KD11-Z
DL11-W

DL11-W/1144 MFM SLU
CZDLDE0

AH-8529E-MC
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IDENTIFICATION

PRODUCT CODE: AC-8528E-MC

PRODUCT NAME: CZDLDE0 DL11-W/1144 MFM SLU

PRODUCT DATE: JUNE 1980

MAINTAINER: DIAGNOSTIC ENGINEERING

HISTORY SECTION

CZDLDDO WAS RELEASED OCT 79

THE FOLLOWING CHANGES WERE MADE. ALL CHANGES ARE INDICATED
BY ;** IN THE COMMENT FIELD:

1. USE THE MFPT INSTRUCTION,AND IF THE CPU IS A 11/44:

   A. DO NOT PERFORM READER ENABLE AND RECEIVER ACTIVE
      TESTS.
   B. IF ERROR FLAGS TESTS AND BREAK TESTS ARE
      ENABLED,PERFORM THESE TESTS ONLY FOR THE SLU
      AT 176500.PERFORM THESE TESTS FOR THE CONSOLE SLU
      IF BIT03 OF SWR IS ADDITIONALLY SET.
   C. WHILE IN MAINTENANCE MODE DO NOT WRITE AND READ
      A ^P OR AN ASCII 220. THIS WILL FORCE THE CONSOLE
      INTO 'CONSOLE MODE'.
   D. IN THE CLOCK REPEATABILITY TEST, ALLOW FOR A
      TOLERANCE OF 2 BETWEEN CLOCK COUNTS. THIS IS TO
      ALLOW ENOUGH TOLERANCE WHEN MOS MEMORY IS USED
      AND REFRESH CYCLES ARE OCCURING.

2. BECAUSE 11/44 SLU INTERRUPT REQUESTS ARE DEPENDANT ON A MFM CLOCK
   ENOUGH TIME MUST BE GIVEN FOR THEM TO OCCUR. THEREFORE, ALL TESTS
   ASSOCIATED WITH XMIT & RECEIVE INTERRUPTS SHOULD HAVE
   A MINIMUM OF 4 NOP'S ACTING AS WAIT FOR INTERRUPT.

3. IT WAS FOUND THAT AN ATTACHED TU58 WOULD BE ACTIVATED
   BY THE DIAGNOSTIC,AND,AS A RESULT,CHARACTERS WOULD BE
   SENT TO THE RECEIVER BUFFER.
   THIS WOULD CAUSE SOME TESTS TO FAIL. THEREFORE TO INHIBIT
   ANY COMMUNICATION TO THE TU58 FROM THE DIAGNOSTIC:

   A.ENABLE MAINTENANCE MODE IN ALL TESTS THAT WRITE TO
     THE XMITTER.
   B.IN ALL TESTS THAT WITE TO XMITTER AND BEFORE LEAVING
     TEST: DELAY ENOUGH TIME TO ALLOW ANY CHARACTERS
     THAT MIGHT BE IN THE PROCESS OF BEING XMITTED TO
     FINISH.
   C.DISABLE MAINTENANCE MODE FOR PURPOSE OF ERROP PRINTING
     ONLY TO THE SLU WHICH THE TERMINAL IS ATTACHED.

4. IT WAS FOUND THAT UPON POWERUP AND WITH THE TU58 ATTACHED,
   CHARACTERS WOULD BE SENT TO THE RECEIVER FROM THE TU58.
   SOME RECEIVER TESTS WOULD FAIL DUE TO THIS. THEREFORE,
   ON ALL TESTS THAT PERFORM RECEIVER TESTS AND FOLLOWING
   MAINTENANCE MODE BEING ENABLED,DELAY ENOUGH TIME TO ALLOW
   TO ALLOW ANY CHARACTERS THAT MIGHT BE IN THE PROCESS OF
   BEING RECEIVED TO FINISH.

5. ADD SOFTWARE THAT WILL IMPLEMENT AUTO INITIATION OF
11/44 T/A CONSOLE TEST VIA WRAP CABLE FROM TU58 TO CONSOLE
PORTS. IT IS SELECTED BY SWR BIT02 AND IS PERFORMED
ONLY AFTER ALL SLUS ARE TESTED.

CZDLDE0 - EXTENDS DIAGNOSTIC SOFTWARE VECTOR ADDRESSING
CAPABILITY TO 776 (OCTAL).

1.0 GENERAL INFORMATION

1.1 ABSTRACT

THIS DIAGNOSTIC IS A LOGIC TEST TO VERIFY THE OPERATION OF THE
THE FOLLOWING MODULES:

1. DL11-W SERIAL LINE/REAL TIME CLOCK INTERFACE
2. 11/44 MULTIFUNCTION MODULE

THE PROGRAM WILL RUN WITHOUT ANY SPECIAL TEST FIXTURES BY DEFAULT.
HOWEVER, THE FOLLOWING OPTIONAL TESTING IS PROVIDED:

1. TEST TO VERIFY XMIT AND RECEIVE OF THE UARTS WITH
   A WRAP CABLE. THE UART UNDER TEST IS LOOPED BACK ON
   ITSELF. THIS IS SELECTED VIA OPERATIONAL SWITCH SETTING
   BIT 7, AND IS APPLICABLE TO THE DL11W AND 11/44 MFM.

2. AUTOMATIC INITIATION OF THE T/A CONSOLE TEST OF THE 11/44
   MFM. THE TU58 PORTS ARE LOOPED TO THE CONSOLE PORTS
   THIS IS SELECTED VIA OPERATIONAL SWITCH SETTING BIT 2
   AND IS APPLICABLE TO 11/44 MFM ONLY.
   (SEE CKKFBA0 FOR T/A CONSOLE TEST EXPLANATION)

THIS DIAGNOSTIC OPERATES ON THE CONSOLE SERIAL LINE AND CLOCK INTERFACES
AS WELL AS UP TO FIFTEEN(15) ADDITIONAL IDENTICALLY CONFIGURED
SERIAL LINE INTERFACES. THE DEFAULT ADDRESSES ARE:

A. CONSOLE - 177560 SERIAL LINE
             177546 CLOCK

B. OTHER SERIAL LINE - 776500 FIRST SERIAL LINE ADDRESS
                              OF 15 CONSECUTIVE SERIAL
                              LINE ADDRESSES

THE PROGRAM IS DESIGNED TO RUN ON ANY PDP-11 WITH 8K OF MEMORY
. IT CAN BE RUN UNDER XXDP,APT, AND ACT MONITORS,
AND ON PROCESSORS WITH NO HARDWARE SWITCH REGISTER,
SOFTWARE SWITCH REGISTER = LOCATION 176

POWER FAILURE IS SUPPORTED FOR SYSTEMS WITH CORE MEMORY.

NOTE: THIS DIAGNOSTIC WITH THE SWR = 000020
(CLOCK TESTS ONLY) SHOULD BE USED ON SWITCHLESS CPU'S
TO TEST KW-11L LINE CLOCK MODULES.

1.2 SYSTEM REQUIREMENTS

1.2.1 EQUIPMENT

STANDARD 11 FAMILY(COMPUTER WITH A CONSOLE OUTPUT DEVICE
AND 8K OF MEMORY.

OPTIONAL:
1.LOOP CABLE FOR UART LOOP BACK ON ITSELF
2.WRAP CABLE FOR 11/44 MFM T/E TESTING
(SEE DWG. #7016942 WRAP AROUND CABLE
AND SECTION 5.0 OF THIS DOCUMENT)

1.2.2 STORAGE

THE PROGRAM USES 5K WORDS OF MEMORY

1.3 ASSUMPTIONS

A. IF THE UNIT UNDER TEST (UUT) IS THE CONSOLE , THE PROGRAM WILL ASSUME THE REAL TIME CLOCK (RTC) IS ENABLED AND WILL TEST IT UNLESS THE TESTS ARE DISABLED BY BIT6 OF THE SWR.

B. IF THE UUT IS NOT THE CONSOLE, THE RTC IS NOT TESTED FOR THAT DEVICE.

C.

FOR THE DL11-W:

THE PROGRAM WILL ASSUME THE ERROR FLAG BITS AND THE BREAK FUNCTION OF THE DL11-W ARE DISABLED AND WILL NOT TEST THESE FUNCTIONS UNLESS ENABLED BY BIT10 (FOR ERROR FLAGS) AND BIT8 (FOR BREAK) OF THE SWR. THE DEFAULT CHARACTER SIZE IS 8 BITS (SEE PARA 2.3.2).

FOR THE 11/44:

THE PROGRAM ASSUMES THAT THE ERROR FLAG BITS AND THE BREAK FUNCTION ARE DISABLED, AND WILL NOT TEST THESE FUNCTIONS HOWEVER, IF BIT 10 (FOR ERROR FLAGS) AND BIT 08 (FOR BREAK) OF SWR ARE SET, THEN ERROR FLAGS AND BREAK TESTS ARE PERFORMED FOR THE TU58 SLU ONLY. IF BIT03 OF SWR IS ALSO SET THEN THESE TESTS WILL BE ENABLED FOR THE CONSOLE.

READER ENABLE AND RECEIVER ACTIVE TESTS ARE NOT PERFORMED SINCE THE 11/44 MFM DOES NOT IMPLEMENT THESE FUNCTIONS.

2.0 OPERATING INSTRUCTIONS

2.1 LOADING PROCEDURE

USE STANDARD PROCEDURE FOR PDP-11 ABSOLUTE BINARY FORMATTED TAPES.

2.2 STARTING PROCEDURE

LOAD THE SWITCH REGISTER WITH SETTING

NOTE: IF USING A CPU WITHOUT HARDWARE SWITCH REGISTER
SOFTWARE SWITCH REGISTER LOCATION = 176.
(FOR A 11/44 CPU USE MFM CONSOLE FOR DEPOSITING
SWITCH REGISTER. TYPE ^P TO ENTER CONSOLE)

A. START AT 200.
AFTER CHECKING THE TRANSMITTER, THE PROGRAM WILL PRINT ITS IDENTIFICATION AND REPORT THE NUMBER OF DEVICES UNDER TEST (NUMBER IS OCTAL).
"END PASS" IS PRINTED AFTER A FULL PASS HAS BEEN MADE ON ALL DEVICES UNDER TEST.

B. START AT 204. ****NOTE****
THE "ECHO" TEST WILL BE EXECUTED. AN "*" IS PRINTED AT THE

```
                BEGINNING OF THE TEST. THE ECHO TEST READS A CHARACTER FROM
                THE TERMINAL,WRITES THAT CHARACTER TO THE TERMINAL AND
                REPORTS ANY ERROR FLAGS SET IN THE RECEIVER BUFFER.
                A CONTROL-C HALTS THE TEST AND PRINTS "STOP" AT THE TERMINAL
                CONTINUING RESTARTS THE ECHO TEST.

            C. START AT 210.        ****NOTE****
                THE TERMINAL OUTPUT TEST WILL BE EXECUTED. DEPRESSING ANY CHARACTER
                AT THE TERMINAL, HALTS THE TEST. CONTINUING RESTARTS THE TEST.
                THE TEST OUTPUTS 32 CHARACTERS ON A LINE AND REPEATS THE
                PATTERN EVERY THREE LINES. THE PATTERN IS AS FOLLOWS
                (OCTAL CODE 040 --> 377):

                                                        (OCTAL CODE)
                     !"#$%&'()*+,-./0123456789:;<=>?    (040 --> 077)


                     @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_    (100 --> 137)
                     'ABCDEFGHIJKLMNOPQRSTUVWXYZ         (140 --> 177) [LOWER CASE ALPHA]

                THIS BOTTOM LINE COULD BE THE FOLLOWING IF THE TERMINAL
                DOES NOT HAVE LOWER CASE:

                     @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\       [UPPER CASE ALPHA]


                                ****NOTE****

                IF THE TESTING ON TERMINIALS OTHER THAN THE CONSOLE IS DESIRED      ;;++C
                FOR TESTS B OR C,SEE SECTION 2.3.4. AND 2.3.5. OF THIS DOCUMENT.   ;;++C
```

2.3 OPERATING PROCEDURE

2.3.1 OPERATIONAL SWITCH SETTINGS

THE DIAGNOSTIC WILL CHECK FOR EXISTENCE OF SWITCH REGISTER AT 177570.
IF NO SWITCH REGISTER IS AVAILABLE THE PROGRAM WILL AUTOMATICALLY USE THE CONTENTS OF LOCATION 176 AS THE SOFTWARE SWITCH REGISTER. THE USER SHOULD SET THIS LOCATION BEFORE STARTING THE PROGRAM. IF A HARDWARE SWITCH IS AVAILABLE AND A SOFTWARE SWR(LOC. 176) IS DESIRED,LOAD ALL 1'S INTO LOCATION 177570.(ALL SWITCHES UP IF PHYSICAL SWITCHES ARE AVAILABLE)

BIT15	- HALT ON ERROR
BIT14	- SCOPE LOOP
BIT13	- INHIBIT ERROR TYPEOUT
BIT12	- UNUSED
BIT11	- UNUSED
BIT10	- ENABLE ERROR FLAGS TESTS
BIT09	- LOOP ON ERROR
BIT08	- ENABLE BREAK FUNCTION TESTS
BIT07	- ENABLE DATA TEST WITH WRAP CABLE
BIT06	- INHIBIT RTC TESTS (ALLOW ONLY SLU TESTS)
BIT05	- ALLOW MANUAL SETTING OF ''$DEVM'' (DEVICE MAP)
BIT04	- INHIBIT SLU TESTS (ALLOW ONLY LINE CLOCK TESTS)
BIT03	- FOR 11/44 MFM: ENABLE BOTH 'BREAK TESTS' AND 'ERROR FLAG TESTS' FOR THE CONSOLE SLU. (THIS BIT IS VALID ONLY IF BIT10 OR BIT08 IS SET.)
BIT02	-11/44 MFM OPTION: SELECT AUTO INITIATION OF T/A CONSOLE TEST VIA WRAP CABLE

FOR DL11-W:

IF THE SOFTWARE SWITCH REGISTER IS USED(LOC. 176) THEN BUILT INTO THE PROGRAM IS THE ABILITY TO DYNAMICALLY CHANGE THE CONTENTS OF SWREG DURING PROGRAM EXECUTION. BY STRIKING ^G (CNTL G) ON CONSOLE TTY THE OPERATOR SETS A REQUEST FLAG TO CHANGE THE CONTENTS OF SWREG, WHICH IS PROCESSED IN KEY AREAS OF THE PROGRAM CODE (IE) ERROR ROUTINES, AFTER HALTS END OF PASS, AND OTHER APPLICABLE AREAS. BECAUSE THIS DIAGNOSTIC USES THE MAINTENANCE BIT OF THE SERIAL LINE, THE CONTROL-G SHOULD BE ISSUED DURING PROGRAM TYPEOUTS AT THAT TIME THE MAINTENANCE BIT IS SURE TO BE CLEAR.

IF A CONTROL-G IS DETECTED, UPON EXECUTION THE CONTENTS OF THE SWREG ARE DUMPED IN OCTAL ON THE CONSOLE TTY AND ANY CHANGES ARE REQUESTED

```
(IE)    SWR=XXXXXX  NEW=
```

POSSIBLE RESPONSES ARE:

1.	<CR>	IF NO CHANGES ARE TO BE MADE
2.	6 DIGITS 0-7	TO REPRESENT IN OCTAL THE NEW SWITCH REGISTER VALUE ;LAST DIGIT FOLLOWED BY <CR>.
3.	^U	TO ALLOW REENTERING VALUE IF ERROR IS COMMITTED KEYING IN SWREG VALUE.

FOR 11/44 CPU:

SINCE THE 11/44 HAS A HARDWARE SWITCH REGISTER LOADED BY THE MFM CONSOLE
THEN THE DIAGNOSTIC SHOULD ALWAYS FIND EXISTENCE OF 177570.
WHEN OPERATING ON THE 11/44 CPU, DYNAMIC CHANGING OF SWREG(177570) DURING
PROGRAM EXECUTION CAN BE ACCOMPLISHED BY USING
TME MFM CONSOLE. TYPING ^P<CR> ON THE CONSOLE TTY WILL ENTER THE
CONSOLE. THIS IS CONSIDERED "CONSOLE MODE".
TO EXAMINE SWREG TYPE ' E SW<CR> ' TO THE CONSOLE PROMPT. TO LOAD THE
SWREG TYPE ' D SW DATA<CR> ' WHERE "DATA" IS AN OCTAL NUMBER.
IN ORDER FOR THE DIAGNOSTIC TO TYPE TO THE TTY IT IS NECESSARY
TO HAVE THE 11/44 MFM IN "PROGRAM I/O MODE". THIS CAN BE ACCOMPLISHED
BY TYPING ' C<CR> ' TO THE CONSOLE PROMPT. THEREFORE,WHEN CONSOLE
USE IS COMPLETED, PLACE THE MFM IN "PROGRAM I/O MODE".
BECAUSE THIS DIAGNOSTIC USES THE MAINTENANCE BIT, ^P WILL
NOT BE ACKNOWLEDGED DURING THESE TESTS.THEREFORE, ISSUE ^P
DURING PROGRAM TYPEOUTS. AT THIS TIME THE MAINTENANCE BIT
WILL BE CLEARED.

2.3.2 SETTING BITS PER CHARACTER

THIS PROGRAM DEFAULTS TO TESTING 8 BITS PER CHARACTER. IF THE SERIAL LINE IS SET FOR 5-->7 BITS PER CHARACTER, SET THE MEMORY LOCATION "$USWR" AS FOLLOWS:

CHAR. SIZE (# OF BITS)	"$USWR" CONTENTS (BINARY)	(OCTAL)
8	100000000	400
7	010000000	200
6	001000000	100
5	000100000	40

"$USWR" IS USED IN THE DATA PATH TESTS TO LIMIT THE BINARY COUNT TEST PATTERN TO THE NUMBER OF BITS SELECTED ON THE SERIAL LINE.

2.3.3 RUNNING UNDER APT

THE APT MAILBOX IS LOCATED AT LOCATION 500, TO ALLOW ADDITIONAL SERIAL LINE VECTOR ASSIGNMENTS TO THE 400 AREA OF MEMORY.

FOR DL11W:

THE DEFAULT EXECUTION TIMES PROVIDED($TSTM,$PASTM) ARE FOR EXECUTION WITH AN 11/34 PROCESSOR, CORE MEMORY , AND 110 BAUD.

FOR 11/44:

THE EXECUTION TIMES PROVIDED IN THE APT SCRIPT THAT FOLLOWS AND IN SECT. 2.4 ARE FOR EXECUTION WITH A 11/44 PROCESSOR, CACHE, 16K CORE MEMORY, AND 300 BAUD.

THE FOLLOWING IS A PROGRAM LOAD FILE USED BY APT:

1. E TABLE 'A' IS USED FOR APT DUMP MODE.
   A. TWO SLU'S ARE TESTED.($SWREG BIT05=1 AND $DEVM=3)
      A SLU AT 177560(DEFAULT CONSOLE SLU) AND AT 176500
      (BASE ADDRESS CODE).
   B. THE ERROR FLAG AND BREAK TESTS ARE SELECTED FOR THE SLU
      AT 176500(TU58 SLU IN MFG.)
      ($SWREG BIT 10 AND 8 =1)

2. E TABLE 'B' IS USED FOR APT QV AND RUN TIME MODES. IT ACCOMPLISHES WHAT E TABLE 'A' DOES, BUT ADDITIONALLY IT SUPPRESSES ALL TYPEOUTS TO THE TERMINAL($ENVM=240) AND SELECTS AUTO TESTING OF T/A CONSOLE TEST VIA WRAP CABLE($SWREG BIT02=1).

1ST PASS RUN TIME	LONGEST TEST TIME	ADDITIONAL RUN TIME
60	50	45

..... E TABLES .....

	A	B
E-MODE/S-MODE ($ENVM/$ENV)	200/000	240/001
SWITCH REGISTER 1 ($SWREG)	002440	002404
SWITCH REGISTER 2	000400	000400
CPU TYPE/OPTIONS	00/0000	00/0000
MEMORY MAP CODE 1	000/00000000	000/00000000
MEMORY MAP CODE 2	000/00000000	000/00000000
MEMORY MAP CODE 3	000/00000000	000/00000000
MEMORY MAP CODE 4	000/00000000	000/00000000
BUS PRIORITY/INTERRUPT 1	0000	0000
BUS PRIORITY/INTERRUPT 2	0000	0000
BUS ADDRESS CODE	176500	176500
DEVICE MAP CODE ($DEVM)	000003	000003
CTLR. SPECIFIC WORD 1	000000	000000
CTLR. SPECIFIC WORD 2	000000	000000

2.3.4 RUN WITH ALTERNATE CONSOLE ADDRESS

TO USE A CONSOLE ADDRESS OTHER THAN 177560, OR VECTOR OTHER THAN 60, THE OPERATOR MUST SUPPLY THE PROGRAM WITH THE CORRECT ADDRESSES BY INSERTING THEM AT THE TAG LABELED "CRCSR":

```
CRCSR:  ADDRESS OF RECEIVER RCSR
CRBUF:  ADDRESS OF RECEIVER BUFFER
CTCSR:  ADDRESS OF TRANSMITTER CSR
CTBUF:  ADDRESS OF TRANSMITTER BUFFER
CRVECT: ADDRESS OF RECEIVER VECTOR
CRPSW:  ADDRESS OF ASSOCIAED PSW
CTVECT: ADDRESS OF TRANSMITTER VECTOR
CTPSW:  ADDRESS OF ASSOCIATED PSW
```

2.3.5 TESTING ADDITIONAL SERIAL LINES

THIS PROGRAM WILL SUPPORT TESTING OF MULTIPLE SLU'S. IT REQUIRES THE ADDRESS OF THE FIRST ADDITIONAL RCSR (STORED AT "$BASE") AND ITS INTERRUPT VECTOR (STORED AT "$VECT1"); AND WILL BE ABLE TO ADDRESS ANY SLU STARTING AT THE SPECIFIED BASE ADDRESS UP TO 15 CONSECUTIVE DEVICES.

```
EXAMPLE:        $BASE:  776500
                $VECT1: 300
```

THE PROGRAM WILL BE ABLE TO TEST THE CONSOLE PLUS ANY ADDITIONAL DL11-W SLU'S WITHIN THE RANGE 776500 --> 776660

$BASE AND $VECT1 DEFAULT TO 776500 AND 300 RESPECTIVELY.

THE PROGRAM ASSOCIATES UNIT NUMBERS TO DEVICES AS FOLLOWS:
(NUMBERS IN PARENTHESIS ARE OCTAL)

```
UNIT# 0 -->  CONSOLE [ADDRESS STORED AT "CRCSR"]
UNIT# 1 -->  BASE ADDRESS STORED AT "$BASE"
             ASSOCIATED BASE VECTOR STORED AT"$VECT1"
UNIT# 2 -->  BASE ADDRESS + (10)
             BASE VECTOR + (10)
UNIT# 3 -->  BASE ADDRESS + (20)
             BASE VECTOR + (20)
UNIT# 4 -->  BASE ADDRESS + (30)
             BASE VECTOR + (30)
                 !
                 !
                 !
                 !
                 !
                 V
UNIT#15 -->  BASE ADDRESS + (160)
             BASE VECTOR + (160)
```

STARTING AT LOCATION 200 AND HAVING BIT5 OF SWR CLEAR, THE PROGRAM WILL SELF
SIZE THE NUMBER OF DEVICES (STARTING AT THE BAS ADDRESS) AND
STORE A BIT MAP AT "$DEVM" (DEVICE MAP) TO INDICATE WHICH UNIT NUMBERS
ARE PRESENT AND WILL BE TESTED:

```
-------------------------------------------------------
! UNIT ! UNIT ! ..........! UNIT ! UNIT ! CONSOLE!
!  15  !  14  ! ..........!   2  !   1  !         !
-------------------------------------------------------
```

A BIT MAP CAN BE ENTERED AT "$DEVM" PRIOR TO STARTING THE PROGRAM
SETTING BIT5 OF THE SWR INHIBITS THE SELF-SIZING AND DEVICE MAP
GENERATION,AND USES THE VALUE STORED BY THE OPERATOR.

EXAMPLE:

```
SWR   =  000040          [BINARY  0 000 000 000 100 000]
$BASE:   776500
$VECT1:  300

$DEVM:   13      [BINARY - 0 000 000 000 001 011]

THE PROGRAM WILL TEST -
        UNIT# 0 = CONSOLE
        UNIT# 1 = 776500 ; 300
        UNIT# 3 = 776520 ; 320
```

2.4 EXECUTION TIMES -

FOR DL11-W: (110 BAUD)
LONGEST SUBTEST TIME = 50 SECONDS
PASS TIME = 60 SECONDS
ADDITIONAL DEVICES = 55 SECONDS/DEVICE

FOR 11/44: (300 BAUD)
LONGEST SUBTEST TIME = 50 SECONDS
PASS TIME = 60 SECONDS
ADDITIONAL DEVICES = 55 SECONDS/DEVICE

3.0 ERROR REPORTING

IF A ROUTINE FAILS AND THE INHIBIT ERROR TYPEOUT (BIT13) OF THE SWR IS NOT SET, A PRINTOUT RESULTS IN THE FORM:

"(SOME ASCII MESSAGE)"
TEST# ERR PC RCSR [ANY APPLICABLE DAT HEADINGS]
XXXXXX XXXXXX XXXXXX [ANY APPLICABLE DATA]

NOTE: "RCSR" IS DEPENDENT ON THE FAILURE
& THEREFORE COULD BE TCSR,RBUF,TBUF,OR LKS

WHERE "XXXXXX" IS AN OCTAL NUMBER.
THIS ERROR PRINTOUT OCCURS PROVIDED THE ERROR THAT EXISTS WOULD NOT HINDER THE TYPEOUT. IN CASES WHERE IT IS NOT POSSIBLE TO PRINT AN ERROR MESSAGE (I.E. FATAL CONSOLE TRANSMITTER FAILURES), A HALT OCCURS AND THE PC CAN BE EXAMINED BY THE OPERATOR TO FIND THE ERROR INFORMATION IN THE PROGRAM LISTING.

NOTE: FOR SOFTWARE SWITCH OPERATION, THE SWITCH REGISTER CAN BE CHANGED BY TYPING A CONTROL-G AT THE CONSOLE DURING ERROR PRINTOUTS. AFTER CONTINUING FROM THE ERROR HALT THE OLD SWR CONTENTS IS DISPLAYED AND THE NEW CONTENTS CAN BE ENTERED. IF ERROR HALTS ARE DISABLED, THE CONTROL-G RESPONSE OCCURS IMMEDIATELY FOLLOWING THE TYPEOUT.

4.0 SUBROUTINE ABSTRACTS

4.1 TRAPCATCHER

THIS IS A SERIES OF INSTRUCTIONS STARTING AT LOCATION 0 DESIGNED TO
DETECT AND ISOLATE UNEXPECTED TRAPS TO THE TRAP AND INTERRUPT VECTOR
AREA OF MEMORY.

EACH VECTOR ENTRANCE ADDRESS IS LOADED WITH THE ADDRESS OF THE NEXT
LOCATION. THE NEXT LOCATION IS LOADED WITH A BREAK POINT TRAP (000003).
THUS AN ILLEGAL TRAP OR INTERRUPT CAUSES A TRAP THROUGH THE BPT VECTOR(14)
WHICH POINTS TO THE "CATCH" ROUTINE.

THE "CATCH" ROUTINE REPORTS THE PC THAT CAUSED THE ORIGINAL TRAP AND
THE LOCATION OF THE TRAP VECTOR (IF UNDER APT, AN ERROR IS INDICATED TO APT).
AFTER REPORTING THE ERROR THE PROGRAM HALTS. THE PROGRAM MUST BE RESTARTED
AT THIS POINT.

4.2 WRPSW

THIS ROUTINE IS USED TO WRITE THE PSW BY POPPING VALUES FROM THE
STACK. THIS METHOD IS USED TO BE COMPATIBLE WITH ALL 11 FAMILY
PROCESSORS.

4.3 SCOPE

THIS ROUTINE CALL IS PLACED BETWEEN EACH SUBTEST. IT RECORDS THE STARTING
ADDRESS OF EACH SUBTEST AS IT IS BEING ENTERED AND UPDATES THE
TEST NUMBER. IF A SCOPE LOOP IS REQUESTED, IT WILL JUMP TO THE START OF THE
SUBTEST AT WHICH THE SCOPE LOOP IS REQUESTED.

4.4 ERROR

THIS ROUTINE CALL IS PLACED WHEREEVER AN ERROR REPORT
IS DESIRED. THE LOWER BYTE OF THIS CALL IS USED AS THE ERROR NUMBER
AND AS A POINTER INTO THE ERROR TABLE . THIS ROUTINE REPORTS ERRORS
TO APT USING "$APTYPE" AND TYPES ERROR REPORTS TO THE CONSOLE
USING "$ERRTYPE".

4.5 $POWER

THIS ROUTINE SAVES ALL GENERAL REGISTERS DURING POWER-DOWN
AND RESTORES THEM AT POWER-UP. IF A POWER FAILURE OCCURS
"POWER" IS PRINTED AT THE CONSOLE AFTER POWER IS RESTORED.

4.6 CKSWR

THIS ROUTINE CALL IS USED TO DETECT THE RECEPTION OF A CONTROL-G
FROM THE CONSOLE. THE CALL USES "$READ" TO PERFORM THE CONTROL-G
SEQUENCE OF DISPLAYING THE CONTENTS OF THE SOFTWARE SWITCH REGISTER
AND THE ENTERING THE NEW CONTENTS FROM THE TERMINAL.

5.0 AUTOMATIC INITIATION OF 11/44 T/A CONSOLE TEST
VIA WRAP CABLE

PURPOSE: THE T/E(OR T/A) CONSOLE TEST CAN BE IMPLEMENTED
BY MANUALLY TYPING T/E(OR T/A) ON THE KEYBOARD
OF THE TERMINAL WHEN IN CONSOLE MODE. IN ORDER TO
IMPLEMENT THIS TEST IN AN AUTOMATIC WAY IN MANUFACTURING
WHILE UNDER APT, THE USE OF A WRAP CABLE FROM
THE TU58 TO THE CONSOLE CAN BE USED ALLOWING THIS
DIAGNOSTIC TO ISSUE THE 'T/A' COMMAND TO THE CONSOLE.
THE DIAGNOSTIC WILL ISSUE THE APPROPRIATE SEQUENCE
OF COMMANDS TO THE CONSOLE VIA THE WRAP CABLE WHEN
BIT02 OF SWR =1. THE DIAGNOSTIC WILL THEN MONITOR
THE EXPECTED RESPONSE FROM THE CONSOLE VIA THE WRAP
CABLE AND HALT IF THERE IS AN ERROR. THE T/A TEST
IS DONE ONLY AFTER ALL SLUS ARE TESTED. IF T/A IS SUCCESSFUL
'END PASS' IS PRINTED AND THE DIAGNOSTIC STARTS AGAIN.

FIGURE 1 SHOWS THE PROPER WRAP CABLE SETUP AND
REQUIREMENTS FOR AUTOMATICALLY INITIATING T/A FROM THE
THE DIAGNOSTIC.NOTICE THAT THIS ARRANGEMENT ALLOWS
FOR THE TERMINAL TO MONITOR ALL COMMUNICATION FROM
THE CONSOLE OUTPUT DURING EXECUTION OF THE DIAGNOSTIC
IN "WRAP MODE".

TYPEOUT EXAMPLES

1. WITH THE CONFIGURATION OF FIGURE 1 AND "WRAP MODE" SELECTED
THE PROGRAM MAY BE LOADED BY APT. IF 'E TABLE B' OF SECTION
2.3.3 WERE USED WITH THE EXCEPTION OF ALLOWING TYPEOUTS($ENVM=200)
THE FOLLOWING WOULD BE SEEN ON THE LOCAL TERMINAL:

```
CZDLDE0 DL11-W/1144 MFM SLU
02 DEVICES UNDER TEST  ^P
CONSOLE
>>>T/A

CONSOLE-TESTB
END PASS ^P
CONSOLE
>>>T/A

CONSOLE-TESTB
END PASS ^P
CONSOLE
>>>T/A

CONSOLE-TESTB
END PASS ^P   .....ETC.
```

DESCRIPTION: REFERING TO THE ABOVE PRINTOUTS:

A. THE DIAGNOSTIC IS LOADED WITH THE TITLE BEING PRINTED.
B. TWO SLU DEVICES(CONSOLE,TU58) ARE SPECIFIED
C. BOTH SLUS ARE TESTED COMPLETELY. AT THIS POINT
THE THE DIAGNOSTIC ISSUES ^P TO THE WRAP CABLE.
THE CONSOLE ENTERS CONSOLE MODE AND
THE ^P TYPED ON THE TERMINAL IS THE MFM CONSOLE ECHO.
D. THE CONSOLE PERFORMS ITS OWN SELF TEST BY TYPING
'CONSOLE' FOLLOWED BY >>>, THE CONSOLE PROMPT.
E. THE DIAGNOSTIC THEN ISSUES T/A AND THE TERMINAL
SHOWS THE CONSOLE ECHO OF THIS.
F. THE MFM THEN PERFORMS THE T/A TEST SHOWN BY THE TERMINAL
TYPING 'CONSOLE-TESTB'.THE DIAGNOSTIC LOOKS FOR THE
'B' IN THIS TYPEOUT,AND WHEN FOUND , CONSIDERS
THE TEST A SUCCESS. THE DIAGNOSTIC WILL TYPE END PASS
INDICATING A SUCCESSFUL PASS OF THE DIAGNOSTIC.
G. THE DIAGNOSTIC CONTINUES WITH FURTHER PASSES OF THE
DIAGNOSTIC.

2. IF 'E TABLE B' OF 2.3.3 WERE USED WITH TYPEOUTS SUPPRESSED ($ENVM=240) AS STATED, THEN THE FOLLOWING TYPEOUTS WOULD BE NOTICED:

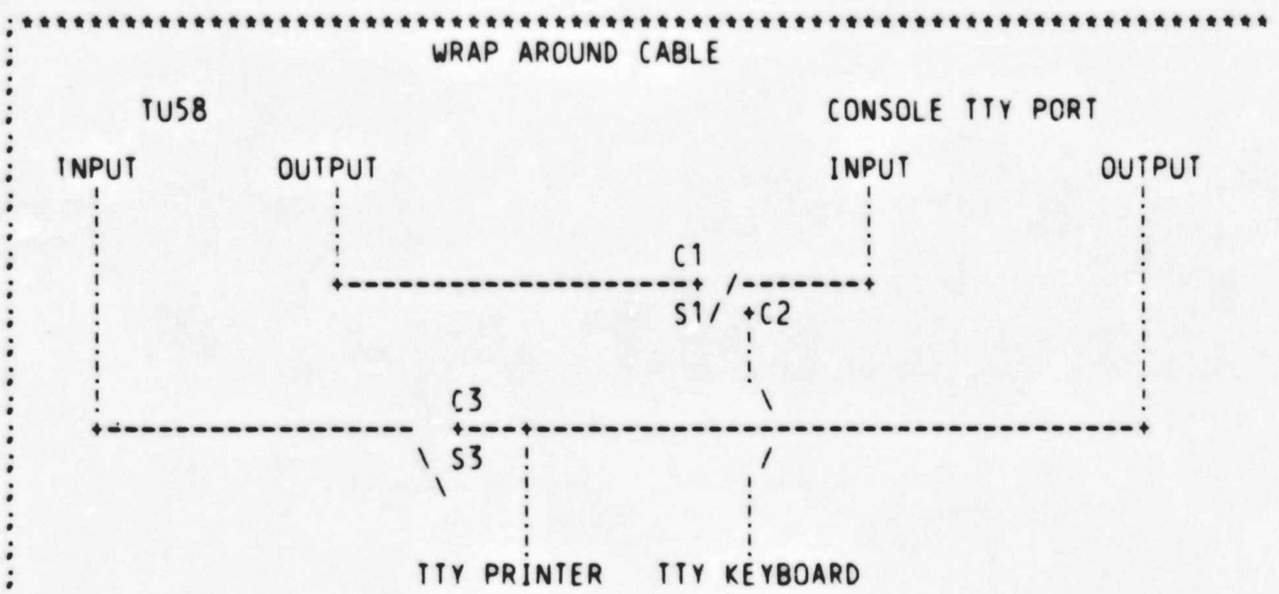
```
^P
CONSOLE
>>>T/A

CONSOLE-TESTB^P
CONSOLE
>>>T/A

CONSOLE-TESTB^P
CONSOLE
>>>T/A

CONSOLE-TESTB^P .....ETC.
```

FIG. 1- WRAPAROUND CONFIGURATION - AUTO INITIATION OF
11/44 T/A CONSOLE TEST



; WHEN THE SWITCH IS IN "NORMAL" MODE CONTACTS ARE:
; S1-C2 IS CLOSED
; S1-C1 IS OPEN
; S3-C3 IS OPEN
; THIS ALLOWS THE USE OF THE TERMINAL WITH THE CONSOLE
;
; WHEN THE SWTICH IS IN "WRAP" MODE CONTACTS ARE
; S1-C1 CLOSED
; S1-C2 OPEN
; S2-C3 CLOSED
; THIS ALLOWS THE TU58 PORT TO COMMUNICATE WITH THE CONSOLE PORT AND FOR
; THE TTY TO MONITOR THE CONSOLE OUTPUT
;
; THIS IS ALL DONE WITH A DPDT SWITCH
;
; BEFORE THIS TEST CAN BE RUN THE CONSOLE UART,TTY,TU58 MUST BE AT
; THE SAME BAUD RATE. THE CONSOLE AND TU58 UART,AND THE TTY SHOULD BE
;SET UP WITH THE SAME STOP BIT SETTING,
; WITH PARITY INHIBITED AND WITH A WORD LENGTH OF 7 OR 8 BITS
;
; FOR MORE INFORMATION SEE THE MFM PRINTS AND THE WRAP AROUND
; CABLE DRAWING NUMBER: 7016942
;

%

```
                        .SBTTL  BASIC DEFINITIONS

                        ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
001100                  STACK=  1100
104000                          ERROR=EMT
000004                          SCOPE=IOT

                        ;*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
177776                          PSW=PS
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
000006                  SP=     %6              ;;STACK POINTER
000007                  PC=     %7              ;;PROGRAM COUNTER

                        ;*PRIORITY LEVEL DEFINITIONS
000000                  PR0=    0               ;;PRIORITY LEVEL 0
000040                  PR1=    40              ;;PRIORITY LEVEL 1
000100                  PR2=    100             ;;PRIORITY LEVEL 2
000140                  PR3=    140             ;;PRIORITY LEVEL 3
000200                  PR4=    200             ;;PRIORITY LEVEL 4
000240                  PR5=    240             ;;PRIORITY LEVEL 5
000300                  PR6=    300             ;;PRIORITY LEVEL 6
000340                  PR7=    340             ;;PRIORITY LEVEL 7

                        ;*''SWITCH REGISTER'' SWITCH DEFINITIONS
100000                  SW15=   100000
040000                  SW14=   40000
```

```
                        SW13=   20000
                        SW12=   10000
                        SW11=   4000
                        SW10=   2000
                        SW09=   1000
                        SW08=   400
                        SW07=   200
                        SW06=   100
                        SW05=   40
                        SW04=   20
                        SW03=   10
                        SW02=   4
                        SW01=   2
                        SW00=   1
                                SW9=SW09
                                SW8=SW08
                                SW7=SW07
                                SW6=SW06
                                SW5=SW05
                                SW4=SW04
                                SW3=SW03
                                SW2=SW02
                                SW1=SW01
                                SW0=SW00

                        ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
                        BIT15=  100000
                        BIT14=  40000
                        BIT13=  20000
                        BIT12=  10000
                        BIT11=  4000
                        BIT10=  2000
                        BIT09=  1000
                        BIT08=  400
                        BIT07=  200
                        BIT06=  100
                        BIT05=  40
                        BIT04=  20
                        BIT03=  10
                        BIT02=  4
                        BIT01=  2
                        BIT00=  1
                                BIT9=BIT09
                                BIT8=BIT08
                                BIT7=BIT07
                                BIT6=BIT06
                                BIT5=BIT05
                                BIT4=BIT04
                                BIT3=BIT03
                                BIT2=BIT02
                                BIT1=BIT01
                                BIT0=BIT00

                        ;*BASIC "CPU" TRAP VECTOR ADDRESSES
                        ERRVEC= 4               ;;TIME OUT AND OTHER ERRORS
                        RESVEC= 10              ;;RESERVED AND ILLEGAL INSTRUCTIONS
```

```
                        TBITVEC=14              ;;"T" BIT
                        TRTVEC= 14              ;;TRACE TRAP
                        BPTVEC= 14              ;;BREAKPOINT TRAP (BPT)
                        IOTVEC= 20              ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
                        PWRVEC= 24              ;;POWER FAIL
                        EMTVEC= 30              ;;EMULATOR TRAP (EMT) **ERROR**
                        TRAPVEC=34              ;;"TRAP" TRAP
                        TKVEC=  60              ;;TTY KEYBOARD VECTOR
                        TPVEC=  64              ;;TTY PRINTER VECTOR
                        PIRQVEC=240             ;;PROGRAM INTERRUPT REQUEST VECTOR
                                MFPT=7
                                ABASE=  176500
                                AVECT1= 300
                                AUSWR=  400
                                $TN=    1
                                $SWR=   161000
                                BPT=    000003          ;THIS IS THE COMMAND FOR A TRAP
                                                        ;   THROUGH 14 (BPT TRAP)

                                .=0
                        ;;**************************************************************************
                                ;*ALL UNUSED LOCATIONS FROM 4-776 CONTAIN A ".+2,BPT"
                                ;*SEQUENCE TO CATCH ILLEGAL TRAPS & INTERRUPPTS
                                ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS


                                .=14                    ;THE BPT TRAP VECTOR POINTS TO THE
000014  014552                  .WORD   CATCH           ;   ILLEGAL TRAP HANDLER "CATCH"
000016  000340                  .WORD   340

                                .=      42
000042  000000                  .WORD   0


                                .=      174
000174  000000          DISPREG:.WORD   0
000176  000000          SWREG:  .WORD   0

                                .=200
000200  000137  003046          JMP     START           ;DO INTERFACE TEST
000204  000137  017324          JMP     ECHO            ;DO ECHO TEST
000210  000137  017544          JMP     OUTTST          ;DO OUTPUT TEST TO TERMINAL
```

```
                        .=      500
                .SBTTL  ACT11 HOOKS

                ;;******************************************************************
                ;HOOKS REQUIRED BY ACT11
                        $SVPC=.                 ;SAVE PC
                        .=46
                        $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
                        .=52
                        .WORD   0               ;;2)SET LOC.52 TO ZERO
                        .=$SVPC                 ;; RESTORE PC
                .SBTTL  APT PARAMETER BLOCK

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

                $APTHD:
                $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
                $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
                $TSTM:  .WORD   50      ;;RUN TIM OF LONGEST TEST
                $PASTM: .WORD   60      ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
                $UNITM: .WORD   55      ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
                        .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
```

```
                                .SBTTL  COMMON TAGS

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

            001000                      .=1000
001000                          $CMTAG:                         ;;START OF COMMON TAGS
001000  000000                          .WORD   0
001002     000                  $TSTNM: .BYTE   0               ;;CONTAINS THE TEST NUMBER
001003     000                  $ERFLG: .BYTE   0               ;;CONTAINS ERROR FLAG
001004  000000                  $ICNT:  .WORD   0               ;;CONTAINS SUBTEST ITERATION COUNT
001006  000000                  $LPADR: .WORD   0               ;;CONTAINS SCOPE LOOP ADDRESS
001010  000000                  $LPERR: .WORD   0               ;;CONTAINS SCOPE RETURN FOR ERRORS
001012  000000                  $ERTTL: .WORD   0               ;;CONTAINS TOTAL ERRORS DETECTED
001014     000                  $ITEMB: .BYTE   0               ;;CONTAINS ITEM CONTROL BYTE
001015     001                  $ERMAX: .BYTE   1               ;;CONTAINS MAX. ERRORS PER TEST
001016  000000                  $ERRPC: .WORD   0               ;;CONTAINS PC OF LAST ERROR INSTRUCTION
001020  000000                  $GDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'GOOD' DATA
001022  000000                  $BDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'BAD' DATA
001024  000000                  $GDDAT: .WORD   0               ;;CONTAINS 'GOOD' DATA
001026  000000                  $BDDAT: .WORD   0               ;;CONTAINS 'BAD' DATA
001030  000000                          .WORD   0               ;;RESERVED--NOT TO BE USED
001032  000000                          .WORD   0
001034     000                  $AUTOB: .BYTE   0               ;;AUTOMATIC MODE INDICATOR
001035     000                  $INTAG: .BYTE   0               ;;INTERRUPT MODE INDICATOR
001036  000000                          .WORD   0
001040  177570                  SWR:    .WORD   DSWR            ;;ADDRESS OF SWITCH REGISTER
001042  177570                  DISPLAY: .WORD  DDISP           ;;ADDRESS OF DISPLAY REGISTER
001044  177560                  $TKS:   177560                  ;;TTY KBD STATUS
001046  177562                  $TKB:   177562                  ;;TTY KBD BUFFER
001050  177564                  $TPS:   177564                  ;;TTY PRINTER STATUS REG. ADDRESS
001052  177566                  $TPB:   177566                  ;;TTY PRINTER BUFFER REG. ADDRESS
001054     000                  $NULL:  .BYTE   0               ;;CONTAINS NULL CHARACTER FOR FILLS
001055     002                  $FILLS: .BYTE   2               ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
001056     012                  $FILLC: .BYTE   12              ;;INSERT FILL CHARS. AFTER A ''LINE FEED''
001057     000                  $TPFLG: .BYTE   0               ;;''TERMINAL AVAILABLE'' FLAG (BIT<07>=0=YES)
001060  000000                  $ESCAPE:0                       ;;ESCAPE ON ERROR ADDRESS
001062     077                  $QUES:  .ASCII  /?/             ;;QUESTION MARK
001063     015                  $CRLF:  .ASCII  <15>            ;;CARRIAGE RETURN
001064  000012                  $LF:    .ASCIZ  <12>            ;;LINE FEED
                                ;;*****************************************************************
                                .SBTTL  APT MAILBOX-ETABLE

                                ;;*****************************************************************
                                .EVEN
001066                          $MAIL:                          ;;APT MAILBOX
001066  000000                  $MSGTY: .WORD   AMSGTY          ;;MESSAGE TYPE CODE
001070  000000                  $FATAL: .WORD   AFATAL          ;;FATAL ERROR NUMBER
001072  000000                  $TESTN: .WORD   ATESTN          ;;TEST NUMBER
001074  000000                  $PASS:  .WORD   APASS           ;;PASS COUNT
001076  000000                  $DEVCT: .WORD   ADEVCT          ;;DEVICE COUNT
001100  000000                  $UNIT:  .WORD   AUNIT           ;;I/O UNIT NUMBER
001102  000000                  $MSGAD: .WORD   AMSGAD          ;;MESSAGE ADDRESS
001104  000000                  $MSGLG: .WORD   AMSGLG          ;;MESSAGE LENGTH
001106                          $ETABLE:                        ;;APT ENVIRONMENT TABLE
```

```
1035  001106  000          $ENV:    .BYTE   AENV    ;;ENVIRONMENT BYTE
1036  001107  000          $ENVM:   .BYTE   AENVM   ;;ENVIRONMENT MODE BITS
1037  001110  000000       $SWREG:  .WORD   ASWREG  ;;APT SWITCH REGISTER
1038  001112  000400       $USWR:   .WORD   AUSWR   ;;USER SWITCHES
1039  001114  000000       $CPUOP:  .WORD   ACPUOP  ;;CPU TYPE,OPTIONS
1040                        ;*                       BITS 15-11=CPU TYPE
1041                        ;*                              11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
1042                        ;*                              11/70=06,PDQ=07,Q=10
1043                        ;*                       BIT 10=REAL TIME CLOCK
1044                        ;*                       BIT  9=FLOATING POINT PROCESSOR
1045                        ;*                       BIT  8=MEMORY MANAGEMENT
1046  001116  000          $MAMS1:  .BYTE   AMAMS1  ;;HIGH ADDRESS,M.S. BYTE
1047  001117  000          $MTYP1:  .BYTE   AMTYP1  ;;MEM. TYPE,BLK#1
1048                        ;*                       MEM.TYPE BYTE   --  (HIGH BYTE)
1049                        ;*                              900 NSEC CORE=001
1050                        ;*                              300 NSEC BIPOLAR=002
1051                        ;*                              500 NSEC MOS=003
1052  001120  000000       $MADR1:  .WORD   AMADR1  ;;HIGH ADDRESS,BLK#1
1053                        ;*                         MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF ''TYPE'' ABOVE
1054  001122  000          $MAMS2:  .BYTE   AMAMS2  ;;HIGH ADDRESS,M.S. BYTE
1055  001123  000          $MTYP2:  .BYTE   AMTYP2  ;;MEM.TYPE,BLK#2
1056  001124  000000       $MADR2:  .WORD   AMADR2  ;;MEM.LAST ADDRESS,BLK#2
1057  001126  000          $MAMS3:  .BYTE   AMAMS3  ;;HIGH ADDRESS,M.S.BYTE
1058  001127  000          $MTYP3:  .BYTE   AMTYP3  ;;MEM.TYPE,BLK#3
1059  001130  000000       $MADR3:  .WORD   AMADR3  ;;MEM.LAST ADDRESS,BLK#3
1060  001132  000          $MAMS4:  .BYTE   AMAMS4  ;;HIGH ADDRESS,M.S.BYTE
1061  001133  000          $MTYP4:  .BYTE   AMTYP4  ;;MEM.TYPE,BLK#4
1062  001134  000000       $MADR4:  .WORD   AMADR4  ;;MEM.LAST ADDRESS,BLK#4
1063  001136  000300       $VECT1:  .WORD   AVECT1  ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
1064  001140  000000       $VECT2:  .WORD   AVECT2  ;;INTERRUPT VECTOR#2BUS PRIORITY#2
1065  001142  176500       $BASE:   .WORD   ABASE   ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
1066  001144  000000       $DEVM:   .WORD   ADEVM   ;;DEVICE MAP
1067  001146               $ETEND:
1068                        .MEXIT
```

ERROR POINTER TABLE SEQ 0026

```
                                .SBTTL  ERROR POINTER TABLE

                                ;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
                                ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
                                ;*LOCATION $ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
                                ;*NOTE1:        IF $ITEMB IS 0 THE ONLY PERTINENT DATA IS ($ERRPC).
                                ;*NOTE2:        EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:

                                ;*      EM              ;;POINTS TO THE ERROR MESSAGE
                                ;*      DH              ;;POINTS TO THE DATA HEADER
                                ;*      DT              ;;POINTS TO THE DATA
                                ;*      DF              ;;POINTS TO THE DATA FORMAT


001146                          $ERRTB:

001146                          .$ERRTB:
001146  017630                          EM1                     ;''CAN NOT ACCESS TCSR''
001150  024012                          DH1                     ;''TEST# ERR PC  TCSR''
001152  024572                          DT1                     ;$TESTN,$ERRPC,TCSR
001154  000000                          0

001156  017654                          EM2                     ;''CAN NOT ACCESS TBUF''
001160  024037                          DH2                     ;''TEST# ERR PC  TBUF''
001162  024602                          DT2                     ;$TESTN,$ERRPC,TBUF
001164  000000                          0

001166  017700                          EM3                     ;''TCSR DONE NOT CLEARED WITH TBUF FULL''
001170  024012                          DH1                     ;''TEST# ERR PC  TCSR''
001172  024572                          DT1                     ;$TESTN,$ERRPC,TCSR
001174  000000                          0

001176  017745                          EM4                     ;''TCSR DONE NOT SET''
001200  024012                          DH1                     ;''TEST# ERR PC  TCSR''
001202  024572                          DT1                     ;$TESTN,$ERRPC,TCSR
001204  000000                          0

001206  017767                          EM5                     ;TCSR DONE NOT SET WITH RESET
001210  024012                          DH1                     ;''TEST# ERR PC  TCSR''
001212  024572                          DT1                     ;$TESTN,$ERRPC,TCSR
001214  000000                          0

001216  020024                          EM6                     ;''CAN NOT ACCESS RCSR''
001220  024064                          DH6                     ;''TEST# ERR PC  RCSR''
001222  024612                          DT6                     ;$TESTN,$ERRPC,RCSR
001224  000000                          0

001226  020050                          EM7                     ;''CAN NOT ACCESS RBUF''
001230  024111                          DH7                     ;''TEST# ERR PC  RBUF''
001232  024622                          DT7                     ;$TESTN,$ERRPC,RBUF
001234  000000                          0

001236  020074                          EM10                    ;''CAN NOT ACCESS LKS''
001240  024136                          DH10                    ;''TEST# ERR PC  LKS''
001242  024632                          DT10                    ;$TESTN,$ERRPC,LKS
001244  000000                          0
```

```
1125
1126  001246  020117                    EM11            ;"BIT0 OF TCSR NOT CLEAR AFTER RESET"
1127  001250  024012                    DH1             ;"TEST# ERR PC  TCSR
1128  001252  024572                    DT1             ;$TESTN,$ERRPC,TCSR
1129  001254  000000                    0
1130
1131  001256  020162                    EM12            ;"CAN NOT SET BIT0 OF TCSR"
1132  001260  024012                    DH1             ;"TEST# ERR PC  TCSR"
1133  001262  024572                    DT1             ;$TESTN,$ERRPC,TCSR
1134  001264  000000                    0
1135
1136  001266  020213                    EM13            ;"CAN NOT CLEAR BIT0 OF TCSR"
1137  001270  024012                    DH1             ;"TEST# ERR PC  TCSR"
1138  001272  024572                    DT1             ;$TESTN,$ERRPC,TCSR
1139  001274  000000                    0
1140
1141  001276  020246                    EM14            ;"RESET DID NOT CLEAR BIT0 OF TCSR"
1142  001300  024012                    DH1             ;"TEST# ERR PC  TCSR"
1143  001302  024572                    DT1             ;$TESTN,$ERRPC,TCSR
1144  001304  000000                    0
1145
1146  001306  020307                    EM15            ;"BIT2 OF TCSR NOT CLEAR AFTER RESET"
1147  001310  024012                    DH1             ;"TEST# ERR PC  TCSR"
1148  001312  024572                    DT1             ;$TESTN,$ERRPC,TCSR
1149  001314  000000                    0
1150
1151  001316  020352                    EM16            ;"CAN NOT SET BIT2 OF TCSR"
1152  001320  024012                    DH1             ;"TEST# ERR PC  TCSR"
1153  001322  024572                    DT1             ;$TESTN,$ERRPC,TCSR
1154  001324  000000                    0
1155
1156  001326  020403                    EM17            ;"CAN NOT CLEAR BIT2 OF TCSR"
1157  001330  024012                    DH1             ;"TEST# ERR PC  TCSR"
1158  001332  024572                    DT1             ;$TESTN,$ERRPC,TCSR
1159  001334  000000                    0
1160
1161  001336  020436                    EM20            ;"RESET DID NOT CLEAR BIT2 OF TCSR"
1162  001340  024012                    DH1             ;"TEST# ERR PC  TCSR"
1163  001342  024572                    DT1             ;$TESTN,$ERRPC,TCSR
1164  001344  000000                    0
1165
1166  001346  020477                    EM21            ;"BIT6 OF TCSR NOT CLEAR AFTER RESET2
1167  001350  024012                    DH1             ;"TEST# ERR PC  TCSR"
1168  001352  024572                    DT1             ;$TESTN,$ERRPC,TCSR
1169  001354  000000                    0
1170
1171  001356  020542                    EM22            ;"XMIT INTERRUPT WITH PRIORITY 7"
1172  001360  024012                    DH1             ;"TEST# ERR PC  TCSR"
1173  001362  024572                    DT1             ;$TESTN,$ERRPC,TCSR
1174  001364  000000                    0
1175
1176  001366  020577                    EM23            ;"CAN NOT SET BIT6 OF TCSR"
1177  001370  024012                    DH1             ;"TEST# ERR PC  TCSR"
1178  001372  024572                    DT1             ;$TESTN,$ERRPC,TCSR
1179  001374  000000                    0
1180
```

```
1181  001376  020630                    EM24            ;''CAN NOT CLEAR BIT6 OF TCSR''
1182  001400  024012                    DH1             ;''TEST# ERR PC  TCSR''
1183  001402  024572                    DT1             ;$TESTN,$ERRPC,TCSR
1184  001404  000000                    0
1185
1186  001406  020663                    EM25            ;''RESET DID NOT CLEAR BIT6 OF TCSR''
1187  001410  024012                    DH1             ;''TEST# ERR PC  TCSR''
1188  001412  024572                    DT1             ;$TESTN,$ERRPC,TCSR
1189  001414  000000                    0
1190
1191  001416  020724                    EM26            ;''BIT6 OF RCSR NOT CLEAR AFTER RESET''
1192  001420  024064                    DH6             ;''TEST# ERR PC  RCSR''
1193  001422  024612                    DT6             ;$TESTN,$ERRPC,RCSR
1194  001424  000000                    0
1195
1196  001426  020767                    EM27            ;''RCVR INTERRUPT WITH PRIORITY 7''
1197  001430  024064                    DH6             ;''TEST# ERR PC  RCSR''
1198  001432  024612                    DT6             ;$TESTN,$ERRPC,RCSR
1199  001434  000000                    0
1200
1201  001436  021026                    EM30            ;''CAN NOT SET BIT6 OF RCSR''
1202  001440  024064                    DH6             ;''TEST# ERR PC  RCSR''
1203  001442  024612                    DT6             ;$TESTN,$ERRPC,RCSR
1204  001444  000000                    0
1205
1206  001446  021057                    EM31            ;''CAN NOT CLEAR BIT6 OF RCSR''
1207  001450  024064                    DH6             ;''TEST# ERR PC  RCSR''
1208  001452  024612                    DT6             ;$TESTN,$ERRPC,RCSR
1209  001454  000000                    0
1210
1211  001456  021112                    EM32            ;''CAN NOT CLEAR BIT6 OF RCSR WITH RESET2
1212  001460  024064                    DH6             ;''TEST# ERR PC  RCSR''
1213  001462  024612                    DT6             ;$TESTN,$ERRPC,RCSR
1214  001464  000000                    0
1215
1216  001466  021160                    EM33            ;''BIT6 OF LKS NOT CLEAR AFTER RESET''
1217  001470  024136                    DH10            ;''TEST# ERR PC  LKS''
1218  001472  024632                    DT10            ;$TESTN,$ERRPC,LKS
1219  001474  000000                    0
1220
1221  001476  021222                    EM34            ;''LKS INTERRUPT WITH PRIORITY 7''
1222  001500  024136                    DH10            ;''TEST# ERR PC  LKS''
1223  001502  024632                    DT10            ;$TESTN,$ERRPC,LKS
1224  001504  000000                    0
1225
1226  001506  021260                    EM35            ;''CAN NOT SET BIT6 OF LKS''
1227  001510  024136                    DH10            ;''TEST# ERR PC  LKS''
1228  001512  024632                    DT10            ;$TESTN,$ERRPC,LKS
1229  001514  000000                    0
1230
1231  001516  021310                    EM36            ;''CAN NOT CLEAR BIT6 OF LKS''
1232  001520  024136                    DH10            ;''TEST# ERR PC  LKS''
1233  001522  024632                    DT10            ;$TESTN,$ERRPC,LKS
1234  001524  000000                    0
1235
1236  001526  021342                    EM37            ;''RESET DID NOT CLEAR BIT6 OF LKS''
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1237  001530  024136                    DH10            ;''TEST# ERR PC  LKS''
1238  001532  024632                    DT10            ;$TESTN,$ERRPC,LKS
1239  001534  000000                    0
1240
1241  001536  021402                    EM40            ;''DUAL ADDRESSING ERROR''
1242  001540  024162                    DH40            ;''TEST# ERR PC  GOOD    BAD''
1243  001542  024642                    DT40            ;$TESTN,$ERRPC,$GDADR,$BDCSR
1244  001544  000000                    0
1245
1246  001546  021430                    EM41            ;''BIT7 OF LKS NOT SET AFTER RESET2
1247  001550  024136                    DH10            ;''TEST# ERR PC  LKS''
1248  001552  024632                    DT10            ;$TESTN,$ERRPC,LKS
1249  001554  000000                    0
1250
1251  001556  021470                    EM42            ;''CAN NOT CLEAR BIT7 OF LKS''
1252  001560  024136                    DH10            ;''TEST# ERR PC  LKS''
1253  001562  024632                    DT10            ;$TESTN,$ERRPC,LKS
1254  001564  000000                    0
1255
1256  001566  021522                    EM43            ;''BIT7 OF LKS DOES NOT SET''
1257  001570  024136                    DH10            ;''TEST# ERR PC  LKS''
1258  001572  024632                    DT10            ;$TESTN,$ERRPC,LKS
1259  001574  000000                    0
1260
1261  001576  021553                    EM44            ;''RTC INTERRUPT AT PRIORITY 7''
1262  001600  024136                    DH10            ;''TEST# ERR PC  LKS''
1263  001602  024632                    DT10            ;$TESTN,$ERRPC,LKS
1264  001604  000000                    0
1265
1266  001606  021607                    EM45            ;''RTC INTERRUPTS WHEN DISABLED''
1267  001610  024136                    DH10            ;''TEST# ERR PC  LKS''
1268  001612  024632                    DT10            ;$TESTN,$ERRPC,LKS
1269  001614  000000                    0
1270
1271  001616  021644                    EM46            ;''RTC INTERRUPT DID NOT OCCUR''
1272  001620  024136                    DH10            ;''TEST# ERR PC  LKS''
1273  001622  024632                    DT10            ;$TESTN,$ERRPC,LKS
1274  001624  000000                    0
1275
1276  001626  021644                    EM47            ;''RTC INTERRUPT DID NOT OCCUR''
1277  001630  024136                    DH10            ;''TEST# ERR PC  LKS''
1278  001632  024632                    DT10            ;$TESTN,$ERRPC,LKS
1279  001634  000000                    0
1280
1281  001636  021700                    EM50            ;''RTC DOUBLE INTERRUPT''
1282  001640  024136                    DH10            ;''TEST# ERR PC  LKS''
1283  001642  024632                    DT10            ;$TESTN,$ERRPC,LKS
1284  001644  000000                    0
1285
1286  001646  021725                    EM51            ;''RESET DID NOT CLEAR RTC INTERRUPT''
1287  001650  024136                    DH10            ;''TEST# ERR PC  LKS''
1288  001652  024632                    DT10            ;$TESTN,$ERRPC,LKS
1289  001654  000000                    0
1290
1291  001656  021755                    EM52            ;''RTC INTERRUPT DID NOT CLEAR WITH BIT7 OF LKS''
1292  001660  024136                    DH10            ;''TEST# ERR PC  LKS''
```

```
1293  001662  024632                  DT10                    ;$TESTN,$ERRPC,LKS
1294  001664  000000                  0
1295
1296  001666  022032                  EM53
1297  001670  024216                  DH53                    ;''TEST# ERR PC  LKS   CNT1   CNT2''
1298  001672  024654                  DT53                    ;$TESTN,$ERRPC,LKS,FIRST,SECND
1299  001674  000000                  0
1300
1301  001676  022056                  EM54                    ;''XMIT INTERRUPTS WHEN DISABLED''
1302  001700  024012                  DH1                     ;''TEST# ERR PC  TCSR''
1303  001702  024572                  DT1                     ;$TESTN,$ERRPC,TCSR
1304  001704  000000                  0
1305
1306  001706  022214                  EM55                    ;''XMIT DID NOT INTERRUPT''
1307  001710  024012                  DH1                     ;''TEST# ERR PC  TCSR''
1308  001712  024572                  DT1                     ;$TESTN,$ERRPC,TCSR
1309  001714  000000                  0
1310
1311  001716  022114                  EM56                    ;''XMIT INTERRUPT AT PRIORITY 7''
1312  001720  024012                  DH1                     ;''TEST# ERR PC  TCSR''
1313  001722  024572                  DT1                     ;$TESTN,$ERRPC,TCSR
1314  001724  000000                  0
1315
1316  001726  022152                  EM57                    ;''XMIT INTERRUPTS WITH ENABLE CLEAR''
1317  001730  024012                  DH1                     ;''TEST# ERR PC  TCSR''
1318  001732  024572                  DT1                     ;$TESTN,$ERRPC,TCSR
1319  001734  000000                  0
1320
1321  001736  022214                  EM60                    ;''XMIT DID NOT INTERRUPT''
1322  001740  024012                  DH1                     ;''TEST# ERR PC  TCSR''
1323  001742  024572                  DT1                     ;$TESTN,$ERRPC,TCSR
1324  001744  000000                  0
1325
1326  001746  022243                  EM61                    ;''XMIT RE-INTERRUPTED''
1327  001750  024012                  DH1                     ;''TEST# ERR PC  TCSR''
1328  001752  024572                  DT1                     ;$TESTN,$ERRPC,TCSR
1329  001754  000000                  0
1330
1331  001756  022267                  EM62                    ;''LOADING TBUF DID NOT CLEAR INTERRUPT''
1332  001760  024012                  DH1                     ;''TEST# ERR PC  TCSR''
1333  001762  024572                  DT1                     ;$TESTN,$ERRPC,TCSR
1334  001764  000000                  0
1335
1336  001766  022334                  EM63                    ;''RCVR ACTIVE NOT SET''
1337  001770  024064                  DH6                     ;''TEST# ERR PC  RCSR''
1338  001772  024612                  DT6                     ;$TESTN,$ERRPC,RCSR
1339  001774  000000                  0
1340
1341  001776  022360                  EM64                    ;''RECEIVER DONE NEVER SET''
1342  002000  024064                  DH6                     ;''TEST# ERR PC  RCSR''
1343  002002  024612                  DT6                     ;$TESTN,$ERRPC,RCSR
1344  002004  000000                  0
1345
1346  002006  022404                  EM65                    ;''RCVR ACTIVE NOT CLEARED WITH DONE SET2
1347  002010  024064                  DH6                     ;''TEST# ERR PC  RCSR''
1348  002012  024612                  DT6                     ;$TESTN,$ERRPC,RCSR
```

```
 1349  002014  000000                          0
 1350
 1351  002016  022452                          EM66                    ;''RESET DID NOT CLEAR RCVR DONE''
 1352  002020  024064                          DH6                     ;''TEST# ERR PC  RCSR''
 1353  002022  024612                          DT6                     ;$TESTN,$ERRPC,RCSR
 1354  002024  000000                          0
 1355
 1356  002026  022510                          EM67                    ;''RDR ENABLE SET DID NOT CLEAR RCVR DONE''
 1357  002030  024064                          DH6                     ;''TEST# ERR PC  RCSR''
 1358  002032  024612                          DT6                     ;$TESTN,$ERRPC,RCSR
 1359  002034  000000                          0
 1360
 1361  002036  022553                          EM70                    ;''READING RBUF DID NOT CLEAR RCVR DONE''
 1362  002040  024064                          DH6                     ;''TEST# ERR PC  RCSR''
 1363  002042  024612                          DT6                     ;$TESTN,$ERRPC,RCSR
 1364  002044  000000                          0
 1365
 1366  002046  022620                          EM71                    ;''RCVR INTERRUPTS WITH ENABLE CLEAR''
 1367  002050  024064                          DH6                     ;''TEST# ERR PC  RCSR''
 1368  002052  024612                          DT6                     ;$TESTN,$ERRPC,RCSR
 1369  002054  000000                          0
 1370
 1371  002056  022767                          EM72                    ;''RCVR DID NOT INTERRUPT''
 1372  002060  024064                          DH6                     ;''TEST# ERR PC  RCSR''
 1373  002062  024612                          DT6                     ;$TESTN,$ERRPC,RCSR
 1374  002064  000000                          0
 1375
 1376  002066  022662                          EM73                    ;''RCVR INTERRUPTS AT PRIORITY 7''
 1377  002070  024064                          DH6                     ;''TEST# ERR PC  RCSR''
 1378  002072  024612                          DT6                     ;$TESTN,$ERRPC,RCSR
 1379  002074  000000                          0
 1380
 1381  002076  022720                          EM74                    ;''RCVR INTERRUPT REQUEST PASSED WITH ENABLE CLEAR''
 1382  002100  024064                          DH6                     ;''TEST# ERR PC  RCSR''
 1383  002102  024612                          DT6                     ;$TESTN,$ERRPC,RCSR
 1384  002104  000000                          0
 1385
 1386  002106  022767                          EM75                    ;''RCVR DID NOT INTERRUPT''
 1387  002110  024064                          DH6                     ;''TEST# ERR PC  RCSR''
 1388  002112  024612                          DT6                     ;$TESTN,$ERRPC,RCSR
 1389  002114  000000                          0
 1390  002116  023016                          EM76                    ;''RECEIVER RE-INTERRUPTED''
 1391  002120  024064                          DH6                     ;''TEST# ERR PC  RCSR''
 1392  002122  024612                          DT6                     ;$TESTN,$ERRPC,RCSR
 1393  002124  000000                          0
 1394
 1395  002126  023042                          EM77                    ;''READING RBUF DID NOT CLEAR INTERRUPT''
 1396  002130  024064                          DH6                     ;''TEST# ERR PC  RCSR''
 1397  002132  024612                          DT6                     ;$TESTN,$ERRPC,RCSR
 1398  002134  000000                          0
 1399
 1400  002136  023107                          EM100                   ;''RESET DID NOT CLEAR RCVR INTERRUPT''
 1401  002140  024064                          DH6                     ;''TEST# ERR PC  RCSR''
 1402  002142  024612                          DT6                     ;$TESTN,$ERRPC,RCSR
 1403  002144  000000                          0
 1404
```

```
1405
1406  002146  023152                    EM101           ;'''OR' FLAG DID NOT SET''
1407  002150  024064                    DH6
1408  002152  024612                    DT6             ;$TESTN,$ERRPC,RCSR
1409  002154  000000                    0
1410
1411  002156  023200                    EM102           ;'''ERROR' NOT SET WITH 'OR' FLAG''
1412  002160  024064                    DH6             ;''TEST# ERR PC  RCSR''
1413  002162  024612                    DT6             ;$TESTN,$ERRPC,RCSR
1414  002164  000000                    0
1415  002166  023237                    EM103           ;''BREAK DID NOT TRANSMIT ALL ZEROES''
1416  002170  024263                    DH103           ;''TEST# ERR PC  RCSR  DATA''
1417  002172  024670                    DT103           ;$TESTN,$ERRPC,RCSR,$BDDAT
1418  002174  000000                    0
1419
1420  002176  023275                    EM104           ;''BREAK DID NOT SET FRAMING ERROR''
1421  002200  024064                    DH6             ;''TEST# ERR PC  RCSR''
1422  002202  024612                    DT6             ;$TESTN,$ERRPC,RCSR
1423  002204  000000                    0
1424
1425  002206  023332                    EM105           ;''DATA COMPARE ERROR''
1426  002210  024320                    DH105           ;''TEST# ERR PC  RCSR  GOOD  BAD''
1427  002212  024702                    DT105           ;$TESTN,$ERRPC,RCSR,GD,BD
1428  002214  000000                    0
1429
1430  002216  023355                    EM106           ;''DATA COMPARE ERROR WITH CABLE''
1431  002220  024320                    DH105           ;''TEST# ERR PC  RCSR    GOOD    BAD''
1432  002222  024702                    DT105           ;$TESTN,$ERRPC,RCSR,GD,BD
1433  002224  000000                    0
1434
1435  002226  023413                    EM107           ;''TIMEOUT IN EXERCISER TEST''
1436  002230  024064                    DH6             ;''TEST# ERR PC  RCSR''
1437  002232  024612                    DT6             ;$TESTN,$ERRPC,RCSR
1438  002234  000000                    0
1439
1440  002236  023445                    EM110           ;''INCORRECT RECEIVE COUNT
1441  002240  024364                    DH110           ;''TEST# ERR PC  RCSR    TRANS   RCV''
1442  002242  024716                    DT110           ;$TESTN,$ERRPC,RCSR,XMTCNT,RCVCNT
1443  002244  000000                    0
1444
1445  002246  023475                    EM111           ;''DATA COMPARE ERROR IN EXERCISER''
1446  002250  024320                    DH105           ;''TEST# ERR PC  RCSR    GOOD    BAD''
1447  002252  024702                    DT105           ;$TESTN,$ERRPC,RCSR,GD,BD
1448  002254  000000                    0
1449
1450  002256  023535                    EM112           ;''TRAP CATCHER''
1451  002260  024430                    DH112           ;''TEST#   ERR PC  RCSR   OLDPC  TRAP ADR''
1452  002262  024732                    DT112           ;$TESTN,$ERRPC,RCSR,OLDPC,BDVECT
1453  002264  000000                    0
1454
1455  002266  023552                    EM113           ;''NO CLK INTERRUPT IN EXERCISER''
1456  002270  024136                    DH10            ;''TEST#  ERR PC  LKS''
1457  002272  024632                    DT10            ;$TESTN,$ERRPC,LKS
1458  002274  000000                    0
1459
1460  002276  023610                    EM114           ;'''ERROR' NOT SET WITH 'FR' FLAG''
```

```
1461  002300  024064                        DH6                     ;"TEST# ERR PC  RCSR"
1462  002302  024612                        DT6                     ;$TESTN,$ERRPC,RCSR
1463  002304  000000                        0
1464
1465  002306  023647                        EM115                   ;RCV ACTVIE NOT CLEAR WITH INIT
1466  002310  024064                        DH6                     ;"TEST# ERR PC  RCSR"
1467  002312  024612                        DT6                     ;$TESTN,$ERRPC,RCSR
1468  002314  000000                        0
1469
1470  002316  023706                        EM116                   ;RCV ACTIVE WITHOUT "START" BIT
1471  002320  024064                        DH6                     ;"TEST# ERR PC  RCSR"
1472  002322  024612                        DT6                     ;$TESTN,$ERRPC,RCSR
1473  002324  000000                        0
1474
1475  002326  023745                        EM117                   ;RDR ENABLE NOT CLEAR WITH RCV ACTIVE
1476  002330  024064                        DH6                     ;"TEST# ERR PC  RCSR"
1477  002332  024612                        DT6                     ;$TESTN,$ERRPC,RCSR
1478  002334  000000                        0
1479
1480                                ;STORAGE LOCATIONS
1481  002336  000000                FIRST:  .WORD   0
1482  002340  000000                LOC1:   .WORD   0               ;TIMER LOOP COUNTER
1483  002342  000000                LOC2:   .WORD   0               ;TIMER LOOP COUNTER
1484  002344  000000                SAVE0:  .WORD   0               ;STORAGE FOR LOCATIONS
1485  002346  000022                SAVLOC: .BLKW   22              ;THAT T/E USES
1486  002412  000010                ENDSTK: .BLKW   10              ;JIMS SPECIAL STACK (WRAP AROUND)
1487  002432  000000                JIMSTK: .WORD   0
1488  002434  000000                SAVEPS: .WORD   0               ;SAVE PSW AREA
1489  002436  000000                OLDSUM: .WORD   0               ;CHECKSUM STORAGE
1490  002440  000000                RCVCNT: .WORD   0
1491  002442  000000                XMTCNT: .WORD   0
1492  002444  000000                CLKCNT: .WORD   0
1493  002446  000000                STPSW:  .WORD   0
1494  002450  000000                SRPSW:  .WORD   0
1495  002452  000000                SCPSW:  .WORD   0
1496  002454  000044                BUF:    .BLKW   44
1497  002564  000020                CNTLP:  .ASCIZ  <20>
1498  002566  050136  006400  041412  PROMPT: .ASCII  /^P/<0><CR><LF>/CONSOLE/<CR><LF>/>>>/<377>
1499  002574  047117  047523  042514
1500  002602  005015  037076  177476
1501  002610  027524  006501  000012  TA:     .ASCIZ  $T/A$<CR><LF>
1502
1503                                    .EVEN
1504  002616  000000                SECND:  .WORD   0
1505  002620  000000                OLDPC:  .WORD   0
1506  002622  000000                BDVECT: .WORD   0
1507
1508
1509
1510
1511
1512  002624  000000                CTSTFL: .WORD   0               ;CONSLE UNDER TEST FLAG
1513  002626  000000                TMP1:   .WORD   0               ;TEMP LOCATION FOR TABLE OFFSETS
1514  002630  000000                TMP2:   .WORD   0               ;TEMP LOCATION FOR DEVICE COUNT
1515  002632  000000                TMP3:   .WORD   0               ;LOCATION FOR DEVICE MAP BIT TEST MASK
1516                                ;REGISTER AND VECTOR ADDRESSES FOR THE DL-11W UNDER TEST
```

```
1517
1518  002634  000000                    RCSR:   .WORD   0
1519  002636  000000                    RBUF:   .WORD   0
1520  002640  000000                    TCSR:   .WORD   0
1521  002642  000000                    TBUF:   .WORD   0
1522  002644  000000                    RVECT:  .WORD   0
1523  002646  000000                    RPSW:   .WORD   0
1524  002650  000000                    TVECT:  .WORD   0
1525  002652  000000                    TPSW:   .WORD   0
1526
1527                                    ;CONSOLE REGISTER AND VECTOR ADDRESSES FOR THE DL-11W
1528
1529  002654  177560                    CRCSR:  177560                  ;ADDRESS OF RECEIVER COMMAND/STATUS REGISTER
1530  002656  177562                    CRBUF:  177562                  ;ADDRESS OF RECEIVER BUFFER
1531  002660  177564                    CTCSR:  177564                  ;ADDRESS OF TRANSMITTER COMMAND/STATUS REGISTER
1532  002662  177566                    CTBUF:  177566                  ;ADDRESS OF TRANSMITTER BUFFER
1533  002664  000060                    CRVECT: 60                      ;RECEIVER INTERRUPT VECTOR
1534  002666  000062                    CRPSW:  62
1535  002670  000064                    CTVECT: 64                      ;TRANSMITTER INTERRUPT VECTOR
1536  002672  000066                    CTPSW:  66
1537
1538                                    ;REAL TIME CLOCK REGISTER AND VECTOR ADDRESSES
1539  002674  177546                    LKS:    .WORD   177546
1540  002676  000100                    RTCVT:  .WORD   100
1541  002700  000102                    RTCPSW: .WORD   102
1542
1543  002702  000020                    ADRTBL: .BLKW   20
1544  002742  000020                    VCTTBL: .BLKW   20
1545  003002  000000                    FLAG44: .WORD   0
1546  003004  176500                    TURCSR: .WORD   176500
1547  003006  176502                    TURBUF: .WORD   176502
1548  003010  176504                    TUTCSR: .WORD   176504
1549  003012  176506                    TUTBUF: .WORD   176506
1550
1551
1552                                    ;SUBROUTINE TO GENERATE DEVICE ADDRESS TABLE
1553
1554  003014  012702  002702            DEVADR: MOV     #ADRTBL,R2      ;POINT R2 TO THE DEVICE ADDRESS TABLE
1555  003020  013700  001142                    MOV     $BASE,R0        ;LOAD BASE DEVICE ADDRESS IN R0
1556  003024  010001                            MOV     R0,R1           ;
1557  003026  062701  000170                    ADD     #170,R1         ;POINT R1 TO LAST DEVICE ADDRESS
1558  003032  010022                    1$:     MOV     R0,(R2)+        ;MOVE DEVICE ADDRESS TO TABLE
1559  003034  062700  000010                    ADD     #10,R0          ;POINT R0 TO NEXT DEVICE ADDRESS
1560  003040  020001                            CMP     R0,R1           ;FINISHED GENERATING TABLE?
1561  003042  003773                            BLE     1$              ;BR, IF LAST DEVICE ADDRESS NOT LOADED
1562  003044  000207                            RTS     PC
1563
1564
1565
1566  003046  005037  001070            START:  CLR     $FATAL          ;CLEAR ERROR NO.
1567  003052  005037  001066                    CLR     $MSGTYP         ;CLEAR MESSAGE TYPE
1568  003056  005037  001072                    CLR     $TESTN          ;CLEAR TEST NO.
1569  003062  005037  002624                    CLR     CTSTFL          ;CLEAR CONSOLE UNDER TEST FLAG
1570  003066  005037  001076                    CLR     $DEVCT          ;CLEAR DEVICE COUNT
1571  003072  005037  001100                    CLR     $UNIT           ;CLEAR UNIT NUMBER
1572  003076  005037  003002                    CLR     FLAG44          ;** CLEAR 11/44 CPU FLAG
```

```
 1573  003102  005737  001112                  TST     $USWR           ;IS $USWR LOADED?
 1574  003106  001003                          BNE     1$              ;BR IF YES
 1575  003110  012737  000400  001112          MOV     #400,$USWR      ;ELSE, DEFAULT TO $USWR=400
 1576  003116  012737  000006  000004  1$:     MOV     #6,@#4          ;INITIALIZE TIMEOUT VECTORS TO TRAP
 1577  003124  012737  000003  000006          MOV     #3,@#6          ;  CATCHER ROUTINE
 1578
 1579                                  .SBTTL  INITIALIZE THE COMMON TAGS
 1580                                  ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
 1581  003132  012706  001000                  MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
 1582  003136  005026                          CLR     (R6)+           ;;CLEAR MEMORY LOCATION
 1583  003140  022706  001040                  CMP     #SWR,R6 ;;DONE?
 1584  003144  001374                          BNE     .-6             ;;LOOP BACK IF NO
 1585  003146  012706  001000                  MOV     #1000,SP                ;;SETUP THE STACK POINTER
 1586                                  ;;INITIALIZE A FEW VECTORS
 1587  003152  012737  015272  000020          MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
 1588  003160  012737  000340  000022          MOV     #340,@#IOTVEC+2 ;;LEVEL 7
 1589  003166  012737  014576  000030          MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
 1590  003174  012737  000340  000032          MOV     #340,@#EMTVEC+2 ;;LEVEL 7
 1591  003202  012737  017246  000034          MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
 1592  003210  012737  000340  000036          MOV     #340,@#TRAPVEC+2;LEVEL 7
 1593  003216  012737  015114  000024          MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
 1594  003224  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;LEVEL 7
 1595  003232  013737  014430  014422          MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
 1596  003240  005037  001060                  CLR     $ESCAPE         ;;CLEAR THE ESCAPE ON ERROR ADDRESS
 1597  003244  112737  000001  001015          MOVB    #1,$ERMAX       ;;ALLOW ONE ERROR PER TEST
 1598  003252  012737  003252  001006          MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
 1599  003260  012737  003260  001010          MOV     #.,$LPERR       ;;SETUP THE ERROR LOOP ADDRESS
 1600                                  ;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
 1601                                  ;;EQUAL TO A "-1", SETUP FOR A SOFTWARE SWITCH REGISTER.
 1602  003266  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
 1603  003272  012737  003326  000004          MOV     #64$,@#ERRVEC   ;;SET UP ERROR VECTOR
 1604  003300  012737  177570  001040          MOV     #DSWR,SWR       ;;SETUP FOR A HARDWARE SWICH REGISTER
 1605  003306  012737  177570  001042          MOV     #DDISP,DISPLAY  ;;AND A HARDWARE DISPLAY REGISTER
 1606  003314  022777  177777  175516          CMP     #-1,@SWR        ;;TRY TO REFERENCE HARDWARE SWR
 1607  003322  001012                          BNE     66$             ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
 1608                                                                  ;;AND  THE HARDWARE SWR IS NOT = -1
 1609  003324  000403                          BR      65$             ;;BRANCH IF NO TIMEOUT
 1610  003326  012716  003334          64$:    MOV     #65$,(SP)       ;;SET UP FOR TRAP RETURN
 1611  003332  000002                          RTI
 1612  003334  012737  000176  001040  65$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
 1613  003342  012737  000174  001042          MOV     #DISPREG,DISPLAY
 1614  003350  012637  000004          66$:    MOV     (SP)+,@#ERRVEC  ;;RESTORE ERROR VECTOR
 1615
 1616  003354  005037  001074                  CLR     $PASS           ;;CLEAR PASS COUNT
 1617  003360  132737  000200  001107          BITB    #APTSIZE,$ENVM  ;;TEST USER SIZE UNDER APT
 1618  003366  001403                          BEQ     67$             ;;YES,USE NON-APT SWITCH
 1619  003370  012737  001110  001040          MOV     #$SWREG,SWR     ;;NO,USE APT SWITCH REGISTER
 1620  003376                          67$:
 1621
 1622                                  ;SIZE FOR 11/44 CPU
 1623
 1624  003376  013746  000010                  MOV     @#10,-(SP)      ;** SAVE VECTOR
 1625  003402  012737  003430  000010          MOV     #10$,@#10       ;** SET UP FOR TRAP
 1626  003410  000007                          MFPT                    ;** WHAT CPU??
 1627  003412  122700  000001                  CMPB    #1,R0           ;** ARE WE A 11/44
 1628  003416  001007                          BNE     11$             ;** NO GO RESET VECTOR
```

```
1629  003420  052737  000001  003002          BIS     #1,@#FLAG44     ;** YES SET FLAG
1630  003426  000403                          BR      11$             ;** SKIP RTI
1631  003430  012716  003436          10$:    MOV     #11$,(SP)       ;** SET STACK RETURN
1632  003434  000002                          RTI                     ;** RETURN
1633  003436  012637  000010          11$:    MOV     (SP)+,@#10      ;** RESTORE VECTOR
1634  003442  032777  000020  175370          BIT     #BIT4,@SWR      ;TEST CLOCK ONLY?
1635  003450  001404                          BEQ     INIT            ;BR IF NOT
1636  003452  005237  002624                  INC     CTSTFL          ;ELSE, SET CONSOLE TEST FLAG TO ENABLE CLOCK TESTS
1637  003456  000137  004620                  JMP     ID              ;  AND JUMP TO TYPE PROGRAM ID
1638  003462  132737  000001  001106  INIT:   BITB    #BIT0,$ENV      ;CHECK IF ON APT
1639  003470  001404                          BEQ     MANL            ;BR IF NOT APT
1640  003472  132737  000200  001107          BITB    #BIT7,$ENVM     ;DID APT SIZE
1641  003500  001056                          BNE     APTSZD          ;BR, IF APT SIZED
1642  003502  032777  000040  175330  MANL:   BIT     #BIT5,@SWR      ;WAS "$DEVM" MANUALLY SET?
1643  003510  001052                          BNE     APTSZD          ;IF YES, SKIP SELF-SIZING
1644
1645  003512  004737  003014          SIZE:   JSR     PC,DEVADR       ;GENERATE DEVICE ADDRESS TABLE
1646  003516  005037  002630                  CLR     TMP2            ;CLR TEMP LOCATION TO KEEP DEVICE COUNT
1647  003522  005037  001144                  CLR     $DEVM           ;CLEAR DEVICE MAP
1648  003526  013703  000004                  MOV     @#4,R3          ;SAVE TIMEOUT VECTOR
1649  003532  012737  003562  000004          MOV     #4$,@#4         ;SET TIMEOUT POINTER
1650  003540  013700  001142                  MOV     $BASE,R0        ;LOAD BASE ADDRESS
1651  003544  062700  000160                  ADD     #160,R0         ;POINT R0 TO UNIT #15 (UNIT#0=CONSOLE)
1652  003550  005710                  3$:     TST     (R0)            ;CHECK FOR DEVICE EXISTANCE
1653  003552  005237  001144                  INC     $DEVM           ;INDICATE DEVICE EXISTANCE IN DEVICE MAP
1654  003556  005237  002630                  INC     TMP2            ;INCREMENT DEVICE COUNT
1655  003562  012706  001000          4$:     MOV     #1000,SP        ;RESET STACK POINTER
1656  003566  006337  001144                  ASL     $DEVM           ;ADJUST DEVICE MAP FOR NEXT UNIT CHECK
1657  003572  162700  000010                  SUB     #10,R0          ;POINT R0 TO NEXT DEVICE NUMBER
1658  003576  023700  001142                  CMP     $BASE,R0        ;FINISHED SIZING?
1659  003602  003762                          BLE     3$              ;BR, IF BASE ADDRESS HAS NOT BEEN CHECKED
1660  003604  013700  002654                  MOV     CRCSR,R0        ;LOAD CONSOLE DEVICE ADDRESS
1661  003610  012737  003630  000004          MOV     #5$,@#4         ;SET UP TIMEOUT POINTER
1662  003616  005710                          TST     (R0)            ;TEST FOR CONSOLE EXISTANCE
1663  003620  005237  001144                  INC     $DEVM           ;INDICATE CONSOLE EXISTANCE IN DEVICE MAP
1664  003624  005237  002630                  INC     TMP2            ;INCREMENT DEVICE COUNT
1665  003630  010337  000004          5$:     MOV     R3,@#4          ;RESTORE TIMEOUT VECTOR
1666
1667  003634  000415                          BR      VCTADR          ;BR TO GENERATE VECTOR ADDRESS TABLE
1668
1669  003636  005037  002630          APTSZD: CLR     TMP2            ;CLEAR TEMP LOCATION TO KEEP DEVICE CNT
1670  003642  013702  001144                  MOV     $DEVM,R2        ;MOVE DEVICE MAP TO R2
1671  003646  005702                  TSTDVM: TST     R2              ;TEST MSB OF DEVICE MAP
1672  003650  100002                          BPL     1$              ;BR, IF MSB IS ZERO
1673  003652  005237  002630                  INC     TMP2            ;INCREMENT DEVICE COUNT, IF MSB=1
1674  003656  006302                  1$:     ASL     R2              ;SHIFT NEXT BIT INTO MSB POSITION
1675  003660  001401                          BEQ     DVADT           ;BR, IF NO OTHER BITS ARE SET IN $DEVM
1676  003662  000771                          BR      TSTDVM          ;CONTINUE CHECKING $DEVM, IF MORE BITS SET
1677  003664  004737  003014          DVADT:  JSR     PC,DEVADR       ;GENERATE DEVICE ADDRESS TABLE
1678
1679                                  ;GENERATE VECTOR ADDRESS TABLE
1680
1681  003670  012702  002742          VCTADR: MOV     #VCTTBL,R2      ;GET LOCATION OF VECTOR TABLE
1682  003674  013700  001136                  MOV     @#$VECT1,R0     ;COPY BASE VECTOR                       ;;**E0
1683  003700  042700  177000                  BIC     #177000,R0      ;CLEAR BYTE SIGN EXTENSION              ;;**E0
1684  003704  010001                          MOV     R0,R1           ;
```

```
1685  003706  062701  000170            ADD     #170,R1         ;POINT R1 TO LAST DEVICE VECTOR
1686  003712  010022            1$:     MOV     R0,(R2)+        ;PUT VECTOR ADDRESS IN TABLE
1687  003714  062700  000010            ADD     #10,R0          ;POINT R0 TO NEXT VECTOR ADDRESS
1688  003720  020001                    CMP     R0,R1           ;FINISHED GENERATING VECTOR TABLE?
1689  003722  003773                    BLE     1$              ;BR, IF LAST VECTOR IS NOT LOADED
1690
1691                            ;MOVE DEVICE COUNT INTO DEVICE COUNT MESSAGE
1692
1693  003724  013700  002630            MOV     TMP2,R0         ;COPY DEVICE COUNT INTO R0
1694  003730  005001                    CLR     R1              ;CLEAR AUXILARY REGISTER
1695  003732  000300                    SWAB    R0              ;PUT DEVICE COUNT IN UPPER BYTE OF R0
1696  003734  006300                    ASL     R0              ;MOVE MSB OF COUNT INTO
1697  003736  006300                    ASL     R0              ;MSB OF R0
1698  003740  006300            SHIFT:  ASL     R0              ;PUT MSB OF COUNT INTO CARRY
1699  003742  106101                    ROLB    R1              ;MOVE MSB OF COUNT INTO R1
1700  003744  006300                    ASL     R0              ;MOVE NEXT BIT TO CARRY
1701  003746  106101                    ROLB    R1              ;MOVE INTO R1
1702  003750  006300                    ASL     R0              ;MOVE LAST BIT OF DIGIT
1703  003752  106101                    ROLB    R1              ;INTO R1
1704  003754  062701  000060            ADD     #60,R1          ;CONVERT DIGIT TO ASCII
1705  003760  000301                    SWAB    R1              ;MOVE DIGIT TO UPPER BYTE
1706  003762  032701  000020            BIT     #BIT4,R1        ;HAVE BOTH DIGITS BEEN MOVED TO R1?
1707  003766  001764                    BEQ     SHIFT           ;BR, IF NOT
1708  003770  010137  024542            MOV     R1,M2A          ;MOVE DEVICE COUNT TO OUTPUT MESSAGE
1709
1710
1711  003774  052737  000002  002632  BEGIN:  BIS     #BIT1,TMP3      ;SET UP BIT MASK TO TEST $DEVM FOR DEVICES EXCEPT CONSOL
1712  004002  005037  002626            CLR     TMP1            ;CLEAR LOCATION TO STORE TABLE OFFSETS
1713  004006  032737  000001  001144    BIT     #BIT0,$DEVM     ;IS CONSOLE TO BE TESTED?
1714  004014  001001                    BNE     TCONS           ;BR, IF CONSOLE IS TO BE TESTED
1715  004016  000414                    BR      TSTDEV          ;BR, TO TEST OTHER DEVICES
1716  004020  005237  002624    TCONS:  INC     CTSTFL          ;INDICATE CONSOLE UNDER TEST
1717  004024  012700  002654            MOV     #CRCSR,R0       ;SET UP CONSOLE DEVICE ADDRESSES
1718  004030  012701  002634            MOV     #RCSR,R1        ;POINT R1 TO UUT ADDRESS TABLE
1719  004034  012021            1$:     MOV     (R0)+,(R1)+     ;TRANSFER CONSOLE ADDRESSES
1720  004036  022701  002652            CMP     #TPSW,R1        ;FINISHED TRANSFER?
1721  004042  002374                    BGE     1$              ;BR, IF NOT
1722  004044  000137  004172            JMP     TST1            ;GO TEST CONSOLE INTERFACE
1723
1724                            ;PREPARE ADDRESSES AND VECTORS FOR UUT
1725  004050  033737  002632  001144  TSTDEV: BIT     TMP3,$DEVM      ;CHECK TO SEE IF DEVICE IS TO BE TESTED
1726  004056  001010                    BNE     SETADR          ;BR, IF YES
1727  004060  006337  002632            ASL     TMP3            ;SHIFT MASK TO CHECK NEXT $DEVM BIT
1728  004064  062737  000002  002626    ADD     #2,TMP1         ;INCREMENT TABLE INDEX
1729  004072  005237  001100            INC     $UNIT           ;INCREMENT UNIT NUMBER
1730  004076  000764                    BR      TSTDEV          ;GO TEST NEXT BIT OF DEVICE MAP
1731
1732  004100  005237  001100    SETADR: INC     $UNIT           ;UPDATE UNIT NUMBER
1733  004104  006337  002632            ASL     TMP3            ;UPDATE DEVICE MAP TEST MASK
1734  004110  013702  002626            MOV     TMP1,R2         ;MOVE TABLE OFFSET TO R2
1735  004114  062737  000002  002626    ADD     #2,TMP1         ;UPDATE TABLE OFFSET FOR NEXT DEVICE
1736  004122  016200  002702            MOV     ADRTBL(R2),R0   ;PUT UUT ADDRESS INTO R0
1737  004126  012701  002634            MOV     #RCSR,R1        ;POINT R1 TO STORAGE AREA FOR UUT ADDRESSES
1738  004132  010021            ADR:    MOV     R0,(R1)+        ;TRANSFER UUT ADDRESS
1739  004134  062700  000002            ADD     #2,R0           ;POINT TO NEXT UUT REGISTER
1740  004140  030027  000006            BIT     R0,#6           ;FINISHED TRANSFER?
```

```
1741  004144  001372                    BNE     ADR             ;BR, IF NOT
1742
1743  004146  016200  002742            MOV     VCTTBL(R2),R0   ;PUT UUT VECTOR INTO R0
1744  004152  010021              VECT:  MOV     R0,(R1)+        ;TRANSFER UUT VECTORS TO ACTIVE TABLE AREA
1745  004154  062700  000002            ADD     #2,R0           ;POINT TO NEXT VECTOR
1746  004160  030027  000006            BIT     R0,#6           ;FINISHED TRANSFER?
1747  004164  001372                    BNE     VECT            ;BR, IF NOT
1748  004166  000137  004172            JMP     TST1            ;GO TEST DEVICE
1749
1750
```

```
1751
1752
1753                                    ;;*****************************************************************
1754                                    ;*TEST 1         TEST ABILITY TO REFERENCE TCSR
1755                                    ;;*****************************************************************
1756  004172  000004                    TST1:   SCOPE
1757  004174  013703  000004                    MOV     @#4,R3          ;SAVE TIMEOUT VECTOR
1758  004200  012737  004214  000004            MOV     #1$,@#4         ;SET UP TIMEOUT VECTOR
1759  004206  005777  176426                    TST     @TCSR           ;REFERENCE THE XMIT COMMAND/STATUS REG.
1760  004212  000412                            BR      4$              ; GO TO END OF TEST
1761
1762  004214  022626                    1$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER TIMEOUT
1763  004216  005737  002624                    TST     CTSTFL          ;CHECK IF DEVICE IS CONSOLE
1764  004222  001002                            BNE     2$              ;IF YES, SKIP ERROR TYPEOUT
1765  004224  104001                            ERROR+1         ;REPORT ERROR TO APT & TTY
1766  004226  000404                            BR      4$              ;BR TO END OF TEST
1767  004230                            2$:
1768  004230  004737  015462                    JSR     PC,$ATY4                ;;ONLY REPORT A FATAL ERROR
1769  004234  000001                            1                               ;;THE ERROR NUMBER (FROM APT LIST)
1770  004236  000000                    3$:     HALT
1771  004240  010337  000004            4$:     MOV     R3,@#4          ;RESTORE TIMEOUT VECTOR
1772
1773
1774
1775                                    ;;*****************************************************************
1776                                    ;*TEST 2         TEST ABILITY TO REFERENCE TBUF
1777                                    ;;*****************************************************************
1778  004244  000004                    TST2:   SCOPE
1779  004246  013703  000004                    MOV     @#4,R3          ;SAVE TIMEOUT VECTOR
1780  004252  012737  004266  000004            MOV     #1$,@#4         ;SET UP TIMEOUT VECTOR
1781  004260  005777  176356                    TST     @TBUF           ;REFERENCE THE XMIT BUFFER
1782  004264  000412                            BR      4$              ;GO TO END OF  TEST
1783
1784  004266  022626                    1$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER TIMEOUT
1785  004270  005737  002624                    TST     CTSTFL          ;CHECK IF DEVICE IS CONSOLE
1786  004274  001002                            BNE     2$              ;IF YES, SKIP ERROR TYPEOUT
1787  004276  104002                            ERROR+2         ;REPORT ERROR TO APT & TTY
1788  004300  000404                            BR      4$              ;BR TO END OF TEST
1789  004302                            2$:
1790  004302  004737  015462                    JSR     PC,$ATY4                ;;ONLY REPORT A FATAL ERROR
1791  004306  000002                            2                               ;;THE ERROR NUMBER (FROM APT LIST)
1792  004310  000000                    3$:     HALT
1793  004312  010337  000004            4$:     MOV     R3,@#4          ;RESTORE TIMEOUT VECTOR
```

```
                                        ;;*************************************************************
                                        ;*TEST 3         TEST THAT BIT2(MAINT. BIT) CAN BE SET & RESET
                                        ;;*************************************************************
004316  000004                  TST3:   SCOPE
004320  000005                          RESET                           ;CLEAR EVERYTHING
004322  032777  000004  176310          BIT     #BIT2,@TCSR             ;TEST FOR BIT2 OF TCSR CLEAR
004330  001411                          BEQ     3$                      ;BR IF CLEAR

004332  005737  002624                  TST     CTSTFL                  ;CHECK IF DEVICE IS CONSOLE
004336  001002                          BNE     1$                      ;IF YES, SKIP ERROR TYPEOUT
004340  104015                          ERROR+15                        ;BIT2 OF TCSR NOT CLEAR AFTER RESET
004342  000404                          BR      3$

004344                          1$:
004344  004737  015462                  JSR     PC,$ATY4                        ;;ONLY REPORT A FATAL ERROR
004350  000015                          15                              ;;THE ERROR NUMBER (FROM APT LIST)
004352  000000                  2$:     HALT

004354  052777  000004  176256  3$:     BIS     #BIT2,@TCSR             ;SET BIT2 OF TCSR
004362  032777  000004  176250          BIT     #BIT2,@TCSR             ;TEST FOR BIT2 SET
004370  001001                          BNE     4$                      ;BR IF SET

004372  104016                          ERROR+16                        ;BIT2 OF TCSR WILL NOT SET

004374  042777  000004  176236  4$:     BIC     #BIT2,@TCSR             ;CLEAR BIT2 OF TCSR
004402  032777  000004  176230          BIT     #BIT2,@TCSR             ;TEST BIT2 CLEAR
004410  001411                          BEQ     7$                      ;BR IF CLEAR

004412  005737  002624                  TST     CTSTFL                  ;CHECK IF DEVICE IS CONSOLE
004416  001002                          BNE     5$                      ;IF YES, SKIP ERROR TYPEOUT
004420  104017                          ERROR+17
004422  000404                          BR      7$
004424                          5$:
004424  004737  015462                  JSR     PC,$ATY4                        ;;ONLY REPORT A FATAL ERROR
004430  000017                          17                              ;;THE ERROR NUMBER (FROM APT LIST)
004432  000000                  6$:     HALT                            ;BIT0 OF TCSR WILL NOT CLEAR

004434  052777  000004  176176  7$:     BIS     #BIT2,@TCSR             ;SET BIT2 OF TCSR
004442  000005                          RESET                           ;CLEAR BIT2 WITH RESET
004444  032777  000004  176166          BIT     #BIT2,@TCSR             ;TEST FOR BIT2 CLEAR
004452  001404                          BEQ     10$                     ;** IF CLEAR, GO TO NEXT TEST

004454  042777  000004  176156          BIC     #BIT2,@TCSR             ;CLEAR BIT2, TO PRINT ERROR
004462  104020                          ERROR+20
                                                                        ;RESET DID NOT CLEAR BIT2 OF TCSR

004464  000240                  10$:    NOP                             ;**
                                        ;;*************************************************************
                                        ;*TEST 4         TEST THAT TCSR BIT7(DONE) CLEARS WHEN XBUF IS LOADED
                                        ;;*************************************************************
004466  000004                  TST4:   SCOPE
004470  052777  000004  176142          BIS     #BIT2,@TCSR             ;** ENABLE MAINT. WRAP
004476  005077  176140                  CLR     @TBUF                   ;LOAD XBUF
004502  105777  176132                  TSTB    @TCSR                   ;CHECK DONE
```

```
1850  004506  100021                          BPL     3$              ;BR IF CLEAR
1851                                                                  ;FILL SECOND BUFFER, BECAUSE REFRESH COULD CAUSE
1852                                                                  ;   FIRST TEST TO FAIL
1853  004510  005077  176126                  CLR     @TBUF           ;FILL DOUBLE BUFFER
1854  004514  105777  176120                  TSTB    @TCSR           ;CHECK DONE
1855  004520  100014                          BPL     3$              ;BR IF CLEAR
1856
1857  004522  005737  002624                  TST     CTSTFL          ;CHECK IF DEVICE IS CONSOLE
1858  004526  001005                          BNE     1$              ;IF YES, SKIP ERROR TYPEOUT
1859  004530  042777  000004  176122          BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
1860                                                                  ;** CONSOLE TO ALLOW FOR COMMUNICATION
1861                                                                  ;** WITH TERMINAL.
1862  004536  104003                          ERROR+3         ;DONE NOT CLEARED WITH TBUF FULL
1863  004540  000404                          BR      3$              ;BR TO END OF TEST
1864  004542                          1$:
1865  004542  004737  015462                  JSR     PC,$ATY4                ;;ONLY REPORT A FATAL ERROR
1866  004546  000003                          3                               ;;THE ERROR NUMBER (FROM APT LIST)
1867  004550  000000                  2$:     HALT                    ;TCSR "DONE" NOT CLEARED WITH TBUF FULL
1868  004552  005000                  3$:     CLR     R0              ;CLEAR TIMER
1869  004554  105777  176060          4$:     TSTB    @TCSR           ;CHECK FOR XMIT DONE
1870  004560  100417                          BMI     ID              ;IF DONE SETS, BR TO END OF TEST
1871  004562  005200                          INC     R0              ;INCREMENT TIMER
1872  004564  001373                          BNE     4$              ;BR IF TIMER NOT DONE
1873
1874  004566  005737  002624                  TST     CTSTFL          ;CHECK IF DEVICE IS CONSOLE
1875  004572  001005                          BNE     5$
1876  004574  042777  000004  176056          BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
1877                                                                  ;** CONSOLE TO ALLOW FOR COMMUNICATION
1878                                                                  ;** WITH TERMINAL.
1879  004602  104004                          ERROR+4         ;TCSR "DONE" DOES NOT SET
1880  004604  000405                          BR      ID              ;BR TO END OF TEST
1881  004606                          5$:
1882  004606  004737  015462                  JSR     PC,$ATY4                ;;ONLY REPORT A FATAL ERROR
1883  004612  000004                          4                               ;;THE ERROR NUMBER (FROM APT LIST)
1884  004614  000000                          HALT
1885  004616  000427                          BR      ENDB7           ;** BR TO NEXT TEST,
1886                                                                  ;** AND SKIP THE TYPEOUT THAT FOLLOWS
1887                                                                  ;**   BECAUSE OF THIS FAILURE
1888
1889  004620                          ID:
1890  004620  042777  000004  176032          BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
1891                                                                  ;** CONSOLE TO ALLOW FOR COMMUNICATION
1892                                                                  ;** WITH TERMINAL.
1893  004626  023737  000042  000046          CMP     @#42,@#46       ;UNDER ACT11?
1894  004634  001412                          BEQ     6$              ;IF YES, SKIP IDENT. TYPEOUT
1895  004636  005737  001074                  TST     $PASS           ;IS THIS THE FIRST PASS?
1896  004642  001007                          BNE     6$              ;IF NOT BR TO NEXT TEST & SKIP THE IDENTIFICATION TYPEOU
1897  004644  005737  001076                  TST     $DEVCT          ;IS THIS THE FIRST SUBPASS?
1898  004650  001004                          BNE     6$              ;IF NOT, BRTO NEXT TEST
1899  004652  104401                          TYPE                    ;TYPE PROGRAM INDENTIFICATION
1900  004654  024502                          M1
1901  004656  104401                          TYPE                    ;TYPE NUMBER OF DEVICES UNDER TEST
1902  004660  024540                          M2
1903  004662  032777  000020  174150  6$:     BIT     #BIT4,@SWR      ;CLOCK TEST ONLY?
1904  004670  001402                          BEQ     ENDB7           ;** BR IF NOT
1905  004672  000137  005536                  JMP     TCLOCK          ;ELSE, JUMP TO TEST CLOCK
```

```
1906  004676                          ENDB7:
1907  004676  005000                          CLR     R0              ;** DELAY ENOUGH TIME TO ALLOW ANY CHARACTERS
1908  004700  012701  000002                  MOV     #2,R1           ;** THAT MIGHT BE IN THE PROCESS OF BEING
1909  004704  005300                  40$:    DEC     R0              ;** TRANSMITTED TO FINISH BEFORE MAINTENANCE
1910  004706  001376                          BNE     40$             ;** WRAP FOR THE UART UNDER TEST IS DISABLED.
1911  004710  005301                          DEC     R1              ;** THIS WILL INHIBIT ANY COMMUNICATION
1912  004712  001374                          BNE     40$             ;** TO HARDWARE MEDIA SUCH AS TU58 THAT MIGHT
1913                                                                  ;** BE ATTACHED TO UART UNDER TEST.
1914
1915
1916                                  ;;*******************************************************************
1917                                  ;*TEST 5         TEST THAT TCSR "DONE" SETS WITH RESET
1918                                  ;;*******************************************************************
1919  004714  000004                  TST5:   SCOPE
1920  004716  052777  000004  175714          BIS     #BIT2,@TCSR     ;** ENABLE MAINT. WRAP
1921  004724  005077  175712                  CLR     @TBUF           ;LOAD TRANSMIT BUFFER
1922  004730  105777  175704          1$:     TSTB    @TCSR           ;WAIT FOR DONE
1923  004734  100375                          BPL     1$
1924  004736  005077  175700                  CLR     @TBUF           ;LOAD SECOND BUFFER
1925  004742  000240                          NOP
1926  004744  000005                          RESET                   ;CLEAR DONE WITH RESET
1927  004746  105777  175666                  TSTB    @TCSR           ;CHECK FOR DONE SET
1928  004752  100401                          BMI     10$             ;** BR TO NEXT TEST IF DONE SET
1929
1930  004754  104005                          ERROR+5         ;TCSR "DONE" DOES NOT SET WITH RESET
1931  004756  000240                  10$:    NOP                     ;**
1932
```

```
                                ;;*****************************************************************
                                ;*TEST 6         TEST ABILITY TO ACCESS RCSR
                                ;;*****************************************************************
004760  000004                  TST6:   SCOPE
004762  013703  000004                  MOV     @#4,R3          ;SAVE TIMEOUT VECTOR
004766  012737  005002  000004          MOV     #1$,@#4         ;SET UP TIMEOUT VECTOR
004774  005777  175634                  TST     @RCSR           ;ACCESS RCSR
005000  000402                          BR      2$              ;BR TO END OF TEST
                                
005002  022626                  1$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER TIMEOUT
005004  104006                          ERROR+6                 ;CAN NOT ACCESS RCSR
005006  010337  000004          2$:     MOV     R3,@#4          ;RESTORE TIMEOUT VECTOR
                                
                                
                                ;;*****************************************************************
                                ;*TEST 7         TEST ABILITY TO ACCESS RBUF
                                ;;*****************************************************************
005012  000004                  TST7:   SCOPE
005014  013703  000004                  MOV     @#4,R3          ;SAVE TIMEOUT VECTOR
005020  012737  005034  000004          MOV     #1$,@#4         ;SET UP TIMEOUT VECTOR
005026  005777  175604                  TST     @RBUF           ;ACCESS RBUF
005032  000402                          BR      2$              ;BR TO END OF TEST
                                
005034  022626                  1$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER TIMEOUT
005036  104007                          ERROR+7                 ;CAN NOT ACCESS RBUF
005040  010337  000004          2$:     MOV     R3,@#4          ;RESTORE TIMEOUT VECTOR
```

```
                                        ;;*************************************************************************
                                        ;*TEST 10        TEST THAT BIT0(BREAK BIT) CAN BE SET & CLEARED & RESET
                                        ;;*************************************************************************
005044  000004                  TST10:  SCOPE
005046  032777  000400  173764          BIT     #BIT8,@SWR      ;IS BREAK FUNCTION ENABLED?
005054  001475                          BEQ     10$             ;** BR TO NEXT TEST, IF NOT
005056  032737  000001  003002          BIT     #BIT0,FLAG44    ;** IS THIS A 11/44
005064  001407                          BEQ     9$              ;** NO
005066  005737  002624                  TST     CTSTFL          ;** YES THIS IS 11/44. IS THIS THE CONSOLE
                                                                ;** SLU
005072  001404                          BEQ     9$              ;** NO
005074  032777  000010  173736          BIT     #BIT03,@SWR     ;** THIS IS THE CONSOLE SLU.SHOULD THE BREAK
                                                                ;** TEST BE PERFORMED
005102  001462                          BEQ     10$             ;** NO
005104  000005                  9$:     RESET                   ;CLEAR EVERYTHING
005106  032777  000001  175524          BIT     #BIT0,@TCSR     ;CHECK BIT0 OF TCSR CLEAR
005114  001411                          BEQ     3$              ;BR IF CLEAR
005116  005737  002624                  TST     CTSTFL
005122  001002                          BNE     1$
005124  104011                          ERROR+11                ;BIT0 WAS NOT CLEAR AFTER RESET
005126  000404                          BR      3$
005130                          1$:
005130  004737  015462                  JSR     PC,$ATY4                ;;ONLY REPORT A FATAL ERROR
005134  000011                          11                              ;;THE ERROR NUMBER (FROM APT LIST)
005136  000000                  2$:     HALT

005140  052777  000001  175472  3$:     BIS     #BIT0,@TCSR     ;SET BIT0 IN TCSR
005146  032777  000001  175464          BIT     #BIT0,@TCSR     ;TEST BIT0 OF TCSR
005154  001001                          BNE     4$              ;BR IF SET

005156  104012                          ERROR+12                ;BIT0 OF TCSR WILL NOT SET
005160  042777  000001  175452  4$:     BIC     #BIT0,@TCSR     ;CLEAR BIT0 OF TCSR
005166  032777  000001  175444          BIT     #BIT0,@TCSR     ;TEST BIT0 OF TCSR
005174  001411                          BEQ     7$
005176  005737  002624                  TST     CTSTFL
005202  001002                          BNE     5$
005204  104013                          ERROR+13                ;BIT0 OF TCSR WILL NOT CLEAR
005206  000404                          BR      7$
005210                          5$:
005210  004737  015462                  JSR     PC,$ATY4                ;;ONLY REPORT A FATAL ERROR
005214  000013                          13                              ;;THE ERROR NUMBER (FROM APT LIST)
005216  000000                  6$:     HALT

005220  052777  000001  175412  7$:     BIS     #BIT0,@TCSR     ;SET BIT0 IN TCSR
005226  000005                          RESET                   ;CLEAR BIT0 WITH RESET
005230  032777  000001  175402          BIT     #BIT0,@TCSR     ;TEST BIT0 CLEAR
005236  001404                          BEQ     10$             ;** BR IF CLEAR
005240  042777  000001  175372          BIC     #BIT0,@TCSR     ;CLEAR BIT0, TO PRINT ERROR
005246  104014                          ERROR+14                ;RESET DID NOT CLEAR BIT0 OF TCSR
005250  000240                  10$:    NOP                     ;**
```

```
                                ;;*****************************************************************
                                ;*TEST 11       TEST THAT BIT6(XMIT INT EN) CAN BE SET & RESET
                                ;;*****************************************************************
005252  000004                TST11:  SCOPE
005254  000005                        RESET                           ;CLEAR EVERYTHING
005256  017703  175366                MOV     @TVECT,R3               ;SAVE XMIT VECTOR
005262  012777  005312  175360        MOV     #1$,@TVECT              ;SET UP INTERRUPT VECTOR FOR ERROR REPORT
005270  004737  014540                JSR     PC,WRPSW                        ;SET PSW TO PRIORITY=7
005274  000340                        .WORD   340
005276  032777  000100  175334        BIT     #BIT6,@TCSR             ;TEST BIT6 OF TCSR
005304  001404                        BEQ     2$                      ;BR IF ZERO
005306  104021                        ERROR+21
                                                                        ;BIT6 IN TCSR NOT CLEAR AFTER RESET
005310  000402                        BR      2$

005312  022626                1$:     CMP     (SP)+,(SP)+             ;RESTORE SP AFTER INTERRUPT
005314  104022                        ERROR+22
                                                                        ;XMIT INTERRUPT OCCURRED  PRIO=7

005316  052777  000100  175314  2$:     BIS     #BIT6,@TCSR             ;SET BIT6 OF TCSR
005324  032777  000100  175306        BIT     #BIT6,@TCSR             ;TEST BIT6 OF TCSR
005332  001001                        BNE     3$                      ;BR, IF SET

005334  104023                        ERROR+23
                                                                        ;CANNOT SET BIT6 OF TCSR

005336  042777  000100  175274  3$:     BIC     #BIT6,@TCSR             ;CLEAR BIT6 OF TCSR
005344  032777  000100  175266        BIT     #BIT6,@TCSR             ;TEST BIT6 OF TCSR
005352  001401                        BEQ     4$                      ;BR IF CLEAR
005354  104024                        ERROR+24
                                                                        ;CANNOT CLEAR BIT6 OF TCSR

005356  052777  000100  175254  4$:     BIS     #BIT6,@TCSR             ;SET BIT6 OF TCSR
005364  000005                        RESET                           ;CLEAR BIT6 WITH RESET
005366  032777  000100  175244        BIT     #BIT6,@TCSR             ;TEST BIT6 OF TCSR
005374  001401                        BEQ     5$                      ;BR IF CLEAR

005376  104025                        ERROR+25
                                                                        ;CANNOT CLEAR BIT6 OF TCSR WITH RESET
005400  010377  175244          5$:     MOV     R3,@TVECT               ;RESTORE XMIT VECTOR
```

```
                                ;;*****************************************************************
                                ;*TEST 12       TEST THAT BIT6 OF RCSR CAN BE SET & RESET
                                ;;*****************************************************************
005404  000004                  TST12:  SCOPE
005406  000005                          RESET                   ;CLEAR EVERYTHING
005410  017703  175230                  MOV     @RVECT,R3       ;SAVE RECEIVE VECTOR
005414  012777  005444  175222          MOV     #1$,@RVECT      ;SET UP INTERRUPT VECTOR FOR ERROR REPORT
005422  004737  014540                  JSR     PC,WRPSW        ;SET PSW TO PRIORITY=7
005426  000340                          .WORD   340
005430  032777  000100  175176          BIT     #BIT6,@RCSR     ;TEST BIT6 OF RCSR
005436  001404                          BEQ     2$
005440  104026                          ERROR+26
                                                                ;BIT6 OF RCSR NOT CLEAR AFTER RESET
005442  000402                          BR      2$

005444  022626                  1$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
005446  104027                          ERROR+27
                                                                ;RCVR INTERRUPT WITH PRIORITY=7

005450  052777  000100  175156  2$:     BIS     #BIT6,@RCSR     ;SET BIT6 OF RCSR
005456  032777  000100  175150          BIT     #BIT6,@RCSR     ;TEST BIT6 OF RCSR
005464  001001                          BNE     3$              ;BR, IF SET

005466  104030                          ERROR+30
                                                                ;CANNOT SET BIT6 OF RCSR

005470  042777  000100  175136  3$:     BIC     #BIT6,@RCSR     ;CLEAR BIT6 OF RCSR
005476  032777  000100  175130          BIT     #BIT6,@RCSR     ;TEST BIT6 OF RCSR
005504  001401                          BEQ     4$              ;BR, IF CLEAR

005506  104031                          ERROR+31
                                                                ;CANNOT CLEAR BIT6 OF RCSR

005510  052777  000100  175116  4$:     BIS     #BIT6,@RCSR     ;SET BIT6 OF RCSR
005516  000005                          RESET                   ;CLEAR BIT6OF RCSR WITH RESET
005520  032777  000100  175106          BIT     #BIT6,@RCSR     ;TEST BIT6 OF RCSR
005526  001401                          BEQ     5$              ;BR, IF CLEAR

005530  104032                          ERROR+32
                                                                ;CANNOT CLEAR BIT6 OF RCSR WITH RESET
005532  010377  175106          5$:     MOV     R3,@RVECT       ;RESTORE RECEIVE VECTOR
```

```
2103
2104  005536  012737  000012  001002  TCLOCK: MOV     #12,$TSTNM      ;ADJUST TEST NUMBER TO (NEXT TEST - 1)
2105                                  ;;**************************************************************
2106                                  ;*TEST 13       TEST ABILITY TO ACCESS LKS
2107                                  ;;**************************************************************
2108  005544  000004                 TST13:  SCOPE
2109  005546  005737  002624                 TST     CTSTFL          ;IS CONSOLE UNDER TEST?
2110  005552  001420                 BEQ     TST14           ;IF NOT, SKIP THIS TEST
2111  005554  032777  000100  173256 BIT     #BIT6,@SWR      ;ARE LINE CLOCK TESTS INHIBITED?
2112  005562  001014                 BNE     TST14           ;IF YES, SKIP THIS TEST
2113  005564  013703  000004         MOV     @#4,R3          ;SAVE TIMEOUT VECTOR
2114  005570  012737  005604  000004 MOV     #1$,@#4         ;SET UP TIMEOUT VECTOR
2115  005576  005777  175072         TST     @LKS            ;ACCESS LKS
2116  005602  000402                 BR      2$              ;NO TIMEOUT -  BR TO END OF TEST
2117
2118  005604  022626          1$:    CMP     (SP)+,(SP)+     ;RESTORE SP AFTER TIMEOUT
2119  005606  104010                 ERROR+10                ;CAN NOT ACCESS LKS
2120
2121  005610  010337  000004  2$:    MOV     R3,@#4          ;RESTORE TIMEOUT VECTOR
2122
2123                                  ;;**************************************************************
2124                                  ;*TEST 14       TEST THAT BIT6 OF LKS CAN BE SET & RESET
2125                                  ;;**************************************************************
2126  005614  000004                 TST14:  SCOPE
2127  005616  005737  002624                 TST     CTSTFL          ;IS CONSOLE UNDER TEST?
2128  005622  001460                 BEQ     TST15           ;IF NOT, SKIP THIS TEST
2129  005624  032777  000100  173206 BIT     #BIT6,@SWR      ;ARE LINE CLOCK TESTS INHIBITED?
2130  005632  001054                 BNE     TST15           ;IF YES, SKIP THIS TEST
2131  005634  000005                 RESET
2132  005636  017703  175034         MOV     @RTCVT,R3       ;SAVE LINE CLOCK VECTOR
2133  005642  012777  005672  175026 MOV     #1$,@RTCVT      ;SET UP INTERRUPT VECTOR FOR ERROR REPORT
2134  005650  004737  014540         JSR     PC,WRPSW        ;SET PSW TO PRIORITY 7
2135  005654  000340                 .WORD   340
2136  005656  032777  000100  175010 BIT     #BIT6,@LKS      ;TEST BIT6 OF LKS
2137  005664  001404                 BEQ     2$
2138  005666  104033                 ERROR+33
2139                                                          ;BIT6 OF LKS NOT CLEAR AFTER RESET
2140  005670  000402                 BR      2$
2141
2142  005672  022626          1$:    CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
2143  005674  104034                 ERROR+34
2144                                                          ;LKS INTERRUPT WITH PRIORITY=7
2145
2146  005676  052777  000100  174770 2$:    BIS     #BIT6,@LKS      ;SET BIT6 OF LKS
2147  005704  032777  000100  174762 BIT     #BIT6,@LKS      ;TEST BIT6 OF LKS
2148  005712  001001                 BNE     3$              ;BR IF SET
2149
2150  005714  104035                 ERROR+35
2151                                                          ;CANNOT SET BIT6 OF LKS
2152
2153  005716  042777  000100  174750 3$:    BIC     #BIT6,@LKS      ;CLEAR BIT6 OF LKS
2154  005724  032777  000100  174742 BIT     #BIT6,@LKS      ;TEST BIT6 OF LK
2155  005732  001401                 BEQ     4$
2156  005734  104036                 ERROR+36
2157                                                          ;CANNOT CLEAR BIT6 OF LKS
2158  005736  052777  000100  174730 4$:    BIS     #BIT6,@LKS      ;SET BIT6 OF LKS
```

```
 2159  005744  000005                          RESET                   ;CLEAR BIT6 OF LKS WITH RESET
 2160  005746  032777  000100  174720          BIT     #BIT6,@LKS      ;TEST BIT6 OF LKS
 2161  005754  001401                          BEQ     5$              ;BR IF CLEAR
 2162
 2163  005756  104037                          ERROR+37
 2164                                                                  ;CANNOT CLEAR BIT6 OF LKS WITH RESET
 2165  005760  010377  174712          5$:     MOV     R3,@RTCVT       ;RESTORE LINE CLOCK VECTOR
```

```
                                ;;*****************************************************************
                                ;*TEST 15       TEST FOR DUAL ADDRESSING OF REGISTERS
                                ;;*****************************************************************
005764  000004                  TST15:  SCOPE
005766  013703  000004                  MOV     @#4,R3          ;SAVE TIMEOUT VECTOR
005772  013704  000006                  MOV     @#6,R4          ;SAVE TIMEOUT PSW
005776  012737  006130  000004          MOV     #4$,@#4         ;SET UP TIMEOUT VECTOR
006004  012737  000340  000006          MOV     #340,@#6        ;KEEP PRIO=7
006012  000005                          RESET                   ;CLEAR EVERYTHING
006014  012700  000002                  MOV     #BIT1,R0        ;SET UP BIT MASK
006020  032777  000020  173012          BIT     #BIT4,@SWR      ;CLOCK TEST ONLY?
006026  001404                          BEQ     1$              ;BR IF NOT
006030  013737  002674  001020          MOV     LKS,$GDADR      ;ELSE, MOVE GOOD LKS ADDRESS INTO $GDADR
006036  000403                          BR      2$
006040  013737  002634  001020  1$:     MOV     RCSR,$GDADR     ;MOVE GOOD RCSR ADDRESS INTO $GDADR
006046  013737  001020  001022  2$:     MOV     $GDADR,$BDADR   ;MOVE GOOD ADDRESS INTO TEST ADDRESS LOCATION
006054  040037  001022                  BIC     R0,$BDADR       ;CREATE BAD ADDRESS BY COMPLEMENTING ONE BIT
006060  023737  001020  001022          CMP     $GDADR,$BDADR   ;ARE ADDRESSES IDENTICAL?
006066  001002                          BNE     3$              ;IF NOT, TEST THIS ADDRESS
006070  050037  001022                  BIS     R0,$BDADR       ;ELSE, BIT SET THIS BIT POSITION TO GENERATE BAD ADDRESS
006074  017737  172722  001024  3$:     MOV     @$BDADR,$GDDAT  ;SAVE CONTENTS OF BAD ADDRESS IF IT EXISTS
006102  052777  000100  172712          BIS     #BIT6,@$BDADR   ;SET BIT6 USING BAD ADDRESS
006110  032777  000100  172702          BIT     #BIT6,@$GDADR   ;CHECK TO SEE IF GOOD ADDRESS CONTAINS BIT6
006116  001011                          BNE     6$              ;BR IF SET ---> ERROR
006120  013777  001024  172674          MOV     $GDDAT,@$BDADR  ;RESTORE ANY MEMORY LOCATION THAT WAS ALTERED
006126  000401                          BR      5$              ;BR TO CONTINUE TEST
006130  022626                  4$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER TIMEOUT
006132  006300                  5$:     ASL     R0              ;SHIFT BIT MASK TO NEXT POSITION
006134  105700                          TSTB    R0              ;COMPLEMENTED ALL BITS FROM 1 - 7?
006136  100343                          BPL     2$              ;BR, IF NOT.
006140  000401                          BR      7$              ;BR TO NEXT TEST
                                
006142  104040                  6$:     ERROR+40                ;DUAL ADDRESSING ERROR
                                                                ;$BDADR = DUAL ADDRESS
                                                                ;$GDADR = GOOD ADDRESS
                                
006144  010337  000004          7$:     MOV     R3,@#4          ;RESTORE TIMEOUT VECTOR
006150  010437  000006                  MOV     R4,@#6          ;RESTORE TIMEOUT PSW
```

```
2206
2207
2208                                    ;;*****************************************************************
2209                                    ;*TEST 16       TEST THAT BIT7 OF LKS SETS & CAN BE CLEARED
2210                                    ;;*****************************************************************
2211  006154  000004                   TST16:  SCOPE
2212  006156  005737  002624                   TST     CTSTFL          ;IS CONSOLE UNDER TEST?
2213  006162  001437                           BEQ     TST17           ;IF NOT, SKIP THIS TEST
2214  006164  032777  000100  172646           BIT     #BIT6,@SWR      ;ARE LINE CLOCK TESTS INHIBITED?
2215  006172  001033                           BNE     TST17           ;IF YES, SKIP THIS TEST
2216  006174  000005                           RESET                   ;CLEAR EVERYTHING & SET BIT7 OF LKS
2217  006176  105777  174472           1$:     TSTB    @LKS            ;TEST FOR BIT7 OF LKS
2218  006202  100401                           BMI     2$              ;BR IF SET
2219
2220  006204  104041                           ERROR+41                ;BIT7 OF LKS DID NOT SET WITH RESET
2221
2222  006206  042777  000200  174460   2$:     BIC     #BIT7,@LKS      ;CLEAR BIT7 OF LKS
2223  006214  032777  000200  174452           BIT     #BIT7,@LKS      ;TEST BIT7 OF LKS
2224  006222  001410                           BEQ     3$
2225  006224  042777  000200  174442           BIC     #BIT7,@LKS      ;TRY ONE MORE TIME BECAUSE THE CLOCK
2226  006232  032777  000200  174434           BIT     #BIT7,@LKS      ;  MAY HAVE SET IMMEDIATELY AFTER THE FIRST CLEAR
2227  006240  001401                           BEQ     3$
2228
2229  006242  104042                           ERROR+42                ;CAN NOT CLEAR BIT7 OF LKS
2230
2231  006244  005000                   3$:     CLR     R0              ;CLEAR TIMER
2232  006246  105777  174422           CONT:   TSTB    @LKS            ;TEST FOR BIT7 OF LKS
2233  006252  100403                           BMI     TST17           ;BR, IF SET
2234  006254  005200                           INC     R0              ;INCREMENT TIMER
2235  006256  001373                           BNE     CONT            ;CONTINUE UNTIL TIME EXPIRES
2236
2237  006260  104043                           ERROR+43                ;BIT7 OF LKS DOES NOT SET
2238
```

```
                                ;;*****************************************************************
                                ;*TEST 17       TEST THAT THE REAL TIME CLOCK INTERRUPTS PROPERLY
                                ;;*****************************************************************
006262  000004                  TST17:  SCOPE
006264  005737  002624                  TST     CTSTFL          ;IS CONSOLE UNDER TEST?
006270  001505                          BEQ     TST20           ;IF NOT, SKIP THIS TEST
006272  032777  000100  172540          BIT     #BIT6,@SWR      ;ARE LINE CLOCK TESTS INHIBITED?
006300  001101                          BNE     TST20           ;IF YES, SKIP THIS TEST
006302  004737  014540                  JSR     PC,WRPSW        ;SET PSW TO PRIORITY 7
006306  000340                                  .WORD   340
006310  017703  174362                  MOV     @RTCVT,R3       ;SAVE LINE CLOCK VECTOR
006314  017704  174360                  MOV     @RTCPSW,R4      ;SAVE LINE CLOCK PSW VECTOR
006320  012777  006364  174350          MOV     #2$,@RTCVT      ;SET RTC INTERRUPT VECTOR TO ERROR REPORT
006326  012777  000340  174344          MOV     #340,@RTCPSW    ;KEEP PRIORITY AT 7
006334  042777  000200  174332          BIC     #BIT7,@LKS      ;CLEAR CLOCK DONE FLAG
006342  052777  000100  174324          BIS     #BIT6,@LKS      ;SET INTERRUPT ENABLE
006350  105777  174320          1$:     TSTB    @LKS            ;WAIT FOR RTC DONE(INTERRUPT REQUEST)
006354  100375                          BPL     1$
006356  000240                          NOP                     ;GIVE TIME FOR ANY INTERRUPTS
006360  000240                          NOP                     ;GIVE TIME FOR ANY INTERRUPTS
006362  000402                          BR      3$              ;BR, IF NO INTERRUPT OCCURS
                                
006364  022626                  2$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
006366  104044                          ERROR+44                ;RTC INTERRUPTS AT PRIORITY 7
                                
006370  005077  174300          3$:     CLR     @LKS    ;DISABLE RTC INTERRUPTS & CLEAR DONE
006374  012777  006424  174274          MOV     #4$,@RTCVT      ;SET RTC INTERRUPT VECTOR FOR ERROR
006402  004737  014540                  JSR     PC,WRPSW        ;CHANGE PSW TO PRIORITY 5
006406  000240                                  .WORD   240
006410  105777  174260          20$:    TSTB    @LKS            ;WAIT FOR DONE (INTERRUPT REQUEST)
006414  100375                          BPL     20$
006416  000240                          NOP                     ;GIVE TIME FOR ANY INTERRUPT
006420  000240                          NOP                     ;GIVE TIME FOR ANY INTERRUPT
006422  000402                          BR      5$              ;IF NO INTERRUPT - BR TO CONTINUE TEST
                                
006424  022626                  4$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
006426  104045                          ERROR+45                ;RTC INTERRUPTS WITH INTERRUPTS DISABLED
                                
006430  012777  006464  174240  5$:     MOV     #7$,@RTCVT      ;POINT RTC VECTOR TO END OF TEST
006436  042777  000200  174230          BIC     #BIT7,@LKS      ;CLEAR CLOCK DONE FLAG
006444  052777  000100  174222          BIS     #BIT6,@LKS      ;ALLOW INTERRUPTS
006452  105777  174216          6$:     TSTB    @LKS            ;WAIT FOR RTC DONE
006456  100375                          BPL     6$
006460  000240                          NOP                     ;GIVE TIME FOR INTERRUPT
                                
006462  104046                          ERROR+46                ;RTC INTERRUPT DID NOT OCCUR
                                
006464  022626                  7$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
006466  042777  000100  174200          BIC     #BIT6,@LKS      ;DISABLE INTERRUPTS
006474  010377  174176                  MOV     R3,@RTCVT       ;RESTORE LINE CLOCK VECTOR
006500  010477  174174                  MOV     R4,@RTCPSW      ;RESTORE LINE CLOCK PSW VECTOR
```

```
                                        ;;*********************************************************************
                                        ;*TEST 20       TEST RTC FOR DOUBLE INTERRUPTS
                                        ;;*********************************************************************
006504  000004                  TST20:  SCOPE
006506  005737  002624                  TST     CTSTFL          ;IS CONSOLE UNDER TEST?
006512  001462                          BEQ     TST21           ;IF NOT, SKIP THIS TEST
006514  032777  000100  172316          BIT     #BIT6,@SWR      ;ARE LINE CLOCK TESTS INHIBITED?
006522  001056                          BNE     TST21           ;IF YES, SKIP THIS TEST
006524  000005                          RESET                   ;CLEAR EVERYTHING
006526  017703  174144                  MOV     @RTCVT,R3       ;SAVE LINE CLOCK VECTOR
006532  017704  174142                  MOV     @RTCPSW,R4      ;SAVE LINE CLOCK PSW VECTOR
006536  012777  006606  174132          MOV     #2$,@RTCVT      ;SET UP RTC INTERRUPT VECTOR
006544  012777  000340  174126          MOV     #340,@RTCPSW    ;DISALLOW INTERRUPTS AFTER THE INTERRUPT
006552  004737  014540                  JSR     PC,WRPSW        ;SET PRIORITY TO 5
006556  000240                          .WORD   240
006560  042777  000200  174106          BIC     #BIT7,@LKS      ;CLEAR CLOCK DONE FLAG
006566  052777  000100  174100          BIS     #BIT6,@LKS      ;ENABLE CLOCK INTERRUPTS
006574  105777  174074          1$:     TSTB    @LKS            ;WAIT FOR DONE
006600  100375                          BPL     1$
006602  000240                          NOP                     ;GIVE TIME FOR ANY INTERRUPT

006604  104047                          ERROR+47                ;RTC INTERRUPT DID NOT OCCUR

006606  022626                  2$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
006610  012777  006636  174060          MOV     #3$,@RTCVT      ;POINT RTC VECTOR TO ERROR REPORT
006616  004737  014540                  JSR     PC,WRPSW        ;SET PSW TO PRIORITY 5
006622  000240                          .WORD   240
006624  000240                          NOP                     ;GIVE SOME TIME FOR AN INTERRUPT
006626  000240                          NOP                     ;GIVE SOME TIME FOR AN INTERRUPT
006630  000240                          NOP                     ;GIVE SOME TIME FOR AN INTERRUPT
006632  000240                          NOP                     ;GIVE SOME TIME FOR AN INTERRUPT
006634  000402                          BR      4$              ;NO INTERRUPT - BR TO END OF TEST

006636  022626                  3$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
006640  104050                          ERROR+50                ;INTERRUPT SEQUENCE DID NOT CLEAR
                                                                ;INTERRUPT REQUEST

006642  042777  000100  174024  4$:     BIC     #BIT6,@LKS      ;DISABLE CLOCK INTERRUPTS
006650  010377  174022                  MOV     R3,@RTCVT       ;RESTORE LINE CLOCK VECTOR
006654  010477  174020                  MOV     R4,@RTCPSW      ;RESTORE LINE CLOCK PSW VECTOR
```

```
2336
2337
2338                                    ;;*****************************************************************
2339                                    ;*TEST 21       TEST THAT RTC INTERRUPT CLEARS WITH RESET
2340                                    ;;*****************************************************************
2341  006660  000004                    TST21:  SCOPE
2342  006662  005737  002624                    TST     CTSTFL          ;IS CONSOLE UNDER TEST?
2343  006666  001445                            BEQ     TST22           ;IF NOT, SKIP THIS TEST
2344  006670  032777  000100  172142            BIT     #BIT6,@SWR      ;ARE LINE CLOCK TESTS INHIBITED?
2345  006676  001041                            BNE     TST22           ;IF YES, SKIP THIS TEST
2346  006700  004737  014540                    JSR     PC,WRPSW        ;SET PRIORITY TO 7
2347  006704  000340                                    .WORD   340
2348  006706  017703  173764                    MOV     @RTCVT,R3       ;SAVE LINE CLOCK VECTOR
2349  006712  012777  006772  173756            MOV     #2$,@RTCVT      ;POINT RTC VECTOR TO ERROR REPORT
2350  006720  042777  000200  173746            BIC     #BIT7,@LKS      ;CLEAR CLOCK DONE FLAG
2351  006726  052777  000100  173740            BIS     #BIT6,@LKS      ;ENABLE CLOCK INTERRUPTS
2352  006734  105777  173734            1$:     TSTB    @LKS            ;WAIT FOR DONE (INTERRUPT REQUEST)
2353  006740  100375                            BPL     1$
2354  006742  000005                            RESET                   ;CLEAR PENDING INTERRUPT WITH RESET
2355  006744  004737  014540                    JSR     PC,WRPSW        ;SET PRIORITY TO 5
2356  006750  000240                                    .WORD   240
2357  006752  000240                            NOP                     ;GIVE TIME FOR ANY INTERRUPT
2358  006754  000240                            NOP                     ;GIVE TIME FOR ANY INTERRUPT
2359  006756  000240                            NOP                     ;GIVE TIME FOR ANY INTERRUPT
2360  006760  000240                            NOP                     ;GIVE TIME FOR ANY INTERRUPT
2361  006762  042777  000100  173704            BIC     #BIT6,@LKS      ;DISALLOW INTERRUPTS
2362  006770  000402                            BR      3$              ;BR TO END OF TEST
2363
2364  006772  022626                    2$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
2365  006774  104051                            ERROR+51                ;RESET DID NOT CLEAR INTERRUPT
2366
2367  006776  010377  173674            3$:     MOV     R3,@RTCVT       ;RESTORE LINE CLOCK VECTOR
```

```
                                ;;*****************************************************************
                                ;*TEST 22       TEST THAT RTC INTERRUPT CLEARS BY CLEARING BIT7 OF LKS
                                ;;*****************************************************************
007002  000004          TST22:  SCOPE
007004  005737  002624          TST     CTSTFL          ;IS CONSOLE UNDER TEST?
007010  001452                  BEQ     TST23           ;IF NOT, SKIP THIS TEST
007012  032777  000100  172020  BIT     #BIT6,@SWR      ;ARE LINE CLOCK TESTS INHIBITED?
007020  001046                  BNE     TST23           ;IF YES, SKIP THIS TEST
007022  004737  014540          JSR     PC,WRPSW        ;SET PRIORITY TO 7
007026  000340                  .WORD   340
007030  017703  173642          MOV     @RTCVT,R3       ;SAVE LINE CLOCK VECTOR
007034  012777  007120  173634  MOV     #2$,@RTCVT      ;POINT RTC VECTOR TO ERROR REPORT
007042  042777  000200  173624  BIC     #BIT7,@LKS      ;CLEAR CLOCK DONE FLAG
007050  052777  000100  173616  BIS     #BIT6,@LKS      ;ENABLE CLOCK INTERRUPTS
007056  105777  173612  1$:     TSTB    @LKS            ;WAIT FOR DONE (INTERRUPT REQUEST)
007062  100375                  BPL     1$
007064  042777  000200  173602  BIC     #BIT7,@LKS      ;CLEAR DONE & INTERRUPT
007072  004737  014540          JSR     PC,WRPSW        ;ALLOW INTERRUPTS
007076  000240                  .WORD   240
007100  000240                  NOP                     ;GIVE TIME FOR ANY INTERRUPT
007102  000240                  NOP                     ;GIVE TIME FOR ANY INTERRUPT
007104  000240                  NOP                     ;GIVE TIME FOR ANY INTERRUPT
007106  000240                  NOP                     ;GIVE TIME FOR ANY INTERRUPT
007110  042777  000100  173556  BIC     #BIT6,@LKS      ;DISALLOW INTERRUPTS
007116  000402                  BR      3$              ;BR TO END OF TEST

007120  022626          2$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
007122  104052                  ERROR+52                ;CLEARING BIT7 OF LKS DID NOT CLEAR INTERRUPT

007124  010377  173546  3$:     MOV     R3,@RTCVT       ;RESTORE LINE CLOCK VECTOR
007130  004737  014540          JSR     PC,WRPSW        ;RESTORE PRIORITY TO 7
007134  000340                  .WORD   340
```

```
                                ;;*****************************************************************
                                ;*TEST 23        TEST CLOCK REPEATABILITY
                                ;;*****************************************************************
007136  000004          TST23:  SCOPE
007140  005737  002624          TST     CTSTFL          ;IS CONSOLE UNDER TEST?
007144  001467          BEQ     TST24           ;IF NOT, SKIP THIS TEST
007146  032777  000100  171664  BIT     #BIT6,@SWR      ;ARE LINE CLOCK TESTS INHIBITED?
007154  001063          BNE     TST24           ;IF YES, SKIP THIS TEST
007156  042777  000100  173510  BIC     #BIT6,@LKS      ;DISALLOW INTERRUPTS

007164  005000          CLR     R0              ;CLEAR A TIMER
007166  012701  177777  MOV     #-1,R1          ;SET A FLAG INDICATING FIRST PASS THRU THIS LOOP
007172  005002  1$:     CLR     R2              ;CLEAR CLOCK COUNTER
007174  005077  173474  CLR     @LKS            ;CLEAR DONE
007200  105777  173470  2$:     TSTB    @LKS            ;SYNC ON DONE
007204  100375          BPL     2$
007206  005077  173462  CLR     @LKS            ;CLEAR DONE
007212  105777  173456  3$:     TSTB    @LKS            ;IS CLOCK DONE?
007216  100003          BPL     4$              ;BR IF NOT , TO INCREMENT TIMER
007220  005202          INC     R2              ;IF DONE, INCREMENT CLOCK COUNT
007222  005077  173446  CLR     @LKS            ;CLEAR DONE
007226  005200  4$:     INC     R0              ;INCREMENT TIMER
007230  001370          BNE     3$              ;BR IF TIME REMAINS
007232  005201          INC     R1              ;INCREMENT LOOP PASS FLAG
007234  001003          BNE     CMPARE          ;BR IF TWO PASSES HAVE BEEN MADE
007236  010237  002336  MOV     R2,FIRST        ;IF NOT, STORE FIRST CLOCK COUNT
007242  000753          BR      1$              ;DO LOOP AGAIN
007244  013701  002336  CMPARE: MOV     FIRST,R1        ;RECALL FIRST CLOCK COUNT
007250  160201          SUB     R2,R1           ;CALCULATE DIFFERENCE OF TWO COUNTS
007252  100001          BPL     TOLER           ;IF POSITIVE,SKIP NEGATION OF DIFFERENCE
007254  005401          NEG     R1              ;MAKE DIFFERENCE A POSITIVE NUMBER
007256  032737  000001  003002  TOLER:  BIT #BIT0,FLAG44        ;** IS THIS A 11/44
007264  001403          BEQ 6$                  ;** NO
007266  020127  000002          CMP R1,#2               ;** YES; COMPARE DIFFERENCE WITH DESIRED
                                                        ;** TOLERANCE OF 2
007272  000402          BR 7$                   ;**
007274  020127  000001  6$:     CMP     R1,#1           ;COMPARE DIFFERENCE WITH DESIRED TOLERANCE
007300  003403          7$:     BLE     5$              ;BR, IF LOWER/EQUAL TO TOLERANCE

007302  010237  002616          MOV     R2,SECND        ;STORE SECOND COUNT
007306  104053          ERROR+53                ;CLOCK REPEATABILITY ERROR

007310  032777  000020  171522  5$:     BIT     #BIT4,@SWR      ;CLOCK TESTS ONLY?
007316  001402          BEQ     TST24           ;BR IF NOT
007320  000137  014400          JMP     $EOP            ;ELSE, JUMP TO END OF PASS ROUTINE
```

```
2451
2452
2453                                    ;;*****************************************************************
2454                                    ;*TEST 24        TEST THAT XMIT INTERRUPTS ONLY WHEN ENABLED
2455                                    ;;*****************************************************************
2456  007324  000004                    TST24:  SCOPE
2457  007326  042777  000100  173304            BIC     #BIT6,@TCSR     ;CLEAR TRANSMIT INTERRUPT ENABLE
2458  007334  017703  173310                    MOV     @TVECT,R3       ;SAVE XMIT VECTOR
2459  007340  012777  007364  173302            MOV     #2$,@TVECT      ;POINT XMIT VECTOR TO ERROR REPORT
2460  007346  105777  173266            1$:     TSTB    @TCSR           ;WAIT FOR DONE
2461  007352  100375                    BPL     1$
2462  007354  004737  014540                    JSR     PC,WRPSW        ;SET PSW TO PRIORITY 3
2463  007360  000140                            .WORD   140
2464  007362  000402                    BR      3$
2465
2466  007364  022626                    2$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
2467  007366  104054                    ERROR+54
2468                                                                    ;XMIT INTERRUPTS WITH INTERRUPT ENABLE CLEAR
2469  007370  012777  007416  173252    3$:     MOV     #4$,@TVECT      ;SET XMIT VECTOR TO END OF TEST
2470  007376  052777  000100  173234            BIS     #BIT6,@TCSR     ;ENABLE INTERRUPTS
2471  007404  000240                    NOP                             ;**
2472  007406  000240                    NOP                             ;**
2473  007410  000240                    NOP                             ;**
2474  007412  000240                    NOP                             ;**
2475
2476  007414  104055                    ERROR+55                        ;XMIT DID NOT INTERRUPT
2477
2478  007416  042777  000100  173214    4$:     BIC     #BIT6,@TCSR     ;DISABLE INTERRUPTS
2479  007424  022626                    CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
2480  007426  010377  173216                    MOV     R3,@TVECT       ;RESTORE XMIT VECTOR
2481
```

```
                                ;;*********************************************************************
                                ;*TEST 25       TEST THAT XMIT INTERRUPTS DO NOT OCCUR WHEN DISABLED
                                ;;*********************************************************************
007432  000004                  TST25:  SCOPE
007434  042777  000100  173176          BIC     #BIT6,@TCSR     ;DISABLE INTERRUPTS
007442  004737  014540                  JSR     PC,WRPSW        ;SET PSW TO PRIORITY 7
007446  000340                          .WORD   340
007450  017703  173174                  MOV     @TVECT,R3       ;SAVE XMIT VECTOR
007454  012777  007510  173166          MOV     #2$,@TVECT      ;POINT XMIT VECTOR TO ERROR REPORT
007462  105777  173152          1$:     TSTB    @TCSR           ;WAIT FOR DONE
007466  100375                  BPL     1$
007470  052777  000100  173142          BIS     #BIT6,@TCSR     ;ENABLE INTERRUPT
007476  000240                          NOP                     ;**
007500  000240                          NOP                     ;**
007502  000240                          NOP                     ;**
007504  000240                          NOP                     ;**
007506  000402                          BR      3$              ;CONTINUE TEST
                                
007510  022626                  2$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
007512  104056                  ERROR+56
                                                                ;XMIT INTERRUPTS AT PRIORITY=7
007514  042777  000100  173116  3$:     BIC     #BIT6,@TCSR     ;CLEAR INTERRUPT ENABLE
007522  012777  007550  173120          MOV     #4$,@TVECT      ;POINT XMIT VECTOR TO ERROR REPORT
007530  004737  014540                  JSR     PC,WRPSW        ;SET PSW TO PRIORITY 3
007534  000140                          .WORD   140
007536  000240                          NOP                     ;**
007540  000240                          NOP                     ;**
007542  000240                          NOP                     ;**
007544  000240                          NOP                     ;**
007546  000402                          BR      5$              ;BR TO END OF TEST-NO INTERRUPT
                                
007550  022626                  4$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
007552  104057                  ERROR+57
                                                                ;XMIT INTERRUPT OCCURES WITH BIT6 CLEAR
007554  010377  173070          5$:     MOV     R3,@TVECT       ;RESTORE XMIT VECTOR
```

```
                                        ;;*********************************************************************
                                        ;*TEST 26       TEST TRANSMITTER FOR DOUBLE INTERRUPTS
                                        ;;*********************************************************************
007560  000004                  TST26:  SCOPE
007562  042777  000100  173050          BIC     #BIT6,@TCSR     ;CLEAR INTERRUPT ENABLE
007570  017703  173054                  MOV     @TVECT,R3       ;SAVE XMIT VECTOR
007574  017704  173052                  MOV     @TPSW,R4        ;SAVE XMIT PSW VECTOR
007600  012777  007650  173042          MOV     #2$,@TVECT      ;SET UP XMIT VECTOR
007606  012777  000340  173036          MOV     #340,@TPSW      ;SET PIO 7 AFTER INTERRUPT
007614  004737  014540                  JSR     PC,WRPSW        ;SET PSW TO PRIORITY 3
007620  000140                          .WORD   140
007622  105777  173012          1$:     TSTB    @TCSR           ;WAIT FOR DONE
007626  100375                          BPL     1$
007630  052777  000100  173002          BIS     #BIT6,@TCSR     ;ENABLE INTERRUPTS
007636  000240                          NOP                     ;**
007640  000240                          NOP                     ;**
007642  000240                          NOP                     ;**
007644  000240                          NOP                     ;**

007646  104060                          ERROR+60
                                                                ;XMIT INTERRUPT DID NOT OCCUR
007650  022626                  2$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
007652  012777  007706  172770          MOV     #4$,@TVECT      ;POINT XMIT VECTOR TO ERROR
007660  004737  014540                  JSR     PC,WRPSW        ;SET PSW TO PRIORITY 3
007664  000140                          .WORD   140
007666  000240                          NOP                     ;GIVE TIME FOR ANY INTERRUPTS
007670  000240                          NOP                     ;GIVE TIME FOR ANY INTERRUPTS
007672  000240                          NOP                     ;GIVE TIME FOR ANY INTERRUPTS
007674  000240                          NOP                     ;GIVE TIME FOR ANY INTERRUPTS
007676  042777  000100  172734          BIC     #BIT6,@TCSR     ;DISABLE INTERRUPTS
007704  000402                          BR      5$              ;BR TO END OF TEST

007706  022626                  4$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
007710  104061                          ERROR+61
                                                                ;XMIT RE-INTERRUPTED
007712  010377  172732          5$:     MOV     R3,@TVECT       ;RESTORE XMIT VECTOR
007716  010477  172730                  MOV     R4,@TPSW        ;RESTORE XMIT PSW VECTOR

                                        ;;*********************************************************************
                                        ;*TEST 27       TEST THAT XMIT INTERRUPT CLEARS WITH LOADING TBUF
                                        ;;*********************************************************************
007722  000004                  TST27:  SCOPE
007724  042777  000100  172706          BIC     #BIT6,@TCSR     ;DISABLE INTERRUPTS
007732  004737  014540                  JSR     PC,WRPSW        ;SET PSW TO PRIORITY 7
007736  000340                          .WORD   340
007740  017703  172704                  MOV     @TVECT,R3       ;SAVE XMIT VECTOR
007744  012777  010032  172676          MOV     #2$,@TVECT      ;POINT XMIT VECTOR TO ERROR
007752  052777  000004  172660          BIS     #BIT2,@TCSR     ;** ENABLE MAINT. WRAP
007760  052777  000100  172652          BIS     #BIT6,@TCSR     ;ENABLE INTERRUPTS
007766  005077  172650                  CLR     @TBUF           ;LOAD TBUF
007772  105777  172642          1$:     TSTB    @TCSR           ;WAIT FOR DONE (INTERRUPT)
007776  100375                          BPL     1$
010000  005077  172636                  CLR     @TBUF           ;FILL SECOND BUFFER TO RESET INT.
010004  004737  014540                  JSR     PC,WRPSW        ;ALLOW INTERRUPTS
```

```
2574  010010  000140                                .WORD   140
2575  010012  000240                          NOP                     ;GIVE TIME FOR ANY INTERRUPTS
2576  010014  000240                          NOP                     ;GIVE TIME FOR ANY INTERRUPTS
2577  010016  000240                          NOP                     ;GIVE TIME FOR ANY INTERRUPTS
2578  010020  000240                          NOP                     ;GIVE TIME FOR ANY INTERRUPTS
2579  010022  042777  000100  172610          BIC     #BIT6,@TCSR     ;DISABLE INTERRUPTS
2580  010030  000405                          BR      3$              ;BR TO END OF TEST
2581
2582  010032  022626                  2$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
2583  010034  042777  000004  172616          BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
2584                                                                  ;** CONSOLE TO ALLOW FOR COMMUNICATION
2585                                                                  ;** WITH TERMINAL.
2586  010042  104062                          ERROR+62
2587                                                                  ;LOADING TBUF DID NOT CLEAR INTERRUPT.
2588  010044  010377  172600          3$:     MOV     R3,@TVECT       ;RESTORE XMIT VECTOR
2589
2590  010050  005000                          CLR     R0              ;** DELAY ENOUGH TIME TO ALLOW ANY CHARACTERS
2591  010052  012701  000002                  MOV     #2,R1           ;** THAT MIGHT BE IN THE PROCESS OF BEING
2592  010056  005300                  40$:     DEC     R0              ;** TRANSMITTED TO FINISH BEFORE MAINTENANCE
2593  010060  001376                          BNE     40$             ;** WRAP FOR THE UART UNDER TEST IS DISABLED.
2594  010062  005301                          DEC     R1              ;** THIS WILL INHIBIT ANY COMMUNICATION
2595  010064  001374                          BNE     40$             ;** TO HARDWARE MEDIA SUCH AS TU58 THAT MIGHT
2596                                                                  ;** BE ATTACHED TO UART UNDER TEST.
```

```
                                        ;;*********************************************************************
                                        ;*TEST 30        TEST THAT RCVR ACTIVE & DONE SET & CLEAR
                                        ;;*********************************************************************
010066  000004                  TST30:  SCOPE
010070  032737  000001  003002          BIT     #BIT0,FLAG44    ;**
010076  001073                         BNE     RCVDON          ;**
010100  000005                         RESET                   ;CLEAR EVERYTHING
010102  052777  000004  172530         BIS     #BIT2,@TCSR     ;SET MAINTENANCE WRAP
010110  005000                         CLR     R0              ;** DELAY ENOUGH TIME TO ALLOW ANY CHARACTERS
010112  012701  000002                 MOV     #2,R1           ;** THAT MIGHT BE IN THE PROCESS OF BEING
                                                                ;** RECEIVED TO FINISH AFTER MAINTENANCE
                                                                ;** WRAP FOR THE UART UNDER TEST IS ENABLED.
010116  105777  172512          42$:    TSTB    @RCSR           ;** CHECK FOR RECEIVER DONE
010122  100405                         BMI     43$             ;**
010124  005300                         DEC     R0              ;**
010126  001373                         BNE     42$             ;**
010130  005301                         DEC     R1              ;**
010132  001371                         BNE     42$             ;**
010134  000402                         BR      .+6             ;**
010136  005777  172474          43$:    TST     @RBUF           ;** READ TO CLEAR DONE
010142  005000                         CLR     R0              ;CLEAR A TIMER
010144  005077  172472                 CLR     @TBUF           ;LOAD TRANSMIT BUFFER
010150  032777  004000  172456  WACTV:  BIT     #BIT11,@RCSR    ;TEST RCVR ACTIVE BIT
010156  001006                         BNE     2$              ;BR IF SET
010160  005200                         INC     R0              ;INCREMENT TIMER IF NOT SET
010162  001372                         BNE     WACTV           ;CONTINUE WAIT IF TIME REMAINS
010164  042777  000004  172466         BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
                                                                ;** CONSOLE TO ALLOW FOR COMMUNICATION
                                                                ;** WITH TERMINAL.
010172  104063                         ERROR+63                ;RCVR ACTIVE DID NOT SET WHILE RECEIVING
010174                          2$:
010174  005000                         CLR     R0              ;** DELAY ENOUGH TIME TO ALLOW ANY CHARACTERS
010176  012701  000002                 MOV     #2,R1           ;** THAT MIGHT BE IN THE PROCESS OF BEING
010202  005300                  40$:    DEC     R0              ;** TRANSMITTED TO FINISH BEFORE MAINTENANCE
010204  001376                         BNE     40$             ;** WRAP FOR THE UART UNDER TEST IS DISABLED.
010206  005301                         DEC     R1              ;** THIS WILL INHIBIT ANY COMMUNICATION
010210  001374                         BNE     40$             ;** TO HARDWARE MEDIA SUCH AS TU58 THAT MIGHT
                                                                ;** BE ATTACHED TO UART UNDER TEST.
010212  000005                         RESET
010214  032777  004000  172412         BIT     #BIT11,@RCSR    ;VERIFY "INIT" CLEARS RCV ACTIVE
010222  001401                         BEQ     3$
010224  104115                         ERROR+115               ;INIT DID NOT CLEAR RCV ACTIVE
010226  005000                  3$:     CLR     R0              ;CLEAR A TIMER
010230  052777  000004  172402         BIS     #BIT2,@TCSR     ;SET MAINTENANCE WRAP
010236  062700  000000          WT:     ADD     #0,R0           ;WAIT AT LEAST ONE BIT TIME
010242  005200                         INC     R0
010244  001374                         BNE     WT
010246  033777  004000  172360         BIT     BIT11,@RCSR     ;VERIFY RCV ACTIVE STILL CLEAR
010254  001404                         BEQ     RCVDON          ;BR IF CLEAR
010256  042777  000004  172374         BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
```

```
                                                        ;** CONSOLE TO ALLOW FOR COMMUNICATION
                                                        ;** WITH TERMINAL.
010264  104116                  ERROR+116              ;RCV ACTIVE WITHOUT "START" BIT

010266  052777  000004  172344  RCVDON: BIS     #BIT2,@TCSR     ;SET MAINTENCE WRAP
010274  005000                  CLR     R0              ;CLEAR TIMER
010276  005077  172340          CLR     @TBUF           ;LOAD TRANSMIT BUFFER
010302  105777  172326          WDONE:  TSTB    @RCSR           ;CHECK FOR RECEIVER DONE
010306  100406                  BMI     5$              ;BR, IF DONE
010310  005200                  INC     R0              ;INCREMENT TIMER, IF NOT DONE
010312  001373                  BNE     WDONE           ;CONTINUE WAIT IF TIME REMAINS
010314  042777  000004  172336  BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
                                                        ;** CONSOLE TO ALLOW FOR COMMUNICATION
                                                        ;** WITH TERMINAL.
010322  104064                  ERROR+64
                                                        ;RECEIVER DONE NEVER SET

010324  032737  000001  003002  5$:     BIT     #BIT0,FLAG44    ;** 11/44??
010332  001010                  BNE     6$              ;** DO NOT EXECUTE THIS SECTION
010334  032777  004000  172272  BIT     #BIT11,@RCSR    ;CHECK FOR RCVR ACTIVE CLEAR
010342  001404                  BEQ     6$              ;BR, IF CLEAR
010344  042777  000004  172306  BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
                                                        ;** CONSOLE TO ALLOW FOR COMMUNICATION
                                                        ;** WITH TERMINAL.
010352  104065                  ERROR+65
                                                        ;RCVR ACTIVE DID NOT CLEAR WITH RCVR DONE

010354  000005                  6$:     RESET           ;CLEAR DONE WITH RESET
010356  105777  172252          TSTB    @RCSR           ;CHECK FOR DONE CLEAR
010362  001404                  BEQ     7$

010364  042777  000004  172266  BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
                                                        ;** CONSOLE TO ALLOW FOR COMMUNICATION
                                                        ;** WITH TERMINAL.
010372  104066                  ERROR+66
                                                        ;RESET DID NOT CLEAR RCVR DONE

010374                  7$:
010374  042777  000004  172256  BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
                                                        ;** CONSOLE TO ALLOW FOR COMMUNICATION
                                                        ;** WITH TERMINAL.
```

```
                                ;;*****************************************************************
                                ;*TEST 31        TEST THAT READING RBUF CLEARS RECEIVER DONE
                                ;;*****************************************************************
010402  000004                  TST31:  SCOPE
010404  000005                          RESET                           ;CLEAR EVERYTHING
010406  052777  000004  172224          BIS     #BIT2,@TCSR             ;SET MAINTENANCE WRAP
010414  005000                          CLR     R0                      ;** DELAY ENOUGH TIME TO ALLOW ANY CHARACTERS
010416  012701  000002                  MOV     #2,R1                   ;** THAT MIGHT BE IN THE PROCESS OF BEING
                                                                        ;** RECEIVED TO FINISH AFTER MAINTENANCE
                                                                        ;** WRAP FOR THE UART UNDER TEST IS ENABLED.
010422  105777  172206          42$:    TSTB    @RCSR                   ;** CHECK FOR RECEIVER DONE
010426  100405                          BMI     43$                     ;**
010430  005300                          DEC     R0                      ;**
010432  001373                          BNE     42$                     ;**
010434  005301                          DEC     R1                      ;**
010436  001371                          BNE     42$                     ;**
010440  000402                          BR      .+6                     ;**
010442  005777  172170          43$:    TST     @RBUF                   ;** READ TO CLEAR DONE
010446  005077  172170                  CLR     @TBUF                   ;LOAD TRANSMITTER
010452  105777  172156          1$:     TSTB    @RCSR                   ;WAIT FOR RECEIVER DONE
010456  100375                          BPL     1$
010460  017700  172152                  MOV     @RBUF,R0                ;READ RECEIVE BUFFER
010464  042777  000004  172166          BIC     #BIT2,@CTCSR            ;** DISABLE MAINTENANCE MODE FOR
                                                                        ;** CONSOLE TO ALLOW FOR COMMUNICATION
                                                                        ;** WITH TERMINAL.
010472  105777  172136                  TSTB    @RCSR                   ;CHECK FOR RECEIVE DONE CLEAR
010476  001401                          BEQ     10$                     ;** BR, IF CLEAR TO NEXT TEST
010500  104070                          ERROR+70
                                                                        ;READING RBUF DID NOT CLEAR RCVR DONE
010502  000240                  10$:    NOP
                                ;;*****************************************************************
                                ;*TEST 32        TEST THAT RDR ENABLE CLEARS RECEIVER DONE FLAG
                                ;;*****************************************************************
010504  000004                  TST32:  SCOPE
010506  032737  000001  003002          BIT     #BIT0,FLAG44            ;** 11/44 ??
010514  001050                          BNE     10$                     ;** YES DO NOT EXECUTE THIS TEST
010516  000005                          RESET                           ;CLEAR EVERYTHING
010520  052777  000001  172106          BIS     #BIT0,@RCSR             ;SET RDR ENABLE
010526  052777  000004  172104          BIS     #BIT2,@TCSR             ;SET MAINTENANCE WRAP
010534  005000                          CLR     R0                      ;** DELAY ENOUGH TIME TO ALLOW ANY CHARACTERS
010536  012701  000002                  MOV     #2,R1                   ;** THAT MIGHT BE IN THE PROCESS OF BEING
                                                                        ;** RECEIVED TO FINISH AFTER MAINTENANCE
                                                                        ;** WRAP FOR THE UART UNDER TEST IS ENABLED.
010542  105777  172066          42$:    TSTB    @RCSR                   ;** CHECK FOR RECEIVER DONE
010546  100405                          BMI     43$                     ;**
010550  005300                          DEC     R0                      ;**
010552  001373                          BNE     42$                     ;**
010554  005301                          DEC     R1                      ;**
010556  001371                          BNE     42$                     ;**
010560  000402                          BR      .+6                     ;**
010562  005777  172050          43$:    TST     @RBUF                   ;** READ TO CLEAR DONE
010566  005077  172050                  CLR     @TBUF                   ;LOAD TRANSMITTER
010572  105777  172036          1$:     TSTB    @RCSR                   ;WAIT FOR RECEIVER DONE
010576  100375                          BPL     1$
```

```
2750  010600  032777  000001  172026          BIT     #BIT0,@RCSR     ;VERIFY RCV ACTIVE CLEARED RDR ENABLE
2751  010606  001401                          BEQ     2$              ;BR IF CLEAR
2752
2753  010610  104117                          ERROR+117               ;RDR ENABLE NOT CLEARED WITH RCV ACTIVE
2754
2755  010612  052777  000001  172014  2$:     BIS     #BIT0,@RCSR     ;CLEAR DONE BY SETTING RDR ENABLE
2756  010620  105777  172010                  TSTB    @RCSR           ;CHECK FOR DONE CLEAR
2757  010624  001404                          BEQ     10$             ;** BR, IF CLEAR TO NEXT TEST
2758  010626  042777  000004  172024          BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
2759                                                                  ;** CONSOLE TO ALLOW FOR COMMUNICATION
2760                                                                  ;** WITH TERMINAL.
2761  010634  104067                          ERROR+67
2762                                                                  ;SETTING RDR ENABLE DID NOT CLEAR RCVR DONE
2763  010636  000240                  10$:     NOP                     ;**
2764
2765
```

```
                                        ;;*********************************************************************
                                        ;*TEST 33       TEST THAT RCVR INTERRUPTS ONLY WHEN ENABLED
                                        ;;*********************************************************************
010640  000004                  TST33:  SCOPE
010642  042777  000100  171770          BIC     #BIT6,@TCSR     ;DISABLE TRANSMIT INTERRUPTS
010650  042777  000100  171756          BIC     #BIT6,@RCSR     ;DISABLE RECEIVER INTERRUPTS
010656  052777  000004  171754          BIS     #BIT2,@TCSR     ;SET MAINTENANCE WRAP
010664  005000                          CLR     R0              ;** DELAY ENOUGH TIME TO ALLOW ANY CHARACTERS
010666  012701  000002                  MOV     #2,R1           ;** THAT MIGHT BE IN THE PROCESS OF BEING
                                                                ;** RECEIVED TO FINISH AFTER MAINTENANCE
                                                                ;** WRAP FOR THE UART UNDER TEST IS ENABLED.
010672  105777  171736          42$:    TSTB    @RCSR           ;** CHECK FOR RECEIVER DONE
010676  100405                          BMI     43$             ;**
010700  005300                          DEC     R0              ;**
010702  001373                          BNE     42$             ;**
010704  005301                          DEC     R1              ;**
010706  001371                          BNE     42$             ;**
010710  000402                          BR      .+6             ;**
010712  005777  171720          43$:    TST     @RBUF           ;** READ TO CLEAR DONE
010716  017703  171722                  MOV     @RVECT,R3       ;SAVE RECEIVE VECTOR
010722  012777  010760  171714          MOV     #2$,@RVECT      ;POINT RCV VECTOR TO ERROR REPORT
010730  004737  014540                  JSR     PC,WRPSW        ;SET PSW TO PRIORITY 3
010734  000140                          .WORD   140
010736  005077  171700                  CLR     @TBUF           ;SEND A CHARACTER
010742  105777  171666          1$:     TSTB    @RCSR           ;WAIT FOR RECEIVER DONE
010746  100375                          BPL     1$
010750  042777  000004  171702          BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
                                                                ;** CONSOLE TO ALLOW FOR COMMUNICATION
                                                                ;** WITH TERMINAL.
010756  000405                          BR      3$              ;CONTINUE TEST
010760                          2$:
010760  042777  000004  171672          BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
                                                                ;** CONSOLE TO ALLOW FOR COMMUNICATION
                                                                ;** WITH TERMINAL.
010766  022626                          CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
010770  104071                          ERROR+71
                                                                ;RECEIVER INTERRPUTS WITH INT. ENABLE CLEAR
010772  012777  011026  171644  3$:     MOV     #4$,@RVECT      ;POINT RCV VECTOR TO END OF TEST
011000  052777  000100  171626          BIS     #BIT6,@RCSR     ;ENABLE RCV INTERRUPTS
011006  000240                          NOP                     ;** GIVE ANY INTERRUPTS TIME
011010  000240                          NOP                     ;** GIVE ANY INTERRUPTS TIME
011012  000240                          NOP                     ;** GIVE ANY INTERRUPTS TIME
011014  000240                          NOP                     ;** GIVE ANY INTERRUPTS TIME
011016  042777  000004  171634          BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
                                                                ;** CONSOLE TO ALLOW FOR COMMUNICATION
                                                                ;** WITH TERMINAL.
011024  104072                          ERROR+72
                                                                ;RCVR DID NOT INTERRUPT
011026  042777  000100  171600  4$:     BIC     #BIT6,@RCSR     ;DISABLE INTERRUPTS
011034  042777  000004  171616          BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
                                                                ;** CONSOLE TO ALLOW FOR COMMUNICATION
                                                                ;** WITH TERMINAL.
011042  022626                          CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
011044  010377  171574                  MOV     R3,@RVECT       ;RESTORE RECEIVE VECTOR
```

```
                                ;;*********************************************************************
                                ;*TEST 34       TEST THAT RCVR INTERRUPTS DO NOT OCCUR WHEN DISABLED
                                ;;*********************************************************************
011050  000004          TST34:  SCOPE
011052  000005                  RESET                   ;CLEAR EVERYTHING
011054  004737  014540          JSR     PC,@WRPSW       ;SET PSW TO PRIORITY 7
011060  000340                  .WORD   340
011062  017703  171556          MOV     @RVECT,R3       ;SAVE RECEIVE VECTOR
011066  012777  011174  171550  MOV     #2$,@RVECT      ;POINT RCVR VECTOR TO ERROR REPORT
011074  052777  000004  171536  BIS     #BIT2,@TCSR     ;SET MAINTENANCE WRAP
011102  005000                  CLR     R0              ;** DELAY ENOUGH TIME TO ALLOW ANY CHARACTERS
011104  012701  000002          MOV     #2,R1           ;** THAT MIGHT BE IN THE PROCESS OF BEING
                                                        ;** RECEIVED TO FINISH AFTER MAINTENANCE
                                                        ;** WRAP FOR THE UART UNDER TEST IS ENABLED.
011110  105777  171520  42$:     TSTB    @RCSR           ;** CHECK FOR RECEIVER DONE
011114  100405                  BMI     43$             ;**
011116  005300                  DEC     R0              ;**
011120  001373                  BNE     42$             ;**
011122  005301                  DEC     R1              ;**
011124  001371                  BNE     42$             ;**
011126  000402                  BR      .+6             ;**
011130  005777  171502  43$:     TST     @RBUF           ;** READ TO CLEAR DONE
011134  105777  167710  6$:      TSTB    @$TPS           ;TEST FOR XMIT READY
011140  100375                  BPL     6$              ;LOOP IF NOT
011142  005077  171474          CLR     @TBUF           ;SEND A CHARACTER
011146  105777  171462  1$:      TSTB    @RCSR           ;WAIT FOR RECEIVER DONE
011152  100375                  BPL     1$
011154  052777  000100  171452  BIS     #BIT6,@RCSR     ;ENABLE INTERRUPTS
011162  000240                  NOP                     ;** GIVE TIME FOR INTERRUPT
011164  000240                  NOP                     ;** GIVE TIME FOR INTERRUPT
011166  000240                  NOP                     ;** GIVE TIME FOR INTERRUPT
011170  000240                  NOP                     ;** GIVE TIME FOR INTERRUPT
011172  000405                  BR      3$              ;CONTINUE TEST

011174          2$:
011174  042777  000004  171456  BIC     #BIT2,@TCSR     ;** DISABLE MAINTENANCE MODE FOR
                                                        ;** CONSOLE TO ALLOW FOR COMMUNICATION
                                                        ;** WITH TERMINAL.
011202  022626                  CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
011204  104073                  ERROR+73
                                                        ;RCVR INTERRUPTS AT PRIORITY 7
011206  042777  000100  171420  3$:     BIC     #BIT6,@RCSR     ;CLEAR INTERRUPT ENABLE
011214  012777  011244  171422  MOV     #4$,@RVECT      ;POINT RCVR VECTOR TO ERROR REPORT
011222  004737  014540          JSR     PC,@WRPSW       ;SET PSW TO PRIORITY 3
011226  000140                  .WORD   140
011230  000240                  NOP                     ;GIVE TIME FOR ANY INTERRUPT
011232  000240                  NOP                     ;GIVE TIME FOR ANY INTERRUPT
011234  042777  000004  171416  BIC     #BIT2,@TCSR     ;** DISABLE MAINTENANCE MODE FOR
                                                        ;** CONSOLE TO ALLOW FOR COMMUNICATION
                                                        ;** WITH TERMINAL.
011242  000405                  BR      5$              ;BR TO END OF TEST, IF NO INTERRUPT
```

```
2877  011244                          4$:
2878  011244  042777  000004  171406          BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
2879                                                                  ;** CONSOLE TO ALLOW FOR COMMUNICATION
2880                                                                  ;** WITH TERMINAL.
2881  011252  022626                          CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
2882  011254  104074                          ERROR+74
2883                                                                  ;RCVR INTERRUPT REQUEST PASSED WITH BIT6 CLEAR
2884  011256  010377  171362          5$:     MOV     R3,@RVECT       ;RESTORE RECEIVE VECTOR
```

```
2885
2886                                    ;;*****************************************************************
2887                                    ;*TEST 35       TEST RECEIVER FOR DOUBLE INTERRUPTS
2888                                    ;;*****************************************************************
2889  011262  000004                    TST35:  SCOPE
2890  011264  000005                            RESET                           ;CLEAR EVERYTHING
2891  011266  017703  171352                   MOV     @RVECT,R3               ;SAVE RECEIVE VECTOR
2892  011272  017704  171350                   MOV     @RPSW,R4                ;SAVE RECEIVE PSW VECTOR
2893  011276  012777  011420  171340           MOV     #2$,@RVECT              ;POINT RCV VECTOR TO CONTINUE TEST
2894  011304  012777  000340  171334           MOV     #340,@RPSW              ;SET PRIORITY TO 7 AFTER INTERRUPT
2895  011312  004737  014540                   JSR     PC,WRPSW                ;SET PSW TO PRIORITY 3
2896  011316  000140                                    .WORD   140
2897  011320  052777  000004  171312           BIS     #BIT2,@TCSR             ;SET MAINTENANCE WRAP
2898  011326  005000                           CLR     R0                      ;** DELAY ENOUGH TIME TO ALLOW ANY CHARACTERS
2899  011330  012701  000002                   MOV     #2,R1                   ;** THAT MIGHT BE IN THE PROCESS OF BEING
2900                                                                            ;** RECEIVED TO FINISH AFTER MAINTENANCE
2901                                                                            ;** WRAP FOR THE UART UNDER TEST IS ENABLED.
2902  011334  105777  171274           42$:    TSTB    @RCSR                   ;** CHECK FOR RECFIVER DONE
2903  011340  100405                           BMI     43$                     ;**
2904  011342  005300                           DEC     R0                      ;**
2905  011344  001373                           BNE     42$                     ;**
2906  011346  005301                           DEC     R1                      ;**
2907  011350  001371                           BNE     42$                     ;**
2908  011352  000402                           BR      .+6                     ;**
2909  011354  005777  171256           43$:    TST     @RBUF                   ;** READ TO CLEAR DONE
2910  011360  005077  171256                   CLR     @TBUF                   ;SEND A CHARACTER
2911  011364  105777  171244           1$:     TSTB    @RCSR                   ;WAIT FOR RCVR DONE
2912  011370  100375                           BPL     1$
2913  011372  042777  000004  171260           BIC     #BIT2,@CTCSR            ;** DISABLE MAINTENANCE MODE FOR
2914                                                                            ;** CONSOLE TO ALLOW FOR COMMUNICATION
2915                                                                            ;** WITH TERMINAL.
2916  011400  052777  000100  171226           BIS     #BIT6,@RCSR             ;ENABLE RCV INTERRUPTS
2917  011406  000240                           NOP                             ;** GIVE SOME TIME
2918  011410  000240                           NOP                             ;** GIVE SOME TIME
2919  011412  000240                           NOP                             ;** GIVE SOME TIME
2920  011414  000240                           NOP                             ;** GIVE SOME TIME
2921
2922  011416  104075                           ERROR+75
2923                                                                            ;RCVR INTERRUPT DID NOT OCCUR
2924  011420  022626                   2$:     CMP     (SP)+,(SP)+             ;RESTORE SP AFTER INTERRUPT
2925  011422  012777  011466  171214           MOV     #3$,@RVECT              ;POINT RCV VECTOR TO ERROR REPORT
2926  011430  004737  014540                   JSR     PC,WRPSW                ;RESET PSW TO PRIORITY 3
2927  011434  000140                                    .WORD   140
2928  011436  000240                           NOP                             ;** GIVE SOME TIME
2929  011440  000240                           NOP                             ;** GIVE SOME TIME
2930  011442  000240                           NOP                             ;** GIVE SOME TIME
2931  011444  000240                           NOP                             ;** GIVE SOME TIME
2932  011446  042777  000100  171160           BIC     #BIT6,@RCSR             ;CLEAR INTERRUPT ENABLE
2933  011454  010377  171164                   MOV     R3,@RVECT               ;RESTORE RECEIVE VECTOR
2934  011460  010477  171162                   MOV     R4,@RPSW                ;RESTORE RECEIVE PSW VECTOR
2935  011464  000402                           BR      4$                      ;BR TO END OF TEST
2936  011466  022626                   3$:     CMP     (SP)+,(SP)+             ;RESTORE SP AFTER INTERRUPT
2937  011470  104076                           ERROR+76
2938                                                                            ;RECEIVER RE-INTERRUPTED
2939  011472  010377  171146           4$:     MOV     R3,@RVECT               ;RESTORE RECEIVE VECTOR
```

```
                                ;;*****************************************************************
                                ;*TEST 36       TEST THAT RCVR INTERRUPT CLEARS BY READING RBUF
                                ;;*****************************************************************
011476  000004          TST36:  SCOPE
011500  000005                  RESET                           ;CLEAR EVERYTHING
011502  004737  014540          JSR     PC,WRPSW                ;SET PSW PRIORITY TO 7
011506  000340                  .WORD   340
011510  017703  171130          MOV     @RVECT,R3               ;SAVE RECEIVE VECTOR
011514  012777  011642  171122  MOV     #2$,@RVECT              ;POINT RCV VECTOR TO ERROR REPORT
011522  052777  000100  171104  BIS     #BIT6,@RCSR             ;SET RCVR INTERRUPT ENABLE
011530  052777  000004  171102  BIS     #BIT2,@TCSR             ;SET MAINTENANCE WRAP
011536  005000                  CLR     R0                      ;** DELAY ENOUGH TIME TO ALLOW ANY CHARACTERS
011540  012701  000002          MOV     #2,R1                   ;** THAT MIGHT BE IN THE PROCESS OF BEING
                                                                ;** RECEIVED TO FINISH AFTER MAINTENANCE
                                                                ;** WRAP FOR THE UART UNDER TEST IS ENABLED.
011544  105777  171064  42$:    TSTB    @RCSR                   ;** CHECK FOR RECFIVER DONE
011550  100405                  BMI     43$                     ;**
011552  005300                  DEC     R0                      ;**
011554  001373                  BNE     42$                     ;**
011556  005301                  DEC     R1                      ;**
011560  001371                  BNE     42$                     ;**
011562  000402                  BR      .+6                     ;**
011564  005777  171046  43$:    TST     @RBUF                   ;** READ TO CLEAR DONE
011570  005077  171046          CLR     @TBUF                   ;SEND A CHARACTER
011574  105777  171034  1$:     TSTB    @RCSR                   ;WAIT FOR DONE (INTERRUPT)
011600  100375                  BPL     1$
011602  042777  000004  171050  BIC     #BIT2,@TCSR             ;** DISABLE MAINTENANCE MODE FOR
                                                                ;** CONSOLE TO ALLOW FOR COMMUNICATION
                                                                ;** WITH TERMINAL.
011610  005077  171022          CLR     @RBUF                   ;READ RBUF TO CLEAR PENDING INTERRPUT
011614  004737  014540          JSR     PC,WRPSW                ;SET PSW TO PRIORITY 3
011620  000140                  .WORD   140
011622  000240                  NOP                             ;** ALLOW TIME FOR ANY ERRONEOUS INTERRUPT
011624  000240                  NOP                             ;** ALLOW TIME FOR ANY ERRONEOUS INTERRUPT
011626  000240                  NOP                             ;** ALLOW TIME FOR ANY ERRONEOUS INTERRUPT
011630  000240                  NOP                             ;** ALLOW TIME FOR ANY ERRONEOUS INTERRUPT
011632  042777  000100  170774  BIC     #BIT6,@RCSR             ;NO INTERRUPT-CLEAR INT. ENABLE
011640  000402                  BR      3$

011642  022626          2$:     CMP     (SP)+,(SP)+             ;RESTORE SP AFTER INTERRUPT
011644  104077                  ERROR+77                        ;READING RBUF DID NOT CLEAR INTERRUPT

011646  010377  170772  3$:     MOV     R3,@RVECT               ;RESTORE RECEIVE VECTOR
```

```
                                ;;*****************************************************************
                                ;*TEST 37       TEST THAT RESET CLEARS RECEIVE INTERRUPT
                                ;;*****************************************************************
011652  000004                  TST37:  SCOPE
011654  000005                          RESET                   ;CLEAR EVERYTHING
011656  004737  014540                  JSR     PC,WRPSW        ;SET PSW TO PRIORITY 7
011662  000340                          .WORD   340
011664  017703  170754                  MOV     @RVECT,R3       ;SAVE RECEIVE VECTOR
011670  012777  012010  170746          MOV     #2$,@RVECT      ;POINT RCV VECTOR TO ERROR REPORT
011676  052777  000100  170730          BIS     #BIT6,@RCSR     ;SET RCV INTERRUPT ENABLE
011704  052777  000004  170726          BIS     #BIT2,@TCSR     ;SET MAINTENANCE WRAP
011712  005000                          CLR     R0              ;** DELAY ENOUGH TIME TO ALLOW ANY CHARACTERS
011714  012701  000002                  MOV     #2,R1           ;** THAT MIGHT BE IN THE PROCESS OF BEING
                                                                ;** RECEIVED TO FINISH AFTER MAINTENANCE
                                                                ;** WRAP FOR THE UART UNDER TEST IS ENABLED.
011720  105777  170710          42$:    TSTB    @RCSR           ;** CHECK FOR RECFIVER DONE
011724  100405                          BMI     43$             ;**
011726  005300                          DEC     R0              ;**
011730  001373                          BNE     42$             ;**
011732  005301                          DEC     R1              ;**
011734  001371                          BNE     42$             ;**
011736  000402                          BR      .+6             ;**
011740  005777  170672          43$:    TST     @RBUF           ;** READ TO CLEAR DONE
011744  012777  000377  170670          MOV     #377,@TBUF      ;SEND AN ALL 1'S CHARACTER
011752  105777  170656          1$:     TSTB    @RCSR           ;WAIT FOR RCV DONE
011756  100375                          BPL     1$
011760  000005                          RESET                   ;CLEAR RCV INTERRUPT & RBUF
011762  004737  014540                  JSR     PC,WRPSW        ;SET PSW TO PRIORITY 3
011766  000140                          .WORD   140
011770  000240                          NOP                     ;** ALLOW TIME FOR AN ERRONEOUS INTERRUPT
011772  000240                          NOP                     ;** ALLOW TIME FOR AN ERRONEOUS INTERRUPT
011774  000240                          NOP                     ;** ALLOW TIME FOR AN ERRONEOUS INTERRUPT
011776  000240                          NOP                     ;** ALLOW TIME FOR AN ERRONEOUS INTERRUPT
012000  042777  000100  170626          BIC     #BIT6,@RCSR     ;NO INTERRUPT-CLEAR INT. ENABLE
012006  000402                          BR      3$              ;CONTINUE TEST

012010  022626                  2$:     CMP     (SP)+,(SP)+     ;RESTORE SP AFTER INTERRUPT
012012  104100                          ERROR+100               ;RESET DID NOT CLEAR RCVR INTERRUPT

012014  010377  170624          3$:     MOV     R3,@RVECT       ;RESTORE RECEIVE VECTOR
```

```
3029
3030
3031                                    ;;*****************************************************************
3032                                    ;*TEST 40       TEST THAT THE "OR" ERROR & "ERROR" CAN BE SET
3033                                    ;;*****************************************************************
3034  012020  000004                    TST40:  SCOPE
3035  012022  032777  002000  167010            BIT     #BIT10,@SWR     ;IS THIS TEST ENABLED
3036  012030  001471                            BEQ     TST41           ;IF NOT ENABLED, BR TO NEXT TEST
3037  012032  032737  000001  003002            BIT     #BIT0,FLAG44    ;** IS THIS A 11/44
3038  012040  001407                            BEQ     9$              ;** NO
3039  012042  005737  002624                    TST     CTSTFL          ;** YES THIS IS 11/44. IS THIS THE CONSOLE
3040                                                                    ;** SLU
3041  012046  001404                            BEQ     9$              ;** NO
3042  012050  032777  000010  166762            BIT     #BIT03,@SWR     ;** THIS IS THE CONSOLE SLU.SHOULD THE OVERRUN
3043                                                                    ;** ERROR TEST BE PERFORMED
3044  012056  001456                            BEQ     TST41           ;** NO
3045  012060  000005                    9$:     RESET                   ;CLEAR EVERYTHING
3046  012062  052777  000004  170550            BIS     #BIT2,@TCSR     ;SET MAINTENANCE WRAP
3047  012070  005000                            CLR     R0              ;** DELAY ENOUGH TIME TO ALLOW ANY CHARACTERS
3048  012072  012701  000002                    MOV     #2,R1           ;** THAT MIGHT BE IN THE PROCESS OF BEING
3049                                                                    ;** RECEIVED TO FINISH AFTER MAINTENANCE
3050                                                                    ;** WRAP FOR THE UART UNDER TEST IS ENABLED.
3051  012076  105777  170532            42$:    TSTB    @RCSR           ;** CHECK FOR RECEIVER DONE
3052  012102  100405                            BMI     43$             ;**
3053  012104  005300                            DEC     R0              ;**
3054  012106  001373                            BNE     42$             ;**
3055  012110  005301                            DEC     R1              ;**
3056  012112  001371                            BNE     42$             ;**
3057  012114  000402                            BR      .+6             ;**
3058  012116  005777  170514            43$:    TST     @RBUF           ;** READ TO CLEAR DONE
3059  012122  012700  000003                    MOV     #3,R0           ;SET CHARACTER COUNT TO SEND 3 CHAR.
3060  012126  005077  170510            1$:     CLR     @TBUF           ;LOAD TRANSMIT BUFFER
3061  012132  105777  170502            2$:     TSTB    @TCSR           ;WAIT FOR TRANSMIT DONE
3062  012136  100375                            BPL     2$
3063  012140  005300                            DEC     R0              ;DECREMENT CHARACTER COUNT
3064  012142  001371                            BNE     1$              ;BR IF ALL CHARACTERS NOT TRANSMITTED
3065  012144  042777  000004  170506            BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
3066                                                                    ;** CONSOLE TO ALLOW FOR COMMUNICATION
3067                                                                    ;** WITH TERMINAL.
3068  012152  032777  040000  170456            BIT     #BIT14,@RBUF    ;TEST FOR "OR" ERROR FLAG
3069  012160  001001                            BNE     3$              ;BR, IF SET
3070  012162  104101                            ERROR+101
3071                                                                    ;"OR" ERROR FLAG DID NOT SET
3072
3073  012164  032777  100000  170444  3$:      BIT     #BIT15,@RBUF    ;TEST "ERROR" FLAG
3074  012172  001001                            BNE     4$              ;BR, IF SET
3075  012174  104102                            ERROR+102
3076                                                                    ;"ERROR" FLAG DID NOT SET WITH "OR" FLAG
3077  012176                            4$:
3078  012176  005000                            CLR     R0              ;** DELAY ENOUGH TIME TO ALLOW ANY CHARACTERS
3079  012200  012701  000002                    MOV     #2,R1           ;** THAT MIGHT BE IN THE PROCESS OF BEING
3080  012204  005300                    40$:    DEC     R0              ;** TRANSMITTED TO FINISH BEFORE MAINTENANCE
3081  012206  001376                            BNE     40$             ;** WRAP FOR THE UART UNDER TEST IS DISABLED.
3082  012210  005301                            DEC     R1              ;** THIS WILL INHIBIT ANY COMMUNICATION
3083  012212  001374                            BNE     40$             ;** TO HARDWARE MEDIA SUCH AS TU58 THAT MIGHT
3084                                                                    ;** BE ATTACHED TO UART UNDER TEST.
```

```
3085
3086
3087                                    ;;*****************************************************************
3088                                    ;*TEST 41        TEST THAT BREAK TRANSMITS ALL ZEROES
3089                                    ;;*****************************************************************
3090  012214  000004                    TST41:  SCOPE
3091  012216  032777  000400  166614            BIT     #BIT8,@SWR      ;IS BREAK FUNCTION TEST ENABLED?
3092  012224  001505                            BEQ     TST42           ;BR TO NEXT TEST, IF NOT ENABLED
3093  012226  032737  000001  003002            BIT     #BIT0,FLAG44    ;** IS THIS A 11/44
3094  012234  001407                            BEQ     9$              ;** NO
3095  012236  005737  002624                    TST     CTSTFL          ;** YES THIS IS 11/44. IS THIS THE CONSOLE
3096                                                                    ;** SLU
3097  012242  001404                            BEQ     9$              ;** NO
3098  012244  032777  000010  166566            BIT     #BIT03,@SWR     ;** THIS IS THE CONSOLE SLU.SHOULD THE BREAK
3099                                                                    ;** TEST BE PERFORMED
3100  012252  001472                            BEQ     TST42           ;** NO
3101  012254  000005                    9$:     RESET                   ;CLEAR EVERYTHING
3102  012256  052777  000004  170354            BIS     #BIT2,@TCSR     ;SET MAINTENANCE WRAP
3103  012264  005000                            CLR     R0              ;** DELAY ENOUGH TIME TO ALLOW ANY CHARACTERS
3104  012266  012701  000002                    MOV     #2,R1           ;** THAT MIGHT BE IN THE PROCESS OF BEING
3105                                                                    ;** RECEIVED TO FINISH AFTER MAINTENANCE
3106                                                                    ;** WRAP FOR THE UART UNDER TEST IS ENABLED.
3107  012272  105777  170336            42$:    TSTB    @RCSR           ;** CHECK FOR RECEIVER DONE
3108  012276  100405                            BMI     43$             ;**
3109  012300  005300                            DEC     R0              ;**
3110  012302  001373                            BNE     42$             ;**
3111  012304  005301                            DEC     R1              ;**
3112  012306  001371                            BNE     42$             ;**
3113  012310  000402                            BR      .+6             ;**
3114  012312  005777  170320            43$:    TST     @RBUF           ;** READ TO CLEAR DONE
3115  012316  012777  177777  170316            MOV     #-1,@TBUF       ;TRANSMIT ALL ONES TO RCVR
3116  012324  105777  170304            1$:     TSTB    @RCSR           ;WAIT FOR RCVR DONE
3117  012330  100375                            BPL     1$
3118  012332  005077  170300                    CLR     @RBUF           ;CLEAR DONE (LEAVING ALL ONES IN RBUF)
3119  012336  052777  000001  170274            BIS     #BIT0,@TCSR     ;TRANSMIT BREAK
3120  012344  005000                            CLR     R0              ;CLEAR A TIMER
3121  012346  117737  170262  001026  2$:      MOVB    @RCSR,$BDDAT    ;WAIT FOR RCVR DONE
3122  012354  100411                            BMI     CONT41          ;BR IF DONE
3123  012356  005200                            INC     R0              ;IF NOT, INCREMENT TIMER
3124  012360  001372                            BNE     2$              ;BR IF TIME REMAINS
3125  012362  042777  000001  170250            BIC     #BIT0,@TCSR       ;CLEAR BREAK  BIT
3126  012370  042777  000004  170262            BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
3127                                                                    ;** CONSOLE TO ALLOW FOR COMMUNICATION
3128                                                                    ;** WITH TERMINAL.
3129  012376  104103                            ERROR+103               ;BREAK DID NOT TRANSMIT ANYTHING
3130  012400  105777  170232            CONT41: TSTB    @RBUF           ;CHECK RECEIVE BUFFER FOR ZERO
3131  012404  001407                            BEQ     3$              ;BR, IF ZERO
3132  012406  042777  000001  170224            BIC     #BIT0,@TCSR       ;CLEAR  BREAK BIT
3133  012414  042777  000004  170236            BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
3134                                                                    ;** CONSOLE TO ALLOW FOR COMMUNICATION
3135                                                                    ;** WITH TERMINAL.
3136  012422  104103                            ERROR+103               ;BREAK DID NOT TRANSMIT ALL ZEROES
3137  012424  042777  000001  170206  3$:      BIC     #BIT0,@TCSR     ;CLEAR  BREAK BIT
3138  012432  042777  000004  170220            BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
3139                                                                    ;** CONSOLE TO ALLOW FOR COMMUNICATION
3140                                                                    ;** WITH TERMINAL.
```

```
3141
3142
3143                                    ;;*****************************************************************
3144                                    ;*TEST 42       TEST THAT "FR" ERROR CAN BE SET DURING BREAK
3145                                    ;;*****************************************************************
3146  012440  000004                    TST42:  SCOPE
3147  012442  032777  002000  166370            BIT     #BIT10,@SWR     ;IS THE "TEST ERROR FLAGS" BIT SET
3148  012450  001470                            BEQ     TST43           ;BR TO NEXT TEST, IF NOT SET
3149  012452  032777  000400  166360            BIT     #BIT8,@SWR      ;IS BREAK FUNCTION ENABLED
3150  012460  001464                            BEQ     TST43           ;BR TO NEXT TEST, IF NOT SET
3151  012462  032737  000001  003002            BIT     #BIT0,FLAG44    ;** IS THIS A 11/44
3152  012470  001407                            BEQ     9$              ;** NO
3153  012472  005737  002624                    TST     CTSTFL          ;** YES THIS IS 11/44. IS THIS THE CONSOLE
3154                                                                    ;** SLU
3155  012476  001404                            BEQ     9$              ;** NO
3156  012500  032777  000010  166332            BIT     #BIT03,@SWR     ;** THIS IS THE CONSOLE SLU.SHOULD THE FRAME
3157                                                                    ;** ERROR TEST BE PERFORMED
3158  012506  001451                            BEQ     TST43           ;** NO
3159  012510  000005                    9$:     RESET                   ;CLEAR EVERYTHING
3160  012512  052777  000004  170120            BIS     #BIT2,@TCSR     ;SET MAINTENANCE WRAP
3161  012520  005000                            CLR     R0              ;** DELAY ENOUGH TIME TO ALLOW ANY CHARACTERS
3162  012522  012701  000002                    MOV     #2,R1           ;** THAT MIGHT BE IN THE PROCESS OF BEING
3163                                                                    ;** RECEIVED TO FINISH AFTER MAINTENANCE
3164                                                                    ;** WRAP FOR THE UART UNDER TEST IS ENABLED.
3165  012526  105777  170102          42$:    TSTB    @RCSR           ;** CHECK FOR RECEIVER DONE
3166  012532  100405                            BMI     43$             ;**
3167  012534  005300                            DEC     R0              ;**
3168  012536  001373                            BNE     42$             ;**
3169  012540  005301                            DEC     R1              ;**
3170  012542  001371                            BNE     42$             ;**
3171  012544  000402                            BR      .+6             ;**
3172  012546  005777  170064          43$:    TST     @RBUF           ;** READ TO CLEAR DONE
3173  012552  052777  000001  170060            BIS     #BIT0,@TCSR     ;SEND BREAK
3174  012560  005077  170056                    CLR     @TBUF           ;TRANSMIT A CHARACTER TO TIME BREAK
3175  012564  105777  170044          1$:     TSTB    @RCSR           ;WAIT FOR RCVR DONE
3176  012570  100375                            BPL     1$
3177  012572  042777  000001  170040            BIC     #BIT0,@TCSR     ;CLEAR  BREAK BIT
3178  012600  042777  000004  170052            BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
3179                                                                    ;** CONSOLE TO ALLOW FOR COMMUNICATION
3180                                                                    ;** WITH TERMINAL.
3181  012606  032777  020000  170022            BIT     #BIT13,@RBUF    ;CHECK FOR FRAMING ERROR FLAG
3182  012614  001001                            BNE     2$              ;BR, IF SET
3183
3184  012616  104104                            ERROR+104
3185                                                                    ;BREAK DID NOT SET FRAMING ERROR
3186  012620  032777  100000  170010  2$:       BIT     #BIT15,@RBUF    ;TEST "ERROR" FLAG
3187  012626  001001                            BNE     3$              ;BR, IF SET
3188
3189  012630  104114                            ERROR+114
3190                                                                    ;"ERROR" FLAG DID NOT SET WITH "OR" FLAG
3191  012632                           3$:
```

```
                                ;;*****************************************************************
                                ;*TEST 43       TEST DATA PATH FROM XMIT TO REC USING MAINT WRAP
                                ;;*****************************************************************
012632  000004                TST43:  SCOPE

012634  000005                        RESET                   ;CLEAR EVERYTHING
012636  052777  000004  167774        BIS     #BIT2,@TCSR     ;SET MAINTENANCE WRAP
                                                                ;TRANSMIT A BINARY COUNT PATTERN - UP
                                                                ;TO THE BIT POSITION INDICATED BY THE
                                                                ;CONTENTS OF LOCATION "$USWR"
012644  005000                        CLR     R0              ;** DELAY ENOUGH TIME TO ALLOW ANY CHARACTERS
012646  012701  000002                MOV     #2,R1           ;** THAT MIGHT BE IN THE PROCESS OF BEING
                                                                ;** RECEIVED TO FINISH AFTER MAINTENANCE
                                                                ;** WRAP FOR THE UART UNDER TEST IS ENABLED.
012652  105777  167756        42$:    TSTB    @RCSR           ;** CHECK FOR RECEIVER DONE
012656  100405                        BMI     43$             ;**
012660  005300                        DEC     R0              ;**
012662  001373                        BNE     42$             ;**
012664  005301                        DEC     R1              ;**
012666  001371                        BNE     42$             ;**
012670  000402                        BR      .+6             ;**
012672  005777  167740        43$:    TST     @RBUF           ;** READ TO CLEAR DONE
012676  005001                        CLR     R1              ;CLEAR REGISTER FOR TEST DATA
012700  105201                1$:     INCB    R1              ;INCREMENT THE TEST DATA
012702  032737  000001  003002        BIT     #BIT0,FLAG44    ;** 11/44 CPU
012710  001406                        BEQ     5$              ;** TEST ALL DATA
012712  122701  000020                CMPB    #20,R1          ;** CHECK  FOR CONT-P IN TEST DATA
012716  001770                        BEQ     1$              ;** DO NOT XMIT ^P
012720  122701  000220                CMPB    #220,R1         ;**
012724  001765                        BEQ     1$              ;** DO NOT XMIT 220
012726  010177  167710        5$:     MOV     R1,@TBUF        ;XMIT A CHARACTER
012732  105777  167676        2$:     TSTB    @RCSR           ;WAIT FOR RECEIVER DONE
012736  100375                        BPL     2$
012740  017702  167672                MOV     @RBUF,R2        ;GET RECEIVED CHARACTER
012744  043701  001112                BIC     @#$USWR,R1      ;CLEAR LOWEST UNUSED DATA BIT POSITITON IN TEST DATA
012750  020102                        CMP     R1,R2           ;COMPARE DATA
012752  001003                        BNE     3$              ;BR, IF NON-COMPARE
012754  105701                        TSTB    R1              ;TEST XMIT DATA FOR ZERO
012756  001411                        BEQ     4$              ;BR, IF FINISHED
012760  000747                        BR      1$              ;CONTINUE IF NOT
012762  010137  001024        3$:     MOV     R1,$GDDAT       ;STORE THE EXPECTED DATA
012766  010237  001026                MOV     R2,$BDDAT       ;STORE RECEIVED DATA
012772  042777  000004  167660        BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
                                                                ;** CONSOLE TO ALLOW FOR COMMUNICATION
                                                                ;** WITH TERMINAL.
013000  104105                        ERROR+105               ;DATA COMPARE DATA

013002                          4$:
013002  042777  000004  167650        BIC     #BIT2,@CTCSR    ;** DISABLE MAINTENANCE MODE FOR
                                                                ;** CONSOLE TO ALLOW FOR COMMUNICATION
                                                                ;** WITH TERMINAL.
```

```
3248                                    ;;*****************************************************************
3249                                    ;*TEST 44        TEST DATA PATHS USING WRAP CABLE
3250                                    ;;*****************************************************************
3251  013010  000004                    TST44:  SCOPE
3252  013012  032777  000200  166020            BIT     #BIT7,@SWR      ;IS THIS TEST ENABLED
3253  013020  001444                            BEQ     TST45           ;BR, IF NOT
3254  013022  000005                            RESET                   ;CLEAR EVERYTHING
3255  013024  005001                            CLR     R1              ;CLEAR REGISTER FOR TEST DATA
3256                                                                    ;TRANSMIT A BINARY COUNT PATTERN - UP
3257                                                                    ;TO THE BIT POSITION INDICATED BY THE
3258                                                                    ;CONTENTS OF LOCATION "$USWR"
3259  013026  105201                    1$:     INCB    R1              ;INCREMENT THE TEST DATA
3260  013030  032737  000001  003002            BIT     #BIT0,FLAG44    ;11/44 CPU
3261  013036  001406                            BEQ     5$              ;TEST ALL DATA
3262  013040  122701  000020                    CMPB    #20,R1          ;CHECK TEST DATA FOR ^P
3263  013044  001770                            BEQ     1$              ;DO NOT XMIT ^P
3264  013046  122701  000220                    CMPB    #220,R1
3265  013052  001765                            BEQ     1$
3266  013054  010177  167562          5$:     MOV     R1,@TBUF        ;XMIT A CHARACTER
3267  013060  005000                            CLR     R0              ;CLEAR A TIMER
3268  013062  105777  167546          2$:     TSTB    @RCSR           ;WAIT FOR RECEIVER DONE
3269  013066  100403                            BMI     3$              ;BR IF DONE
3270  013070  005200                            INC     R0              ;INCREMENT TIMER IF NOT
3271  013072  001373                            BNE     2$              ;BR IF TIME REMAINS
3272
3273  013074  104064                            ERROR+64                ;RECEIVER DONE NOT SET
3274
3275  013076  017702  167534          3$:     MOV     @RBUF,R2        ;GET RECEIVED CHARACTER
3276  013102  043701  001112                    BIC     @#$USWR,R1      ;CLEAR LOWEST UNUSED DATA BIT POSITITON IN TEST DATA
3277  013106  020102                            CMP     R1,R2           ;COMPARE DATA
3278  013110  001003                            BNE     4$              ;BR, IF NON-COMPARE
3279  013112  105701                            TSTB    R1              ;TEST XMIT DATA FOR ZERO
3280  013114  001406                            BEQ     TST45           ;BR, IF FINISHED
3281  013116  000743                            BR      1$              ;CONTINUE IF NOT
3282  013120  010137  001024          4$:     MOV     R1,$GDDAT       ;STORE EXPECTED DATA
3283  013124  010237  001026                    MOV     R2,$BDDAT       ;STORE RECEIVED DATA
3284
3285  013130  104106                            ERROR+106               ;DATA COMPARE ERROR WITH WRAP CABLE
```

```
                                ;;*****************************************************************
                                ;*TEST 45       TEST DL11-W LOGIC BY EXERCISING THE XMIT,REC, & CLOCK
                                ;;*****************************************************************
013132  000004                  TST45:  SCOPE
013134  000005                          RESET                           ;CLEAR EVERYTHING
013136  004737  014540                  JSR     PC,WRPSW                ;SET PRIORITY TO 7
013142  000340                          .WORD   340
013144  017703  167500                  MOV     @TVECT,R3               ;SAVE XMIT VECTOR
013150  017704  167470                  MOV     @RVECT,R4               ;SAVE RECEIVE VECTOR
013154  017705  167516                  MOV     @RTCVT,R5               ;SAVE CLOCK VECTOR
013160  017737  167466  002446          MOV     @TPSW,STPSW             ;SAVE XMIT PSW VECTOR
013166  017737  167454  002450          MOV     @RPSW,SRPSW             ;SAVE RECEIVE PSW VECTOR
013174  017737  167500  002452          MOV     @RTCPSW,SCPSW           ;SAVE CLOCK PSW VECTOR
013202  012777  013614  167440          MOV     #XMIT,@TVECT            ;POINT TRANSMIT VECTOR TO TRANSMIT ROUTINE
013210  012777  000200  167434          MOV     #200,@TPSW              ;NO MULTIPLE INTERUPTS ALLOWED
013216  012777  013666  167420          MOV     #RCV,@RVECT             ;POINT RECEIVE VECTOR TO RECEIVE ROUTINE
013224  012777  000200  167414          MOV     #200,@RPSW              ;NO MULT INTERUPTS
013232  005737  002624                  TST     CTSTFL                  ;IS CONSOLE UNDER TEST?
013236  001415                          BEQ     1$                      ;IF NOT SKIP CLOCK SET UP
013240  032777  000100  165572          BIT     #BIT6,@SWR              ;IF YES, ARE CLOCK TEST DISABLED?
013246  001011                          BNE     1$                      ;IF YES, SKIP CLOCK SET UP
013250  012777  013702  167420          MOV     #CLK,@RTCVT             ;POINT VECTOR TO CLOCK INTERRUPT ROUTINE
013256  012777  000300  167414          MOV     #300,@RTCPSW            ;NO MULT INTERUPTS
013264  052777  000100  167402          BIS     #BIT6,@LKS              ;ENABLE CLOCK INTERRUPTS
013272  052777  000004  167340  1$:     BIS     #BIT2,@TCSR             ;SET MAINTENANCE WRAP
013300  005000                          CLR     R0                      ;** DELAY ENOUGH TIME TO ALLOW ANY CHARACTERS
013302  012701  000002                  MOV     #2,R1                   ;** THAT MIGHT BE IN THE PROCESS OF BEING
                                                                        ;** RECEIVED TO FINISH AFTER MAINTENANCE
                                                                        ;** WRAP FOR THE UART UNDER TEST IS ENABLED.
013306  105777  167322          42$:    TSTB    @RCSR                   ;** CHECK FOR RECEIVER DONE
013312  100405                          BMI     43$                     ;**
013314  005300                          DEC     R0                      ;**
013316  001373                          BNE     42$                     ;**
013320  005301                          DEC     R1                      ;**
013322  001371                          BNE     42$                     ;**
013324  000402                          BR      .+6                     ;**
013326  005777  167304          43$:    TST     @RBUF                   ;** READ TO CLEAR DONE
013332  052777  000100  167300          BIS     #BIT6,@TCSR             ;ENABLE TRANSMIT INTERRUPTS
013340  052777  000100  167266          BIS     #BIT6,@RCSR             ;ENABLE RECEIVE INTERRUPTS
013346  005037  002442                  CLR     XMTCNT                  ;CLEAR XMIT INTERRUPT COUNTER
013352  005037  002440                  CLR     RCVCNT                  ;CLEAR RCV INTERRUPT COUNTER
013356  005001                          CLR     R1                      ;CLEAR A REGISTER FOR TEST DATA USE
013360  005000                          CLR     R0                      ;CLEAR TIMER
013362  012702  002454                  MOV     #BUF,R2                 ;POINT R2 TO RECEIVE DATA STORAGE
013366  005077  167250                  CLR     @TBUF                   ;SEND FIRST CHARACTER
013372  004737  014540                  JSR     PC,WRPSW                ;SET PSW TO PRIORITY 3
013376  000140                          .WORD   140
                                                                        ;WAIT FOR INTERRUPTS
013400  000240                  2$:     NOP                             ;STALL
013402  000240                          NOP                             ;STALL
013404  062700  000000                  ADD     #0,R0                   ;ADD INSTRUCTIONS ARE USED TO LENGTHEN LOOP TIME
013410  062700  000001                  ADD     #1,R0                   ;  TO COVER THE SLOWEST BAUD RATE ON THE FASTEST CPU
013414  001371                          BNE     2$
013416  032777  000100  167214          BIT     #BIT6,@TCSR             ;FINISHED ENTIRE TRANSMISSION
```

```
3342  013424  001402                        BEQ     3$              ;BR, IF INTERRPUTS ARE DISABLED (FINISHED)
3343  013426  000005                        RESET                   ;CLEAR EVERYTHING
3344
3345  013430  104107                        ERROR+107               ;TRANSMIT INTERRUPT TIMEOUT IN MAIN. DATA TEST
3346
3347  013432  023737  002442  002440  3$:   CMP     XMTCNT,RCVCNT   ;COMPARE THE NUMBER OF INTERRUPTS
3348  013440  001402                        BEQ     4$              ;BR, IF EQUAL
3349  013442  000005                        RESET                   ;CLEAR EVERYTHING
3350
3351  013444  104110                        ERROR+110               ;RECEIVER DID NOT GET FULL TRANSMISSION
3352                                                                ;    IF RCVCNT=0, NO DATA RECEIVED
3353                                                                ;    IF RCVCNT=?, THEN (XMTCNT-RCVCNT)
3354                                                                ;    EQUALS THE NO, OF INTERRUPTS LOST.
3355
```

```
3356
3357
3358  013446  005737  002624          4$:   TST     CTSTFL          ;IS CONCOLE UNDER TEST?
3359  013452  001410                        BEQ     5$              ;IF NOT, SKIP CLOCK COUNT CHECK
3360  013454  032777  000100  165356        BIT     #BIT6,@SWR      ;IF YES, ARE CLOCK TESTS DISABLED?
3361  013462  001004                        BNE     5$              ;IF YES, SKIP CLOCK COUNT CHECK
3362  013464  005737  002444                TST     CLKCNT          ;CHECK FOR AT LESST ONE CLOCK INTERRUPT
3363  013470  001001                        BNE     5$              ;BR IF INTERRUPTS OCCURRED
3364
3365  013472  104113                        ERROR+113               ;NO CLOCK INTERRUPTS IN EXERCISER
3366
3367  013474  000005                  5$:   RESET                   ;CLEAR EVERYTHING
3368  013476  012700  002454                MOV     #BUF,R0         ;LOAD RECEIVED DATA POINTER TO R0
3369  013502  005001                        CLR     R1              ;SET UP REGISTER FOR COMPARISON
3370  013504  022001                  COMP: CMP     (R0)+,R1        ;COMPARE XMIT & RCV DATA
3371  013506  001014                        BNE     6$              ;BR, IF NOT EQUAL
3372  013510  105201                  9$:   INCB    R1              ;INCREMENT COMPARE DATA
3373  013512  032737  000001  003002        BIT     #BIT0,FLAG44    ;11/44 CPU
3374  013520  001403                        BEQ     8$              ;YES SKIP
3375  013522  122701  000020                CMPB    #20,R1          ;SKIP 20 DATA IF 11/44
3376  013526  001770                        BEQ     9$              ;SKIP 20
3377  013530  032701  000040          8$:   BIT     #BIT5,R1        ;FINISHED CHECKING RECEIVED DATA?
3378  013534  001763                        BEQ     COMP            ;BR, IF NOT FINISHED
3379  013536  000405                        BR      7$              ;BR TO END OF TEST
3380  013540  014037  001026          6$:   MOV     -(R0),$BDDAT    ;STORE BAD DATA FOR ERROR REPORT
3381  013544  010137  001024                MOV     R1,$GDDAT       ;STORE GOOD DATA FOR ERROR REPORT
3382  013550  104111                        ERROR+111               ;DATA COMPARE ERROR IN EXERCISER
3383
3384  013552  010377  167072          7$:   MOV     R3,@TVECT       ;RESTORE XMIT VECTOR
3385  013556  010477  167062                MOV     R4,@RVECT       ;RESTORE RECEIVE VECTOR
3386  013562  010577  167110                MOV     R5,@RTCVT       ;RESTORE CLOCK VECTOR
3387  013566  013777  002446  167056        MOV     STPSW,@TPSW     ;RESTORE XMIT PSW VECTOR
3388  013574  013777  002450  167044        MOV     SRPSW,@RPSW     ;RESTORE RECEIVE PSW VECTOR
3389  013602  013777  002452  167070        MOV     SCPSW,@RTCPSW   ;RESTORE CLOCK PSW VECTOR
3390  013610  000137  014344                JMP     ENDEV           ;GOTO NEXT TEST
3391  013614  005237  002442          XMIT: INC     XMTCNT          ;INCREMENT XMIT INTERRUPT COUNTER
3392  013620  105201                  1$:   INCB    R1              ;INCREMENT TEST DATA
3393  013622  032737  000001  003002        BIT     #BIT0,FLAG44    ;11/44 CPU
3394  013630  001403                        BEQ     2$              ;TEST ALL DATA
3395  013632  122701  000020                CMPB    #20,R1          ;CHECK DATA FOR ^P
3396  013636  001770                        BEQ     1$              ;DO NOT XMIT ^P
3397  013640  032701  000040          2$:   BIT     #BIT5,R1        ;SEND DATA PATTERN FROM 00 --> 37
3398  013644  001404                        BEQ     XCONT           ;BR, IF MORE DATA TO BE SENT
3399  013646  042777  000100  166764        BIC     #BIT6,@TCSR     ;CLEAR XMIT INTERRUPT ENABLE
3400  013654  000402                        BR      XRET            ;RETURN, WITHOUT SENDING ANY MORE DATA
3401  013656  110177  166760          XCONT: MOVB   R1,@TBUF        ;SEND NEW CHARACTER
3402  013662  005000                  XRET: CLR     R0              ;CLEAR TIMER
3403  013664  000002                        RTI                     ;RETURN
3404  013666  017722  166744          RCV:  MOV     @RBUF,(R2)+     ;STORE RECEIVED DATA
3405  013672  005237  002440                INC     RCVCNT          ;INCREMENT RCV INTERRUPT COUNTER
3406  013676  005000                        CLR     R0              ;CLEAR TIMER
3407  013700  000002                        RTI                     ;RETURN
3408  013702  005237  002444          CLK:  INC     CLKCNT          ;INCREMENT CLOCK INTERRUPT COUNT
3409  013706  000002                        RTI                     ;RETURN
3410
```

```
                        ;*******************************************************************************
                        ;       WRAPAROUND TESTING- AUTO INITIATION OF T/A CONSOLE TEST
                        
                        
                        
 176500                                 RCSR58 = 176500
 176502                                 RBUF58 = 176502
 176504                                 TCSR58 = 176504
 176506                                 TBUF58 = 176506
 003014                                 BGNADD = DEVADR
 024746                                 ENDADD = ENDADR
                        
                        ;;*****************************************************************
                        ;*TEST 46       TEST CONSOLE WITH WRAP AROUND
                        ;;*****************************************************************
013710  000004          TST46:  SCOPE
                        ;*******************************************************************************
                        ;
                        ; MAIN LINE TEST
                        ;
                        ; THIS TEST PUTS COMMANDS OUT OVER THE SERIAL LINE WHICH IS WRAPPED
                        ; AROUND TO THE CONSOLE AND RECEIVES THE RESPONSES
                        ;
                        ; CONTROL P IS SEND TO GET THE CONSOLE'S ATTENTION AND THEN
                        ; T/A(A FOR APT) IS SENT.  SINCE THE CPU IS HALTED DURING THE TESTING
                        ; THE PROGRAM CAN NOT SEE THE CHARS RETURNING, THUS THE PROGRAM WILL
                        ; SIT IN A LOOP WAITING FOR A "B" TO BE PRINTED BY THE CONSOLE AS A
                        ; SIGNAL TO APT THAT THE TESTING IS DONE. ALSO SINCE THE TESTING
                        ; INVOLES WRITTING TO THE CPU'S MEMORY A CHECKSUM IS CALCULATED AND THE
                        ; MEMORY TO BE USED INSIDE THIS PROGRAMS SPACE IS SAVE BEFORE TESTING
                        ; AND RESTORED AFTER TEST WITH ANOTHER CHECKSUM CALCULATION
                        ;
                        ;*******************************************************************************
                        
013712  032777  000004  165120  WRAP:   BIT     #BIT2,@SWR              ;RUN THIS TEST ONLY IF
013720  001451                          BEQ     10$                     ;SW BIT 2 IS ON
                        
013722  013737  177776  002434          MOV     PSW,SAVEPS              ;SAVE OLD PSW
013730  012737  000340  177776          MOV     #340,PSW                ;PUT IN NOW PSW
013736  012706  002432                  MOV     #JIMSTK,SP              ;USE MY STACK (SO NO CLOBER)
                        
013742  005037  002340                  CLR     LOC1
013746  012737  000100  002342          MOV     #100,LOC2               ;TIMING LOOP COUNTERS
                        
013754  004537  014254                  JSR     R5,SAVETE               ;SAVE LOCATIONS T/A WRITES
                        
013760  004537  014062                  JSR     R5,CHKSUM               ;CALCULATE CHECKSUM
013764  010437  002436                  MOV     R4,OLDSUM               ;SAVE OLD CHECKSUM
                        
013770  012700  002564                  MOV     #CNTLP,R0
013774  004537  014102                  JSR     R5,PUTLIN               ;SEND OUT CONTROL P
                        
014000  012700  002566                  MOV     #PROMPT,R0
014004  004537  014134                  JSR     R5,GETLIN               ;GET CRLF CONSOLE>>>
```

```
3467  014010  012700  002610                    MOV     #TA,R0
3468  014014  004537  014102                    JSR     R5,PUTLIN               ;SEND OUT T/A<CRLF>
3469
3470  014020  004537  014200                    JSR     R5,GETB                 ;GET THE A FROM "-TESTB"
3471
3472  014024  004537  014310                    JSR     R5,RESTTE               ;RESTORE LOCATIONS T/A WRITES
3473
3474  014030  004537  014062                    JSR     R5,CHKSUM               ;RECALCULATE CHECKSUM
3475  014034  020437  002436                    CMP     R4,OLDSUM
3476  014040  001401                            BEQ     10$
3477  014042  000000                            HALT
3478  014044  012706  001000          10$:      MOV     #1000,SP                ;RETURN THEIR SP
3479  014050  013737  002434  177776            MOV     SAVEPS,PSW              ;RETURN PSW
3480  014056  000137  014400                    JMP     $EOP                    ;BR TO END OF PASS ROUTINE
3481
3482
3483                                  ;*************************************************************************
3484                                  ;
3485                                  ; ROUTINE TO CALCULATE CHECKSUM ON PROGRAM
3486                                  ;
3487                                  ; INPUT CONDITIONS
3488                                  ;
3489                                  ;       BGNADD = ADDRESS TO START CHECK SUM (INCLUSIVE)
3490                                  ;       ENDADD = ADDRESS TO END CHECK SUM (EXCLUSIVE)
3491                                  ;
3492                                  ; OUTPUT CONDITIONS
3493                                  ;
3494                                  ;       REG4 = CHECK SUM
3495                                  ;
3496                                  ;*************************************************************************
3497
3498
3499  014062  012700  003014          CHKSUM:   MOV     #BGNADD,R0              ;GET STARTING ADDRESS
3500  014066  005004                            CLR     R4                      ;RESET SUM
3501  014070  062004                  1$:       ADD     (R0)+,R4                ;ADD WORD TO SUM
3502  014072  022700  024746                    CMP     #ENDADD,R0              ;CHECK FOR END
3503  014076  001374                            BNE     1$                      ;IF NOT DONE LOOP
3504  014100  000205                            RTS     R5                      ;DONE RETURN
3505
3506
3507                                  ;*************************************************************************
3508                                  ;
3509                                  ; THIS ROUTINE OUTPUTS TO THE SERIAL LINE CHARS STARTING AT
3510                                  ; THE ADDRESS IN REG0 UNTIL IT HITS A <377>
3511                                  ;
3512                                  ;*************************************************************************
3513
3514
3515  014102  112001                  PUTLIN:   MOVB    (R0)+,R1                ;GET DATA
3516  014104  001412                            BEQ     10$                     ;END OF DATA
3517  014106  004537  014234          1$:       JSR     R5,TIMER                ;PROVIDE FOR TIMOUT
3518  014112  032737  000200  176504            BIT     #BIT7,TCSR58            ;TEST FOR XMIT READY
3519  014120  001772                            BEQ     1$                      ;WAIT FOR XMIT READY
3520  014122  110137  176506                    MOVB    R1,TBUF58               ;OUTPUT CHAR
3521  014126  000137  014102                    JMP     PUTLIN                  ;REPETE
3522  014132  000205                  10$:      RTS     R5                      ;RETURN
```

```
                                ;*****************************************************************************
                                ;
                                ; THIS ROUTINE INPUTS A CHARS FROM THE SERIAL LINE AND COMPARES
                                ; IT WITH THE EXPECTED VALUES POINTED TO BY REG0 UNTIL NULL<00>
                                ;
                                ;*****************************************************************************

014134  112001          GETLIN: MOVB    (R0)+,R1        ;GET EXPECTED CHAR
014136  105201                  INCB    R1
014140  001416                  BEQ     10$             ;IF NULL EXIT
014142  105301                  DECB    R1
014144  004537  014234  1$:     JSR     R5,TIMER        ;PROVIDE FOR TIMOUT
014150  032737  000200  176500  BIT     #BIT7,RCSR58    ;TEST FOR REC READY
014156  001772                  BEQ     1$              ;WAIT FOR REC READY
014160  113702  176502          MOVB    RBUF58,R2
014164  042702  000200          BIC     #BIT7,R2        ;STRIP PARITY
014170  120102                  CMPB    R1,R2           ;ARE THEY THE SAME
014172  001760                  BEQ     GETLIN          ;SAME GET MORE
014174  000000                  HALT                    ;NOT SAME HALT
014176  000205          10$:    RTS     R5              ;RETURN

                                ;*****************************************************************************
                                ;
                                ; THIS ROUTINE INPUTS CHARS UNTIL IT GETS THE CHAR "B"
                                ; AND THEN RETURNS
                                ;
                                ;*****************************************************************************


014200  004537  014234  GETB:   JSR     R5,TIMER        ;OUT TIMING LOOP OUT
014204  032737  000200  176500  BIT     #BIT7,RCSR58    ;TEST OFR REC READY
014212  001772                  BEQ     GETB            ;NOT DONE YET
014214  113702  176502          MOVB    RBUF58,R2
014220  042702  000200          BIC     #BIT7,R2        ;STRIP PARITY
014224  122702  000102          CMPB    #102,R2         ;CHECK FOR "B"
014230  001363                  BNE     GETB            ;NOT "B" REPETE
014232  000205                  RTS     R5              ;WAS "B" RETURN

                                ;*****************************************************************************
                                ;
                                ; THIS ROUTINE IS USED AS A TIME OUT FEATURE
                                ; WHEN THE TIMING LOOPS BOTH REACH 0 THIS ROUTINE WILL
                                ; CAUSE A HALT
                                ;
                                ;*****************************************************************************


014234  005337  002340  TIMER:  DEC     LOC1
014240  001004                  BNE     10$             ;DECREMPNT TIMING LOOPS
014242  005337  002342          DEC     LOC2
014246  001001                  BNE     10$
014250  000000                  HALT                    ;IF ZERO THIS ROUTINE
014252  000205          10$:    RTS     R5              ;EXECUTED R3 TIMES
```

```
                                ;*******************************************************************************
                                ;
                                ; THIS ROUTINE SAVES THE LOCATIONS WRITTEN BY THE T/A CONSOLE TEST
                                ; SO THEY MAY BE RESTORED LATER
                                ;
                                ;*******************************************************************************

014254  013737  000000  002344  SAVETE:        MOV     0,SAVE0                 ;SAVE LOCATION 0
014262  012702  000002                          MOV     #2,R2                   ;SET UP INDIRECT PNTER
014266  012701  002346                          MOV     #SAVLOC,R1              ;SET UP STORAGE LOC. PNTER
014272  011221                  1$:             MOV     (R2),(R1)+              ;GET WORD AND SAVE
014274  000241                                  CLC                             ;DONT ROT IN ANY BITS
014276  006102                                  ROL     R2                      ;SET NEXT ADDRESS
014300  020227  024746                          CMP     R2,#ENDADD              ;SEE IF AT END
014304  100772                                  BMI     1$                      ;NO REPETE
014306  000205                                  RTS     R5

                                ;*******************************************************************************
                                ;
                                ; THIS ROUTINE RESTORES THE SAVED LOCATIONS THAT T/A WRITES INTO
                                ;
                                ;*******************************************************************************

014310  013737  002344  000000  RESTTE:        MOV     SAVE0,0
014316  012702  000002                          MOV     #2,R2                   ;SET UP INDIRECT PNTER
014322  012701  002346                          MOV     #SAVLOC,R1              ;SET UP STORAGE LOC. PNTER
014326  012112                  1$:             MOV     (R1)+,(R2)              ;GET WORD AND RESTORE
014330  000241                                  CLC                             ;DONT ROT IN ANY BITS
014332  006102                                  ROL     R2                      ;SET NEXT ADDRESS
014334  020227  024746                          CMP     R2,#ENDADD              ;SEE IF AT END
014340  100772                                  BMI     1$                      ;NO REPETE
014342  000205                                  RTS     R5
```

```
                                        ;END OF DEVICE PASS ROUTINE
                                        .EVEN
014344  005037  001002          ENDEV:  CLR     $TSTNM          ;CLEAR TEST NO. COUNT FOR SCOPE ROUTINE
014350  005237  001076                  INC     $DEVCT          ;INCREMENT DEVICE COUNTER
014354  023737  002630  001076          CMP     TMP2,$DEVCT     ;ALL DEVICES TESTED
014362  001002                          BNE     NOEOP           ;BR, IF NO
014364  000137  013712                  JMP     WRAP            ;EXECUTE WRAP AROUND AFTER ALL DEVICES
014370  005037  002624          NOEOP:  CLR     CTSTFL          ;CLEAR CONSOLE UNDER TEST FLAG
014374  000137  004050                  JMP     TSTDEV          ;GO TEST NEXT DEVICE


                                        .SBTTL  END OF PASS ROUTINE

                                        ;;**************************************************************************
                                        ;*INCREMENT THE PASS NUMBER ($PASS)
                                        ;*IF THERES A MONITOR GO TO IT
                                        ;*IF THERE ISN'T JUMP TO GOAGIN

014400                          $EOP:
014400  000004                          SCOPE
014402  005037  001002                  CLR     $TSTNM          ;;ZERO THE TEST NUMBER
014406  005237  001074                  INC     $PASS           ;;INCREMENT THE PASS NUMBER
014412  042737  100000  001074          BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
014420  005327                          DEC     (PC)+           ;;LOOP?
014422  000001          $EOPCT: .WORD   1
014424  003015                          BGT     $DOAGN          ;;YES
014426  012737                          MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
014430  000001          $ENDCT: .WORD   1
014432  014422                          $EOPCT
014434  104401  014470                  TYPE    ,ENDMG          ;;TYPE "END PASS"
014440  013700  000042          $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
014444  001405                          BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
014446  000005                          RESET                   ;;CLEAR THE WORLD
014450  004710          $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
014452  000240                          NOP                     ;;SAVE ROOM
014454  000240                          NOP                     ;;FOR
014456  000240                          NOP                     ;;ACT11
014460                          $DOAGN:
014460  000137                          JMP     @(PC)+          ;;RETURN
014462  014504          $RTNAD: .WORD   GOAGIN
014464    377     377     000   $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
        014470                          .EVEN
014470  005015  047105  020104  ENDMG:  .ASCIZ  <CR><LF>/END PASS /
014476  040520  051523  000040
```

```
3662
3663  014504  005037  001076           GOAGIN: CLR     $DEVCT          ;CLEAR DEVICE COUNT
3664  014510  022737  000001  002630           CMP     #1,TMP2         ;IS THERE ONLY ONE DEVICE UNDER TEST?
3665  014516  001004                           BNE     RSTRT           ;BR, IF NOT
3666  014520  012706  001000                   MOV     #1000,SP                ;RESET STACK POINTER
3667  014524  000137  004172                   JMP     TST1            ;GO DO ANOTHER PASS
3668
3669  014530  005037  001100           RSTRT:  CLR     $UNIT           ;CLEAR UNIT NUMBER
3670  014534  000137  003774                   JMP     BEGIN
3671
3672  014540  011646                   WRPSW:  MOV(SP),-(SP)           ;COPY RETUN PC
3673  014542  013616                           MOV     @(SP)+,(SP)     ;MOVE NEW PSW TO STACK
3674  014544  062746  000002                   ADD     #2,-(SP)        ;ADJUST JSR RETURN
3675  014550  000002                           RTI                     ;POP RETURN PC & NEW PSW
3676
3677                                   ;SUBROUTINE TO REPORT UNEXPECTED OR ERRONEOUS TRAPS OR INTERRUPTS
3678
3679  014552  012600                   CATCH:  MOV     (SP)+,R0        ;GET ADDRESS OF TRAP VECTOR + 4
3680  014554  162700  000004                   SUB     #4,R0           ;ADJUST TO POINT TO TRAP ADDRESS
3681  014560  010037  002622                   MOV     R0,BDVECT       ;STORE TRAP OR INTERRUPT ADDRESS
3682  014564  016637  000002  002620           MOV     2(SP),OLDPC     ;GET PC WHERE TRAP OR INTERRUPT OCCURRED
3683  014572  104112                           ERROR+112               ;REPORT ERROR
3684
3685  014574  000000                           HALT                    ;PROGRAM MUST BE RESTARTED AT THIS POINT
3686
```

```
3687
3688                                    ;;*********************************************************************
3689                                    ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
3690                                    ;*SAVE THE ERROR ITEM NUMBER AND ADDRESS OF THE ERROR CALL
3691                                    ;*AND GO TO $ERRTYP ON ERROR
3692                                    ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
3693                                    ;*SW15=1         HALT ON ERROR
3694                                    ;*SW13=1         INHIBIT ERROR TYPEOUTS
3695                                    ;*SW09=1         LOOP IN ERROR
3696                                    ;*CALL
3697                                    ;*      ERROR+N ;;ERROR=EMT AND N=ERROR ITEM NUMBER
3698                                    ;;*********************************************************************
3699
3700  014576                            $ERROR:
3701  014576  105237  001003           7$:     INCB    $ERFLG          ;SET THE ERROR FLAG
3702  014602  001775                            BEQ     7$              ;DON'T LET FLAG GO TO ZERO
3703  014604  013777  001002  164230            MOV     $TSTNM,@DISPLAY ;DISPLAY TEST NUMBER AND ERROR FLAG
3704  014612  005237  001012                    INC     $ERTTL          ;INCREMENT ERROR COUNT
3705  014616  011637  001016                    MOV     (SP),$ERRPC     ;GET ADDRESS OF ERROR INSTRUCTION
3706  014622  162737  000002  001016            SUB     #2,$ERRPC
3707  014630  117737  164162  001014            MOVB    @$ERRPC,$ITEMB  ;STRIP AND SAVE THE ERROR ITEM CODE
3708  014636  032777  020000  164174            BIT     #BIT13,@SWR     ;SKIP TYPEOUT IF SET
3709  014644  001004                            BNE     20$             ;SKIP TYPEOUTS
3710  014646  004737  014760                    JSR     PC,$ERRTYP      ;GO TO USER ERROR ROUTINE
3711  014652  104401  001063                    TYPE    ,$CRLF
3712  014656                            20$:
3713  014656  122737  000001  001106            CMPB    #APTENV,$ENV    ;RUNNING IN APT MODE
3714  014664  001007                            BNE     2$              ;NO, SKIP APT ERROR REPORT
3715  014666  113737  001014  014700            MOVB    $ITEMB,21$      ;SET ITEM NUMBER AS ERROR NUMBER
3716  014674  004737  015462                    JSR     PC,$ATY4        ;REPORT FATAL ERROR TO APT
3717  014700     000                    21$:    .BYTE   0
3718  014701     000                            .BYTE   0
3719  014702  000777                    22$:    BR      22$             ;APT ERROR LOOP
3720  014704  005777  164130           2$:     TST     @SWR            ;HALT ON ERROR
3721  014710  100001                            BPL     3$              ;SKIP IF CONTINUE
3722  014712  000000                            HALT                    ;HALT ON ERROR!
3723  014714  104406                    3$:     CKSWR                   ;TEST FOR CHANGE IN SOFT-SWR
3724  014716  032777  001000  164114            BIT     #BIT09,@SWR     ;LOOP ON ERROR SWITCH SET?
3725  014724  001402                            BEQ     4$              ;BR IF NO
3726  014726  013716  001010                    MOV     $LPERR,(SP)     ;FUDGE RETURN FOR LOOPING
3727  014732  005737  001060           4$:     TST     $ESCAPE         ;CHECK FOR AN ESCAPE ADDRESS
3728  014736  001402                            BEQ     5$              ;BR IF NONE
3729  014740  013716  001060                    MOV     $ESCAPE,(SP)    ;FUDGE RETURN ADDRESS FOR ESCAPE
3730  014744                            5$:
3731  014744  022737  014450  000042            CMP     #$ENDAD,@#42    ;ACT-11 AUTO-ACCEPT?
3732  014752  001001                            BNE     6$              ;BR IF NO
3733  014754  000000                            HALT                    ;YES
3734  014756                            6$:
3735  014756  000002                            RTI                     ;RETURN
3736
```

```
                                .SBTTL  ERROR MESSAGE TYPEOUT ROUTINE

                                ;;*****************************************************************
                                ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
                                ;*ERROR IS TO BE REPORTED. IT THEN OBTAINS, FROM THE "ERROR TABLE" ($ERRTB),
                                ;*AND REPORTS THE APPROPRIATE INFORMATION CONCERNING THE ERROR.

014760                          $ERRTYP:
014760  104401  001063                  TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
014764  010046                          MOV     R0,-(SP)        ;;SAVE R0
014766  005000                          CLR     R0              ;;PICKUP THE ITEM INDEX
014770  153700  001014                  BISB    @#$ITEMB,R0
014774  001004                          BNE     1$              ;;IF ITEM NUMBER IS ZERO, JUST
                                                                ;;TYPE THE PC OF THE ERROR
014776  013746  001016                  MOV     $ERRPC,-(SP)    ;;SAVE $ERRPC FOR TYPEOUT
                                                                ;;ERROR ADDRESS
015002  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
015004  000426                          BR      6$              ;;GET OUT
015006  005300                  1$:     DEC     R0              ;;ADJUST THE INDEX SO THAT IT WILL
015010  006300                          ASL     R0              ;;      WORK FOR THE ERROR TABLE
015012  006300                          ASL     R0
015014  006300                          ASL     R0
015016  062700  001146                  ADD     #$ERRTB,R0      ;;FORM TABLE POINTER
015022  012037  015032                  MOV     (R0)+,2$        ;;PICKUP "ERROR MESSAGE" POINTER
015026  001404                          BEQ     3$              ;;SKIP TYPEOUT IF NO POINTER
015030  104401                          TYPE                    ;;TYPE THE "ERROR MESSAGE"
015032  000000                  2$:     .WORD   0               ;;"ERROR MESSAGE" POINTER GOES HERE
015034  104401  001063                  TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
015040  012037  015050          3$:     MOV     (R0)+,4$        ;;PICKUP "DATA HEADER" POINTER
015044  001404                          BEQ     5$              ;;SKIP TYPEOUT IF 0
015046  104401                          TYPE                    ;;TYPE THE "DATA HEADER"
015050  000000                  4$:     .WORD   0               ;;"DATA HEADER" POINTER GOES HERE
015052  104401  001063                  TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
015056  011000                  5$:     MOV     (R0),R0         ;;PICKUP "DATA TABLE" POINTER
015060  001004                          BNE     7$              ;;GO TYPE THE DATA
015062  012600                  6$:     MOV     (SP)+,R0        ;;RESTORE R0
015064  104401  001063                  TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
015070  000207                          RTS     PC              ;;RETURN
015072                          7$:
015072  013046                          MOV     @(R0)+,-(SP)    ;;SAVE @(R0)+ FOR TYPEOUT
015074  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
015076  005710                          TST     (R0)            ;;IS THERE ANOTHER NUMBER?
015100  001770                          BEQ     6$              ;;BR IF NO
015102  104401  015110                  TYPE    ,8$             ;;TYPE TWO(2) SPACES
015106  000771                          BR      7$              ;;LOOP
015110  020040      000         8$:     .ASCIZ  /  /            ;;TWO(2) SPACES
        015114                          .EVEN
```

```
                                .SBTTL  POWER DOWN AND UP ROUTINES
                                ;;**********************************************************************
                                        ;*POWER DOWN ROUTINE
                                ;;**********************************************************************
015114  012737  015254  000024  $PWRDN: MOV     #$ILLUP,@#PWRVEC ;SET FOR FAST UP
015122  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;PRIO:7
015130  010046                        MOV     R0,-(SP)        ;PUSH R0 ON STACK
015132  010146                        MOV     R1,-(SP)        ;PUSH R1 ON STACK
015134  010246                        MOV     R2,-(SP)        ;PUSH R2 ON STACK
015136  010346                        MOV     R3,-(SP)        ;PUSH R3 ON STACK
015140  010446                        MOV     R4,-(SP)        ;PUSH R4 ON STACK
015142  010546                        MOV     R5,-(SP)        ;PUSH R5 ON STACK
015144  017746  163670                MOV     @SWR,-(SP)      ;PUSH @SWR ON STACK
015150  010637  015260                MOV     SP,$SAVR6       ;SAVE SP
015154  012737  015166  000024        MOV     #$PWRUP,@#PWRVEC ;SET UP VECTOR
015162  000000                        HALT
015164  000776                        BR      .-2             ;HANG UP

                                ;;**********************************************************************
                                        ;*POWER UP ROUTINE
                                ;;**********************************************************************
015166  012737  015254  000024  $PWRUP: MOV     #$ILLUP,@#PWRVEC ;SET FOR FAST DOWN
015174  013706  015260                MOV     $SAVR6,SP       ;GET SP
015200  012677  163634                MOV     (SP)+,@SWR      ;POP STACK INTO @SWR
015204  012605                        MOV     (SP)+,R5
015206  012604                        MOV     (SP)+,R4        ;POP STACK INTO R4
015210  012603                        MOV     (SP)+,R3        ;POP STACK INTO R3
015212  012602                        MOV     (SP)+,R2        ;POP STACK INTO R2
015214  012601                        MOV     (SP)+,R1        ;POP STACK INTO R1
015216  012600                        MOV     (SP)+,R0        ;POP STACK INTO R0
015220  012737  015114  000024        MOV     #$PWRDN,@#PWRVEC ;SET UP THE POWER DOWN VECTOR
015226  012737  000340  000026        MOV     #340,@#PWRVEC+2 ;PRIO:7
015234  005037  015260                CLR     $SAVR6          ;WAIT LOOP FOR THE TTY
015240  005237  015260        1$:     INC     $SAVR6          ;WAIT FOR THE INC
015244  001375                        BNE     1$              ;OF WORD
015246  104401                        TYPE                    ;REPORT THE POWER FAILURE
015250  015262                $PWRMG: .WORD   $POWER          ;POWER FAIL MESSAGE POINTER
015252  000002                        RTI
015254  000000                $ILLUP: HALT                    ;THE POWER UP SEQUENCE WAS STARTED
015256  000776                        BR      .-2             ; BEFORE THE POWER DOWN WAS COMPLETE
015260  000000                $SAVR6: 0                       ;PUT THE SP HERE
015262  005015  047520  042527  $POWER: .ASCIZ  <15><12>"POWER"
015270  000122
```

```
                                .SBTTL  SCOPE HANDLER ROUTINE

                                ;;**********************************************************************
                                ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
                                ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
                                ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
                                ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
                                ;*SW14=1         LOOP ON TEST
                                ;*SW09=1         LOOP ON ERROR
                                ;*CALL
                                ;*      SCOPE           ;;SCOPE=IOT

015272                          $SCOPE:
015272  104406                         CKSWR                           ;;TEST  FOR CHANGE IN SOFT-SWR
015274  032777  040000  163536  1$:     BIT     #BIT14,@SWR            ;;LOOP ON PRESENT TEST?
015302  001052                         BNE     $OVER                   ;;YES IF SW14=1
                                ;#####START OF CODE FOR THE XOR TESTER#####
015304  000416                  $XTSTR: BR      6$                      ;;IF RUNNING ON THE "XOR" TESTER CHANGE
                                                                        ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
015306  013746  000004                 MOV     @#ERRVEC,-(SP)          ;;SAVE THE CONTENTS OF THE ERROR VECTOR
015312  012737  015332  000004         MOV     #5$,@#ERRVEC            ;;SET FOR TIMEOUT
015320  005737  177060                 TST     @#177060                ;;TIME OUT ON XOR?
015324  012637  000004                 MOV     (SP)+,@#ERRVEC          ;;RESTORE THE ERROR VECTOR
015330  000421                         BR      $SVLAD                  ;;GO TO THE NEXT TEST
015332  022626                  5$:     CMP     (SP)+,(SP)+             ;;CLEAR THE STACK AFTER A TIME OUT
015334  012637  000004                 MOV     (SP)+,@#ERRVEC          ;;RESTORE THE ERROR VECTOR
015340  000407                         BR      7$                      ;;LOOP ON THE PRESENT TEST
015342                          6$:;#####END OF CODE FOR THE XOR TESTER#####
015342  105737  001003          2$:     TSTB    $ERFLG                  ;;HAS AN ERROR OCCURRED?
015346  001412                         BEQ     $SVLAD                  ;;BR IF NO
015350  032777  001000  163462         BIT     #BIT09,@SWR             ;;LOOP ON ERROR?
015356  001404                         BEQ     4$                      ;;BR IF NO
015360  013737  001010  001006  7$:     MOV     $LPERR,$LPADR           ;;SET LOOP ADDRESS TO LAST SCOPE
015366  000420                         BR      $OVER
015370  105037  001003          4$:     CLRB    $ERFLG                  ;;ZERO THE ERROR FLAG
015374  105237  001002          $SVLAD: INCB    $TSTNM                  ;;COUNT TEST NUMBERS
015400  113737  001002  001072         MOVB    $TSTNM,$TESTN           ;;SET TEST NUMBER IN APT MAILBOX
015406  011637  001006                 MOV     (SP),$LPADR             ;;SAVE SCOPE LOOP ADDRESS
015412  011637  001010                 MOV     (SP),$LPERR             ;;SAVE ERROR LOOP ADDRESS
015416  005037  001060                 CLR     $ESCAPE                 ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
015422  112737  000001  001015         MOVB    #1,$ERMAX               ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
015430  013777  001002  163404  $OVER: MOV     $TSTNM,@DISPLAY         ;;DISPLAY TEST NUMBER
015436  013716  001006                 MOV     $LPADR,(SP)             ;;FUDGE RETURN ADDRESS
015442  000002                         RTI                             ;;FIXES PS
```

```
                                        ;;*****************************************************************
                                        .SBTTL  APT COMMUNICATIONS ROUTINE
                                        ;;*****************************************************************

015444  112737  000001  015710  $ATY1:  MOVB    #1,$FFLG        ;TO REPORT FATAL ERROR
015452  112737  000001  015706  $ATY3:  MOVB    #1,$MFLG        ;TO TYPE A MESSAGE
015460  000403                  BR      $ATYC
015462  112737  000001  015710  $ATY4:  MOVB    #1,$FFLG        ;TO ONLY REPORT FATAL ERROR
015470                          $ATYC:
015470  010046                  MOV     R0,-(SP)        ;PUSH R0 ON STACK
015472  010146                  MOV     R1,-(SP)        ;PUSH R1 ON STACK
015474  105737  015706          TSTB    $MFLG           ;SHOULD TYPE A MESSAGE?
015500  001450                  BEQ     5$              ;IF NOT: BR
015502  122737  000001  001106  CMPB    #APTENV,$ENV    ;OPERATING UNDER APT?
015510  001031                  BNE     3$              ;IF NOT: BR
015512  132737  000100  001107  BITB    #APTSPOOL,$ENVM ;SHOULD SPOOL MESSAGE?
015520  001425                  BEQ     3$              ;IF NOT: BR
015522  017600  000004          MOV     @4(SP),R0       ;GET MESSAGE ADDRESS
015526  062766  000002  000004  ADD     #2,4(SP)        ;BUMP RETURN ADDRESS
015534  005737  001066  1$:     TST     $MSGTYPE                ;SEE IF DONE W/ LAST XMISSION?
015540  001375                  BNE     1$              ;IF NOT: WAIT
015542  010037  001102          MOV     R0,$MSGAD       ;PUT ADDRESS IN MAILBOX
015546  105720          2$:     TSTB    (R0)+           ;FIND END OF MESSAGE
015550  001376                  BNE     2$
015552  163700  001102          SUB     $MSGAD,R0       ;SUB START OF MESSAGE
015556  006200                  ASR     R0              ;GET MESSAGE LENGTH IN WORDS
015560  010037  001104          MOV     R0,$MSGLGT      ;PUT LENGTH IN MAILBOX
015564  012737  000004  001066  MOV     #4,$MSGTYPE     ;TELL APT TO TAKE MESSAGE
015572  000413                  BR      5$
015574  017637  000004  015620  3$:     MOV     @4(SP),4$       ;PUT MSG ADDR IN JSR LINKAGE
015602  062766  000002  000004  ADD     #2,4(SP)        ;BUMP RETURN ADDRESS
015610  013746  177776          MOV     177776,-(SP)    ;PUSH 177776 ON STACK
015614  004737  015712          JSR     PC,$TYPE        ;CALL TYPE MACRO
015620  000000          4$:     .WORD   0
015622                  5$:
015622  105737  015710  10$:     TSTB    $FFLG           ;SHOULD REPORT FATAL ERROR?
015626  001413                  BEQ     12$             ;IF NOT: BR
015630  005737  001106          TST     $ENV            ;RUNNING UNDER APT?
015634  001410                  BEQ     12$             ;IF NOT: BR
015636  005737  001066  11$:     TST     $MSGTYPE        ;FINISHED LAST MESSAGE?
015642  001375                  BNE     11$             ;IF NOT: WAIT
015644  017637  000004  001070  MOV     @4(SP),$FATAL   ;GET ERROR #
015652  005237  001066          INC     $MSGTYPE        ;TELL APT TO TAKE ERROR
015656  062766  000002  000004  12$:     ADD     #2,4(SP)        ;BUMP RETURN ADDRESS
015664  105037  015710          CLRB    $FFLG           ;CLEAR FATAL FLAG
015670  105037  015707          CLRB    $LFLG           ;CLEAR LOG FLAG
015674  105037  015706          CLRB    $MFLG           ;CLEAR MESSAGE FLAG
015700  012601                  MOV     (SP)+,R1        ;POP STACK INTO R1
015702  012600                  MOV     (SP)+,R0        ;POP STACK INTO R1
015704  000207                  RTS     PC              ;RETURN
015706     000          $MFLG:  .BYTE   0
015707     000          $LFLG:  .BYTE   0               ;LOG FLAG
015710     000          $FFLG:  .BYTE   0               ;FATAL FLAG

                                .EVEN
015712
```

```
3934            000200                  APTSIZE=200
3935            000001                  APTENV=001
3936            000100                  APTSPOOL=100
3937            000040                  APTCSUP=040
3938
3939
```

```
                                .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
                                ;*

015712  105737  001057          $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
015716  100002                          BPL     1$              ;;BR IF YES
015720  000000                          HALT                    ;;HALT HERE IF NO TERMINAL
015722  000430                          BR      3$              ;;LEAVE
015724  010046                  1$:     MOV     R0,-(SP)        ;;SAVE R0
015726  017600  000002                  MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
015732  122737  000001  001106          CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
015740  001011                          BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
015742  132737  000100  001107          BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
015750  001405                          BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
015752  010037  015762                  MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
015756  004737  015452                  JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
015762  000000                  61$:    .WORD   0               ;;MESSAGE ADDRESS
015764  132737  000040  001107  62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
015772  001003                          BNE     60$             ;;YES,SKIP TYPE OUT
015774  112046                  2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
015776  001005                          BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
016000  005726                          TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
016002  012600                  60$:    MOV     (SP)+,R0        ;;RESTORE R0
016004  062716  000002          3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
016010  000002                          RTI                     ;;RETURN
016012  122716  000011          4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
016016  001430                          BEQ     8$
016020  122716  000200                  CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
016024  001006                          BNE     5$
016026  005726                          TST     (SP)+           ;;POP  <CR><LF> EQUIV
016030  104401                          TYPE                    ;;TYPE A CR AND LF
016032  001063                          $CRLF
016034  105037  016240                  CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
016040  000755                          BR      2$              ;;GET NEXT CHARACTER
016042  004737  016124          5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
016046  123726  001056          6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
016052  001350                          BNE     2$              ;;IF NO GO GET NEXT CHAR.
016054  013746  001054                  MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
                                                                ;;AND THE NULL CHAR.
016060  105366  000001          7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
016064  002770                          BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
016066  004737  016124                  JSR     PC,$TYPEC       ;;GO TYPE A NULL
016072  105337  016240                  DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
```

```
3996  016076  000770                        BR      7$              ;;LOOP
3997
3998                                  ;HORIZONTAL TAB PROCESSOR
3999
4000  016100  112716  000040          8$:   MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
4001  016104  004737  016124          9$:   JSR     PC,$TYPEC       ;;TYPE A SPACE
4002  016110  132737  000007  016240        BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
4003  016116  001372                        BNE     9$              ;;TAB STOP
4004  016120  005726                        TST     (SP)+           ;;POP SPACE OFF STACK
4005  016122  000724                        BR      2$              ;;GET NEXT CHARACTER
4006  016124  105777  162720        $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
4007  016130  100375                        BPL     $TYPEC
4008  016132  116677  000002  162712        MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
4009  016140  105777  162700                TSTB    @$TKS           ;;SEE IF KEYBOARD IS TALKING.
4010  016144  100021                        BPL     2$              ;;BRANCH IF IT ISN'T.
4011  016146  017746  162674                MOV     @$TKB,-(SP)     ;;PUSH CHARACTER ONTO STACK.
4012  016152  042716  177600                BIC     #177600,(SP)    ;;BIT CLEAR TOP BYTE AND PARITY BIT.
4013  016156  022726  000023                CMP     #23,(SP)+       ;;SEE IF THIS IS A ^S.
4014  016162  001012                        BNE     2$              ;;BRANCH TO CONTINUE IF IT ISN'T.
4015  016164  105777  162654          3$:   TSTB    @$TKS           ;;WAIT FOR ANOTHER INPUT.
4016  016170  100375                        BPL     3$              ;;BRANCH BACK IF NOT READY.
4017  016172  017746  162650                MOV     @$TKB,-(SP)     ;;PUSH NEXT CHARACTER ON STACK.
4018  016176  042716  177600                BIC     #177600,(SP)    ;;BIT CLEAR TOP BYTE AND PARITY BIT.
4019  016202  022726  000021                CMP     #21,(SP)+       ;;SEE IF THIS IS A ^Q.
4020  016206  001366                        BNE     3$              ;;BRANCH BACK FOR MORE WAIT IF NOT.
4021  016210  122766  000015  000002  2$:   CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
4022  016216  001003                        BNE     1$              ;;BRANCH IF NO
4023  016220  105037  016240                CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
4024  016224  000406                        BR      $TYPEX          ;;EXIT
4025  016226  122766  000012  000002  1$:   CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
4026  016234  001402                        BEQ     $TYPEX          ;;BRANCH IF YES
4027  016236  105227                        INCB    (PC)+           ;;COUNT THE CHARACTER
4028  016240  000000              $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
4029  016242  000207              $TYPEX: RTS     PC
4030
4031                                  .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
4032
4033                                  ;;**********************************************************************
4034                                  ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
4035                                  ;*OCTAL (ASCII) NUMBER AND TYPE IT.
4036                                  ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
4037                                  ;*CALL:
4038                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
4039                                  ;*      TYPOS                   ;;CALL FOR TYPEOUT
4040                                  ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
4041                                  ;*      .BYTE   M               ;;M=1 OR 0
4042                                  ;*                                      ;;1=TYPE LEADING ZEROS
4043                                  ;*                                      ;;0=SUPPRESS LEADING ZEROS
4044                                  ;*
4045                                  ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
4046                                  ;*$TYPOS OR $TYPOC
4047                                  ;*CALL:
4048                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
4049                                  ;*      TYPON                   ;;CALL FOR TYPEOUT
4050                                  ;*
4051                                  ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
```

```
                                        ;*CALL:
                                        ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                        ;*      TYPOC                   ;;CALL FOR TYPEOUT
                                        ;
016244  017646  000000          $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
016250  116637  000001  016467          MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
016256  112637  016471                  MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
016262  062716  000002                  ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
016266  000406                          BR      $TYPON
016270  112737  000001  016467  $TYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
016276  112737  000006  016471          MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
016304  112737  000005  016466  $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
016312  010346                          MOV     R3,-(SP)        ;;SAVE R3
016314  010446                          MOV     R4,-(SP)        ;;SAVE R4
016316  010546                          MOV     R5,-(SP)        ;;SAVE R5
016320  113704  016471                  MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
016324  005404                          NEG     R4
016326  062704  000006                  ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
016332  110437  016470                  MOVB    R4,$OMODE       ;;SAVE IT FOR USE
016336  113704  016467                  MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
016342  016605  000012                  MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
016346  005003                          CLR     R3              ;;CLEAR THE OUTPUT WORD
016350  006105                  1$:     ROL     R5              ;;ROTATE MSB INTO "C"
016352  000404                          BR      3$              ;;GO DO MSB
016354  006105                  2$:     ROL     R5              ;;FORM THIS DIGIT
016356  006105                          ROL     R5
016360  006105                          ROL     R5
016362  010503                          MOV     R5,R3
016364  006103                  3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
016366  105337  016470                  DECB    $OMODE          ;;TYPE THIS DIGIT?
016372  100016                          BPL     7$              ;;BR IF NO
016374  042703  177770                  BIC     #177770,R3      ;;GET RID OF JUNK
016400  001002                          BNE     4$              ;;TEST FOR 0
016402  005704                          TST     R4              ;;SUPPRESS THIS 0?
016404  001403                          BEQ     5$              ;;BR IF YES
016406  005204                  4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
016410  052703  000060                  BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
016414  052703  000040          5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
016420  110337  016464                  MOVB    R3,8$           ;;SAVE FOR TYPING
016424  104401  016464                  TYPE    ,8$             ;;GO TYPE THIS DIGIT
016430  105337  016466          7$:     DECB    $OCNT           ;;COUNT BY 1
016434  003347                          BGT     2$              ;;BR IF MORE TO DO
016436  002402                          BLT     6$              ;;BR IF DONE
016440  005204                          INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
016442  000744                          BR      2$              ;;GO DO THE LAST DIGIT
016444  012605                  6$:     MOV     (SP)+,R5        ;;RESTORE R5
016446  012604                          MOV     (SP)+,R4        ;;RESTORE R4
016450  012603                          MOV     (SP)+,R3        ;;RESTORE R3
016452  016666  000002  000004          MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
016460  012616                          MOV     (SP)+,(SP)
016462  000002                          RTI                     ;;RETURN
016464     000                  8$:     .BYTE   0               ;;STORAGE FOR ASCII DIGIT
016465     000                          .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
016466     000          $OCNT:  .BYTE   0               ;;OCTAL DIGIT COUNTER
016467     000          $OFILL: .BYTE   0               ;;ZERO FILL SWITCH
016470  000000          $OMODE: .WORD   0               ;;NUMBER OF DIGITS TO TYPE
```

```
                                        .SBTTL  TTY INPUT ROUTINE

                                        ;;**********************************************************************
                                        .ENABL  LSB

                                        ;;**********************************************************************
                                        ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
                                        ;*ROUTINE IS ENTERED FROM THE TRAP HANDLER, AND WILL
                                        ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP CALL
                                        ;*WHEN OPERATING IN TTY FLAG MODE.
016472  022737  000176  001040  $CKSWR: CMP     #SWREG,SWR      ;;IS THE SOFT-SWR SELECTED?
016500  001074                        BNE     15$             ;;BRANCH IF NO
016502  105777  162336                TSTB    @$TKS           ;;CHAR THERE?
016506  100071                        BPL     15$             ;;IF NO, DON'T WAIT AROUND
016510  117746  162332                MOVB    @$TKB,-(SP)     ;;SAVE THE CHAR
016514  042716  177600                BIC     #^C177,(SP)     ;;STRIP-OFF THE ASCII
016520  022726  000007                CMP     #7,(SP)+        ;;IS IT A CONTROL G?
016524  001062                        BNE     15$             ;;NO, RETURN TO USER
016526  123727  001034  000001        CMPB    $AUTOB,#1       ;;ARE WE RUNNING IN AUTO-MODE?
016534  001456                        BEQ     15$             ;;BRANCH IF YES

016536  104401  017217                TYPE    ,$CNTLG         ;;ECHO THE CONTROL-G (^G)
016542  104401  017224        $GTSWR: TYPE    ,$MSWR          ;;TYPE CURRENT CONTENTS
016546  013746  000176                MOV     SWREG,-(SP)     ;;SAVE SWREG FOR TYPEOUT
016552  104402                        TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
016554  104401  017235                TYPE    ,$MNEW          ;;PROMPT FOR NEW SWR
016560  005046                19$:    CLR     -(SP)           ;;CLEAR COUNTER
016562  005046                        CLR     -(SP)           ;;THE NEW SWR
016564  105777  162254        7$:     TSTB    @$TKS           ;;CHAR THERE?
016570  100375                        BPL     7$              ;;IF NOT TRY AGAIN

016572  117746  162250                MOVB    @$TKB,-(SP)     ;;PICK UP CHAR
016576  042716  177600                BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII



016602  021627  000025        9$:     CMP     (SP),#25        ;;IS IT A CONTROL-U?
016606  001005                        BNE     10$             ;;BRANCH IF NOT
016610  104401  017212                TYPE    ,$CNTLU         ;;YES, ECHO CONTROL-U (^U)
016614  062706  000006        20$:    ADD     #6,SP           ;;IGNORE PREVIOUS INPUT
016620  000757                        BR      19$             ;;LET'S TRY IT AGAIN

016622  021627  000015        10$:    CMP     (SP),#15        ;;IS IT A <CR>?
016626  001022                        BNE     16$             ;;BRANCH IF NO
016630  005766  000004                TST     4(SP)           ;;YES, IS IT THE FIRST CHAR?
016634  001403                        BEQ     11$             ;;BRANCH IF YES
016636  016677  000002  162174        MOV     2(SP),@SWR      ;;SAVE NEW SWR
016644  062706  000006        11$:    ADD     #6,SP           ;;CLEAR UP STACK
016650  104401  001063        14$:    TYPE    ,$CRLF          ;;ECHO <CR> AND <LF>
016654  123727  001035  000001        CMPB    $INTAG,#1       ;;RE-ENABLE TTY KBD INTERRUPTS?
016662  001003                        BNE     15$             ;;BRANCH IF NOT
016664  012777  000100  162152        MOV     #100,@$TKS      ;;RE-ENABLE TTY KBD INTERRUPTS
016672  000002                15$:    RTI                     ;;RETURN
```

```
4164  016674  004737  016124          16$:    JSR     PC,$TYPEC       ;;ECHO CHAR
4165  016700  021627  000060                  CMP     (SP),#60        ;;CHAR < 0?
4166  016704  002420                          BLT     18$             ;;BRANCH IF YES
4167  016706  021627  000067                  CMP     (SP),#67        ;;CHAR > 7?
4168  016712  003015                          BGT     18$             ;;BRANCH IF YES
4169  016714  042726  000060                  BIC     #60,(SP)+       ;;STRIP-OFF ASCII
4170  016720  005766  000002                  TST     2(SP)           ;;IS THIS THE FIRST CHAR
4171  016724  001403                          BEQ     17$             ;;BRANCH IF YES
4172  016726  006316                          ASL     (SP)            ;;NO, SHIFT PRESENT
4173  016730  006316                          ASL     (SP)            ;;   CHAR OVER TO MAKE
4174  016732  006316                          ASL     (SP)            ;;   ROOM FOR NEW ONE.
4175  016734  005266  000002          17$:    INC     2(SP)           ;;KEEP COUNT OF CHAR
4176  016740  056616  177776                  BIS     -2(SP),(SP)     ;;SET IN NEW CHAR
4177  016744  000707                          BR      7$              ;;GET THE NEXT ONE
4178  016746  104401  001062          18$:    TYPE    ,$QUES          ;;TYPE ?<CR><LF>
4179  016752  000720                          BR      20$             ;;SIMULATE CONTROL-U
4180                                  .DSABL  LSB
4181
4182
4183                                  ;;**********************************************************************
4184                                  ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
4185                                  ;*CALL:
4186                                  ;*      RDCHR                   ;;INPUT A SINGLE CHARACTER FROM THE TTY
4187                                  ;*      RETURN HERE             ;;CHARACTER IS ON THE STACK
4188                                  ;*                              ;;WITH PARITY BIT STRIPPED OFF
4189                                  ;
4190
4191  016754  011646                  $RDCHR: MOV     (SP),-(SP)      ;;PUSH DOWN THE PC
4192  016756  016666  000004  000002          MOV     4(SP),2(SP)     ;;SAVE THE PS
4193  016764  105777  162054          1$:     TSTB    @$TKS           ;;WAIT FOR
4194  016770  100375                          BPL     1$              ;;A CHARACTER
4195  016772  117766  162050  000004          MOVB    @$TKB,4(SP)     ;;READ THE TTY
4196  017000  042766  177600  000004          BIC     #^C<177>,4(SP)  ;;GET RID OF JUNK IF ANY
4197  017006  026627  000004  000023          CMP     4(SP),#23       ;;IS IT A CONTROL-S?
4198  017014  001013                          BNE     3$              ;;BRANCH IF NO
4199  017016  105777  162022          2$:     TSTB    @$TKS           ;;WAIT FOR A CHARACTER
4200  017022  100375                          BPL     2$              ;;LOOP UNTIL ITS THERE
4201  017024  117746  162016                  MOVB    @$TKB,-(SP)     ;;GET CHARACTER
4202  017030  042716  177600                  BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
4203  017034  022627  000021                  CMP     (SP)+,#21       ;;IS IT A CONTROL-Q?
4204  017040  001366                          BNE     2$              ;;IF NOT DISCARD IT
4205  017042  000750                          BR      1$              ;;YES, RESUME
4206  017044  026627  000004  000140  3$:     CMP     4(SP),#140      ;;IS IT UPPER CASE?
4207  017052  002407                          BLT     4$              ;;BRANCH IF YES
4208  017054  026627  000004  000175          CMP     4(SP),#175      ;;IS IT A SPECIAL CHAR?
4209  017062  003003                          BGT     4$              ;;BRANCH IF YES
4210  017064  042766  000040  000004          BIC     #40,4(SP)       ;;MAKE IT UPPER CASE
4211  017072  000002                  4$:     RTI                     ;;GO BACK TO USER
4212                                  ;;**********************************************************************
4213                                  ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
4214                                  ;*CALL:
4215                                  ;*      RDLIN                   ;;INPUT A STRING FROM THE TTY
4216                                  ;*      RETURN HERE             ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
4217                                  ;*                              ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
4218
4219  017074  010346                  $RDLIN: MOV     R3,-(SP)        ;;SAVE R3
```

```
4220  017076  012703  017202          1$:     MOV     #$TTYIN,R3      ;;GET ADDRESS
4221  017102  022703  017212          2$:     CMP     #$TTYIN+8.,R3   ;;BUFFER FULL?
4222  017106  101405                          BLOS    4$              ;;BR IF YES
4223  017110  104407                          RDCHR                   ;;GO READ ONE CHARACTER FROM THE TTY
4224  017112  112613                          MOVB    (SP)+,(R3)      ;;GET CHARACTER
4225  017114  122713  000177          10$:    CMPB    #177,(R3)       ;;IS IT A RUBOUT
4226  017120  001003                          BNE     3$              ;;SKIP IF NOT
4227  017122  104401  001062          4$:     TYPE    ,$QUES          ;;TYPE A '?'
4228  017126  000763                          BR      1$              ;;CLEAR THE BUFFER AND LOOP
4229  017130  111337  017200          3$:     MOVB    (R3),9$         ;;ECHO THE CHARACTER
4230  017134  104401  017200                  TYPE    ,9$
4231  017140  122723  000015                  CMPB    #15,(R3)+       ;;CHECK FOR RETURN
4232  017144  001356                          BNE     2$              ;;LOOP IF NOT RETURN
4233  017146  105063  177777                  CLRB    -1(R3)          ;;CLEAR RETURN (THE 15)
4234  017152  104401  001064                  TYPE    ,$LF            ;;TYPE A LINE FEED
4235  017156  012603                          MOV     (SP)+,R3        ;;RESTORE R3
4236  017160  011646                          MOV     (SP),-(SP)      ;;ADJUST THE STACK AND PUT ADDRESS OF THE
4237  017162  016666  000004  000002          MOV     4(SP),2(SP)     ;;      FIRST ASCII CHARACTER ON IT
4238  017170  012766  017202  000004          MOV     #$TTYIN,4(SP)
4239  017176  000002                          RTI                     ;;RETURN
4240  017200     000          9$:     .BYTE   0                       ;;STORAGE FOR ASCII CHAR. TO TYPE
4241  017201     000                  .BYTE   0                       ;;TERMINATOR
4242  017202  000010          $TTYIN: .BLKB   8.                      ;;RESERVE 8 BYTES FOR TTY INPUT
4243  017212  052536  005015  000   $CNTLU: .ASCIZ  /^U/<15><12>    ;;CONTROL "U"
4244  017217     136  006507  000012$CNTLG: .ASCIZ  /^G/<15><12>    ;;CONTROL "G"
4245  017224  005015  053523  020122$MSWR:  .ASCIZ  <15><12>/SWR = /
4246  017232  020075     000
4247  017235     040  047040  053505$MNEW:  .ASCIZ  /  NEW = /
4248  017242  036440  000040
4249
```

```
                                        .SBTTL  TRAP DECODER

                                        ;;**********************************************************************
                                        ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
                                        ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
                                        ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
                                        ;*GO TO THAT ROUTINE.

017246  010046                  $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
017250  016600  000002                  MOV     2(SP),R0        ;;GET TRAP ADDRESS
017254  005740                          TST     -(R0)           ;;BACKUP BY 2
017256  111000                          MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
017260  006300                          ASL     R0              ;;POSITION FOR INDEXING
017262  016000  017302                  MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
017266  000200                          RTS     R0              ;;GO TO ROUTINE

                                        ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO

017270  011646                  $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
017272  016666  000004  000002          MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
017300  000002                          RTI                     ;;RESTORE THE PSW

                                        .SBTTL  TRAP TABLE

                                        ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
                                        ;*BY THE "TRAP" INSTRUCTION.

                                        ;       ROUTINE
                                        ;       -------
017302  017270                  $TRPAD: .WORD   $TRAP2
017304  015712                          $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
017306  016270                          $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
017310  016244                          $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
017312  016304                          $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)

017314  016542                          $GTSWR  ;;CALL=GTSWR    TRAP+5(104405)  GET SOFT-SWR SETTING

017316  016472                          $CKSWR  ;;CALL=CKSWR    TRAP+6(104406)  TEST FOR CHANGE IN SOFT-SWR
017320  016754                          $RDCHR  ;;CALL=RDCHR    TRAP+7(104407)  TTY TYPEIN CHARACTER ROUTINE
017322  017074                          $RDLIN  ;;CALL=RDLIN    TRAP+10(104410) TTY TYPEIN STRING ROUTINE
```

```
                                        .SBTTL  ECHO TEST
                                ;;**********************************************************************
                                ;*THIS ROUTINE WILL ECHO ANY CHARACTER TYPED
                                ;*AT THE CONSOLE
                                ;*THE TEST IS HALTED BY TYPING A CONTROL-C
                                ;*TEST CAN BE RESTARTED AFTER HALTING BY JUST CONTINUING
                                ;;**********************************************************************
017324                          ECHO:
017324  000005                          RESET                   ;CLEAR EVERYTHING
017326  112777  000052  163326          MOVB    #'*,@CTBUF      ;TRANSMIT PROMPT "*"
017334  105777  163314          2$:     TSTB    @CRCSR          ;WAIT FOR INPUT
017340  100375                          BPL     2$
017342  117777  163310  163312          MOVB    @CRBUF,@CTBUF   ;ECHO INPUT
017350  017700  163302                  MOV     @CRBUF,R0       ;STORE INPUT
017354  100023                          BPL     5$              ;BR IF "ERROR" NOT SET
017356  052701  010000                  BIS     #BIT12,R1       ;SET PARITY ERROR TEST MASK
017362  030100                          BIT     R1,R0           ;CHECK  FOR PARITY ERROR FLAG
017364  001403                          BEQ     3$              ;BR IF NOT SET
017366  004737  017450                  JSR     PC,MSG          ;REPORT PARITY ERROR
017372  017476                          MPAR
017374  006301                  3$:     ASL     R1              ;SHIFT MASK TO TEST "FR" FLAG
017376  030100                          BIT     R1,R0           ;TEST FOR FRAMING ERROR FLAG
017400  001403                          BEQ     4$              ;BR IF NOT SET
017402  004737  017450                  JSR     PC,MSG          ;REPSORT FRAMING ERROR
017406  017507                          MFR
017410  006301                  4$:     ASL     R1              ;SHIFT MASK TO TEST "OR" FLAG
017412  030100                          BIT     R1,R0           ;TEST FOR OVERFLOW ERROR
017414  001403                          BEQ     5$              ;BR IF NOT SET
017416  004737  017450                  JSR     PC,MSG          ;REPORT OVERFLOW ERROR
017422  017521                          MOR
017424  042700  000200          5$:     BIC     #BIT7,R0        ;CLEAR ANY PARITY BIT
017430  022700  000003                  CMP     #3,R0           ;WAS INPUT CONTROL-C
017434  001337                          BNE     2$              ;BR IF NOT
017436  004737  017450                  JSR     PC,MSG          ;REPORT PROGRAM STOP
017442  017534                          MSTOP
017444  000000                          HALT                    ;END OF TEST HALT
017446  000726                          BR      ECHO            ;AFTER END OF TEST HALT
                                                                ;   PRESS CONTINUE TO RESTART ECHO TEST

017450  013600                  MSG:    MOV     @(SP)+,R0       ;PICK UP MESSAGE POINTER
017452  062746  000002                  ADD     #2,-(SP)        ;ADJUST RETURN PC
017456  105777  163176          WAIT:   TSTB    @CTCSR          ;WAIT FOR XMIT DONE
017462  100375                          BPL     WAIT
017464  112077  163172                  MOVB    (R0)+,@CTBUF    ;SEND CHARACTER
017470  105710                          TSTB    (R0)            ;IS THIS END OF MESSAGE?
017472  001371                          BNE     WAIT            ;BR IF NOT
017474  000207                          RTS     PC              ;RETURN

017476  005015  040520  044522  MPAR:   .ASCIZ  <CR><LF>/PARITY/
017504  054524     000
017507     015  043012  040522  MFR:    .ASCIZ  <CR><LF>/FRAMING/
017514  044515  043516     000
017521     015  047412  042526  MOR:    .ASCIZ  <CR><LF>/OVERFLOW/
017526  043122  047514  000127
017534  005015  052123  050117  MSTOP:  .ASCIZ  <CR><LF>/STOP/
017542     000
```

```
                        017544                          .EVEN
                                                .SBTTL  TERMINAL OUTPUT TEST
                                                ;;*****************************************************************
                                                ;*THIS ROUTINE WILL OUTPUT ALL WRITABLE CHARACTERS FOR THE
                                                ;*THE OCTAL CODE 040 --> 377
                                                ;*32 CHARACTERS ARE PRINTED ON EACH LINE
                                                ;*THE PATTERN IS REPEATED EVERY THREE LINES
                                                ;*
                                                ;;*****************************************************************
017544  012701  000040          OUTTST: MOV     #40,R1          ;LOAD FIRST WRITABLE CHARACTER
017550  012700  000040          1$:     MOV     #40,R0          ;LOAD CHAR COUNT PER LINE
017554  105777  163100          2$:     TSTB    @CTCSR          ;WAIT FOR DONE
017560  100375                          BPL     2$
017562  010177  163074                  MOV     R1,@CTBUF       ;TRANSMIT A CHARACTER
017566  105201                          INCB    R1              ;INCREMENT CHARACTER CODE
017570  005300                          DEC     R0              ;DECREMENT CHAR COUNT
017572  001370                          BNE     2$              ;BR IF LINE NOT COMPLETE
017574  004737  017450                  JSR     PC,MSG          ;SSUE CR,LINE FEED

017600  001063                          $CRLF
017602  105777  163046                  TSTB    @CRCSR          ;ANY CHARACTER RECEIVED?
017606  100404                          BMI     3$              ;BR IF YES
017610  032701  000200                  BIT     #BIT7,R1        ;FINISHED ONE PASS OF WRITABLE CHARACTERS?
017614  001353                          BNE     OUTTST          ;BR IF YES
017616  000754                          BR      1$              ;IF NOT WRITE NEXT LINE

017620  005077  163032          3$:     CLR     @CRBUF          ;CLEAR RECEIVER
017624  000000                          HALT                    ;STOP TEST
017626  000746                          BR      OUTTST          ;RESTART TEST IF CONTINUED
```

```
 4384
 4385
 4386  017630  040503  020116  047516  EM1:    .ASCIZ  /CAN NOT ACCESS TCSR/
 4387  017636  020124  041501  042503
 4388  017644  051523  052040  051503
 4389  017652  000122
 4390  017654  040503  020116  047516  EM2:    .ASCIZ  /CAN NOT ACCESS TBUF/
 4391  017662  020124  041501  042503
 4392  017670  051523  052040  052502
 4393  017676  000106
 4394  017700  041524  051123  042040  EM3:    .ASCIZ  /TCSR DONE NOT CLEARED WITH TBUF FULL/
 4395  017706  047117  020105  047516
 4396  017714  020124  046103  040505
 4397  017722  042522  020104  044527
 4398  017730  044124  052040  052502
 4399  017736  020106  052506  046114
 4400  017744     000
 4401  017745     124  051503  020122  EM4:    .ASCIZ  /TCSR DONE NOT SET/
 4402  017752  047504  042516  047040
 4403  017760  052117  051440  052105
 4404  017766     000
 4405  017767     124  051503  020122  EM5:    .ASCIZ  /TCSR DONE NOT SET WITH RESET/
 4406  017774  047504  042516  047040
 4407  020002  052117  051440  052105
 4408  020010  053440  052111  020110
 4409  020016  042522  042523  000124
 4410  020024  040503  020116  047516  EM6:    .ASCIZ  /CAN NOT ACCESS RCSR/
 4411  020032  020124  041501  042503
 4412  020040  051523  051040  051503
 4413  020046  000122
 4414  020050  040503  020116  047516  EM7:    .ASCIZ  /CAN NOT ACCESS RBUF/
 4415  020056  020124  041501  042503
 4416  020064  051523  051040  052502
 4417  020072  000106
 4418  020074  040503  020116  047516  EM10:   .ASCIZ  /CAN NOT ACCESS LKS/
 4419  020102  020124  041501  042503
 4420  020110  051523  046040  051513
 4421  020116     000
 4422  020117     102  052111  020060  EM11:   .ASCIZ  /BITO OF TCSR NOT CLEAR AFTER RESET/
 4423  020124  043117  052040  051503
 4424  020132  020122  047516  020124
 4425  020140  046103  040505  020122
 4426  020146  043101  042524  020122
 4427  020154  042522  042523  000124
 4428  020162  040503  020116  047516  EM12:   .ASCIZ  /CAN NOT SET BITO OF TCSR/
 4429  020170  020124  042523  020124
 4430  020176  044502  030124  047440
 4431  020204  020106  041524  051123
 4432  020212     000
 4433  020213     103  047101  047040  EM13:   .ASCIZ  /CAN NOT CLEAR BITO OF TCSR/
 4434  020220  052117  041440  042514
 4435  020226  051101  041040  052111
 4436  020234  020060  043117  052040
 4437  020242  051503  000122
 4438  020246  042522  042523  020124  EM14:   .ASCIZ  /RESET DID NOT CLEAR BITO OF TCSR/
 4439  020254  044504  020104  047516
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 4440  020262  020124  046103  040505
 4441  020270  020122  044502  030124
 4442  020276  047440  020106  041524
 4443  020304  051123     000
 4444  020307     102  052111  020062  EM15:   .ASCIZ  /BIT2 OF TCSR NOT CLEAR AFTER RESET/
 4445  020314  043117  052040  051503
 4446  020322  020122  047516  020124
 4447  020330  046103  040505  020122
 4448  020336  043101  042524  020122
 4449  020344  042522  042523  000124
 4450  020352  040503  020116  047516  EM16:   .ASCIZ  /CAN NOT SET BIT2 OF TCSR/
 4451  020360  020124  042523  020124
 4452  020366  044502  031124  047440
 4453  020374  020106  041524  051123
 4454  020402     000
 4455  020403     103  047101  047040  EM17:   .ASCIZ  /CAN NOT CLEAR BIT2 OF TCSR/
 4456  020410  052117  041440  042514
 4457  020416  051101  041040  052111
 4458  020424  020062  043117  052040
 4459  020432  051503  000122
 4460  020436  042522  042523  020124  EM20:   .ASCIZ  /RESET DID NOT CLEAR BIT2 OF TCSR/
 4461  020444  044504  020104  047516
 4462  020452  020124  046103  040505
 4463  020460  020122  044502  031124
 4464  020466  047440  020106  041524
 4465  020474  051123     000
 4466  020477     102  052111  020066  EM21:   .ASCIZ  /BIT6 OF TCSR NOT CLEAR AFTER RESET/
 4467  020504  043117  052040  051503
 4468  020512  020122  047516  020124
 4469  020520  046103  040505  020122
 4470  020526  043101  042524  020122
 4471  020534  042522  042523  000124
 4472  020542  046530  052111  044440  EM22:   .ASCIZ  /XMIT INTERRUPT AT PRIORITY 7/
 4473  020550  052116  051105  052522
 4474  020556  052120  040440  020124
 4475  020564  051120  047511  044522
 4476  020572  054524  033440     000
 4477  020577     103  047101  047040  EM23:   .ASCIZ  /CAN NOT SET BIT6 OF TCSR/
 4478  020604  052117  051440  052105
 4479  020612  041040  052111  020066
 4480  020620  043117  052040  051503
 4481  020626  000122
 4482  020630  040503  020116  047516  EM24:   .ASCIZ  /CAN NOT CLEAR BIT6 OF TCSR/
 4483  020636  020124  046103  040505
 4484  020644  020122  044502  033124
 4485  020652  047440  020106  041524
 4486  020660  051123     000
 4487  020663     122  051505  052105  EM25:   .ASCIZ  /RESET DID NOT CLEAR BIT6 OF TCSR/
 4488  020670  042040  042111  047040
 4489  020676  052117  041440  042514
 4490  020704  051101  041040  052111
 4491  020712  020066  043117  052040
 4492  020720  051503  000122
 4493  020724  044502  033124  047440  EM26:   .ASCIZ  /BIT6 OF RCSR NOT CLEAR AFTER RESET/
 4494  020732  020106  041522  051123
 4495  020740  047040  052117  041440
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4496  020746  042514  051101  040440
4497  020754  052106  051105  051040
4498  020762  051505  052105     000
4499  020767     122  053103  020122  EM27:   .ASCIZ  /RCVR INTERRUPT WITH PRIORITY 7/
4500  020774  047111  042524  051122
4501  021002  050125  020124  044527
4502  021010  044124  050040  044522
4503  021016  051117  052111  020131
4504  021024  000067
4505  021026  040503  020116  047516  EM30:   .ASCIZ  /CAN NOT SET BIT6 OF RCSR/
4506  021034  020124  042523  020124
4507  021042  044502  033124  047440
4508  021050  020106  041522  051123
4509  021056     000
4510  021057     103  047101  047040  EM31:   .ASCIZ  /CAN NOT CLEAR BIT6 OF RCSR/
4511  021064  052117  041440  042514
4512  021072  051101  041040  052111
4513  021100  020066  043117  051040
4514  021106  051503  000122
4515  021112  040503  020116  047516  EM32:   .ASCIZ  /CAN NOT CLEAR BIT6 OF RCSR WITH RESET/
4516  021120  020124  046103  040505
4517  021126  020122  044502  033124
4518  021134  047440  020106  041522
4519  021142  051123  053440  052111
4520  021150  020110  042522  042523
4521  021156  000124
4522  021160  044502  033124  047440  EM33:   .ASCIZ  /BIT6 OF LKS NOT CLEAR AFTER RESET/
4523  021166  020106  045514  020123
4524  021174  047516  020124  046103
4525  021202  040505  020122  043101
4526  021210  042524  020122  042522
4527  021216  042523  000124
4528  021222  045514  020123  047111  EM34:   .ASCIZ  /LKS INTERRUPT WITH PRIORITY 7/
4529  021230  042524  051122  050125
4530  021236  020124  044527  044124
4531  021244  050040  044522  051117
4532  021252  052111  020131  000067
4533  021260  040503  020116  047516  EM35:   .ASCIZ  /CAN NOT SET BIT6 OF LKS/
4534  021266  020124  042523  020124
4535  021274  044502  033124  047440
4536  021302  020106  045514  000123
4537  021310  040503  020116  047516  EM36:   .ASCIZ  /CAN NOT CLEAR BIT6 OF LKS/
4538  021316  020124  046103  040505
4539  021324  020122  044502  033124
4540  021332  047440  020106  045514
4541  021340  000123
4542  021342  042522  042523  020124  EM37:   .ASCIZ  /RESET DID NOT CLEAR BIT6 OF LKS/
4543  021350  044504  020104  047516
4544  021356  020124  046103  040505
4545  021364  020122  044502  033124
4546  021372  047440  020106  045514
4547  021400  000123
4548  021402  052504  046101  040440  EM40:   .ASCIZ  /DUAL ADDRESSING ERROR/
4549  021410  042104  042522  051523
4550  021416  047111  020107  051105
4551  021424  047522  000122
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 4552  021430  044502  033124  047440  EM41:   .ASCIZ  /BIT6 OF LKS NOT SET AFTER RESET/
 4553  021436  020106  045514  020123
 4554  021444  047516  020124  042523
 4555  021452  020124  043101  042524
 4556  021460  020122  042522  042523
 4557  021466  000124
 4558  021470  040503  020116  047516  EM42:   .ASCIZ  /CAN NOT CLEAR BIT7 OF LKS/
 4559  021476  020124  046103  040505
 4560  021504  020122  044502  033524
 4561  021512  047440  020106  045514
 4562  021520  000123
 4563  021522  044502  033524  047440  EM43:   .ASCIZ  /BIT7 OF LKS DOES NOT SET/
 4564  021530  020106  045514  020123
 4565  021536  047504  051505  047040
 4566  021544  052117  051440  052105
 4567  021552     000
 4568  021553     122  041524  044440  EM44:   .ASCIZ  /RTC INTERRUPT AT PRIORITY 7/
 4569  021560  052116  051105  052522
 4570  021566  052120  040440  020124
 4571  021574  051120  047511  044522
 4572  021602  054524  033440     000
 4573  021607     122  041524  044440  EM45:   .ASCIZ  /RTC INTERRUPTS WHEN DISABLED/
 4574  021614  052116  051105  052522
 4575  021622  052120  020123  044127
 4576  021630  047105  042040  051511
 4577  021636  041101  042514  000104
 4578  021644                          EM47:
 4579  021644  052122  020103  047111  EM46:   .ASCIZ  /RTC INTERRUPT DID NOT OCCUR/
 4580  021652  042524  051122  050125
 4581  021660  020124  044504  020104
 4582  021666  047516  020124  041517
 4583  021674  052503  000122
 4584  021700  052122  020103  047504  EM50:   .ASCIZ  /RTC DOUBLE INTERRUPT/
 4585  021706  041125  042514  044440
 4586  021714  052116  051105  052522
 4587  021722  052120     000
 4588  021725     122  051505  052105  EM51:   .ASCIZ  /RESET DID NOT INTERRUPT/
 4589  021732  042040  042111  047040
 4590  021740  052117  044440  052116
 4591  021746  051105  052522  052120
 4592  021754     000
 4593  021755     122  041524  044440  EM52:   .ASCIZ  /RTC INTERRUPT DID NOT CLEAR WITH BIT7 OF LKS/
 4594  021762  052116  051105  052522
 4595  021770  052120  042040  042111
 4596  021776  047040  052117  041440
 4597  022004  042514  051101  053440
 4598  022012  052111  020110  044502
 4599  022020  033524  047440  020106
 4600  022026  045514  000123
 4601  022032  046103  041517  020113  EM53:   .ASCIZ  /CLOCK REPEATABILITY/
 4602  022040  042522  042520  052101
 4603  022046  041101  046111  052111
 4604  022054  000131
 4605  022056  046530  052111  044440  EM54:   .ASCIZ  /XMIT INTERRUPTS WHEN DISABLED/
 4606  022064  052116  051105  052522
 4607  022072  052120  020123  044127
```

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 4608  022100  047105  042040  051511
 4609  022106  041101  042514  000104
 4610  022114  046530  052111  044440  EM56:   .ASCIZ  /XMIT INTERRUPTS AT PRIORITY 7/
 4611  022122  052116  051105  052522
 4612  022130  052120  020123  052101
 4613  022136  050040  044522  051117
 4614  022144  052111  020131  000067
 4615  022152  046530  052111  044440  EM57:   .ASCIZ  /XMIT INTERRUPTS WITH ENABLE CLEAR/
 4616  022160  052116  051105  052522
 4617  022166  052120  020123  044527
 4618  022174  044124  042440  040516
 4619  022202  046102  020105  046103
 4620  022210  040505  000122
 4621  022214                  EM55:
 4622  022214  046530  052111  042040  EM60:   .ASCIZ  /XMIT DID NOT INTERRUPT/
 4623  022222  042111  047040  052117
 4624  022230  044440  052116  051105
 4625  022236  052522  052120     000
 4626  022243     130  044515  020124  EM61:   .ASCIZ  /XMIT RE-INTERRUPTED/
 4627  022250  042522  044455  052116
 4628  022256  051105  052522  052120
 4629  022264  042105     000
 4630  022267     114  040517  044504  EM62:   .ASCIZ  /LOADING TBUF DID NOT CLEAR INTERRUPT/
 4631  022274  043516  052040  052502
 4632  022302  020106  044504  020104
 4633  022310  047516  020124  046103
 4634  022316  040505  020122  047111
 4635  022324  042524  051122  050125
 4636  022332  000124
 4637  022334  041522  051126  040440  EM63:   .ASCIZ  /RCVR ACTIVE NOT SET/
 4638  022342  052103  053111  020105
 4639  022350  047516  020124  042523
 4640  022356  000124
 4641  022360  041522  051126  042040  EM64:   .ASCIZ  /RCVR DONE NEVER SET/
 4642  022366  047117  020105  042516
 4643  022374  042526  020122  042523
 4644  022402  000124
 4645  022404  041522  051126  040440  EM65:   .ASCIZ  /RCVR ACTIVE NOT CLEARED WITH DONE SET/
 4646  022412  052103  053111  020105
 4647  022420  047516  020124  046103
 4648  022426  040505  042522  020104
 4649  022434  044527  044124  042040
 4650  022442  047117  020105  042523
 4651  022450  000124
 4652  022452  042522  042523  020124  EM66:   .ASCIZ  /RESET DID NOT CLEAR RCVR DONE/
 4653  022460  044504  020104  047516
 4654  022466  020124  046103  040505
 4655  022474  020122  041522  051126
 4656  022502  042040  047117  000105
 4657  022510  042122  020122  047105  EM67:   .ASCIZ  /RDR ENABLE DID NOT CLEAR RCVR DONE/
 4658  022516  041101  042514  042040
 4659  022524  042111  047040  052117
 4660  022532  041440  042514  051101
 4661  022540  051040  053103  020122
 4662  022546  047504  042516     000
 4663  022553     122  040505  044504  EM70:   .ASCIZ  /READING RBUF DID NOT CLEAR RCVR DONE/
```

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 4664  022560  043516  051040  052502
 4665  022566  020106  044504  020104
 4666  022574  047516  020124  046103
 4667  022602  040505  020122  041522
 4668  022610  051126  042040  047117
 4669  022616  000105
 4670  022620  041522  051126  044440  EM71:   .ASCIZ  /RCVR INTERRUPTS WITH ENABLE CLEAR/
 4671  022626  052116  051105  052522
 4672  022634  052120  020123  044527
 4673  022642  044124  042440  040516
 4674  022650  046102  020105  046103
 4675  022656  040505  000122
 4676  022662  041522  051126  044440  EM73:   .ASCIZ  /RCVR INTERRUPTS AT PRIORITY 7/
 4677  022670  052116  051105  052522
 4678  022676  052120  020123  052101
 4679  022704  050040  044522  051117
 4680  022712  052111  020131  000067
 4681  022720  041522  051126  044440  EM74:   .ASCIZ  /RCVR INT RQST PASSED WITH ENABLE CLEAR/
 4682  022726  052116  051040  051521
 4683  022734  020124  040520  051523
 4684  022742  042105  053440  052111
 4685  022750  020110  047105  041101
 4686  022756  042514  041440  042514
 4687  022764  051101     000
 4688  022767                  EM72:
 4689  022767     122  053103  020122  EM75:   .ASCIZ  /RCVR DID NOT INTERRUPT/
 4690  022774  044504  020104  047516
 4691  023002  020124  047111  042524
 4692  023010  051122  050125  000124
 4693  023016  041522  051126  051040  EM76:   .ASCIZ  /RCVR RE-INTERRUPTED/
 4694  023024  026505  047111  042524
 4695  023032  051122  050125  042524
 4696  023040  000104
 4697  023042  042522  042101  047111  EM77:   .ASCIZ  /READING RBUF DID NOT CLEAR INTERRUPT/
 4698  023050  020107  041122  043125
 4699  023056  042040  042111  047040
 4700  023064  052117  041440  042514
 4701  023072  051101  044440  052116
 4702  023100  051105  052522  052120
 4703  023106     000
 4704  023107     122  051505  052105  EM100:  .ASCIZ  /RESET DID NOT CLEAR RCVR INTERRUPT/
 4705  023114  042040  042111  047040
 4706  023122  052117  041440  042514
 4707  023130  051101  051040  053103
 4708  023136  020122  047111  042524
 4709  023144  051122  050125  000124
 4710  023152  047447  023522  043040  EM101:  .ASCIZ  /'OR' FLAG DID NOT SET/
 4711  023160  040514  020107  044504
 4712  023166  020104  047516  020124
 4713  023174  042523  000124
 4714  023200  042447  051122  051117  EM102:  .ASCIZ  /'ERROR' NOT SET WITH 'OR' FLAG/
 4715  023206  020047  047516  020124
 4716  023214  042523  020124  044527
 4717  023222  044124  023440  051117
 4718  023230  020047  046106  043501
 4719  023236     000
```

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 4720  023237     102  042522  045501  EM103:  .ASCIZ  /BREAK DID NOT XMIT ALL ZEROES/
 4721  023244  042040  042111  047040
 4722  023252  052117  054040  044515
 4723  023260  020124  046101  020114
 4724  023266  042532  047522  051505
 4725  023274     000
 4726  023275     102  042522  045501  EM104:  .ASCIZ  /BREAK DID NOT SET 'FR' ERROR/
 4727  023302  042040  042111  047040
 4728  023310  052117  051440  052105
 4729  023316  023440  051106  020047
 4730  023324  051105  047522  000122
 4731  023332  040504  040524  041440  EM105:  .ASCIZ  /DATA COMPARE ERROR/
 4732  023340  046517  040520  042522
 4733  023346  042440  051122  051117
 4734  023354     000
 4735  023355     104  052101  020101  EM106:  .ASCIZ  /DATA COMPARE ERROR WITH CABLE/
 4736  023362  047503  050115  051101
 4737  023370  020105  051105  047522
 4738  023376  020122  044527  044124
 4739  023404  041440  041101  042514
 4740  023412     000
 4741  023413     124  046511  047505  EM107:  .ASCIZ  /TIMEOUT IN EXERCISER TEST/
 4742  023420  052125  044440  020116
 4743  023426  054105  051105  044503
 4744  023434  042523  020122  042524
 4745  023442  052123     000
 4746  023445     111  041516  051117  EM110:  .ASCIZ  /INCORRECT RECEIVE COUNT/
 4747  023452  042522  052103  051040
 4748  023460  041505  044505  042526
 4749  023466  041440  052517  052116
 4750  023474     000
 4751  023475     104  052101  020101  EM111:  .ASCIZ  /DATA COMPARE ERROR IN EXERCISER/
 4752  023502  047503  050115  051101
 4753  023510  020105  051105  047522
 4754  023516  020122  047111  042440
 4755  023524  042530  041522  051511
 4756  023532  051105     000
 4757  023535     124  040522  020120  EM112:  .ASCIZ  /TRAP CATCHER/
 4758  023542  040503  041524  042510
 4759  023550  000122
 4760  023552  047516  041440  045514  EM113:  .ASCIZ  /NO CLK INTERRUPT IN EXERCISER/
 4761  023560  044440  052116  051105
 4762  023566  052522  052120  044440
 4763  023574  020116  054105  051105
 4764  023602  044503  042523  000122
 4765  023610  042442  051122  051117  EM114:  .ASCIZ  /''ERROR'' NOT SET WITH ''FR'' FLAG/
 4766  023616  020042  047516  020124
 4767  023624  042523  020124  044527
 4768  023632  044124  021040  051106
 4769  023640  020042  046106  043501
 4770  023646     000
 4771  023647     122  053103  040440  EM115:  .ASCIZ  /RCV ACTIVE NOT CLEAR WITH INIT/
 4772  023654  052103  053111  020105
 4773  023662  047516  020124  046103
 4774  023670  040505  020122  044527
 4775  023676  044124  044440  044516
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 4776  023704  000124
 4777  023706  041522  020126  041501  EM116:  .ASCIZ  /RCV ACTIVE WITHOUT "START" BIT/
 4778  023714  044524  042526  053440
 4779  023722  052111  047510  052125
 4780  023730  021040  052123  051101
 4781  023736  021124  041040  052111
 4782  023744     000
 4783  023745     122  051104  042440  EM117:  .ASCIZ  /RDR ENABLE NOT CLEAR WITH RCV ACTIVE/
 4784  023752  040516  046102  020105
 4785  023760  047516  020124  046103
 4786  023766  040505  020122  044527
 4787  023774  044124  051040  053103
 4788  024002  040440  052103  053111
 4789  024010  000105
 4790
 4791  024012  042524  052123  020043  DH1:    .ASCIZ  /TEST#   ERROR#  TCSR/
 4792  024020  020040  051105  047522
 4793  024026  021522  020040  041524
 4794  024034  051123     000
 4795  024037     124  051505  021524  DH2:    .ASCIZ  /TEST#   ERR PC  TBUF/
 4796  024044  020040  042440  051122
 4797  024052  050040  020103  052040
 4798  024060  052502  000106
 4799  024064  042524  052123  020043  DH6:    .ASCIZ  /TEST#   ERR PC  RCSR/
 4800  024072  020040  051105  020122
 4801  024100  041520  020040  041522
 4802  024106  051123     000
 4803  024111     124  051505  021524  DH7:    .ASCIZ  /TEST#   ERR PC  RBUF/
 4804  024116  020040  042440  051122
 4805  024124  050040  020103  051040
 4806  024132  052502  000106
 4807  024136  042524  052123  020043  DH10:   .ASCIZ  /TEST#   ERR PC  LKS/
 4808  024144  020040  051105  020122
 4809  024152  041520  020040  045514
 4810  024160  000123
 4811  024162  042524  052123  020043  DH40:   .ASCIZ  /TEST#   ERR PC  GOOD    BAD/
 4812  024170  020040  051105  020122
 4813  024176  041520  020040  047507
 4814  024204  042117  020040  020040
 4815  024212  040502  000104
 4816  024216  042524  052123  020043  DH53:   .ASCIZ  /TEST#   ERR PC  LKS     CNT1    CNT2/
 4817  024224  020040  051105  020122
 4818  024232  041520  020040  045514
 4819  024240  020123  020040  020040
 4820  024246  047103  030524  020040
 4821  024254  020040  047103  031124
 4822  024262     000
 4823  024263     124  051505  021524  DH103:  .ASCIZ  /TEST#   ERR PC  RCSR    DATA/
 4824  024270  020040  042440  051122
 4825  024276  050040  020103  051040
 4826  024304  051503  020122  020040
 4827  024312  042040  052101  000101
 4828  024320  042524  052123  020043  DH105:  .ASCIZ  /TEST#   ERR PC  RCSR    GOOD    BAD/
 4829  024326  020040  051105  020122
 4830  024334  041520  020040  041522
 4831  024342  051123  020040  020040
```

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 4832  024350  047507  042117  020040
 4833  024356  020040  040502  000104
 4834  024364  042524  052123  020043  DH110:  .ASCIZ  /TEST#   ERR PC  RCSR    TRANS   RCV/
 4835  024372  020040  051105  020122
 4836  024400  041520  020040  041522
 4837  024406  051123  020040  020040
 4838  024414  051124  047101  020123
 4839  024422  020040  041522  000126
 4840  024430  042524  052123  020043  DH112:  .ASCIZ  /TEST#   ERR PC  RCSR    OLDPC   TRAP ADR/
 4841  024436  020040  051105  020122
 4842  024444  041520  020040  041522
 4843  024452  051123  020040  020040
 4844  024460  046117  050104  020103
 4845  024466  020040  051124  050101
 4846  024474  040440  051104     000
 4847          024502                  .EVEN
 4848  024502  005015  055103  046104  M1:     .ASCIZ  <CR><LF>/CZDLDE0 DL11-W,1144 MFM SLU/
 4849  024510  042504  020060  046104
 4850  024516  030461  053455  030454
 4851  024524  032061  020064  043115
 4852  024532  020115  046123  000125
 4853                                  .EVEN
 4854  024540  005015                  M2:     .ASCII  <CR><LF>
 4855  024542  020040  042040  053105  M2A:    .ASCIZ  /   DEVICES UNDER TEST  /
 4856  024550  041511  051505  052440
 4857  024556  042116  051105  052040
 4858  024564  051505  020124  000040
 4859
 4860                                  .EVEN
 4861  024572  001072  001016  002640  DT1:    .WORD   $TESTN,$ERRPC,TCSR,0
 4862  024600  000000
 4863  024602  001072  001016  002642  DT2:    .WORD   $TESTN,$ERRPC,TBUF,0
 4864  024610  000000
 4865  024612  001072  001016  002634  DT6:    .WORD   $TESTN,$ERRPC,RCSR,0
 4866  024620  000000
 4867  024622  001072  001016  002636  DT7:    .WORD   $TESTN,$ERRPC,RBUF,0
 4868  024630  000000
 4869  024632  001072  001016  002674  DT10:   .WORD   $TESTN,$ERRPC,LKS,0
 4870  024640  000000
 4871  024642  001072  001016  001020  DT40:   .WORD   $TESTN,$ERRPC,$GDADR,$BDADR,0
 4872  024650  001022  000000
 4873  024654  001072  001016  002674  DT53:   .WORD   $TESTN,$ERRPC,LKS,FIRST,SECND,0
 4874  024662  002336  002616  000000
 4875  024670  001072  001016  002634  DT103:  .WORD   $TESTN,$ERRPC,RCSR,$BDDAT,0
 4876  024676  001026  000000
 4877  024702  001072  001016  002634  DT105:  .WORD   $TESTN,$ERRPC,RCSR,$GDDAT,$BDDAT,0
 4878  024710  001024  001026  000000
 4879  024716  001072  001016  002634  DT110:  .WORD   $TESTN,$ERRPC,RCSR,XMTCNT,RCVCNT,0
 4880  024724  002442  002440  000000
 4881  024732  001072  001016  002634  DT112:  .WORD   $TESTN,$ERRPC,RCSR,OLDPC,BDVECT,0
 4882  024740  002620  002622  000000
 4883  024746  000000                  ENDADR: .WORD   0               ;END ADDRESS FOR CHECKSUM AND SAVE AREA
 4884                                                                  ;OF WRAP AROUND CONSOLE TEST
 4885
 4886          000001                          .END
```

```
ABASE = 176500            911#   1024    1065
ACDW1 = 000000           1024
ACDW2 = 000000           1024
ACPUOP= 000000           1024    1039
ADDW0 = 000000           1024
ADDW1 = 000000           1024
ADDW10= 000000           1024
ADDW11= 000000           1024
ADDW12= 000000           1024
ADDW13= 000000           1024
ADDW14= 000000           1024
ADDW15= 000000           1024
ADDW2 = 000000           1024
ADDW3 = 000000           1024
ADDW4 = 000000           1024
ADDW5 = 000000           1024
ADDW6 = 000000           1024
ADDW7 = 000000           1024
ADDW8 = 000000           1024
ADDW9 = 000000           1024
ADEVCT= 000000           1024    1030
ADEVM = 000000           1024    1066
ADR     004132           1738#   1741
ADRTBL  002702           1543#   1554    1736
AENV  = 000000           1024    1035
AENVM = 000000           1024    1036
AFATAL= 000000           1024    1027
AMADR1= 000000           1024    1052
AMADR2= 000000           1024    1056
AMADR3= 000000           1024    1059
AMADR4= 000000           1024    1062
AMAMS1= 000000           1024    1046
AMAMS2= 000000           1024    1054
AMAMS3= 000000           1024    1057
AMAMS4= 000000           1024    1060
AMSGAD= 000000           1024    1032
AMSGLG= 000000           1024    1033
AMSGTY= 000000           1024    1026
AMTYP1= 000000           1024    1047
AMTYP2= 000000           1024    1055
AMTYP3= 000000           1024    1058
AMTYP4= 000000           1024    1061
APASS = 000000           1024    1029
APRIOR= 000000           1024
APTCSU= 000040           3937#   3970
APTENV= 000001           3713    3892    3935#   3963
APTSIZ= 000200           1617    3934#
APTSPO= 000100           3894    3936#   3965
APTSZD  003636           1641    1643    1669#
ASWREG= 000000           1024    1037
ATESTN= 000000           1024    1028
AUNIT = 000000           1024    1031
AUSWR = 000400            913#   1024    1038
AVECT1= 000300            912#   1024    1063
AVECT2= 000000           1024    1064
BDVECT  002622           1506#   3681*   4881
```

```
BEGIN   003774          1711#   3670
BGNADD= 003014          3420#   3499
BIT0  = 000001           895#   1638    1713    1972    1981    1992    1993    1997    1998    2009    2011    2013    2436
                        2602    2670    2730    2733    2750    2755    3037    3093    3119    3125    3132    3137    3151
                        3173    3177    3218    3260    3373    3393
BIT00 = 000001           885#    895
BIT01 = 000002           884#    894
BIT02 = 000004           883#    893
BIT03 = 000010           882#    892    1977    3042    3098    3156
BIT04 = 000020           881#    891
BIT05 = 000040           880#    890
BIT06 = 000100           879#    889
BIT07 = 000200           878#    888
BIT08 = 000400           877#    887
BIT09 = 001000           876#    886    3724    3863
BIT1  = 000002           894#   1711    2177
BIT10 = 002000           875#   3035    3147
BIT11 = 004000           874#   2620    2639    2649    2672
BIT12 = 010000           873#   4309
BIT13 = 020000           872#   3181    3708
BIT14 = 040000           871#   3068    3847
BIT15 = 100000           870#   3073    3186
BIT2  = 000004           893#   1801    1814    1815    1820    1821    1833    1835    1838    1847    1859    1876    1890
                        1920    2567    2583    2605    2624    2645    2652    2657    2664    2674    2684    2691    2700
                        2717    2734    2758    2773    2793    2798    2810    2816    2831    2858    2871    2878    2897
                        2913    2952    2968    2998    3046    3065    3102    3126    3133    3138    3160    3178    3200
                        3236    3242    3312    3446
BIT3  = 000010           892#
BIT4  = 000020           891#   1634    1706    1903    2178    2447
BIT5  = 000040           890#   1642    3377    3397
BIT6  = 000100           889#   2028    2038    2039    2045    2046    2051    2053    2070    2080    2081    2087    2088
                        2094    2096    2111    2129    2136    2146    2147    2153    2154    2158    2160    2189    2190
                        2214    2246    2255    2280    2288    2302    2312    2333    2344    2351    2361    2376    2383
                        2393    2411    2413    2457    2470    2478    2487    2494    2504    2524    2533    2549    2562
                        2568    2579    2771    2772    2805    2815    2849    2865    2916    2932    2951    2978    2997
                        3021    3307    3311    3325    3326    3341    3360    3399
BIT7  = 000200           888#   1640    2222    2223    2225    2226    2254    2279    2311    2350    2382    2386    3252
                        3518    3537    3540    3556    3559    4324    4377
BIT8  = 000400           887#   1970    3091    3149
BIT9  = 001000           886#
BPT   = 000003           916#
BPTVEC= 000014           902#
BUF     002454          1496#   3331    3368
CATCH   014552           927    3679#
CHKSUM  014062          3458    3474    3499#
CKSWR = 104406          3723    3846    4290#
CLK     013702          3309    3408#
CLKCNT  002444          1492#   3362    3408*
CMPARE  007244          2429    2432#
CNTLP   002564          1497#   3461
COMP    013504          3370#   3378
CONT    006246          2232#   2235
CONT41  012400          3122    3130#
CR    = 000015           810#   1498    1501    3660    4021    4031    4342    4344    4346    4348    4848    4854
CRBUF   002656          1530#   4306    4307    4381*
CRCSR   002654          1529#   1660    1717    4304    4375
```

```
CRLF   = 000200            811#   3980   4031
CRPSW    002666           1534#
CRVECT   002664           1533#
CTBUF    002662           1532#  4303*  4306*  4337*  4368*
CTCSR    002660           1531#  1859*  1876*  1890*  2583*  2624*  2652*  2664*  2674*  2684*  2691*  2717*  2758*
                          2793*  2798*  2810*  2816*  2858*  2871*  2878*  2913*  2968*  3065*  3126*  3133*  3138*
                          3178*  3236*  3242*  4335   4366
CTPSW    002672           1536#
CTSTFL   002624           1512#  1569*  1636*  1716*  1763   1785   1804   1824   1857   1874   1974   1983   2000
                          2109   2127   2212   2244   2300   2342   2374   2409   3039   3095   3153   3305   3358
                          3624*
CTVECT   002670           1535#
DDISP  = 177570            817#  1007   1605
DEVADR   003014           1554#  1645   1677   3420
DH1      024012           1087   1097   1102   1107   1127   1132   1137   1142   1147   1152   1157   1162   1167
                          1172   1177   1182   1187   1302   1307   1312   1317   1322   1327   1332   4791#
DH10     024136           1122   1217   1222   1227   1232   1237   1247   1252   1257   1262   1267   1272   1277
                          1282   1287   1292   1456   4807#
DH103    024263           1416   4823#
DH105    024320           1426   1431   1446   4828#
DH110    024364           1441   4834#
DH112    024430           1451   4840#
DH2      024037           1092   4795#
DH40     024162           1242   4811#
DH53     024216           1297   4816#
DH6      024064           1112   1192   1197   1202   1207   1212   1337   1342   1347   1352   1357   1362   1367
                          1372   1377   1382   1387   1391   1396   1401   1407   1412   1421   1436   1461   1466
                          1471   1476   4799#
DH7      024111           1117   4803#
DISPLA   001042           1007#  1605*  1613*  3703*  3874*
DISPRE   000174            937#  1613
DSWR   = 177570            816#  1006   1604
DT1      024572           1088   1098   1103   1108   1128   1133   1138   1143   1148   1153   1158   1163   1168
                          1173   1178   1183   1188   1303   1308   1313   1318   1323   1328   1333   4861#
DT10     024632           1123   1218   1223   1228   1233   1238   1248   1253   1258   1263   1268   1273   1278
                          1283   1288   1293   1457   4869#
DT103    024670           1417   4875#
DT105    024702           1427   1432   1447   4877#
DT110    024716           1442   4879#
DT112    024732           1452   4881#
DT2      024602           1093   4863#
DT40     024642           1243   4871#
DT53     024654           1298   4873#
DT6      024612           1113   1193   1198   1203   1208   1213   1338   1343   1348   1353   1358   1363   1368
                          1373   1378   1383   1388   1392   1397   1402   1408   1413   1422   1437   1462   1467
                          1472   1477   4865#
DT7      024622           1118   4867#
DVADT    003664           1675   1677#
ECHO     017324            942   4301#  4330
EMTVEC= 000030             905#  1589*  1590*
EM1      017630           1086   4386#
EM10     020074           1121   4418#
EM100    023107           1400   4704#
EM101    023152           1406   4710#
EM102    023200           1411   4714#
EM103    023237           1415   4720#
```

```
EM104   023275          1420    4726#
EM105   023332          1425    4731#
EM106   023355          1430    4735#
EM107   023413          1435    4741#
EM11    020117          1126    4422#
EM110   023445          1440    4746#
EM111   023475          1445    4751#
EM112   023535          1450    4757#
EM113   023552          1455    4760#
EM114   023610          1460    4765#
EM115   023647          1465    4771#
EM116   023706          1470    4777#
EM117   023745          1475    4783#
EM12    020162          1131    4428#
EM13    020213          1136    4433#
EM14    020246          1141    4438#
EM15    020307          1146    4444#
EM16    020352          1151    4450#
EM17    020403          1156    4455#
EM2     017654          1091    4390#
EM20    020436          1161    4460#
EM21    020477          1166    4466#
EM22    020542          1171    4472#
EM23    020577          1176    4477#
EM24    020630          1181    4482#
EM25    020663          1186    4487#
EM26    020724          1191    4493#
EM27    020767          1196    4499#
EM3     017700          1096    4394#
EM30    021026          1201    4505#
EM31    021057          1206    4510#
EM32    021112          1211    4515#
EM33    021160          1216    4522#
EM34    021222          1221    4528#
EM35    021260          1226    4533#
EM36    021310          1231    4537#
EM37    021342          1236    4542#
EM4     017745          1101    4401#
EM40    021402          1241    4548#
EM41    021430          1246    4552#
EM42    021470          1251    4558#
EM43    021522          1256    4563#
EM44    021553          1261    4568#
EM45    021607          1266    4573#
EM46    021644          1271    4579#
EM47    021644          1276    4578#
EM5     017767          1106    4405#
EM50    021700          1281    4584#
EM51    021725          1286    4588#
EM52    021755          1291    4593#
EM53    022032          1296    4601#
EM54    022056          1301    4605#
EM55    022214          1306    4621#
EM56    022114          1311    4610#
EM57    022152          1316    4615#
EM6     020024          1111    4410#
```

```
EM60    022214            1321    4622#
EM61    022243            1326    4626#
EM62    022267            1331    4630#
EM63    022334            1336    4637#
EM64    022360            1341    4641#
EM65    022404            1346    4645#
EM66    022452            1351    4652#
EM67    022510            1356    4657#
EM7     020050            1116    4414#
EM70    022553            1361    4663#
EM71    022620            1366    4670#
EM72    022767            1371    4688#
EM73    022662            1376    4676#
EM74    022720            1381    4681#
EM75    022767            1386    4689#
EM76    023016            1390    4693#
EM77    023042            1395    4697#
ENDADD= 024746            3421#   3502    3594    3611
ENDADR  024746            3421    4883#
ENDB7   004676            1885    1904    1906#
ENDEV   014344            3390    3619#
ENDMG   014470            3647    3660#
ENDSTK  002412            1486#
ERROR = 104000             804#   1765    1787    1806    1818    1826    1839    1862    1879    1930    1945    1959    1985
                          1996    2002    2014    2030    2035    2042    2048    2056    2072    2077    2084    2091    2099
                          2119    2138    2143    2150    2156    2163    2200    2220    2229    2237    2263    2276    2285
                          2317    2330    2365    2398    2445    2467    2476    2502    2515    2539    2553    2586    2628
                          2642    2655    2667    2677    2687    2722    2753    2761    2802    2813    2862    2882    2922
                          2937    2982    3026    3070    3075    3129    3136    3184    3189    3239    3273    3285    3345
                          3351    3365    3382    3683
ERRVEC= 000004             898#   1602    1603*   1614*   3852    3853*   3855*   3858*
FIRST   002336            1481#   2430*   2432    4873
FLAG44  003002            1545#   1572*   1629*   1972    2436    2602    2670    2730    3037    3093    3151    3218    3260
                          3373    3393
GETB    014200            3470    3555#   3557    3561
GETLIN  014134            3465    3532#   3542
GNS   = ****** U          4283    4284    4285    4286    4288    4290    4291    4292
GOAGIN  014504            3657    3663#
GTSWR = 104405            4288#
HT    = 000011             808#   3978    4031
ID      004620            1637    1870    1880    1889#
INIT    003462            1635    1638#
IOTVEC= 000020             903#   1587*   1588*
JIMSTK  002432            1487#   3451
LF    = 000012             809#   1498    1501    3660    4025    4031    4342    4344    4346    4348    4848    4854
LKS     002674            1539#   2115    2136    2146*   2147    2153*   2154    2158*   2160    2180    2217    2222*   2223
                          2225*   2226    2232    2254*   2255*   2256    2265*   2269    2279*   2280*   2281    2288*   2311*
                          2312*   2313    2333*   2350*   2351*   2352    2361*   2382*   2383*   2384    2386*   2393*   2413*
                          2418*   2419    2421*   2422    2425*   3311*   4869    4873
LOC1    002340            1482#   3453*   3573*
LOC2    002342            1483#   3454*   3575*
MANL    003502            1639    1642#
MFPT  = 000007             910#   1626
MFR     017507            4318    4344#
MOR     017521            4323    4346#
MPAR    017476            4313    4342#
```

```
MSG     017450            4312    4317    4322    4327    4333#   4372
MSTOP   017534            4328    4348#
M1      024502            1900    4848#
M2      024540            1902    4854#
M2A     024542            1708*   4855#
NOEOP   014370            3622    3624#
OLDPC   002620            1505#   3682*   4881
OLDSUM  002436            1489#   3459*   3475
OUTTST  017544             943    4364#   4378    4383
PIRQ  = 177772             815#
PIRQVE= 000240             909#
PROMPT  002566            1498#   3464
PR0   = 000000             832#
PR1   = 000040             833#
PR2   = 000100             834#
PR3   = 000140             835#
PR4   = 000200             836#
PR5   = 000240             837#
PR6   = 000300             838#
PR7   = 000340             839#
PS    = 177776             812#    813
PSW   = 177776             813#    3449    3450*   3479*
PUTLIN  014102            3462    3468    3515#   3521
PWRVEC= 000024              904#   1593*   1594*   3791*   3792*   3801*   3809*   3818*   3819*
RBUF    002636            1519#   1955    2617    2712    2716    2746    2785    2843    2909    2964    2971*   3010    3058
                          3068    3073    3114    3118*   3130    3172    3181    3186    3215    3227    3275    3324    3404
                          4867
RBUF58= 176502            3417#   3539    3558
RCSR    002634            1518#   1718    1737    1941    2070    2080*   2081    2087*   2088    2094*   2096    2182    2610
                          2620    2639    2649    2660    2672    2681    2705    2714    2720    2733*   2739    2748    2750
                          2755*   2756    2772*   2778    2791    2805*   2815*   2836    2847    2849*   2865*   2902    2911
                          2916*   2932*   2951*   2957    2966    2978*   2997*   3003    3012    3021*   3051    3107    3116
                          3121    3165    3175    3208    3225    3268    3317    3326*   4865    4875    4877    4879    4881
RCSR58= 176500            3416#   3537    3556
RCV     013666            3303    3404#
RCVCNT  002440            1490#   3328*   3347    3405*   4879
RCVDON  010266            2603    2650    2657#
RDCHR = 104407            4223    4291#
RDLIN = 104410            4292#
RESTTE  014310            3472    3605#
RESVEC= 000010              899#
RPSW    002646            1523#   2892    2894*   2934*   3299    3304*   3388*
RSTRT   014530            3665    3669#
RTCPSW  002700            1541#   2251    2253*   2290*   2306    2308*   2335*   3300    3310*   3389*
RTCVT   002676            1540#   2132    2133*   2165*   2250    2252*   2266*   2278*   2289*   2305    2307*   2320*   2334*
                          2348    2349*   2367*   2380    2381*   2400*   3297    3309*   3386*
RVECT   002644            1522#   2066    2067*   2101*   2786    2787*   2804*   2820*   2829    2830*   2866*   2884*   2891
                          2893*   2925*   2933*   2939*   2949    2950*   2984*   2995    2996*   3028*   3296    3303*   3385*
SAVEPS  002434            1488#   3449*   3479
SAVETE  014254            3456    3588#
SAVEO   002344            1484#   3588*   3605
SAVLOC  002346            1485#   3590    3607
SCOPE = 000004             805#   1756    1778    1799    1846    1919    1938    1952    1969    2022    2064    2108    2126
                          2171    2211    2243    2299    2341    2373    2408    2456    2486    2523    2561    2601    2698
                          2729    2770    2825    2889    2945    2991    3034    3090    3146    3197    3251    3291    3426
                          3637
```

```
SCPSW   002452          1495#   3300*   3389
SECND   002616          1504#   2444*   4873
SETADR  004100          1726    1732#
SHIFT   003740          1698#   1707
SIZE    003512          1645#
SRPSW   002450          1494#   3299*   3388
STACK = 001100           803#
START   003046           941    1566#
STKLMT= 177774           814#
STPSW   002446          1493#   3298*   3387
SWR     001040          1006#   1583    1604*   1606    1612*   1619*   1634    1642    1903    1970    1977    2111    2129
                        2178    2214    2246    2302    2344    2376    2411    2447    3035    3042    3091    3098    3147
                        3149    3156    3252    3307    3360    3446    3708    3720    3724    3799    3811*   3847    3863
                        4120    4157*
SWREG   000176           938#   1612    4120    4133
SW0   = 000001           867#
SW00  = 000001           857#    867
SW01  = 000002           856#    866
SW02  = 000004           855#    865
SW03  = 000010           854#    864
SW04  = 000020           853#    863
SW05  = 000040           852#    862
SW06  = 000100           851#    861
SW07  = 000200           850#    860
SW08  = 000400           849#    859
SW09  = 001000           848#    858
SW1   = 000002           866#
SW10  = 002000           847#
SW11  = 004000           846#
SW12  = 010000           845#
SW13  = 020000           844#
SW14  = 040000           843#
SW15  = 100000           842#
SW2   = 000004           865#
SW3   = 000010           864#
SW4   = 000020           863#
SW5   = 000040           862#
SW6   = 000100           861#
SW7   = 000200           860#
SW8   = 000400           859#
SW9   = 001000           858#
TA      002610          1501#   3467
TBITVE= 000014           900#
TBUF    002642          1521#   1781    1848*   1853*   1921*   1924*   2569*   2572*   2619*   2659*   2713*   2747*   2790*
                        2846*   2910*   2965*   3011*   3060*   3115*   3174*   3224*   3266*   3332*   3401*   4863
TBUF58= 176506          3419#   3520*
TCLOCK  005536          1905    2104#
TCONS   004020          1714    1716#
TCSR    002640          1520#   1759    1801    1814*   1815    1820*   1821    1833*   1835    1838*   1847*   1849    1854
                        1869    1920*   1922    1927    1981    1992*   1993    1997*   1998    2009*   2011    2013*   2028
                        2038*   2039    2045*   2046    2051*   2053    2457*   2460    2470*   2478*   2487*   2492    2494*
                        2504*   2524*   2531    2533*   2549*   2562*   2567*   2568*   2570    2579*   2605*   2645*   2657*
                        2700*   2734*   2771*   2773*   2831*   2897*   2952*   2998*   3046*   3061    3102*   3119*   3125*
                        3132*   3137*   3160*   3173*   3177*   3200*   3312*   3325*   3341    3399*   4861
TCSR58= 176504          3418#   3518
TIMER   014234          3517    3536    3555    3573#
```

```
TKVEC = 000060            907#
TMP1    002626          1513#   1712*   1728*   1734    1735*
TMP2    002630          1514#   1646*   1654*   1664*   1669*   1673*   1693    3621    3664
TMP3    002632          1515#   1711*   1725    1727*   1733*
TOLER   007256          2434    2436#
TPSW    002652          1525#   1720    2526    2528*   2556*   3298    3302*   3387*
TPVEC = 000064            908#
TRAPVE= 000034            906#   1591*   1592*
TRTVEC= 000014            901#
TSTDEV  004050          1715    1725#   1730    3625
TSTDVM  003646          1671#   1676
TST1    004172          1722    1748    1756#   3667
TST10   005044          1969#
TST11   005252          2022#
TST12   005404          2064#
TST13   005544          2108#
TST14   005614          2110    2112    2126#
TST15   005764          2128    2130    2171#
TST16   006154          2211#
TST17   006262          2213    2215    2233    2243#
TST2    004244          1778#
TST20   006504          2245    2247    2299#
TST21   006660          2301    2303    2341#
TST22   007002          2343    2345    2373#
TST23   007136          2375    2377    2408#
TST24   007324          2410    2412    2448    2456#
TST25   007432          2486#
TST26   007560          2523#
TST27   007722          2561#
TST3    004316          1799#
TST30   010066          2601#
TST31   010402          2698#
TST32   010504          2729#
TST33   010640          2770#
TST34   011050          2825#
TST35   011262          2889#
TST36   011476          2945#
TST37   011652          2991#
TST4    004466          1846#
TST40   012020          3034#
TST41   012214          3036    3044    3090#
TST42   012440          3092    3100    3146#
TST43   012632          3148    3150    3158    3197#
TST44   013010          3251#
TST45   013132          3253    3280    3291#
TST46   013710          3426#
TST5    004714          1919#
TST6    004760          1938#
TST7    005012          1952#
TURBUF  003006          1547#
TURCSR  003004          1546#
TUTBUF  003012          1549#
TUTCSR  003010          1548#
TVECT   002650          1524#   2024    2025*   2058*   2458    2459*   2469*   2480*   2490    2491*   2505*   2517*   2525
                        2527*   2542*   2555*   2565    2566*   2588*   3295    3301*   3384*
TYPE  = 104401          1899    1901    3647    3711    3746    3763    3765    3768    3770    3774    3781    3823    3983
```

```
                    4091    4131    4132    4135    4148    4159    4178    4227    4230    4234    4283#
TYPOC = 104402      3754    3778    4134    4284#
TYPON = 104404      4286#
TYPOS = 104403      4285#
VCTADR  003670      1667    1681#
VCTTBL  002742      1544#   1681    1743
VECT    004152      1744#   1747
WACTV   010150      2620#   2623
WAIT    017456      4335#   4336    4339
WDONE   010302      2660#   2663
WRAP    013712      3446#   3623
WRPSW   014540      2026    2068    2134    2248    2267    2309    2321    2346    2355    2378    2387    2401    2462
                    2488    2506    2529    2543    2563    2573    2788    2827    2867    2895    2926    2947    2972
                    2993    3015    3293    3333    3672#
WT      010236      2646#   2648
XCONT   013656      3398    3401#
XMIT    013614      3301    3391#
XMTCNT  002442      1491#   3327*   3347    3391*   4879
XRET    013662      3400    3402#
$APTHD  000500       965     971#
$ASTAT= ****** U    1768    1790    1810    1829    1865    1882    1988    2005
$ATYC   015470      3885    3887#
$ATY1   015444      3883#
$ATY3   015452      3884#   3968
$ATY4   015462      1768    1790    1810    1829    1865    1882    1988    2005    3716    3886#
$AUTOB  001034      1003#   4128    4249
$BASE   001142      1065#   1555    1650    1658
$BDADR  001022       998#   2183*   2184*   2185    2187*   2188    2189*   2192*   4871
$BDDAT  001026      1000#   3121*   3235*   3283*   3380*   4875    4877
$CHARC  016240      3985*   3995*   4002    4023*   4028#
$CKSWR  016472      4120#   4290
$CMTAG  001000       986#   1580    1581    1589    1595    1596
$CM3  = 000000      1016#
$CNTLG  017217      4131    4244#
$CNTLU  017212      4148    4243#
$CPUOP  001114      1039#
$CRLF   001063      1018#   3711    3746    3765    3770    3774    3984    4031    4159    4243    4374
$DEVCT  001076      1030#   1570*   1897    3620*   3621    3663*
$DEVM   001144      1066#   1647*   1653*   1656*   1663*   1670    1713    1725
$DOAGN  014460      3643    3649    3655#
$ENDAD  014450       952    3651#   3731
$ENDCT  014430      1595    3645#
$ENULL  014464      3658#
$ENV    001106      1035#   1638    3713    3892    3916    3963
$ENVM   001107      1036#   1617    1640    3894    3965    3970
$EOP    014400      2449    3480    3636#
$EOPCT  014422      1595*   3642#   3646
$ERFLG  001003       989#   3701*   3838    3861    3867*   3877
$ERMAX  001015       995#   1597*   3873*   3877
$ERROR  014576      1589    3700#
$ERRPC  001016       996#   3705*   3706*   3707    3752    4861    4863    4865    4867    4869    4871    4873    4875
                    4877    4879    4881
$ERRTB  001146      1083#   3760
$ERRTY  014760      3710    3745#
$ERTTL  001012       993#   3704*
$ESCAP  001060      1016#   1596*   3727    3729    3872*
```

```
$ETABL  001106            1034#
$ETEND  001146             977    1067#
$FATAL  001070            1027#   1566*   3920*
$FFLG   015710            3883*   3886*   3914    3923*   3931#
$FILLC  001056            1014#   3988    4031
$FILLS  001055            1013#   4031
$GDADR  001020             997#   2180*   2182*   2183    2185    2190    4871
$GDDAT  001024             999#   2188*   2192    3234*   3282*   3381*   4877
$GET42  014440            3648#
$GTSWR  016542            4132#   4288
$HIBTS  000500             972#
$ICNT   001004             990#
$ILLUP  015254            3791    3809    3826#
$INTAG  001035            1004#   4160    4249
$ITEMB  001014             994#   3707*   3715    3749
$LF     001064            1019#   4031    4234    4243
$LFLG   015707            3924*   3930#
$LPADR  001006             991#   1598*   3865*   3870*   3875    3877
$LPERR  001010             992#   1599*   3726    3865    3871*   3877
$MADR1  001120            1052#
$MADR2  001124            1056#
$MADR3  001130            1059#
$MADR4  001134            1062#
$MAIL   001066             973     977    1025#   1616    3869    3963
$MAMS1  001116            1046#
$MAMS2  001122            1054#
$MAMS3  001126            1057#
$MAMS4  001132            1060#
$MBADR  000502             973#
$MFLG   015706            3884*   3890    3925*   3929#
$MNEW   017235            4135    4247#
$MSGAD  001102            1032#   3900*   3903
$MSGLG  001104            1033#   3905*
$MSGTY  001066            1026#   1567*   3898    3906*   3918    3921*
$MSWR   017224            4132    4245#
$MTYP1  001117            1047#
$MTYP2  001123            1055#
$MTYP3  001127            1058#
$MTYP4  001133            1061#
$NULL   001054            1012#   3990    4031
$NWTST= 000001            1753#   1775#   1796#   1843#   1916#   1935#   1949#   1966#   2019#   2061#   2105#   2123#   2168#
                          2208#   2240#   2296#   2338#   2370#   2405#   2453#   2483#   2520#   2558#   2598#   2695#   2726#
                          2767#   2822#   2886#   2942#   2988#   3031#   3087#   3143#   3194#   3248#   3288#   3423#
$OCNT   016466            4063*   4092*   4105#
$OMODE  016470            4058*   4062*   4067    4070*   4081*   4107#
$OVER   015430            3848    3866    3874#
$PASS   001074            1029#   1616*   1895    3639*   3640*   3658
$PASTM  000506             975#
$POWER  015262            3824    3829#
$PWRDN  015114            1593    3791#   3818
$PWRMG  015250            3824#
$PWRUP  015166            3801    3809#
$QUES   001062            1017#   4031    4178    4227    4243
$RDCHR  016754            4191#   4291
$RDDEC= ****** U          4293
$RDLIN  017074            4219#   4292
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$RDSZ = 000010          4212#
$RTNAD  014462          3657#
$R2A  = ****** U        4293
$SAVRE= ****** U        4293
$SAVR6  015260          3800*   3810    3820*   3821*   3828#
$SCOPE  015272          1587    3845#
$SETUP= 000137           934#   1586    1587    1589    1591    1593    1595    1596    1598    3638    3846    4115    4249
$STUP = 177777           934#
$SVLAD  015374          3956    3862    3868#
$SVPC = 000500           950#    955
$SWR  = 161000           915#   1016    1017    1596    1598    1599    1757    1779    1800    1847    1920    1939    1953
                        1970    2023    2065    2109    2127    2172    2212    2244    2300    2342    2374    2409    2457
                        2487    2524    2562    2602    2699    2730    2771    2826    2890    2946    2992    3035    3091
                        3147    3198    3252    3292    3427    3633    3639    3650    3656    3658    3839    3840    3841
                        3842    3847    3859    3861    3862    3863    3868    3871    3874    3877
$SWREG  001110          1037#   1619
$SWRMK= 000000          3842
$TESTN  001072          1028#   1568*   3869*   4861    4863    4865    4867    4869    4871    4873    4875    4877    4879
                        4881
$TKB    001046          1009#   4011    4017    4113    4124    4141    4195    4201
$TKS    001044          1008#   4009    4015    4113    4122    4138    4162*   4193    4199
$TN   = 000047           914#   1753    1757#   1775    1779#   1796    1800#   1843    1847#   1916    1920#   1935    1939#
                        1949    1953#   1966    1970#   2019    2023#   2061    2065#   2104    2105    2109#   2123    2127#
                        2168    2172#   2208    2212#   2240    2244#   2296    2300#   2338    2342#   2370    2374#   2405
                        2409#   2453    2457#   2483    2487#   2520    2524#   2558    2562#   2598    2602#   2695    2699#
                        2726    2730#   2767    2771#   2822    2826#   2886    2890#   2942    2946#   2988    2992#   3031
                        3035#   3087    3091#   3143    3147#   3194    3198#   3248    3252#   3288    3292#   3423    3427#
$TPB    001052          1011#   4008*   4031
$TPFLG  001057          1015#   3957    4031
$TPS    001050          1010#   2844    4006    4031
$TRAP   017246          1591    4260#
$TRAP2  017270          4271#   4282
$TRP  = 000011          4275#   4284#   4285#   4286#   4287#   4288    4289#   4290    4291#   4292#   4293#
$TRPAD  017302          4265    4282#
$TSTM   000504           974#
$TSTNM  001002           988#   2104*   3619*   3638*   3703    3838    3868*   3869    3874    3877
$TTYIN  017202          4220    4221    4238    4242#
$TYPBN= ****** U        4287
$TYPDS= ****** U        4287
$TYPE   015712          3911    3957#   4275    4283
$TYPEC  016124          3987    3994    4001    4006#   4007    4164
$TYPEX  016242          4024    4026    4029#
$TYPOC  016270          4061#   4284
$TYPON  016304          4060    4063#   4286
$TYPOS  016244          4056#   4285
$UNIT   001100          1031#   1571*   1729*   1732*   3669*
$UNITM  000510           976#
$USWR   001112          1038#   1573    1575*   3228    3276
$VECT1  001136          1063#   1682
$VECT2  001140          1064#
$XTSTR  015304          3850#
$$GET4= 000000          3650#
$OFILL  016467          4057*   4061*   4071    4106#
$40CAT= ****** U        3847
.     = 024750           919#    925     926#    930#    936#    940#    945#    950     951#    953#    955#    961     962#
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                      964#    966#    985#    1020    1485#   1486#   1496#   1543#   1544#   1584    1598    1599    2616
                     2711     2745    2784    2842    2908    2963    3009    3057    3113    3171    3214    3323    3658
                     3659#   3784#   3803    3827    3877    3933#   4031    4113    4242#   4243    4249    4352#   4847#
.$ERRT  001146       1085#
.$X    = 000500       961#    966
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```
CLKTST    790#   2109   2127   2212   2244   2300   2342   2374   2409
COMMEN      1#    910#
CTESTS    792#   2104
DISMNT    796#   1859   1876   1890   2583   2624   2652   2664   2674   2684   2691   2717   2758   2793   2798
          2810   2816   2858   2871   2878   2913   2968   3065   3126   3133   3138   3178   3236   3242
ENDCOM      1#    910#
ENDPAS    791#   3647
ESCAPE      1#    910#
GETPRI      1#    910#
GETSWR      1#    910#
MULT        1#    910#
NEWTST      1#    910#   1753   1775   1796   1843   1916   1935   1949   1966   2019   2061   2105   2123   2168
          2208   2240   2296   2338   2370   2405   2453   2483   2520   2558   2598   2695   2726   2767   2822
          2886   2942   2988   3031   3087   3143   3194   3248   3288   3423
POP         1#    800#   910#
PUSH        1#    800#   910#
RECDLY    798#   2606   2701   2735   2774   2832   2898   2953   2999   3047   3103   3161   3204   3313
REPORT      1#    910#   1767   1789   1809   1828   1864   1881   1987   2004
SETPRI      1#    910#
SETTRA    4275#  4284   4285   4286   4288   4290   4291   4292
SETUP       1#    800#   910#   1579
SKIP        1#    910#
SLASH       1#    910#
SPACE     794#    910#
STARS       1#    800#   910#   920    948    958    960    967    981    1020   1023   1753   1755   1775   1777
          1796   1798   1843   1845   1916   1918   1935   1937   1949   1951   1966   1968   2019   2021   2061
          2063   2105   2107   2123   2125   2168   2170   2208   2210   2240   2242   2296   2298   2338   2340
          2370   2372   2405   2407   2453   2455   2483   2485   2520   2522   2558   2560   2598   2600   2695
          2697   2726   2728   2767   2769   2822   2824   2886   2888   2942   2944   2988   2990   3031   3033
          3087   3089   3143   3145   3194   3196   3248   3250   3288   3290   3423   3425   3631   3688   3698
          3740   3788   3790   3806   3808   3835   3879   3881   3942   4033   4112   4115   4183   4212   4254
          4295   4300   4356   4362
SWRSU       1#    910#   1600#
TRMTRP    4275#
TYPBIN      1#    910#
TYPDEC      1#    910#
TYPNAM      1#    910#
TYPNUM      1#    910#
TYPOCS      1#    910#
TYPOCT      1#    910#   3752   3776   4133
TYPTXT      1#    910#
XMTDLY    797#   1907   2590   2630   3078
$CLKTS    789#   2109   2127   2212   2244   2300   2342   2374   2409
$$CMRE    979#
$$CMTM    979#
$$ESCA      1#    910#
$$NEWT      1#    910#   1753   1775   1796   1843   1916   1935   1949   1966   2019   2061   2105   2123   2168
          2208   2240   2296   2338   2370   2405   2453   2483   2520   2558   2598   2695   2726   2767   2822
          2886   2942   2988   3031   3087   3143   3194   3248   3288   3423
$$SET     4275#  4284   4285   4286   4288   4290   4291   4292
$$SETM    1616#
$$SKIP      1#    910#
.EQUAT      1#    800#
.EQUIV    794#    800#   804    805    813    858    859    860    861    862    863    864    865    866    867
          886    887    888    889    890    891    892    893    894    895
.HEADE      1#
```

```
.MAIN.  MACY11 30A(1052)  10-JUN-80  15:21  PAGE 124
CZDLDE.P11    10-JUN-80 15:20          CROSS REFERENCE TABLE -- MACRO NAMES                    SEQ 0121

.KT11       1#
.SETUP      1#     800#    934
.SWRHI      1#
.$ACT1      1#     800#    946
.$APTB      1#     800#   1021#
.$APTH      1#     800#    956
.$APTY      1#
.$ASTA      1#
.$CATC      1#
.$CMTA      1#     800#    979
.$DB2D      1#
.$DB2O      1#
.$DIV       1#
.$EOP       1#     800#   3629
.$ERRO      1#
.$ERRT      1#     800#   3738
.$MULT      1#
.$POWE      1#
.$RAND      1#
.$RDDE      1#
.$RDOC      1#
.$READ      1#     800#   4110
.$R2AZ      1#
.$SAVE      1#
.$SB2D      1#
.$SB2O      1#
.$SCOP      1#     800#   3833
.$SIZE      1#
.$SUPR      1#
.$TRAP      1#     800#   4252
.$TYPB      1#
.$TYPD      1#
.$TYPE      1#     800#   3940
.$TYPO      1#     800#   4031
.$40CA      1#
.1170       1#


. ABS.  024750     000


 ERRORS DETECTED:  0

 CZDLDE.BIN,CZDLDE.LST/CRF/SOL/NL:TOC=CZDLDE.SML,CZDLDE.P11
 RUN-TIME: 45 61 4 SECONDS
 RUN-TIME RATIO: 231/112=2.0
 CORE USED:  33K  (65 PAGES)
```