR     ;;SKIP TYPEOUT IF SET
(1)  014206  001004                        BNE     20$             ;;SKIP TYPEOUTS
(1)  014210  004737  014310                JSR     PC,SWRCK        ;;GO TO USER ERROR ROUTINE
(1)  014214  104401  002165                TYPE    ,$CRLF
(1)  014220                          20$:
(1)  014220  122737  000001  002210        CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
(1)  014226  001007                        BNE     2$              ;;NO,SKIP APT ERROR REPORT
(1)  014230  113737  002114  014242        MOVB    $ITEMB,21$      ;;SET ITEM NUMBER AS ERROR NUMBER
(1)  014236  004737  013232                JSR     PC,$ATY4        ;;REPORT FATAL ERROR TO APT
(1)  014242     000                  21$:  .BYTE   0
(1)  014243     000                        .BYTE   0
(1)  014244  000777                  22$:  BR      22$             ;;APT ERROR LOOP
(1)  014246  005777  165666          2$:   TST     @SWR            ;;HALT ON ERROR
(1)  014252  100002                        BPL     3$              ;;SKIP IF CONTINUE
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  (1)  014254  000000                        HALT                    ;;HALT ON ERROR!
  (1)  014256  104407                        CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
  (1)  014260  032777  001000  165652  3$:   BIT     #BIT09,@SWR     ;;LOOP ON ERROR SWITCH SET?
  (1)  014266  001402                        BEQ     4$              ;;BR IF NO
  (1)  014270  013716  002110                MOV     $LPERR,(SP)     ;;FUDGE RETURN FOR LOOPING
  (1)  014274  005737  002162          4$:   TST     $ESCAPE         ;;CHECK FOR AN ESCAPE ADDRESS
  (1)  014300  001402                        BEQ     5$              ;;BR IF NONE
  (1)  014302  013716  002162                MOV     $ESCAPE,(SP)    ;;FUDGE RETURN ADDRESS FOR ESCAPE
  (1)  014306                          5$:
  (1)  014306  000002                        RTI                     ;;RETURN
 1437                                ;;*****************************************************************
 1438                                ;GO TYPE ERROR
 1439                                ;GO UPDATE SOFTWARE SWR IF 'CNTRL/G'
 1440                                ;;*****************************************************************
 1441  014310  113737  002102  002432 $SWRCK: MOVB    $TSTNM,TSTNUM   ;SET UP TEST # ON ER
 1442  014316  004737  014326             JSR     PC,$ERRTYP      ;GO TYPE ERROR
 1443  014322  104407                     CKSWR                   ;GO LOOK FOR SWR CHANGE
 1444  014324  000207                     RTS     PC              ;RETURN TO ERROR HANDLER
 1445                                .SBTTL  ERROR MESSAGE TYPEOUT ROUTINE
  (1)                                
  (2)                                ;;*****************************************************************
  (1)                                ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
  (1)                                ;*ERROR IS TO BE REPORTED. IT THEN OBTAINS, FROM THE "ERROR TABLE" ($ERRTB),
  (1)                                ;*AND REPORTS THE APPROPRIATE INFORMATION CONCERNING THE ERROR.
  (1)                                
  (1)  014326                        $ERRTYP:
  (1)  014326  104401  002165                TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
  (1)  014332  010046                        MOV     R0,-(SP)        ;;SAVE R0
  (1)  014334  005000                        CLR     R0              ;;PICKUP THE ITEM INDEX
  (1)  014336  153700  002114                BISB    @#$ITEMB,R0
  (1)  014342  001004                        BNE     1$              ;;IF ITEM NUMBER IS ZERO, JUST
  (1)                                                                ;;TYPE THE PC OF THE ERROR
  (2)  014344  013746  002116                MOV     $ERRPC,-(SP)    ;;SAVE $ERRPC FOR TYPEOUT
  (2)                                                                ;;ERROR ADDRESS
  (2)  014350  104402                        TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
  (1)  014352  000426                        BR      6$              ;;GET OUT
  (1)  014354  005300                1$:     DEC     R0              ;;ADJUST THE INDEX SO THAT IT WILL
  (1)  014356  006300                        ASL     R0              ;;       WORK FOR THE ERROR TABLE
  (1)  014360  006300                        ASL     R0
  (1)  014362  006300                        ASL     R0
  (1)  014364  062700  002252                ADD     #$ERRTB,R0      ;;FORM TABLE POINTER
  (1)  014370  012037  014400                MOV     (R0)+,2$        ;;PICKUP "ERROR MESSAGE" POINTER
  (1)  014374  001404                        BEQ     3$              ;;SKIP TYPEOUT IF NO POINTER
  (1)  014376  104401                        TYPE                    ;;TYPE THE "ERROR MESSAGE"
  (1)  014400  000000                2$:     .WORD   0               ;;"ERROR MESSAGE" POINTER GOES HERE
  (1)  014402  104401  002165                TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
  (1)  014406  012037  014416          3$:   MOV     (R0)+,4$        ;;PICKUP "DATA HEADER" POINTER
  (1)  014412  001404                        BEQ     5$              ;;SKIP TYPEOUT IF 0
  (1)  014414  104401                        TYPE                    ;;TYPE THE "DATA HEADER"
  (1)  014416  000000                4$:     .WORD   0               ;;"DATA HEADER" POINTER GOES HERE
  (1)  014420  104401  002165                TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
  (1)  014424  011000                5$:     MOV     (R0),R0         ;;PICKUP "DATA TABLE" POINTER
  (1)  014426  001004                        BNE     7$              ;;GO TYPE THE DATA
  (1)  014430  012600                6$:     MOV     (SP)+,R0        ;;RESTORE R0
  (1)  014432  104401  002165                TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
  (1)  014436  000207                        RTS     PC              ;;RETURN
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(1)  014440                          7$:
(2)  014440  013046                          MOV     @(R0)+,-(SP)    ;;SAVE @(R0)+ FOR TYPEOUT
(2)  014442  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
(1)  014444  005710                          TST     (R0)            ;;IS THERE ANOTHER NUMBER?
(1)  014446  001770                          BEQ     6$              ;;BR IF NO
(1)  014450  104401  014456                  TYPE    ,8$             ;;TYPE TWO(2) SPACES
(1)  014454  000771                          BR      7$              ;;LOOP
(1)  014456  020040      000        8$:      .ASCIZ  /  /            ;;TWO(2) SPACES
(1)          014462                          .EVEN
1446                                 .SBTTL  SCOPE HANDLER ROUTINE
(1)
(2)                                  ;;**************************************************************************
(1)                                  ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
(1)                                  ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
(1)                                  ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
(1)                                  ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
(1)                                  ;*SW14=1        LOOP ON TEST
(1)                                  ;*SW11=1        INHIBIT ITERATIONS
(1)                                  ;*SW09=1        LOOP ON ERROR
(1)                                  ;*SW08=1        LOOP ON TEST IN SWR<7:0>
(1)                                  ;*CALL
(1)                                  ;*      SCOPE           ;;SCOPE=IGT
(1)
(1)  014462                          $SCOPE:
(1)  014462  104407                          CKSWR                   ;;TEST  FOR CHANGE IN SOFT-SWR
(1)  014464  032777  040000  165446  1$:      BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
(1)  014472  001114                          BNE     $OVER           ;;YES IF SW14=1
(1)                                  ;#####START OF CODE FOR THE XOR TESTER#####
(1)  014474  000416                  $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
(1)                                                                  ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
(1)  014476  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
(1)  014502  012737  014522  000004          MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
(1)  014510  005737  177060                  TST     @#177060        ;;TIME OUT ON XOR?
(1)  014514  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
(1)  014520  000463                          BR      $SVLAD          ;;GO TO THE NEXT TEST
(1)  014522  022626                  5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
(1)  014524  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
(1)  014530  000423                          BR      7$              ;;LOOP ON THE PRESENT TEST
(1)  014532                          6$:;#####END OF CODE FOR THE XOR TESTER#####
(1)  014532  032777  000400  165400          BIT     #BIT08,@SWR     ;;LOOP ON SPEC. TEST?
(1)  014540  001404                          BEQ     2$              ;;BR IF NO
(1)  014542  127737  165372  002102          CMPB    @SWR,$TSTNM     ;;ON THE RIGHT TEST?    SWR<7:0>
(1)  014550  001465                          BEQ     $OVER           ;;BR IF YES
(1)  014552  105737  002103          2$:     TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
(1)  014556  001421                          BEQ     3$              ;;BR IF NO
(1)  014560  123737  002115  002103          CMPB    $ERMAX,$ERFLG   ;;MAX. ERRORS FOR THIS TEST OCCURRED?
(1)  014566  101015                          BHI     3$              ;;BR IF NO
(1)  014570  032777  001000  165342          BIT     #BIT09,@SWR     ;;LOOP ON ERROR?
(1)  014576  001404                          BEQ     4$              ;;BR IF NO
(1)  014600  013737  002110  002106  7$:      MOV     $LPERR,$LPADR   ;;SET LOOP ADDRESS TO LAST SCOPE
(1)  014606  000446                          BR      $OVER
(1)  014610  105037  002103          4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
(1)  014614  005037  002160                  CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
(1)  014620  000415                          BR      1$              ;;ESCAPE TO THE NEXT TEST
(1)  014622  032777  004000  165310  3$:     BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
(1)  014630  001011                          BNE     1$              ;;BR IF YES
```

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(1)  014632  005737  002176              TST     $PASS           ;;IF FIRST PASS OF PROGRAM
(1)  014636  001406                      BEQ     1$              ;;     INHIBIT ITERATIONS
(1)  014640  005237  002104              INC     $ICNT           ;;INCREMENT ITERATION COUNT
(1)  014644  023737  002160  002104      CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
(1)  014652  002024                      BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
(1)  014654  012737  000001  002104  1$: MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
(1)  014662  013737  014740  002160      MOV     $MXCNT,$TIMES   ;;SET NUMBER OF ITERATIONS TO DO
(1)  014670  105237  002102          $SVLAD: INCB    $TSTNM      ;;COUNT TEST NUMBERS
(1)  014674  113737  002102  002174      MOVB    $TSTNM,$TESTN   ;;SET TEST NUMBER IN APT MAILBOX
(1)  014702  011637  002106              MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
(1)  014706  011637  002110              MOV     (SP),$LPERR     ;;SAVE ERROR LOOP ADDRESS
(1)  014712  005037  002162              CLR     $ESCAPE         ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
(1)  014716  112737  000001  002115      MOVB    #1,$ERMAX       ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
(1)  014724  013777  002102  165210  $OVER: MOV   $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
(1)  014732  013716  002106              MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
(1)  014736  000002                      RTI                     ;;FIXES PS
(1)  014740  000001                  $MXCNT: 1.                  ;;MAX. NUMBER OF ITERATIONS
1447                                  .SBTTL  TTY INPUT ROUTINE
(1)
(2)                                   ;;**************************************************************************
(1)                                   .ENABL  LSB
(1)
(2)                                   ;;**************************************************************************
(1)                                   ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
(1)                                   ;*ROUTINE IS ENTERED FROM THE TRAP HANDLER, AND WILL
(1)                                   ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP CALL
(1)                                   ;*WHEN OPERATING IN TTY FLAG MODE.
(1)  014742  022737  000176  002140  $CKSWR: CMP     #$SWREG,SWR     ;;IS THE SOFT-SWR SELECTED?
(1)  014750  001074                      BNE     15$             ;;BRANCH IF NO
(1)  014752  105777  165166              TSTB    @$TKS           ;;CHAR THERE?
(1)  014756  100071                      BPL     15$             ;;IF NO, DON'T WAIT AROUND
(1)  014760  117746  165162              MOVB    @$TKB,-(SP)     ;;SAVE THE CHAR
(1)  014764  042716  177600              BIC     #^C177,(SP)     ;;STRIP-OFF THE ASCII
(1)  014770  022726  000007              CMP     #7,(SP)+        ;;IS IT A CONTROL G?
(1)  014774  001062                      BNE     15$             ;;NO, RETURN TO USER
(1)  014776  123727  002134  000001      CMPB    $AUTOB,#1       ;;ARE WE RUNNING IN AUTO-MODE?
(1)  015004  001456                      BEQ     15$             ;;BRANCH IF YES
(1)
(1)  015006  104401  015477              TYPE    ,$CNTLG         ;;ECHO THE CONTROL-G (^G)
(1)  015012  104401  015504          $GTSWR: TYPE    ,$MSWR      ;;TYPE CURRENT CONTENTS
(2)  015016  013746  000176              MOV     $WREG,-(SP)     ;;SAVE SWREG FOR TYPEOUT
(2)  015022  104402                      TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
(1)  015024  104401  015515              TYPE    ,$MNEW          ;;PROMPT FOR NEW SWR
(1)  015030  005046                  19$: CLR     -(SP)           ;;CLEAR COUNTER
(1)  015032  005046                      CLR     -(SP)           ;;THE NEW SWR
(1)  015034  105777  165104          7$: TSTB    @$TKS           ;;CHAR THERE?
(1)  015040  100375                      BPL     7$              ;;IF NOT TRY AGAIN
(1)
(1)  015042  117746  165100              MOVB    @$TKB,-(SP)     ;;PICK UP CHAR
(1)  015046  042716  177600              BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
(1)
(1)
(1)
(1)  015052  021627  000025          9$: CMP     (SP),#25        ;;IS IT A CONTROL-U?
(1)  015056  001005                      BNE     10$             ;;BRANCH IF NOT
(1)  015060  104401  015472              TYPE    ,$CNTLU         ;;YES, ECHO CONTROL-U (^U)
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(1)  015064  062706  000006          20$:   ADD     #6,SP           ;;IGNORE PREVIOUS INPUT
(1)  015070  000757                        BR      19$             ;;LET'S TRY IT AGAIN
(1)
(1)
(1)  015072  021627  000015          10$:   CMP     (SP),#15        ;;IS IT A <CR>?
(1)  015076  001022                        BNE     16$             ;;BRANCH IF NO
(1)  015100  005766  000004                TST     4(SP)           ;;YES, IS IT THE FIRST CHAR?
(1)  015104  001403                        BEQ     11$             ;;BRANCH IF YES
(1)  015106  016677  000002  165024        MOV     2(SP),@SWR      ;;SAVE NEW SWR
(1)  015114  062706  000006          11$:   ADD     #6,SP           ;;CLEAR UP STACK
(1)  015120  104401  002165          14$:   TYPE    ,$CRLF          ;;ECHO <CR> AND <LF>
(1)  015124  123727  002135  000001        CMPB    $INTAG,#1       ;;RE-ENABLE TTY KBD INTERRUPTS?
(1)  015132  001003                        BNE     15$             ;;BRANCH IF NOT
(1)  015134  012777  000100  165002        MOV     #100,@$TKS      ;;RE-ENABLE TTY KBD INTERRUPTS
(1)  015142  000002                  15$:   RTI                     ;;RETURN
(1)  015144  004737  013072          16$:   JSR     PC,$TYPEC       ;;ECHO CHAR
(1)  015150  021627  000060                CMP     (SP),#60        ;;CHAR < 0?
(1)  015154  002420                        BLT     18$             ;;BRANCH IF YES
(1)  015156  021627  000067                CMP     (SP),#67        ;;CHAR > 7?
(1)  015162  003015                        BGT     18$             ;;BRANCH IF YES
(1)  015164  042726  000060                BIC     #60,(SP)+       ;;STRIP-OFF ASCII
(1)  015170  005766  000002                TST     2(SP)           ;;IS THIS THE FIRST CHAR
(1)  015174  001403                        BEQ     17$             ;;BRANCH IF YES
(1)  015176  006316                        ASL     (SP)            ;;NO, SHIFT PRESENT
(1)  015200  006316                        ASL     (SP)            ;;   CHAR OVER TO MAKE
(1)  015202  006316                        ASL     (SP)            ;;   ROOM FOR NEW ONE.
(1)  015204  005266  000002          17$:   INC     2(SP)           ;;KEEP COUNT OF CHAR
(1)  015210  056616  177776                BIS     -2(SP),(SP)     ;;SET IN NEW CHAR
(1)  015214  000707                        BR      7$              ;;GET THE NEXT ONE
(1)  015216  104401  002164          18$:   TYPE    ,$QUES          ;;TYPE ?<CR><LF>
(1)  015222  000720                        BR      20$             ;;SIMULATE CONTROL-U
(1)                                 .DSABL  LSB
(1)
(1)
(2)                                 ;;**************************************************************
(1)                                 ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
(1)                                 ;*CALL:
(1)                                 ;*      RDCHR                   ;;INPUT A SINGLE CHARACTER FROM THE TTY
(1)                                 ;*      RETURN HERE             ;;CHARACTER IS ON THE STACK
(1)                                 ;*                              ;;WITH PARITY BIT STRIPPED OFF
(1)                                 ;
(1)
(1)  015224  011646                $RDCHR: MOV     (SP),-(SP)      ;;PUSH DOWN THE PC
(1)  015226  016666  000004  000002        MOV     4(SP),2(SP)     ;;SAVE THE PS
(1)  015234  105777  164704          1$:   TSTB    @$TKS           ;;WAIT FOR
(1)  015240  100375                        BPL     1$              ;;A CHARACTER
(1)  015242  117766  164700  000004        MOVB    @$TKB,4(SP)     ;;READ THE TTY
(1)  015250  042766  177600  000004        BIC     #^C<177>,4(SP)  ;;GET RID OF JUNK IF ANY
(1)  015256  026627  000004  000023        CMP     4(SP),#23       ;;IS IT A CONTROL-S?
(1)  015264  001013                        BNE     3$              ;;BRANCH IF NO
(1)  015266  105777  164652          2$:   TSTB    @$TKS           ;;WAIT FOR A CHARACTER
(1)  015272  100375                        BPL     2$              ;;LOOP UNTIL ITS THERE
(1)  015274  117746  164646                MOVB    @$TKB,-(SP)     ;;GET CHARACTER
(1)  015300  042716  177600                BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
(1)  015304  022627  000021                CMP     (SP)+,#21       ;;IS IT A CONTROL-Q?
(1)  015310  001366                        BNE     2$              ;;IF NOT DISCARD IT
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(1)  015312  000750                          BR      1$                ;;YES, RESUME
(1)  015314  026627  000004  000021  3$:     CMP     4(SP),#$XON       ;;IS IT A RANDOM XON?                    ;RAN001
(1)  015322  001744                          BEQ     1$                ;;BRANCH IF YES                          ;RAN001
(1)  015324  026627  000004  000140          CMP     4(SP),#140        ;;IS IT UPPER CASE?
(1)  015332  002407                          BLT     4$                ;;BRANCH IF YES
(1)  015334  026627  000004  000175          CMP     4(SP),#175        ;;IS IT A SPECIAL CHAR?
(1)  015342  003003                          BGT     4$                ;;BRANCH IF YES
(1)  015344  042766  000040  000004          BIC     #40,4(SP)         ;;MAKE IT UPPER CASE
(1)  015352  000002                  4$:     RTI                       ;;GO BACK TO USER
(2)                                         ;;*****************************************************************
(1)                                         ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
(1)                                         ;*CALL:
(1)                                         ;*      RDLIN                     ;;INPUT A STRING FROM THE TTY
(1)                                         ;*      RETURN HERE               ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
(1)                                         ;*                                ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
(1)
(1)  015354  010346                  $RDLIN: MOV     R3,-(SP)          ;;SAVE R3
(1)  015356  012703  015462          1$:     MOV     #$TTYIN,R3        ;;GET ADDRESS
(1)  015362  022703  015472          2$:     CMP     #$TTYIN+80.,R3    ;;BUFFER FULL?
(1)  015366  101405                          BLOS    4$                ;;BR IF YES
(1)  015370  104410                          RDCHR                     ;;GO READ ONE CHARACTER FROM THE TTY
(1)  015372  112613                          MOVB    (SP)+,(R3)        ;;GET CHARACTER
(1)  015374  122713  000177          10$:    CMPB    #177,(R3)         ;;IS IT A RUBOUT
(1)  015400  001003                          BNE     3$                ;;SKIP IF NOT
(1)  015402  104401  002164          4$:     TYPE    ,$QUES            ;;TYPE A '?'
(1)  015406  000763                          BR      1$                ;;CLEAR THE BUFFER AND LOOP
(1)  015410  111337  015460          3$:     MOVB    (R3),9$           ;;ECHO THE CHARACTER
(1)  015414  104401  015460                  TYPE    ,9$
(1)  015420  122723  000015                  CMPB    #15,(R3)+         ;;CHECK FOR RETURN
(1)  015424  001356                          BNE     2$                ;;LOOP IF NOT RETURN
(1)  015426  105063  177777                  CLRB    -1(R3)            ;;CLEAR RETURN (THE 15)
(1)  015432  104401  002166                  TYPE    ,$LF              ;;TYPE A LINE FEED
(1)  015436  012603                          MOV     (SP)+,R3          ;;RESTORE R3
(1)  015440  011646                          MOV     (SP),-(SP)        ;;ADJUST THE STACK AND PUT ADDRESS OF THE
(1)  015442  016666  000004  000002          MOV     4(SP),2(SP)       ;;      FIRST ASCII CHARACTER ON IT
(1)  015450  012766  015462  000004          MOV     #$TTYIN,4(SP)
(1)  015456  000002                          RTI                       ;;RETURN
(1)  015460     000                  9$:     .BYTE   0                 ;;STORAGE FOR ASCII CHAR. TO TYPE
(1)  015461     000                          .BYTE   0                 ;;TERMINATOR
(1)  015462  000010                  $TTYIN: .BLKB   8.                ;;RESERVE 8 BYTES FOR TTY INPUT
(1)  015472  052536  005015     000  $CNTLU: .ASCIZ  /^U/<15><12>      ;;CONTROL "U"
(1)  015477     136  006507  000012  $CNTLG: .ASCIZ  /^G/<15><12>      ;;CONTROL "G"
(1)  015504  005015  053523  020122  $MSWR:  .ASCIZ  <15><12>/SWR = /
(1)  015515     040  047040  053505  $MNEW:  .ASCIZ  /  NEW = /
1448                                        .SBTTL  POWER DOWN AND UP ROUTINES
(1)
(2)                                         ;;*****************************************************************
(1)                                         ;POWER DOWN ROUTINE
(1)  015526  012737  015672  000024  $PWRDN: MOV     #$ILLUP,@#PWRVEC  ;;SET FOR FAST UP
(1)  015534  012737  000340  000026          MOV     #340,@#PWRVEC+2   ;;PRIO:7
(3)  015542  010046                          MOV     R0,-(SP)          ;;PUSH R0 ON STACK
(3)  015544  010146                          MOV     R1,-(SP)          ;;PUSH R1 ON STACK
(3)  015546  010246                          MOV     R2,-(SP)          ;;PUSH R2 ON STACK
(3)  015550  010346                          MOV     R3,-(SP)          ;;PUSH R3 ON STACK
(3)  015552  010446                          MOV     R4,-(SP)          ;;PUSH R4 ON STACK
(3)  015554  010546                          MOV     R5,-(SP)          ;;PUSH R5 ON STACK
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(3)  015556  017746  164356                 MOV     @SWR,-(SP)        ;;PUSH @SWR ON STACK
(1)  015562  010637  015676                 MOV     SP,$SAVR6         ;;SAVE SP
(1)  015566  012737  015600  000024         MOV     #$PWRUP,@#PWRVEC  ;;SET UP VECTOR
(1)  015574  000000                         HALT
(1)  015576  000776                         BR      .-2               ;;HANG UP
(1)
(2)                                 ;;**************************************************************
(1)                                 ;POWER UP ROUTINE
(1)  015600  012737  015672  000024 $PWRUP: MOV     #$ILLUP,@#PWRVEC  ;;SET FOR FAST DOWN
(1)  015606  013706  015676                 MOV     $SAVR6,SP         ;;GET SP
(1)  015612  005037  015676                 CLR     $SAVR6            ;;WAIT LOOP FOR THE TTY
(1)  015616  005237  015676         1$:     INC     $SAVR6            ;;WAIT FOR THE INC
(1)  015622  001375                         BNE     1$                ;;OF  WORD
(3)  015624  012677  164310                 MOV     (SP)+,@SWR        ;;POP STACK INTO @SWR
(3)  015630  012605                         MOV     (SP)+,R5          ;;POP STACK INTO R5
(3)  015632  012604                         MOV     (SP)+,R4          ;;POP STACK INTO R4
(3)  015634  012603                         MOV     (SP)+,R3          ;;POP STACK INTO R3
(3)  015636  012602                         MOV     (SP)+,R2          ;;POP STACK INTO R2
(3)  015640  012601                         MOV     (SP)+,R1          ;;POP STACK INTO R1
(3)  015642  012600                         MOV     (SP)+,R0          ;;POP STACK INTO R0
(1)  015644  012737  015526  000024         MOV     #$PWRDN,@#PWRVEC  ;;SET UP THE POWER DOWN VECTOR
(1)  015652  012737  000340  000026         MOV     #340,@#PWRVEC+2   ;;PRIO:7
(1)  015660  104401                         TYPE                      ;;REPORT THE POWER FAILURE
(1)  015662  015700                 $PWRMG: .WORD   PWRMSG             ;;POWER FAIL MESSAGE POINTER
(1)  015664  012716                         MOV     (PC)+,(SP)        ;;RESTART AT START1
(1)  015666  003134                 $PWRAD: .WORD   START1            ;;RESTART ADDRESS
(1)  015670  000002                         RTI
(1)  015672  000000                 $ILLUP: HALT                      ;;THE POWER UP SEQUENCE WAS STARTED
(1)  015674  000776                         BR      .-2               ;; BEFORE THE POWER DOWN WAS COMPLETE
(1)  015676  000000                 $SAVR6: 0                         ;;PUT THE SP HERE
1449 015700  005015  042522  052123 PWRMSG: .ASCIZ  <15><12>/RESTARTED FROM PWR FAIL/
1450                                .EVEN
1451                                .SBTTL  TRAP DECODER
(1)
(2)                                 ;;**************************************************************
(1)                                 ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
(1)                                 ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
(1)                                 ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
(1)                                 ;*GO TO THAT ROUTINE.
(1)
(1)  015732  010046                 $TRAP:  MOV     R0,-(SP)          ;;SAVE R0
(1)  015734  016600  000002                 MOV     2(SP),R0          ;;GET TRAP ADDRESS
(1)  015740  005740                         TST     -(R0)             ;;BACKUP BY 2
(1)  015742  111000                         MOVB    (R0),R0           ;;GET RIGHT BYTE OF TRAP
(1)  015744  006300                         ASL     R0                ;;POSITION FOR INDEXING
(1)  015746  016000  015766                 MOV     $TRPAD(R0),R0     ;;INDEX TO TABLE
(1)  015752  000200                         RTS     R0                ;;GO TO ROUTINE
(1)
(1)
(1)                                 ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
(1)
(1)  015754  011646                 $TRAP2: MOV     (SP),-(SP)        ;;MOVE THE PC DOWN
(1)  015756  016666  000004  000002         MOV     4(SP),2(SP)       ;;MOVE THE PSW DOWN
(1)  015764  000002                         RTI                       ;;RESTORE THE PSW
(1)
(3)                                 .SBTTL  TRAP TABLE
```

```
(3)
(3)                                     ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
(3)                                     ;*BY THE "TRAP" INSTRUCTION.
(3)
(3)                                     ;       ROUTINE
(3)                                     ;       -------
(3)  015766  015754                     $TRPAD: .WORD   $TRAP2
(3)  015770  012660                             $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
(3)  015772  013506                             $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
(3)  015774  013462                             $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
(3)  015776  013522                             $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
(3)  016000  013710                             $TYPDS  ;;CALL=TYPDS    TRAP+5(104405)  TYPE DECIMAL NUMBER (WITH SIGN)
(1)
(3)  016002  015012                             $GTSWR  ;;CALL=GTSWR    TRAP+6(104406)  GET SOFT-SWR SETTING
(1)
(3)  016004  014742                             $CKSWR  ;;CALL=CKSWR    TRAP+7(104407)  TEST FOR CHANGE IN SOFT-SWR
(3)  016006  015224                             $RDCHR  ;;CALL=RDCHR    TRAP+10(104410) TTY TYPEIN CHARACTER ROUTINE
(3)  016010  015354                             $RDLIN  ;;CALL=RDLIN    TRAP+11(104411) TTY TYPEIN STRING ROUTINE
1452
1453                                    .SBTTL  ASCII MESSAGES
1454                                    ;;GPA TITLED:   .ASCIZ  <15><12>/CVDRDA  DRV11J DIAG TEST PART 2/<15><12>
1455  016012  041600  042126  042122    TITLED: .ASCIZ  <200>/CVDRDB  DRV11J DIAG TEST PART 2/<200>     ;;GPA
1456                                    ;;GPA TLCABL:   .ASCIZ  <15><12>/DRV11J CABLE REQ'D/<15><12>
1457  016054  042200  053122  030461    TLCABL: .ASCIZ  <200>/DRV11J CABLE REQ'D/<200>                  ;;GPA
1458
1459  016101     122  043505  052040    EM1:    .ASCIZ  /REG TIMEOUT ER/
1460  016120  042522  020107  042522    EM2:    .ASCIZ  'REG READ/WRITE ER'
1461  016142  051111  020122  042522    EM3:    .ASCIZ  /IRR REG ER/
1462  016155     101  051103  051040    EM4:    .ASCIZ  /ACR REG ER/
1463  016170  046511  020122  042522    EM5:    .ASCIZ  /IMR REG ER/
1464  016203     111  051123  051040    EM6:    .ASCIZ  /ISR REG ER/
1465  016216  046111  042514  040507    EM7:    .ASCIZ  /ILLEGAL VECTOR MEM ADDR ER/
1466  016251     103  044510  020120    EM10:   .ASCIZ  /CHIP STAT ER/
1467                                    ;;GPA EM11:     .ASCIZ  /ILLEGAL INTERRUPT RECEIVED/
1468  016266  046111  042514  040507    EM11:   .ASCIZ  /ILLEGAL INTERRUPT REC'D/                       ;;GPA
1469  016316  047111  042524  051122    EM12:   .ASCIZ  /INTERRUPT TEST ERROR/
1470                                    ;;GPA EM13:     .ASCIZ  /MULTIPLE INTERRUPTS RECEIVED/
1471  016343     115  046125  044524    EM13:   .ASCIZ  /MULTIPLE INTERRUPTS REC'D/                     ;;GPA
1472  016375     126  041505  020124    EM14:   .ASCIZ  /VECT ADDR MEM ER/
1473  016416  051105  050122  020103    DH1:    .ASCIZ  /ERRPC   TSTNUM  BUSADR  EXPCT   RCVD/
1474  016463     105  051122  041520    DH2:    .ASCIZ  /ERRPC   TSTNUM  BUSADR  VAM     ADDR    EXPCT   RCVD/
1475  016550  051105  050122  020103    DH3:    .ASCIZ  /ERRPC   TSTNUM  BUSADR  VAM     ADDR/
1476  016615     105  051122  041520    DH4:    .ASCIZ  /ERRPC  TSTNUM  TESTPC  BUSADR  VAM     ADDR/
1477
1478                                            .EVEN
1479  016666  002116  002432  002122    DT1:    $ERRPC,TSTNUM,$BDADR,$GDDAT,$BDDAT,0
1480  016702  002116  002432  002122    DT2:    $ERRPC,TSTNUM,$BDADR,VECVAL,VECLOC,$GDDAT,$BDDAT,0
1481  016722  002116  002432  002122    DT3:    $ERRPC,TSTNUM,$BDADR,VECVAL,VECLOC,0
1482  016736  002116  002432  002120    DT4:    $ERRPC,TSTNUM,$GDADR,$BDADR,VECVAL,VECLOC,0
1483
1484
1485                                    ;;**************************************************************************
1486                                    ;'DBUF' IS THE STORAGE AREA FOR SYSMAC LOCATIONS 0-202
1487                                    ;PRESERVED IN ORDER TO TEST DRV11J VECTORING TO
1488                                    ;VECTOR SPACE 0-200.
1489                                    ;;**************************************************************************
```

```
1490  016754  000102                DBUF:   .BLKW   66.             ;1ST ADRS OF DATA STORAGE AREA
1491
1492                                ;;*****************************************************************
1493                                ;VECTOR BUFFER USED FOR VECTOR UNIQUENESS TEST
1494                                ;FOR 64 INTERRUPT VECTORS.
1495                                ;;*****************************************************************
1496  017160  000100                VBUF:   .BLKW   64.
1497  017360                        ENDBUF:
```

```
                                .SBTTL  FALCON (KXT-11) UPGRADE ROUTINES.                       ;:GPA
                                ;
                                ; THE FOLLOWING ROUTINES HAVE BEEN ADDED TO ALLOW DIAGNOSTIC(S)
                                ; TO RUN ON A FALCON (KXT-11) 3ASED SYSTEM.
                                ; TO DETERMINE WHETHER WE'RE A FALCON OR NOT, WE'LL SIZE THE 1ST 3/4 OF
                                ; THE I/O PAGE (28K TO 31K).  FALCON HAS 2KW LOCAL RAM AT 28K(+4) TO 30K
                                ; AND A MACRO-ODT AT 30K TO 31K.  CONSEQUENTLY, ALL I/O DEVICES MUST
                                ; BE PLACED BETWEEN 174000 AND 177776.  ADDITIONALLY, WE'LL STRAP THE
                                ; EMT AND TRAP SERVICE LEVEL TO PRI6, AND SET THE HALT VECTOR SO THAT
                                ; WE CAN STOP THE SUCKER !!
                                ;
                                ; TO MINIMIZE THE IMPACT OF THESE CHANGES ON FINAL PROGRAM SIZE, THE
                                ; BULK OF THIS CODE IS PLACED IN THE FLOATING VECTOR SPACE (400-776).
                                ; IF THE CPU AT HAND IS A FALCON (KXT11), IT STAYS THERE (NO HARM DONE).
                                ; OTHERWISE, THE AREA IS RESTORED TO ITS ORIGINAL "TRAP-CATCHER" STATE.
                                ;
017360  005227  177777          FALCON: INC     #-1             ; ONCE-ONLY !!!                 ;:GPA
017364  001002                          BNE     1$                                              ;:GPA
017366  004737  000400                  CALL    KXTCHK          ; EXECUTE FALCON CHECK          ;:GPA
017372  005727                  1$:     TST     (PC)+           ; TEST FALCON FLAG...           ;:GPA
017374  000000                  KXTFLAG: 0                      ;...NZ = FALCON...              ;:GPA
017376  000207                          RETURN                  ;...AND RETURN TO CALLER...     ;:GPA
                                
        017400                          $SVPC= .                                                ;:GPA
        000400                          .= 400                  ; RESTORE FROM 374:376 A1 END   ;:GPA
000400  005037  017374          KXTCHK: CLR     KXTFLAG         ; ASSUME NOT FALCON.            ;:GPA
000404  013746  000004                  MOV     @#4,-(SP)       ; SAVE ERROR VECTOR.            ;:GPA
000410  012737  000504  000004          MOV     #2$,@#4         ; SET A TRAP CATCHER.           ;:GPA
000416  012700  160010                  MOV     #160010,R0      ; FALCON RAM STARTS AT 28K+4.   ;:GPA
000422  005720                  1$:     TST     (R0)+           ;                               ;:GPA
000424  000240                          240                                                     ;:GPA
000426  020027  174000                  CMP     R0,#174000      ; SIZE TO 31K.                  ;:GPA
000432  103773                          BLO     1$                                              ;:GPA
000434  010037  017374                  MOV     R0,KXTFLAG      ; MUST BE FALCON, SET THE FLAG  ;:GPA
000440  012700  000040                  MOV     #40,R0          ; GET PRI1 BIT...               ;:GPA
000444  040037  000006                  BIC     R0,@#6          ;...AND LOWER BUS-ERROR...      ;:GPA
000450  040037  000016                  BIC     R0,@#16         ;...BPT...                      ;:GPA
000454  040037  000022                  BIC     R0,@#22         ;...IOT...                      ;:GPA
000460  040037  000032                  BIC     R0,@#32         ;...EMT...                      ;:GPA
000464  040037  000036                  BIC     R0,@#36         ;...AND TRAP SERVICE TO PRI6    ;:GPA
000470  012737  170000  000140          MOV     #170000,@#140   ; ENABLE "BREAK" HALT.          ;:GPA
000476  012637  000004                  MOV     (SP)+,@#4       ; RESTORE ERROR VECTOR...       ;:GPA
000502  000207                          RETURN                  ;...AND RETURN                  ;:GPA
                                
000504  012716  000512          2$:     MOV     #3$,(SP)        ; TRAP -- NOT A FALCON...       ;:GPA
000510  000002                          RTI                     ;...CONTINUE.                   ;:GPA
000512  012637  000004          3$:     MOV     (SP)+,@#4       ; RESET ERROR VECTOR            ;:GPA
000516  012700  000402                  MOV     #402,R0         ; SET-UP TO RESTORE FLOATING... ;:GPA
000522  013701  000376                  MOV     @#376,R1        ;...VECTORS (400 - 776).        ;:GPA
000526  010602                          MOV     SP,R2           ; SAVE STACK POINTER IN R2      ;:GPA
000530  012704  000570                  MOV     #6$,R4
000534  014446                  4$:     MOV     -(R4),-(SP)     ; PUSH THE RESTORE CODE...      ;:GPA
000536  020427  000546                  CMP     R4,#5$          ;...ONTO THE STACK.             ;:GPA
000542  101374                          BHI     4$                                              ;:GPA
000544  010607                          MOV     SP,PC           ; AND EXECUTE IT.               ;:GPA
```

```
                                        ;
                                        ; THIS CODE IS RELOCATED TO AND EXECUTED IN THE STACK AREA.
                                        ;
000546  010060  177776        5$:     MOV     R0,-2(R0)       ; RESTORE .+2...                ;;GPA
000552  010110                        MOV     R1,(R0)         ;...HALT (OR IOT).              ;;GPA
000554  022020                        CMP     (R0)+,(R0)+                                     ;;GPA
000556  020027  000776                CMP     R0,#776                                         ;;GPA
000562  101771                        BLOS    5$              ; LOOP 'TIL DONE                ;;GPA
000564  010206                        MOV     R2,SP           ; THEN RESTORE SP...            ;;GPA
000566  000207                        RETURN                  ;...AND RETURN TO CALLER        ;;GPA
000570                          6$:                                                           ;;GPA
                                        ;
                                        ; IF FALCON, THIS AREA IS FREE FOR ANY PROGRAM UNIQUE
                                        ; CHANGES OR DATA STRUCTURES.
                                        ; IF USED, YOU'D BETTER PROTECT IT !!!
                                        ;
        000104          $FREE=  <1000-.>/2              ; FREE WORDS LEFT.              ;;GPA

        017400                  .=$SVPC                                                 ;;GPA
        017400          LASTAD= .                                                       ;;GPA
        000001                  .END
```

```
ABASE = 164160
ACDW1 = 000000
ACDW2 = 000000
ACPUOP= 000000
ACRLOC  002450
ADDW0 = 000000
ADDW1 = 000000
ADDW10= 000000
ADDW11= 000000
ADDW12= 000000
ADDW13= 000000
ADDW14= 000000
ADDW15= 000000
ADDW2 = 000000
ADDW3 = 000000
ADDW4 = 000000
ADDW5 = 000000
ADDW6 = 000000
ADDW7 = 000000
ADDW8 = 000000
ADDW9 = 000000
ADEVCT= 000000
ADEVM = 000001
AENV  = 000000
AENVM = 000000
AFATAL= 000000
AMADR1= 000000
AMADR2= 000000
AMADR3= 000000
AMADR4= 000000
AMAMS1= 000000
AMAMS2= 000000
AMAMS3= 000000
AMAMS4= 000000
AMSGAD= 000000
AMSGLG= 000000
AMSGTY= 000000
AMTYP1= 000000
AMTYP2= 000000
AMTYP3= 000000
AMTYP4= 000000
APASS = 000000
APRIOR= 000000
APTCSU= 000040
APTENV= 000001
APTSIZ= 000200
APTSPO= 000100
APTVEC  011614
APT200  012066
ASWREG= 000000
ATESTN= 000000
AUNIT = 000000
AUSWR = 000000

AVECT1= 000000
AVECT2= 000000
BDSAV   002464
BGCHP3  012636
BIT0  = 000001
BIT00 = 000001
BIT01 = 000002
BIT02 = 000004
BIT03 = 000010
BIT04 = 000020
BIT05 = 000040
BIT06 = 000100
BIT07 = 000200
BIT08 = 000400
BIT09 = 001000
BIT1  = 000002
BIT10 = 002000
BIT11 = 004000
BIT12 = 010000
BIT13 = 020000
BIT14 = 040000
BIT15 = 100000
BIT2  = 000004
BIT3  = 000010
BIT4  = 000020
BIT5  = 000040
BIT6  = 000100
BIT7  = 000200
BIT8  = 000400
BIT9  = 001000
BPTVEC= 000014
BYCNT   002470
BYNUM   002472
CAT200  012024
CHPISR= 000140
CIMR  = 000040
CIRMR = 000020
CIRR  = 000100
CISR  = 000160
CKSWR = 104407
CLRBF   011334
CLRCSR  011014
CLRIRR  011074
CR    = 000015
CRLF  = 000200
CSIMR = 000050
CSIRMR= 000030
CSIRR = 000110
CSISR = 000170
DBUF    016754
DDISP = 177570
DH1     016416
DH2     016463

DH3     016550
DH4     016615
DIR   = 000400
DISPLA  002142
DISPRE  000174
DMAP    002434
DRCSA   002412
DRCSB   002416
DRCSC   002422
DRCSD   002426
DRDBA   002414
DRDBB   002420
DRDBC   002424
DRDBD   002430
DSWR  = 177570
DT1     016666
DT2     016702
DT3     016722
DT4     016736
EDCHP3  012656
EMTVEC= 000030
EM1     016101
EM10    016251
EM11    016266
EM12    016316
EM13    016343
EM14    016375
EM2     016120
EM3     016142
EM4     016155
EM5     016170
EM6     016203
EM7     016216
ENDBUF  017360
ENDTRP  011636
END200  012106
ERRVEC= 000004
FALCON  017360
FRMBUF  011374
GRPCNT  002462
GTSWR = 104406
HT    = 000011
IE    = 001000
IMRLOC  002442
INTBY4  011700
INTFLG  002436
INTSR1  011644
INTSR3  012124
INT0    012236
INT1    012242
INT10   012306
INT11   012312
INT12   012316

INT13   012322
INT14   012326
INT15   012332
INT16   012336
INT17   012342
INT18   012346
INT19   012352
INT2    012246
INT20   012356
INT21   012362
INT22   012366
INT23   012372
INT24   012376
INT25   012402
INT26   012406
INT27   012412
INT28   012416
INT29   012422
INT3    012252
INT30   012426
INT31   012432
INT32   012436
INT33   012442
INT34   012446
INT35   012452
INT36   012456
INT37   012462
INT38   012466
INT39   012472
INT4    012256
INT40   012476
INT41   012502
INT42   012506
INT43   012512
INT44   012516
INT45   012522
INT46   012526
INT47   012532
INT48   012536
INT49   012542
INT5    012262
INT50   012546
INT51   012552
INT52   012556
INT53   012562
INT54   012566
INT55   012572
INT56   012576
INT57   012602
INT58   012606
INT59   012612
INT6    012266
INT60   012616

INT61   012622
INT62   012626
INT63   012632
INT7    012272
INT8    012276
INT9    012302
IOTVEC= 000020
IRRLOC  002446
ISRLOC  002444
KXTCHK  000400
KXTFLA  017374
LASTAD= 017400
LF    = 000012
LMD04 = 000200
LMD57 = 000240
LVLCNT  002466
LVLSAV  002474
MACR  = 000254
MIMR  = 000244
MIRR  = 000250
MISR  = 000240
NEXPAS  003200
NEXPA1  003204
NEXPA2  003250
NXDEV   010632
NXDE.1  010636
PACR  = 000300
PIMR    000260
PIRQ  = 177772
PIRQVE= 000240
PR0   = 000000
PR1   = 000040
PR2   = 000100
PR3   = 000140
PR4   = 000200
PR5   = 000240
PR6   = 000300
PR7   = 000340
PS    = 177776
PSW   = 177776
PVMA  = 000340
PWRMSG  015700
PWRVEC= 000024
RDCHR = 104410
RDLIN = 104411
RDY   = 100000
RESTRP  011432
RESVEC= 000010
RES200  011762
R6    =%000006
R7    =%000007
SETVEC  012210
SIMR  = 000060
```

```
CVDRDB DRV11J DIAG TST PRT2     MACY11 30G(1063)  10-AUG-81  11:00  PAGE 4-1
CVDRDB.P11    10-AUG-81 10:52          SYMBOL TABLE

SIRR  = 000120    TOBUF   011354    $CPUOP  002216    $LPADR  002106    $STUP = 177777
SSIMR = 000070    TPVEC = 000064    $CRLF   002105    $LPERR  002110    $SVLAD  014670
SSIRR = 000130    TRAPVE= 000034    $DBLK   014124    $MADR1  002222    $SVPC = 017400
STACK = 001100    TRPALL  011752    $DEVCT  002200    $MADR2  002226    $SWR  = 165400
START   002476    TRPCAT  011524    $DEVM   002246    $MADR3  002232    $SWREG  002212
START1  003134    TRPOUT  011734    $DOAGN  010770    $MADR4  002236    $SWRMK= 000000
STKLMT= 177774    TRP200  012170    $DTBL   014114    $MAIL   002170    $TESTN  002174
STRVEC  011300    TRTVEC= 000014    $ENDAD  010760    $MAMS1  002220    $TIMES  002160
SWR     002140    TSTNUM  002432    $ENDCT  010726    $MAMS2  002224    $TKB    002146
SWRCK   014310    TST1    003254    $ENDMG  010777    $MAMS3  002230    $TKS    002144
SWREG   000176    TST2    004122    $ENULL  010774    $MAMS4  002234    $TN   = 000007
SWRSAV  002460    TST3    004622    $ENV    002210    $MBADR  002002    $TPB    002152
SW0   = 000001    TST4    005536    $ENVM   002211    $MFLG   013456    $TPFLG  002157
SW00  = 000001    TST5    006530    $EOP    010672    $MNEW   015515    $TPS    002150
SW01  = 000002    TST6    007476    $EOPCT  010720    $MSGAD  002204    $TRAP   015732
SW02  = 000004    TYPDS = 104405    $ERFLG  002103    $MSGLG  002206    $TRAP2  015754
SW03  = 000010    TYPE  = 104401    $ERMAX  002115    $MSGTY  002170    $TRP  = 000012
SW04  = 000020    TYPOC = 104402    $ERROR  014134    $MSWR   015504    $TRPAD  015766
SW05  = 000040    TYPON = 104404    $ERRPC  002116    $MTYP1  002221    $TSTM   002004
SW06  = 000100    TYPOS = 104403    $ERRTB  002252    $MTYP2  002225    $TSTNM  002102
SW07  = 000200    VBUF    017160    $ERRTY  014326    $MTYP3  002231    $TTYIN  015462
SW08  = 000400    VECFIL  011132    $ERTTL  002112    $MTYP4  002235    $TYPDS  013710
SW09  = 001000    VECLOC  002452    $ESCAP  002162    $MXCNT  014740    $TYPE   012660
SW1   = 000002    VECPAT  002454    $ETABL  002210    $NULL   002154    $TYPEC  013072
SW10  = 002000    VECVAL  002456    $ETEND  002252    $NWTST= 000001    $TYPEX  013212
SW11  = 004000    XXDP    002440    $FATAL  002172    $OCNT   013704    $TYPOC  013206
SW12  = 010000    $APTHD  002000    $FFLG   013460    $OMODE  013706    $TYPON  013522
SW13  = 020000    $ATYC   013240    $FILLC  002156    $OVER   014724    $TYPOS  013462
SW14  = 040000    $ATY1   013214    $FILLS  002155    $PASS   002176    $UNIT   002202
SW15  = 100000    $ATY3   013222    $FREE = 000104    $PASTM  002006    $UNITM  002010
SW2   = 000004    $ATY4   013232    $GDADR  002120    $PWRAD  015666    $USWR   002214
SW3   = 000010    $AUTOB  002134    $GDDAT  002124    $PWRDN  015526    $VECT1  002240
SW4   = 000020    $BASE   002244    $GET42  010750    $PWRMG  015662    $VECT2  002242
SW5   = 000040    $BDADR  002122    $GTSWR  015012    $PWRUP  015600    $XOFF = 000023
SW6   = 000100    $BDDAT  002126    $HD   = 000003    $QUES   002164    $XON  = 000021
SW7   = 000200    $CDW1   002250    $HIBTS  002000    $RDCHR  015224    $XTSTR  014474
SW8   = 000400    $CHARC  013210    $ICNT   002104    $RDLIN  015354    $$GET4= 000000
SW9   = 001000    $CKSWR  014742    $ILLUP  015672    $RDSZ = 000010    $OFILL  013705
TBITVE= 000014    $CMTAG  002100    $INTAG  002135    $RTNAD  010772    .       = 017400
TITLED  016012    $CM3  = 000000    $ITEMB  002114    $SAVR6  015676    .$X   = 002000
TKVEC = 000060    $CNTLG  015477    $LP     002166    $SCOPE  014462
TLCABL  016054    $CNTLU  015472    $LFLG   013457    $SETUP= 000117

. ABS.  017400      000        CON   RW    ABS   LCL   I


 ERRORS DETECTED:  0

 CVDRDB,CVDRDB=CVDRDB
 RUN-TIME: 19 7 .4 SECONDS
 RUN-TIME RATIO: 76/27=2.8
 CORE USED.  25K  (49 PAGES)
```