DUV/LSI-11

OFFLINE COMBINED TESTS

MD-11-DZDUV-A

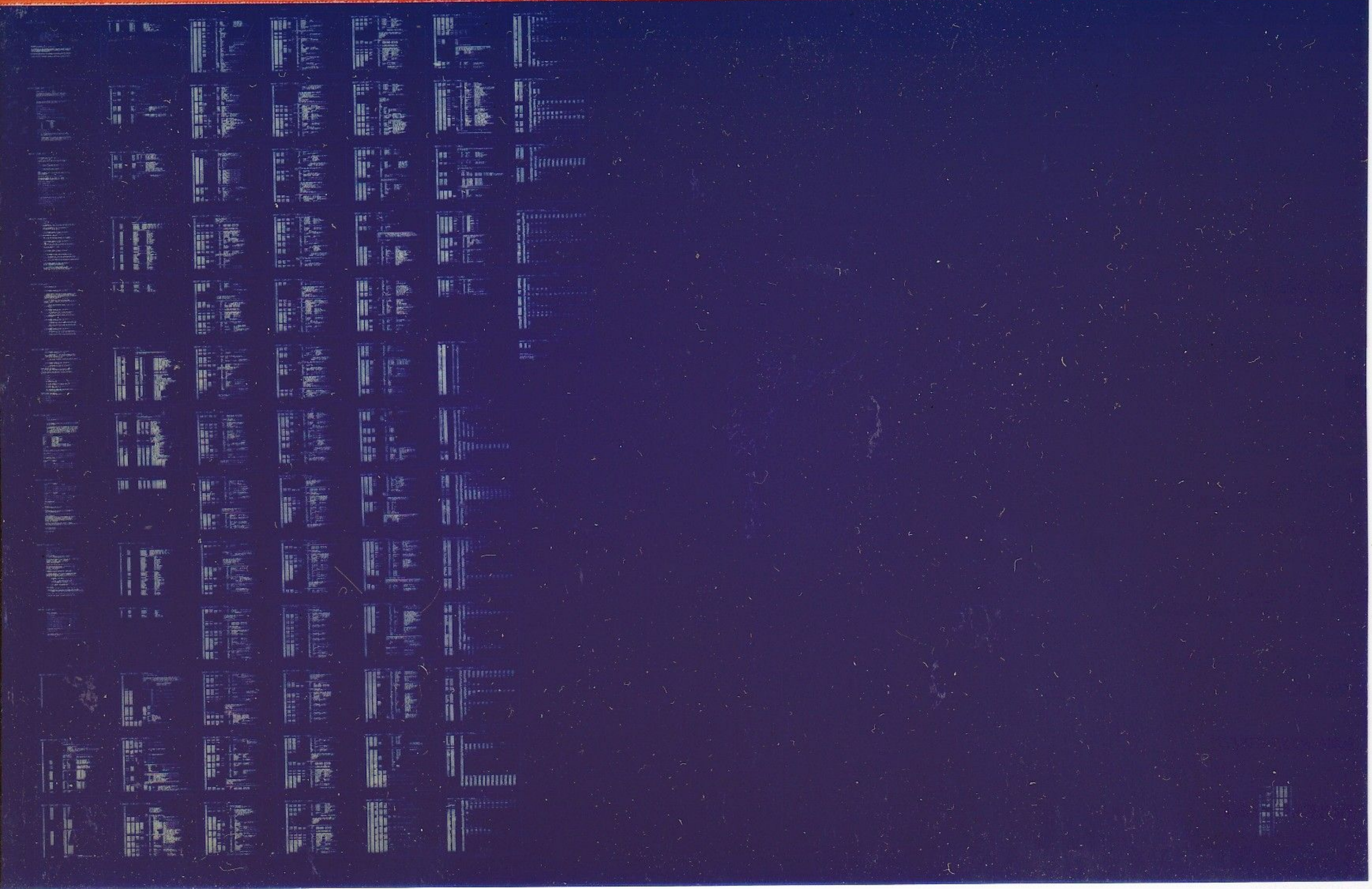
EP-DZDUV-A-DL-A

FICHE 1 OF 1

APR 1977

digital

MADE IN USA



.REM *

I D E N T I F I C A T I O N

PRODUCT CODE: MAINDEC-11-DZDUV-A-D

PRODUCT NAME: DUV11 OFFLINE COMBINED TESTS

RELEASE DATE: FEB. 1977

MAINTAINER : DIAGNOSTICS

*
.REM *

*

.REM *

GENERAL DESCRIPTION

THIS DIAGNOSTIC CAN CHAIN 16 DUV11'S. THIS MEANS THAT
16 DEVICES CAN BE SEQUENTIALLY EXERCISED. THE DIAGNOSTIC
MAKES ONE PASS BEFORE PROCEEDING TO THE NEXT DEVICE,
AND CONTINUES EXERCISING ALL DEVICES IN THIS FASHION UNTIL
HALTED.

*
.REM *

1. THE DUV11 OFFLINE COMBINED TESTS VERIFY THAT THE TRANSMITTER
AND RECEIVER CAN TALK THRU THE EXTERNAL MODEM CABLE
PROVIDING THAT THE H315 CONNECTOR IS ON

*
.REM *

2. REQUIREMENTS

PDP-11/03 COMPUTER (LSI)

DUV11 SYNCRONOUS/ISOCRONOUS OPTION

ONE CONSOLE TELETYPE OR EQUIVALENT

2.2 STORAGE
THE PROGRAM LOADS INTO 4K OF MEMORY WITH BOOTSTRAP

3. LOADING PROCEDURE

THE STANDARD PROCEDURE FOR LOADING ABSOLUTE BINARY TAPES
IS TO BE USED.

	STARTING ADDRESS FOR ABSOLUTE LOADER
4K	017500
8K	037500
12K	057500
16K	077500
20K	117500
24K	137500
28K	157500

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

NOTE: ALL SWITCHES RESIDE INTERNAL TO THE CPU AT ADDRESS
176. THESE MAY BE SET VIA THE CONSOLE TTY BY DIRECTLY
MODIFYING LOC. 176.

NOTE: RUNNING UNDER APT-11, THERE IS A USER SWITCH REGISTER
CALLED "$USWR". IN ORDER TO BE FLEXIBLE ON THE AVAILIBILITY OF THE
H315 CONNECTOR, ONE BIT PASSES STATUS TO APT-11.
BIT 0 IN $USWR REFLECTS THIS STATUS, A 0 = CONNECTOR
PRESENT, A 1 = CONNECTOR NOT AVAILIBLE.

4.1.1 AFTER PROGRAM LOAD (INITIAL PROGRAM START)
ALL CONSOLE SWITCHES DOWN

4.1.2 TO MODIFY DEVICE VECTOR AND CONTROL REGISTER ADDRESSES
AFTER PROGRAM RESTART OR TO RUN MULTIPLE DEVICES

SW00=1

4.1.3 TO START PROGRAM AT SELECTED TEST AFTER A PROGRAM RESTART
(ONLY IN SINGLE DEVICE TESTS)
SW01=1

4.1.4 TO LOCK ON SELECTED TEST AFTER A PROGRAM RESTART
(ONLY IN SINGLE DEVICE TESTS)

SW02=1
NOTE1: IN GENERAL SW01 WILL BE USED WHEN SW02=1 IS USED
NOTE2: WITHOUT SW01=1 "LOCK ON TEST" WILL DEFAULT TO TEST 1

4.2 STARTING ADDRESS

THE STARTING ADDRESS FOR ALL TESTS IS 000200

THE RETARTING ADDRESS FOR ALL TESTS IS 000200
THE STARTING ADDRESS TO ENTER A SELECTED TEST IS 000200
THE STARTING ADDRESS TO LOCK ON TEST IS 000200

4.3 PROGRAM AND/OR OPERATOR ACTION

4.3.1 INITIAL PROGRAM START

4.3.1.1 LOAD PROGRAM INTO MEMORY WITH ABSOLUTE LOADER

4.3.1.2 SET SWITCH REGISTER (LOC. 176) TO ZERO.

4.3.1.3 TYPE 200G.

4.3.1.4 PROGRAM WILL START.

* .REM *

4.3.1.5 THE PROGRAM WILL TYPE "DUV11 DZDUV-A TAPE F" (ONCE ONLY)

* .REM *

4.3.1.6 THE PROGRAM WILL TYPE "R" TO INDICATE THAT IT IS ABOUT
TO START TESTING ,AND THEN TESTING WILL BEGIN

4.3.2 PROGRAM RESTART WITH ALL SWITCHES DOWN

4.3.2.1 THE PROGRAM WILL TYPE "R" AND WILL COMMENCE TESTING

4.3.3 PROGRAM RESTART WITH SW00=1

4.3.3.1 SET SWITCH REGISTER (LOC. 176) TO A 000001.

4.3.3.2 TYPE 200G.

4.3.3.3 PROGRAM WILL START.

4.3.3.4 THE PROGRAM WILL TYPE " 1ST DEVICE: RECEIVER CONTROL REGISTER ADDRESS" AND WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD

4.3.3.5 TYPE IN THE ADDRESS OF THE FIRST RECEIVER CONTROL REGISTER ADDRESS OF THE DUV11 TO BE TESTED FOLLOWED BY A ‹CARRIAGE RETURN›

IF AN INCORRECT ADDRESS IS TYPED ,THE PROGRAM WILL TYPE "?" AND WILL THEN REPEAT THE MESSAGE OF 4.3.3.4

4.3.3.6 THE PROGRAM WILL TYPE "VECTOR ADDRESS-" AND WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD

4.3.3.7 TYPE IN THE BASE RECEIVER INTERRUPT VECTOR ADDRESS FOR THE DUV11 TO BE TESTED FOLLOWED BY A ‹CARRIAGE RETURN›

IF AN INCORRECT ADDRESS IS TYPED ,THE PROGRAM WILL TYPE "?" AND WILL THEN REPEAT THE MESSAGE OF 4.3.3.6

4.3.3.8 THE PROGRAM WILL TYPE "ARE YOU RUNNING MULTIPLE DEVICES ?" (Y OR N)-" AND WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD

4.3.3.9 TYPE IN THE APPROPRIATE ANSWER YES OR NO FOLLOWED BY A ‹CARRIAGE RETURN›

IF AN INCORRECT ANSWER IS GIVEN, THE PROGRAM WILL TYPE "?" AND WILL THEN REPEAT THE MESSAGE OF 4.3.3.8

IF A "NO" ANSWER IS GIVEN: JUMP TO SECTION 4.3.3.12
IF A "YES" ANSWER IS GIVEN:THE NEXT QUESTION IS ASKED

4.3.3.10 THE PROGRAM WILL TYPE "LAST DEVICE:RECEIVER CONTROL REGISTER ADDRESS-" AND WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD

4.3.3.11 TYPE IN THE ADDRESS OF THE LAST RECEIVER CONTROL REGISTER ADDRESS OF THE DUV11 TO BE TESTED FOLLOWED BY A ‹CARRIAGE RETURN›

IF AN INCORRECT ANSWER IS TYPED ,THE PROGRAM WILL TYPE "?" AND WILL THEN REPEAT THE MESSAGE OF 4.3.3.10
NOTE:ALL ADDRESSES SHALL BE CONTIGUOUS

4.3.3.11.1 IF AN "OUT OF RANGE" ADDRESS IS TYPED IE. MORE THAN 16 (10) DEVICES AWAY (UPWARDS).....THE PROGRAM WILL TYPE "OUT OF RANGE:RETYPE LAST DEVICE RXCSR ADDRESS-" AND WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD

4.3.3.11.2 TYPE IN THE ADDRESS OF THE LAST RECEIVER CONTROL

REGISTER ADDRESS OF THE DUV11 TO BE TESTED FOLLOWED
BY A <CARRIAGE RETURN>

IF AN INCORRECT ANSWER IS TYPED ,THE PROGRAM WILL TYPE "?"
AND WILL REPEAT THE MESSAGE OF 4.3.3.11.1

IF A DEVICE ADDRESS LOWER THAN 1ST DEVICE ADDRESS IS TYPED.....
....SCHOOLS OUT.....THERE IS NO PROTECTION FOR THIS.
THE PROGRAM WILL DEFAULT TO TWO DEVICES ACTIVE (UPWARDS FROM
1ST DEVICE ADDRESS).THE SAME APPLIES TO IDENTICAL ADDRESSES
TYPED FOR FIRST AND LAST DEVICE.
OBSERVE LOCATION @ ACTREG: SEE SECTION 7.2

4.3.3.12 THE PROGRAM WILL TYPE "# OF SYNC CHARS
SELECTED (1 OR 2)-" AND WAIT FOR AN INPUT FROM THE TELETYPE
KEYBOARD. REFER TO MANUAL FOR PROPER SWITCH SETTINGS OF
SWITCH E55-4.

4.3.3.13 TYPE IN THE APPROPRIATE ANSWER "1" OR "2" FOLLOWED
BY A <CARRIAGE RETURN>.(NOTE:ALL MULTIPLE DEVICES MUST
BE THE SAME)

IF AN INCORRECT ANSWER IS TYPED ,THE PROGRAM WILL TYPE "?"
AND WILL REPEAT THE MESSAGE OF 4.3.3.12

4.3.3.14 THE PROGRAM WILL TYPE " IS SEC XMIT SWITCH E55-2 ON? (Y OR N)-"
AND WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD

4.3.3.15 TYPE IN THE APPROPRIATE ANSWER YES OR NO FOLLOWED
BY A <CARRIAGE RETURN>.(NOTE THAT ALL MULTIPLE DEVICES
MUST BE THE SAME)

IF AN INCORRECT ANSWER IS TYPED ,THE PROGRAM WILL TYPE "?"
AND WILL REPEAT THE MESSAGE OF 4.3.3.14

4.3.3.16 THE PROGRAM WILL TYPE "IS SEC REC SWITCH E55-3 ON?
(Y OR N)-" AND WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD

4.3.3.17 TYPE IN THE APPROPRIATE ANSWER YES OR NO FOLLOWED
BY A <CARRIAGE RETURN>. (NOTE: ALL MULTIPLE DEVICES MUST BE THE SAME)

IF AN INCORRECT ANSWER IS TYPED ,THE PROGRAM WILL TYPE "?"
AND WILL REPEAT THE MESSAGE OF 4.3.3.16

4.3.3.18 THE PROGRAM WILL TYPE "IS OPT CLR ENABLE SWITCH
E55-1 ON? (Y OR N)-" AND WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD

4.3.3.19 TYPE IN THE APPROPRIATE ANSWER YES OR NO FOLLOWED
BY A <CARRIAGE RETURN>. (NOTE: ALL MULTIPLE DEVICES MUST BE THE SAME)

IF AN INCORRECT ANSWER IS TYPED ,THE PROGRAM WILL TYPE "?"
AND WILL REPEAT THE MESSAGE OF 4.3.3.18

4.3.3.20 THE PROGRAM WILL TYPE "ARE YOU RUNNING IN MAINT.
MODE EXTERNAL ? AND .....DO YOU HAVE THE EXTERNAL MODEM
BYPASS JUMPER CONNECTOR ON ? (Y OR N)-" AND WAIT FOR AN
INPUT FROM THE TELETYPE KEYBOARD

4.3.3.21 TYPE IN THE APPROPRIATE ANSWER YES OR NO FOLLOWED BY
A <CARRIAGE RETURN>. (NOTE: ALL MULTIPLE DEVICES MUST BE THE SAME)

IF AN INCORRECT ANSWER IS TYPED ,THE PROGRAM WILL TYPE "?"
AND WILL REPEAT THE MESSAGE OF 4.3.3.20

4.3.3.22 THE PROGRAM WILL TYPE "R" TO INDICATE THAT IT
HAS STARTED AND WILL COMMENCE TESTING AT TEST 1

4.3.4 PROGRAM RESTART WITH SW01=1
NOTE: THIS WILL ONLY WORK WHEN A SINGLE DEVICE IS SELECTED
,,,IT WILL NOT WORK IF MULTIPLE DEVICES ARE SELECTED

IF MULTIPLE DEVICES WERE PREVIOUSLY SELECTED,LOAD 000200,
AND SELECT SW00=1 AND ANSWER "NO" TO THE MULTIPLE DEVICE QUESTION
SEE 4.3.3

4.3.4.1 SET SW01=1 IN SWITCH REG (LOC. 176)

4.3.4.2 TYPE 200G.

4.3.4.3 PROGRAM WILL START.

4.3.4.4 THE PROGRAM WILL TYPE "TEST PC-" AND WAIT FOR AN INPUT FROM
THE TELETYPE KEYBOARD

4.3.4.5 TYPE IN THE ADDRESS OF THE TEST AT WHICH THE PROGRAM IS TO
BE STARTED FOLLOWED BY A <CARRIAGE RETURN>

4.3.4.6 THE PROGRAM WILL TYPE "R" TO INDICATE THAT IT HAS STARTED
TESTING AT THE SELECTED TEST

NOTE: CARE MUST BE TAKEN WHEN THIS FEATURE IS USED
,SINCE THERE IS NO PROTECTION AGAINST SELECTING AN ADDRESS
THAT IS IN THE MIDDLE OF A TEST

4.3.5 PROGRAM RESTART WITH SW02 =1
NOTE: THIS WILL ONLY WORK WHEN A SINGLE DEVICE IS SELECTED
SEE NOTE IN 4.3.4 FOR MORE DETAILS

4.3.5.1 SET SW02=1 IN SWITCH REG. (LOC. 176)

4.3.5.2 TYPE 200G.

4.3.5.3 PROGRAM WILL START.

4.3.5.4 THE PROGRAM WILL TYPE "LOCK ON SELECTED TEST ? (Y OR N)-"

AND WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD

4.3.5.5 TYPE IN THE APPROPRIATE ANSWER YES OR NO FOLLOWED BY A
<CARRIAGE RETURN>

IF A NO ANSWER IS GIVEN: THIS LOCK ON TEST WILL BE IGNORED
AND THE PROGRAM WILL TYPE "R" TO INDICATE THAT IT HAS STARTED
TESTING AT TEST 1

4.3.5.6 IF A YES ANSWER WAS GIVEN:THE PROGRAM WILL ACT AS FOLLOWS...
THE PROGRAM WILL TYPE "R" TO INDICATE THAT IT HAS STARTED
TESTING AT TEST 1 AND WILL REMAIN IN TEST 1 UNTIL HALTED
OR IF ANY KEY IS STRUCK ON THE TELETYPE ,THE PROGRAM
WILL FREEZE ON THE NEXT TEST UNTIL A KEY IS STRUCK ON
THE TELETYPE AND SO FORTH THRU THE PROGRAM. IF SW01 =1 IT
WILL PERFORM AS IN SECTION 4.3.4 ALLOWING ONE TO FREEZE
ON A SELECTED TEST RATHER THAN DEFAULTING TO TEST 1

5. OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS (INTERNAL TO THE CPU, ACCESSED VIA LOC. 176).

SW15 =1	HALT ON ERROR
SW14 =1	LOOP ON CURRENT TEST
SW13 =1	INHIBIT ERROR TYPEOUT
SW11 =1	INHIBIT ITERATIONS
SW10 =1	ESCAPE TO NEXT TEST ON ERROR
SW09 =1	LOOP ON ERROR
SW02 =1	LOCK ON TEST
SW01 =1	RESTART PROGRAM AT SELECTED TEST
SW00 =1	RESELECT VECTOR AND CONTROL REGISTER ADRESSES &PARAMETERS AFTER A PROGRAM RESTART

TO INHIBIT "END OF PASS" TYPEOUT - TURN TELETYPE OFF

6. ERRORS

6.1 ERROR HALTS (UNDER LSI ALL HALT ERRORS RETURN CONTROL TO O.D.T.)
THERE ARE FOUR DISTINCT ERROR TYPEOUTS

6.1.1 PC+2 = ERROR PC
WHERE PC +2 IS THE ADDRESS OF THE CALL TO THE ERROR HANDLER +2

REFER TO THE ABOVE "HLT" IN DIAGNOSTIC FOR ERROR DESCRIPTION

CHECK ADDRESS @ RXCSR: TO LOCATE THE DEVICE PRESENTLY UNDER
TEST WHEN RUNNING MULTIPLE DEVICES

6.1.2 PC +2 = REGISTER ERROR PC

REGISTER	EXPECTED	ACTUAL
16XXXX	YYYYYY	ZZZZZZ

WHERE 16XXXX IS THE ADDRESS OF THE FAILING DEVICE REGISTER

WHERE YYYYYY IS THE EXPECTED CONTENTS OF THAT REGISTER

WHERE ZZZZZZ IS THE ACTUAL CONTENTS OF THAT REGISTER

6.1.3 PC +2 = RECEIVER ERROR PC

REGISTER	EXPECTED	ACTUAL
16XXXX	YYYYYY	ZZZZZZ

WHERE 16XXXX IS THE ADDRESS OF THE FAILING RECEIVER (RXDBUF) REGISTER

WHERE YYYYYY IS THE EXPECTED DATA CONTENTS OF THAT REGISTER

WHERE ZZZZZZ IS THE ACTUAL DATA CONTENTS OF THAT REGISTER

6.1.4 PC +2 = TRANSMITTER ERROR PC

REGISTER	EXPECTED	ACTUAL
16XXXX	YYYYYY	ZZZZZZ

WHERE 16XXXX IS THE ADDRESS OF THE FAILING TRANSMITTER (TXCSR) REGISTER

WHERE YYYYYY IS THE EXPECTED CONTENTS OF THAT REGISTER

WHERE ZZZZZZ IS THE ACTUAL CONTENTS OF THAT REGISTER

6.1.5 ERROR DESCRIPTIONS
SEE LISTINGS FOR DETAILS OF ERRORS

6.2 ERROR RECOVERY

6.2.1 SW15 =0
IF THE PROGRAM IS RUN WITH SW15 =0 ,NO OPERATOR ACTION IS
REQUIRED TO CONTINUE TESTING

6.2.2 SW15 =1
IF THE PROGRAM IS RUN WITH SW15 =1 ,TO CONTINUE TESTING
AFTER THE PROGRAM HAS HALTED ,PRESS THE PROCESSOR
CONSOLE "CONTINUE SWITCH"

NOTE: THE PC + 2 OF THE "HLT" WILL BE DISPLAYED IN THE DATA LIGHTS

6.2.3 ILLEGAL INTERRUPTS
IF AN INTERRUPT OCCURS TO A VECTOR ADDRESS NOT SELECTED
DURING PROGRAM INITIALIZATION, THE PROGRAM WILL HALT IN
THE TRAPCATCHER. THE ADDRESS AT WHICH THE PROGRAM
HALTS IS 2 GREATER THAN THE ADDRESS TO WHICH THE INTERRUPT
OCCURED. THE PROGRAM MUST BE RESTARTED AT 000200 TO
RECOVER FROM THIS ERROR.

6.2.4 ADDITIONAL TROUBLESHOOTING AIDS ERRCNT: & PASCNT:
CHECK THESE TWO TAG LOCATIONS FOR TOTAL # OF ERRORS AND PASSES RESPECTIVELY.
LOADING 000200 AND RESTARTING WILL CLEAR THESE LOCATIONS.

6.3 END OF PASS ROUTINE
THIS TYPEOUT IS MENTIONED HERE FOR CONVENIENCE
IT IS IN THE FORM:

END OF PASS TAPE Y
16XXXX = DEVICE

WHERE Y IS THE TAPE LOADED

WHERE 16XXXX IS THE DEVICE'S BASE REGISTER ADDRESS

TO INHIBIT THIS TYPEOUT - TURN TELETYPE OFF

7. RESTRICTIONS

7.1 MULTIPLE DEVICES
UP TO 16(10) DEVICES MAY BE TESTED. HOWEVER, THEY
MUST HAVE CONTIGUOUS ADDRESSES AND VECTORS

NOTE: IF ALL DEVICES UNDER TEST HAVE THE SAME INTERRUPT VECTOR
YOU CAN CHANGE "ZERO: ADD #10,BASEIV ;NEXT BLOCK
(VECTORS)" TO "ZERO: ADD #0,BASEIV";
THEREBY THE VECTOR ADDRESSES WILL NOT BE
UPDATED AFTER EACH PASS.

7.2 DISQUALIFYING DEVICES WHEN RUNNING MULTIPLE DEVICES

WHEN RUNNING MULTIPLE DEVICES AN ACTIVE BIT IS SET
FOR EACH DEVICE RUNNING UNDER TEST IE. BIT 0 FOR
DEVICE 0 ,BIT 15 FOR DEVICE 15
TO DISQUALIFY DEVICES:

7.2.1 IF DEVICE 0 IS TO BE DISQUALIFIED ,SIMPLY RESTART
PROGRAM WITH SW00 =1 AND OMIT THE FIRST DEVICE.

7.2.2 IF HOWEVER, DEVICES 1 THRU 15 OR ANY COMBINATION THEREOF
ARE TO BE DISQUALIFIED....LOAD THE LOCATION OF ACTREG:
OBSERVE THE ACTIVE BITS (ACTIVE =1, NONACTIVE = 0)
AND DEPOSIT 0 WHERE THOSE DEVICES ARE TO BE DISQUALIFIED

7.2.2.1 TO RESTART...TYPE 200G...
THE PROGRAM WILL CONTINUE WITH THE DEVICE IT WAS IN BEFORE HALTING.

7.2.2.2 .....OR .....SET SW00=1 IN SWITCH REG (LOC. 176) AND TYPE 200G....
ANSWER THE QUESTION :1ST DEVICE : ETC.....
....THE PROGRAM WILL CONTINUE WITH DEVICE 0

7.2.2.3 IF ALL DEVICES ARE DISQUALIFIED BY MISTAKE THE PROGRAM
WILL TYPEOUT AN ERROR MESSAGE.....TYPE 200G.

7.3 CABLE DELAYS
NOTE: EXTERNAL LOOP BACK TESTS ONLY (MODEM CABLE WITH H315 CONNECTOR ON)

7.3.1 TO PROVIDE SUFFICIENT DELAY FOR CLOCK SIGNAL OVER THE CABLE,
LOCATION "HOLD:" MUST BE MODIFIED TO ACCOMODATE FOR FASTER MACHINES.
PRESENTLY "HOLD:" =20 IS SUFFICIENT TIME ON AN 11/03 MACHINE.

BASICALLY DON'T TRY TO EXCEED 10K TO 12K RATE USING THE EIA DRIVERS

7.4 TO USE THE "XOR" TESTER ,THE BRANCH AROUND THE "XOR"
CODE MUST BE PATCHED TO A "NOP". (SEE LISTINGS FOR DETAILS)

8. DEFAULT PARAMETERS:
1ST DEVICE: RECEIVER CONTROL REGISTER ADDRESS- RXCSR: 160010

VECTOR ADDRESS- DURIV: 770

ARE YOU RUNNING MULTIPLE DEVICES ?- NO MULTD: 0

LAST DEVICE: RECEIVER CONTROL REGISTER ADDRESS- LASTADD: 0

OF SYNC CHARS SELECTED - 2 SYNCNO: 377

IS SEC XMIT SWITCH E55-2 ON?- YES SEXMIT: 377

IS SEC REC SWITCH E55-3 ON?- YES SEREC: 377

IS OPT CLR ENABLE SWITCH E55-1 ON?- YES OPTCLR: 377

DO YOU HAVE THE EXTERNAL MODEM BYPASS JUMPER
CONNECTOR ON (H315)- YES JMRBY: 377

9. PROGRAM DESCRIPTION

*
.REM *

9.1 THIS PROGRAM PERFORMS THE OFFLINE COMBINED (TRANSMITTER & RECEIVER)
CABLE TESTING OF THE DEVICE
SEE LISTING FOR DETAILS

*
.REM *

10. FLOW CHARTS: RECEIVER FLOW,TRANSMITTER FLOW,TRANSMITTER & RECEIVER FLOW

11. LISTINGS

*

```
522
523
524
525
526
527
528
529
530
531
532
533
534             000001                  $TN=1
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
```

```
                                .ENABLE ABS

                                ;DUV11 DZDUV-A TAPE F
                                ;COPYRIGHT 1977, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754

                                        ;STARTING PROCEDURE
                                        ;TYPE 200G
                                        ;PROGRAM WILL TYPE "DUV11 DZDUV-A TAPE F "
                                        ;PROGRAM WILL TYPE "R" TO INDICATE THAT TESTING HAS STARTED
                                        ;AT THE END OF A PASS, PROGRAM WILL TYPE "END OF PASS TAPE F"
                                        ;AND THEN RESUME TESTING

                                .SBTTL  BASIC DEFINITIONS

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

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

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

NO1

BASIC DEFINITIONS

```
                020000                  SW13=   20000
                010000                  SW12=   10000
                004000                  SW11=   4000
                002000                  SW10=   2000
                001000                  SW09=   1000
                000400                  SW08=   400
                000200                  SW07=   200
                000100                  SW06=   100
                000040                  SW05=   40
                000020                  SW04=   20
                000010                  SW03=   10
                000004                  SW02=   4
                000002                  SW01=   2
                000001                  SW00=   1
                                        .EQUIV  SW09,SW9
                                        .EQUIV  SW08,SW8
                                        .EQUIV  SW07,SW7
                                        .EQUIV  SW06,SW6
                                        .EQUIV  SW05,SW5
                                        .EQUIV  SW04,SW4
                                        .EQUIV  SW03,SW3
                                        .EQUIV  SW02,SW2
                                        .EQUIV  SW01,SW1
                                        .EQUIV  SW00,SW0

                                        ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
        100000                          BIT15=  100000
        040000                          BIT14=  40000
        020000                          BIT13=  20000
        010000                          BIT12=  10000
        004000                          BIT11=  4000
        002000                          BIT10=  2000
        001000                          BIT09=  1000
        000400                          BIT08=  400
        000200                          BIT07=  200
        000100                          BIT06=  100
        000040                          BIT05=  40
        000020                          BIT04=  20
        000010                          BIT03=  10
        000004                          BIT02=  4
        000002                          BIT01=  2
        000001                          BIT00=  1
                                        .EQUIV  BIT09,BIT9
                                        .EQUIV  BIT08,BIT8
                                        .EQUIV  BIT07,BIT7
                                        .EQUIV  BIT06,BIT6
                                        .EQUIV  BIT05,BIT5
                                        .EQUIV  BIT04,BIT4
                                        .EQUIV  BIT03,BIT3
                                        .EQUIV  BIT02,BIT2
                                        .EQUIV  BIT01,BIT1
                                        .EQUIV  BIT00,BIT0

                                        ;*BASIC "CPU" TRAP VECTOR ADDRESSES
        000004                          ERRVEC= 4               ;;TIME OUT AND OTHER ERRORS
        000010                          RESVEC= 10              ;;RESERVED AND ILLEGAL INSTRUCTIONS
```

```
   668          000014                  TBITVEC=14              ;;"T" BIT
   669          000014                  TRTVEC= 14              ;;TRACE TRAP
   670          000014                  BPTVEC= 14              ;;BREAKPOINT TRAP (BPT)
   671          000020                  IOTVEC= 20              ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
   672          000024                  PWRVEC= 24              ;;POWER FAIL
   673          000030                  EMTVEC= 30              ;;EMULATOR TRAP (EMT) **ERROR**
   674          000034                  TRAPVEC=34              ;;"TRAP" TRAP
   675          000060                  TKVEC=  60              ;;TTY KEYBOARD VECTOR
   676          000064                  TPVEC=  64              ;;TTY PRINTER VECTOR
   677          000240                  PIRQVEC=240             ;;PROGRAM INTERRUPT REQUEST VECTOR
```

```
                                        ;STANDARD INTERRUPT VECTORS

                000174                  .=174
000174  000000                         DISPREG:0
000176  000000                         SWREG:0
                000200                  .=200
000200  000167  001746                  JMP     .START          ;GO TO START OF PROGRAM

                001100                  .=1100
001100  000000                         .WORD 0
001102  177570                         LIGHTS:177570

                                        ;PROGRAM CONTROL PARAMETERS

001104  000000                         RETURN: 0
001106  000000                         NEXT:   0                       ;ADDRESS OF NEXT TEST TO BE EXECUTED
001110  000000                         LOCK:   0                       ;ADDRESS FOR LOCK ON CURRENT DATA
001112  000000                         PASCNT: 0               ;ADDRESS CONTAINING PASS COUNT
001114  000000                         ERRCNT: 0                       ;ERROR COUNT
001116  000000                         SAVSP:  0               ;STACK POINTER STORAGE

                                        ;PROGRAM VARIABLES

001120  000020                         HOLD:   20              ;TEMPORARY STORAGE=DELAY TIME FOR CABLES
001122  000000                         SHIFT:  0               ;TEMPORARY STORAGE= # OF SHIFTS PER CHAR
001124  000000                         COUNT:  0               ;TEMPORARY STORAGE= # OF TIMES A CHAR WILL BE SENT
001126  000000                         SAVPC:  0                       ;PROGRAM COUNTER STORAGE
001130  000000                         HLD0:   0
001132  000000                         HLD1:   0
001134  000000                         HLD2:   0
001136  000000                         HLD3:   0
001140  000000                         HLD4:   0
001142  000000                         HLD5:   0
001144  000000                         HLD6:   0
```

```
DZDUV-A MACY11 27(1006)  03-FEB-77  08:30  PAGE 18
DZDUVA.M11    13-OCT-76 08:26          BASIC DEFINITIONS

                                       ;PROGRAM CONVERSATIONAL PARAMETERS
001146     377                 SYNCNO: .BYTE   377     ;# OF SYNC CHARS REQ'D FOR SYNC'ZATION
001147     377                 SEXMIT: .BYTE   377     ;SEC XMIT JUMPER "IN"
001150     377                 SEREC:  .BYTE   377     ;SEC REC JUMPER "IN"
001151     377                 OPTCLR: .BYTE   377     ;OPTIONAL JUMPER CLR "IN"
001152     000                 MULTD:  .BYTE   0       ;NO MULTIPLE DEVICE FLAG
001153     377                 JMRBY:  .BYTE   377     ;EXTERNAL MODEM BYPASS JUMPER "IN"
                               .EVEN
                                       ;PROGRAM MULTIPLE DEVICE PARAMETERS
001154  000000                 BASEADD:        0       ;PROG CONTROLLED 1ST DEVICE ADDR
001156  000000                 KEEPADD:        0       ;SAVED 1ST DEVICE ADDR
001160  000000                 LASTADD:        0       ;LAST DEVICE RXCSR ADDR
001162  000000                 BASEIV:         0       ;PROG CONTROLLED IV
001164  000000                 KEEPIV:         0       ;SAVED INTR VECTOR
001166  000000                 ACTREG:         0       ;ACTIVE REGISTER ,,,MODIFY THIS
                                                       ;LOCATION TO DISQUALIFY OR QUALIFY
                                                       ;DEVICES (1= RUN,,,0= DON'T RUN)
001170  000000                 ROTADD:         0       ;ROTATING POINTER FOR ACTREG..POINTS
                               ;TO DEVICE PRESENTLY UNDER TEST WHEN RUNNING MULTIPLE DEVICES

                                       ;PROGRAM CONTROL FLAGS

001172     000                 INIFLG: .BYTE   0               ;PROGRAM INITIALIZATION FLAG
001173     000                 STFLG:  .BYTE   0               ;TEST START FLAG
001174     000                 LOKFLG: .BYTE   0               ;LOCK ON CURRENT TEST FLAG
          001176                .EVEN
          001400                .=1400
```

```
                                ;INSTRUCTION DEFINITIONS

005746                          PUSH1SP=5746    ;DECREMENT PROCESSOR STACK 1 WORD =TST -(SP)
005726                          POP1SP=5726     ;INCREMENT PROCESSOR STACK 1 WORD =TST (SP)+
010046                          PUSHR0=10046    ;SAVE R0 ON STACK =MOV R0,-(SP)
012600                          POPR0=12600     ;RESTORE R0 FROM STACK =MOV (SP)+,R0
024646                          PUSH2SP=24646   ;DECREMENT STACK TWICE =CMP -(SP),-(SP)
022626                          POP2SP=22626    ;INCREMENT STACK TWICE =CMP (SP)+,(SP)+
                                ;REGISTER DEFINITIONS
                                        ;RXCSR BIT DEFINITIONS
100000                          DSC=BIT15               ;DATA SET CHANGE
040000                          RING=BIT14              ;RING
020000                          CTS=BIT13               ;CLR TO SEND
010000                          CARDET=BIT12            ;CARRIER DETECT
004000                          RECACT=BIT11            ;REC ACTIVE
002000                          SRD=BIT10               ;SEC REC DATA
001000                          DSR=BIT9                ;DATA SET RDY
000400                          STPSYN=BIT8             ;STRIP SYNC
000200                          RXDONE=BIT7             ;REC DONE
000100                          RINTEN=BIT6             ;REC INTR ENABLE
000040                          DSINTE=BIT5             ;DSC INTR ENABLE
000020                          SYNSCH=BIT4             ;SYNC SEARCH
000010                          STD=BIT3                ;SEC XMIT DATA
000004                          RTS=BIT2                ;REQ TO SEND
000002                          DTR=BIT1                ;DATA TERM RDY
000001                          VOID=BIT0
                                        ;RXDBUF BIT DEFINITIONS
100000                          RXERR=BIT15             ;REC ERROR
040000                          OVRRUN=BIT14            ;OVERRUN
020000                          FRMERR=BIT13            ;FRAME ERROR
010000                          PARER=BIT12             ;PARITY ERROR
                                        ;PARCSR BIT DEFINITIONS
001000                          PAREN=BIT9              ;PARITY ENABLE
000400                          EVPAR=BIT8              ;EVEN PARITY SENSE
                                        ;PARCSR WRD DEFINITIONS
030000                          SYNINT=30000            ;SYNC EXTERNAL MODE
020000                          SYNEXT=20000            ;SYNC INTERNAL MODE
000000                          ISYMOD=0                ;ISOC MODE
000000                          FIVE=0                  ;WORD LENGTH 5 BITS
002000                          SIX=2000                ;WORD LENGTH 6 BITS
004000                          SEVEN=4000              ;WORD LENGTH 7 BITS
006000                          EIGHT=6000              ;WORD LENGTH 8 BITS
000000                          NOPAR=0                 ;NO PARITY
001000                          ODDPAR=1000             ;ODD PARITY
001400                          EVEPAR=1400             ;EVEN PARITY
                                        ;TXCSR BIT DEFINITIONS
100000                          DNA=BIT15               ;DATA NOT AVAILABLE
040000                          MTDATA=BIT14            ;MAINT DATA
020000                          CLK=BIT13               ;CLK
002000                          BITW=BIT10              ;BIT WINDOW
000400                          MRESET=BIT8             ;MASTER RESET
000200                          TXDONE=BIT7             ;XMIT DONE
000100                          TXINTE=BIT6             ;XMIT INTR ENABLE
```

F02

BASIC DEFINITIONS

```
804          000040                  DNAINTE=BIT5                ;DNA INTR ENAB
805          000020                  SEND=BIT4                   ;SEND
806          000010                  HDXEN=BIT3                  ;HDX/FDX
807          000001                  BREAK=BIT0                  ;BREAK
808                                          ;TXCSR WRD DEFINITIONS
809          000000                  USER=0                      ;USER MODE
810          004000                  MINT=4000                   ;MAINT INT MODE
811          010000                  MEXT=10000                  ;MAINT EXT MODE
812          014000                  SYSTST=14000                ;SYSTEM TEST MODE
```

```
                                .SBTTL  COMMON TAGS
                                
                                ;;**********************************************************************
                                ;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
                                ;*USED IN THE PROGRAM.
                                
                    001400              .=.
001400                          $CMTAG:                         ;;START OF COMMON TAGS
001400  000000                          .WORD   0
001402  000                     $TSTNM: .BYTE   0               ;;CONTAINS THE TEST NUMBER
001403  000                     $ERFLG: .BYTE   0               ;;CONTAINS ERROR FLAG
001404  000000                  $ICNT:  .WORD   0               ;;CONTAINS SUBTEST ITERATION COUNT
001406  000000                  $LPADR: .WORD   0               ;;CONTAINS SCOPE LOOP ADDRESS
001410  000000                  $LPERR: .WORD   0               ;;CONTAINS SCOPE RETURN FOR ERRORS
001412  000000                  $ERTTL: .WORD   0               ;;CONTAINS TOTAL ERRORS DETECTED
001414  000                     $ITEMB: .BYTE   0               ;;CONTAINS ITEM CONTROL BYTE
001415  001                     $ERMAX: .BYTE   1               ;;CONTAINS MAX. ERRORS PER TEST
001416  000000                  $ERRPC: .WORD   0               ;;CONTAINS PC OF LAST ERROR INSTRUCTION
001420  000000                  $GDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'GOOD' DATA
001422  000000                  $BDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'BAD' DATA
001424  000000                  $GDDAT: .WORD   0               ;;CONTAINS 'GOOD' DATA
001426  000000                  $BDDAT: .WORD   0               ;;CONTAINS 'BAD' DATA
001430  000000                          .WORD   0               ;;RESERVED--NOT TO BE USED
001432  000000                          .WORD   0
001434  000                     $AUTOB: .BYTE   0               ;;AUTOMATIC MODE INDICATOR
001435  000                     $INTAG: .BYTE   0               ;;INTERRUPT MODE INDICATOR
001436  000000                          .WORD   0
001440  177570                  SWR:    .WORD   DSWR            ;;ADDRESS OF SWITCH REGISTER
001442  177570                  DISPLAY: .WORD  DDISP           ;;ADDRESS OF DISPLAY REGISTER
001444  177560                  $TKS:   177560                  ;;TTY KBD STATUS
001446  177562                  $TKB:   177562                  ;;TTY KBD BUFFER
001450  177564                  $TPS:   177564                  ;;TTY PRINTER STATUS REG. ADDRESS
001452  177566                  $TPB:   177566                  ;;TTY PRINTER BUFFER REG. ADDRESS
001454  000                     $NULL:  .BYTE   0               ;;CONTAINS NULL CHARACTER FOR FILLS
001455  002                     $FILLS: .BYTE   2               ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
001456  012                     $FILLC: .BYTE   12              ;;INSERT FILL CHARS. AFTER A "LINE FEED"
001457  000                     $TPFLG: .BYTE   0               ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
001460  000000                  $REGAD: .WORD   0               ;;CONTAINS THE ADDRESS FROM
                                                                ;;WHICH  ($REG0) WAS OBTAINED
001462  000000                  $REG0:  .WORD   0               ;;CONTAINS (($REGAD)+0)
001464  000000                  $REG1:  .WORD   0               ;;CONTAINS (($REGAD)+2)
001466  000000                  $REG2:  .WORD   0               ;;CONTAINS (($REGAD)+4)
001470  000000                  $REG3:  .WORD   0               ;;CONTAINS (($REGAD)+6)
001472  000000                  $REG4:  .WORD   0               ;;CONTAINS (($REGAD)+10)
001474  000000                  $REG5:  .WORD   0               ;;CONTAINS (($REGAD)+12)
001476  000000                  $TMP0:  .WORD   0               ;;USER DEFINED
001500  000000                  $TMP1:  .WORD   0               ;;USER DEFINED
001502  000000                  $TMP2:  .WORD   0               ;;USER DEFINED
001504  000000                  $TMP3:  .WORD   0               ;;USER DEFINED
001506  000000                  $TMP4:  .WORD   0               ;;USER DEFINED
001510  000000                  $TMP5:  .WORD   0               ;;USER DEFINED
001512  000000                  $TIMES: 0                       ;;MAX. NUMBER OF ITERATIONS
001514  000000                  $ESCAPE:0                       ;;ESCAPE ON ERROR ADDRESS
001516  177607  000377          $BELL:  .ASCIZ  <207><377><377> ;;CODE FOR BELL
001522  077                     $QUES:  .ASCII  /?/             ;;QUESTION MARK
001523  015                     $CRLF:  .ASCII  <15>            ;;CARRIAGE RETURN
```

```
DZDUV-A MACY11 27(1006)  03-FEB-77  08:30  PAGE 22
DZDUVA.M11    13-OCT-76 08:26          COMMON TAGS

   869  001524  000012                $LF:    .ASCIZ  <12>            ;;LINE FEED
   870                                ;;*****************************************************************
   871                                .SBTTL  APT MAILBOX-ETABLE
   872
   873                                ;;*****************************************************************
   874                                .EVEN
   875  001526                        $MAIL:                          ;;APT MAILBOX
   876  001526  000000                $MSGTY: .WORD   AMSGTY          ;;MESSAGE TYPE CODE
   877  001530  000000                $FATAL: .WORD   AFATAL          ;;FATAL ERROR NUMBER
   878  001532  000000                $TESTN: .WORD   ATESTN          ;;TEST NUMBER
   879  001534  000000                $PASS:  .WORD   APASS           ;;PASS COUNT
   880  001536  000000                $DEVCT: .WORD   ADEVCT          ;;DEVICE COUNT
   881  001540  000000                $UNIT:  .WORD   AUNIT           ;;I/O UNIT NUMBER
   882  001542  000000                $MSGAD: .WORD   AMSGAD          ;;MESSAGE ADDRESS
   883  001544  000000                $MSGLG: .WORD   AMSGLG          ;;MESSAGE LENGTH
   884  001546                        $ETABLE:                        ;;APT ENVIRONMENT TABLE
   885  001546     000                $ENV:   .BYTE   AENV            ;;ENVIRONMENT BYTE
   886  001547     000                $ENVM:  .BYTE   AENVM           ;;ENVIRONMENT MODE BITS
   887  001550  000000                $SWREG: .WORD   ASWREG          ;;APT SWITCH REGISTER
   888  001552  000000                $USWR:  .WORD   AUSWR           ;;USER SWITCHES
   889  001554  000000                $CPUOP: .WORD   ACPUOP          ;;CPU TYPE,OPTIONS
   890                                ;*                              BITS 15-11=CPU TYPE
   891                                ;*                                      11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
   892                                ;*                                      11/70=06,PDQ=07,Q=10
   893                                ;*                              BIT 10=REAL TIME CLOCK
   894                                ;*                              BIT  9=FLOATING POINT PROCESSOR
   895                                ;*                              BIT  8=MEMORY MANAGEMENT
   896  001556     000                $MAMS1: .BYTE   AMAMS1          ;;HIGH ADDRESS,M.S. BYTE
   897  001557     000                $MTYP1: .BYTE   AMTYP1          ;;MEM. TYPE,BLK#1
   898                                ;*                              MEM.TYPE BYTE   --  (HIGH BYTE)
   899                                ;*                                      900 NSEC CORE=001
   900                                ;*                                      300 NSEC BIPOLAR=002
   901                                ;*                                      500 NSEC MOS=003
   902  001560  000000                $MADR1: .WORD   AMADR1          ;;HIGH ADDRESS,BLK#1
   903                                ;*                                MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABOVE
   904  001562     000                $MAMS2: .BYTE   AMAMS2          ;;HIGH ADDRESS,M.S. BYTE
   905  001563     000                $MTYP2: .BYTE   AMTYP2          ;;MEM.TYPE,BLK#2
   906  001564  000000                $MADR2: .WORD   AMADR2          ;;MEM.LAST ADDRESS,BLK#2
   907  001566     000                $MAMS3: .BYTE   AMAMS3          ;;HIGH ADDRESS,M.S.BYTE
   908  001567     000                $MTYP3: .BYTE   AMTYP3          ;;MEM.TYPE,BLK#3
   909  001570  000000                $MADR3: .WORD   AMADR3          ;;MEM.LAST ADDRESS,BLK#3
   910  001572     000                $MAMS4: .BYTE   AMAMS4          ;;HIGH ADDRESS,M.S.BYTE
   911  001573     000                $MTYP4: .BYTE   AMTYP4          ;;MEM.TYPE,BLK#4
   912  001574  000000                $MADR4: .WORD   AMADR4          ;;MEM.LAST ADDRESS,BLK#4
   913  001576  000000                $VECT1: .WORD   AVECT1          ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
   914  001600  000000                $VECT2: .WORD   AVECT2          ;;INTERRUPT VECTOR#2BUS PRIORITY#2
   915  001602  000000                $BASE:  .WORD   ABASE           ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
   916  001604  000000                $DEVM:  .WORD   ADEVM           ;;DEVICE MAP
   917  001606  000000                $CDW1:  .WORD   ACDW1           ;;CONTROLLER DESCRIPTION WORD#1
   918  001610  000000                $CDW2:  .WORD   ACDW2           ;;CONTROLLER DESCRIPTION WORD#2
   919  001612  000000                $DDW0:  .WORD   ADDW0           ;;DEVICE DESCRIPTOR WORD#0
   920  001614  000000                $DDW1:  .WORD   ADDW1           ;;DEVICE DESCRIPTOR WORD#1
   921  001616  000000                $DDW2:  .WORD   ADDW2           ;;DEVICE DESCRIPTOR WORD#2
   922  001620  000000                $DDW3:  .WORD   ADDW3           ;;DEVICE DESCRIPTOR WORD#3
   923  001622  000000                $DDW4:  .WORD   ADDW4           ;;DEVICE DESCRIPTOR WORD#4
   924  001624  000000                $DDW5:  .WORD   ADDW5           ;;DEVICE DESCRIPTOR WORD#5
```

APT MAILBOX-ETABLE

```
    925  001626  000000                  $DDW6:  .WORD   ADDW6   ;;DEVICE DESCRIPTOR WORD#6
    926  001630  000000                  $DDW7:  .WORD   ADDW7   ;;DEVICE DESCRIPTOR WORD#7
    927  001632  000000                  $DDW8:  .WORD   ADDW8   ;;DEVICE DESCRIPTOR WORD#8
    928  001634  000000                  $DDW9:  .WORD   ADDW9   ;;DEVICE DESCRIPTOR WORD#9
    929  001636  000000                  $DDW10: .WORD   ADDW10  ;;DEVICE DESCRIPTOR WORD#10
    930  001640  000000                  $DDW11: .WORD   ADDW11  ;;DEVICE DESCRIPTOR WORD#11
    931  001642  000000                  $DDW12: .WORD   ADDW12  ;;DEVICE DESCRIPTOR WORD#12
    932  001644  000000                  $DDW13: .WORD   ADDW13  ;;DEVICE DESCRIPTOR WORD#13
    933  001646  000000                  $DDW14: .WORD   ADDW14  ;;DEVICE DESCRIPTOR WORD#14
    934  001650  000000                  $DDW15: .WORD   ADDW15  ;;DEVICE DESCRIPTOR WORD#15
    935
    936
    937  001652                          $ETEND:
    938
    939
    940
```

```
                                ;INSTRUCTION DEFINITIONS

005746                          PUSH1SP=5746    ;DECREMENT PROCESSOR STACK 1 WORD =TST -(SP)
005726                          POP1SP=5726     ;INCREMENT PROCESSOR STACK 1 WORD =TST (SP)+
010046                          PUSHR0=10046    ;SAVE R0 ON STACK =MOV R0,-(SP)
012600                          POPR0=12600     ;RESTORE R0 FROM STACK =MOV (SP)+,R0
024646                          PUSH2SP=24646   ;DECREMENT STACK TWICE =CMP -(SP),-(SP)
022626                          POP2SP=22626    ;INCREMENT STACK TWICE =CMP (SP)+,(SP)+
                                ;REGISTER DEFINITIONS
                                        ;RXCSR BIT DEFINITIONS
100000                          DSC=BIT15               ;DATA SET CHANGE
040000                          RING=BIT14              ;RING
020000                          CTS=BIT13               ;CLR TO SEND
010000                          CARDET=BIT12            ;CARRIER DETECT
004000                          RECACT=BIT11            ;REC ACTIVE
002000                          SRD=BIT10               ;SEC REC DATA
001000                          DSR=BIT9                ;DATA SET RDY
000400                          STPSYN=BIT8             ;STRIP SYNC
000200                          RXDONE=BIT7             ;REC DONE
000100                          RINTEN=BIT6             ;REC INTR ENABLE
000040                          DSINTE=BIT5             ;DSC INTR ENABLE
000020                          SYNSCH=BIT4             ;SYNC SEARCH
000010                          STD=BIT3                ;SEC XMIT DATA
000004                          RTS=BIT2                ;REQ TO SEND
000002                          DTR=BIT1                ;DATA TERM RDY
000001                          VOID=BIT0
                                        ;RXDBUF BIT DEFINITIONS
100000                          RXERR=BIT15             ;REC ERROR
040000                          OVRRUN=BIT14            ;OVERRUN
020000                          FRMERR=BIT13            ;FRAME ERROR
010000                          PARER=BIT12             ;PARITY ERROR
                                        ;PARCSR BIT DEFINITIONS
001000                          PAREN=BIT9              ;PARITY ENABLE
000400                          EVPAR=BIT8              ;EVEN PARITY SENSE
                                        ;PARCSR WRD DEFINITIONS
030000                          SYNINT=30000            ;SYNC EXTERNAL MODE
020000                          SYNEXT=20000            ;SYNC INTERNAL MODE
000000                          ISYMOD=0                ;ISOC MODE
000000                          FIVE=0                  ;WORD LENGTH 5 BITS
002000                          SIX=2000                ;WORD LENGTH 6 BITS
004000                          SEVEN=4000              ;WORD LENGTH 7 BITS
006000                          EIGHT=6000              ;WORD LENGTH 8 BITS
000000                          NOPAR=0                 ;NO PARITY
001000                          ODDPAR=1000             ;ODD PARITY
001400                          EVEPAR=1400             ;EVEN PARITY
                                        ;TXCSR BIT DEFINITIONS
100000                          DNA=BIT15               ;DATA NOT AVAILABLE
040000                          MTDATA=BIT14            ;MAINT DATA
020000                          CLK=BIT13               ;CLK
002000                          BITW=BIT10              ;BIT WINDOW
000400                          MRESET=BIT8             ;MASTER RESET
000200                          TXDONE=BIT7             ;XMIT DONE
000100                          TXINTE=BIT6             ;XMIT INTR ENABLE
```

```
                                APT MAILBOX-ETABLE

   997          000040                  DNAINTE=BIT5            ;DNA INTR ENAB
   998          000020                  SEND=BIT4               ;SEND
   999          000010                  HDXEN=BIT3              ;HDX/FDX
  1000          000001                  BREAK=BIT0              ;BREAK
  1001                                          ;TXCSR WRD DEFINITIONS
  1002          000000                  USER=0                  ;USER MODE
  1003          004000                  MINT=4000               ;MAINT INT MODE
  1004          010000                  MEXT=10000              ;MAINT EXT MODE
  1005          014000                  SYSTST=14000            ;SYSTEM TEST MODE
```

```
                                        ERROR POINTER TABLE

                                        .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


001652                                  $ERRTB:
                                                ;ERROR TABLE
001652  001762                                         EM1     ;ERROR 1        REGISTER ERROR
001654  002067                                         DH1
001656  002116                                         DT1
001660  002132                                         DF1
001662  002022                                         EM2     ;ERROR 2        RECEIVER ERROR
001664  002067                                         DH1
001666  002116                                         DT1
001670  002132                                         DF1
001672  002043                                         EM3     ;ERROR 3        TRANSMITTER ERROR
001674  002067                                         DH1
001676  002116                                         DT1
001700  002132                                         DF1
001702  001746                                         EM4     ;ERROR 4        BIT ERROR (GENERAL)
001704  000000                                         0
001706  002126                                         DT4
001710  002132                                         DF1

                                                ;DEFAULT DU ADDRESSES
001712  160010                          RXCSR:  160010
001714  160011                          HRXCSR: 160011
001716  160012                          RXDBUF: 160012
001720  160013                          HRXDBUF:        160013
001722  160012                          PARCSR: 160012
001724  160013                          HPARCSR:        160013
001726  160014                          TXCSR:  160014
001730  160015                          HTXCSR: 160015
001732  160016                          TXDBUF: 160016
001734  160017                          HTXDBUF:        160017
                                                ;DEFAULT DU VECTORS
001736  000770                          DURIV:  770     ;REC INTR VECTOR
001740  000772                          DURIS:  772     ;REC INTR STATUS
001742  000774                          DUTIV:  774     ;XMIT INTR VECTOR
001744  000776                          DUTIS:  776     ;XMIT INTR STATUS
                                                ;ERROR MESSAGES
001746  020040  051105  047522          EM4:    .ASCIZ  /  ERROR PC /
001754  020122  041520  000040
001762  020040  047503  050115          EM1:    .ASCIZ /  COMPARISON ERROR ON REGISTERS/
001770  051101  051511  047117
001776  042440  051122  051117
002004  047440  020116  042522
```

```
                                                ERROR POINTER TABLE

1062  002012  044507  052123  051105
1063  002020  000123
1064  002022  020040  042522  042503  EM2:    .ASCIZ  /  RECEIVER ERROR/
1065  002030  053111  051105  042440
1066  002036  051122  051117     000
1067  002043     040  052040  040522  EM3:    .ASCIZ  /  TRANSMITTER ERROR/
1068  002050  051516  044515  052124
1069  002056  051105  042440  051122
1070  002064  051117     000
1071                                          ;DATA HEADERS FOR ERROR MESSAGES
1072  002067     105  051122  041520  DH1:    .ASCIZ  /ERRPC  WANTED  ACTUAL/
1073  002074  020040  040527  052116
1074  002102  042105  020040  041501
1075  002110  052524  046101     000
1076          002116                  .EVEN
1077                                          ;DATA TABLES FOR ERROR MESSAGES
1078  002116  001416  001130  001132  DT1:    .WORD   $ERRPC,HLD0,HLD1,0
1079  002124  000000
1080
1081  002126  001416  000000          DT4:    .WORD   $ERRPC,0
1082
1083  002132     000     000     000  DF1:    .BYTE   0,0,0,0
1084  002135     000
1085                                  .EVEN
1086                                  .SBTTL  ACT11 HOOKS
1087
1088                                  ;;*****************************************************************
1089
1090          002136                  ;HOOKS REQUIRED BY ACT11
1091          000046                          $SVPC=.                 ;SAVE PC
1092  000046  012662                          .=46
1093          000052                          $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
1094  000052  000000                          .=52
1095          002136                          .WORD   0               ;;2)SET LOC.52 TO ZERO
1096                                          .=$SVPC                 ;; RESTORE PC
                                      .SBTTL  APT PARAMETER BLOCK
1097
1098                                  ;;*****************************************************************
1099
1100                                  ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
1101                                  ;;*****************************************************************
1101          002136                          .$X=.   ;;SAVE CURRENT LOCATION
1102          000024                          .=24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
1103  000024  000200                          200     ;;FOR APT START UP
1104          000044                          .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
1105  000044  002136                          $APTHDR ;;POINT TO APT HEADER BLOCK
1106          002136                          .=.$X   ;;RESET LOCATION COUNTER
1107                                  ;;*****************************************************************
1108
1109                                  ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
1110                                  ;INTERFACE SPEC.
1111  002136                          $APTHD:
1112  002136  000000                 $HIBTS: .WORD   0        ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
1113  002140  001526                 $MBADR: .WORD   $MAIL    ;;ADDRESS OF APT MAILBOX (BITS 0-15)
1114  002142  000010                 $TSTM:  .WORD   10       ;;RUN TIM OF LONGEST TEST
1115  002144  000010                 $PASTM: .WORD   10       ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
1116  002146  000000                 $UNITM: .WORD            ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
1117  002150  000052                         .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
```

```
1118
1119
1120                                            ;PROGRAM INITIALIZATION
1121                                            ;LOCK OUT INTERRUPTS
1122                                            ;SET UP PROCESSOR STACK
1123                                            ;SET UP POWER FAIL VECTOR
1124                                            ;CLEAR PROGRAM CONTROL FLAGS AND COUNTS
1125                                            ;TYPE TITLE MESSAGE
1126
1127  002152                                .START:
1128                                        .SBTTL  INITIALIZE THE COMMON TAGS
1129                                        ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
1130  002152  012706  001400                        MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
1131  002156  005026                                CLR     (R6)+           ;;CLEAR MEMORY LOCATION
1132  002160  022706  001440                        CMP     #SWR,R6 ;;DONE?
1133  002164  001374                                BNE     .-6             ;;LOOP BACK IF NO
1134  002166  012706  001100                        MOV     #@#STACK,SP             ;;SETUP THE STACK POINTER
1135                                        ;;INITIALIZE A FEW VECTORS
1136  002172  012737  016312  000020                MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
1137  002200  012737  000340  000022                MOV     #340,@#IOTVEC+2 ;;LEVEL 7
1138  002206  012737  014202  000030                MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
1139  002214  012737  000340  000032                MOV     #340,@#EMTVEC+2 ;;LEVEL 7
1140  002222  012737  016630  000034                MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
1141  002230  012737  000340  000036                MOV     #340,@#TRAPVEC+2;LEVEL 7
1142  002236  012737  015004  000024                MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
1143  002244  012737  000340  000026                MOV     #340,@#PWRVEC+2 ;;LEVEL 7
1144  002252  005067  177234                       CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
1145  002256  005067  177232                       CLR     $ESCAPE         ;;CLEAR THE ESCAPE ON ERROR ADDRESS
1146  002262  112767  000001  177125               MOVB    #1,$ERMAX       ;;ALLOW ONE ERROR PER TEST
1147  002270  012767  002270  177110               MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
1148  002276  012767  002276  177104               MOV     #.,$LPERR       ;;SETUP THE ERROR LOOP ADDRESS
1149                                        ;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
1150                                        ;;EQUAL TO A "-1", SETUP FOR A SOFTWARE SWITCH REGISTER.
1151  002304  013746  000004                       MOV     @#ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
1152  002310  012737  002344  000004                MOV     #64$,@#ERRVEC   ;;SET UP ERROR VECTOR
1153  002316  012767  177570  177114               MOV     #DSWR,SWR       ;;SETUP FOR A HARDWARE SWICH REGISTER
1154  002324  012767  177570  177110               MOV     #DDISP,DISPLAY  ;;AND A HARDWARE DISPLAY REGISTER
1155  002332  022777  177777  177100               CMP     #-1,@SWR        ;;TRY TO REFERENCE HARDWARE SWR
1156  002340  001012                               BNE     66$             ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
1157                                                                        ;;AND  THE HARDWARE SWR IS NOT = -1
1158  002342  000403                               BR      65$             ;;BRANCH IF NO TIMEOUT
1159  002344  012716  002352          64$:         MOV     #65$,(SP)       ;;SET UP FOR TRAP RETURN
1160  002350  000002                               RTI
1161  002352  012767  000176  177060  65$:         MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
1162  002360  012767  000174  177054               MOV     #DISPREG,DISPLAY
1163  002366  012637  000004          66$:         MOV     (SP)+,@#ERRVEC  ;;RESTORE ERROR VECTOR
1164
1165  002372  005067  177136                       CLR     $PASS           ;;CLEAR PASS COUNT
1166  002376  132767  000200  177143               BITB    #APTSIZE,$ENVM  ;;TEST USER SIZE UNDER APT
1167  002404  001403                               BEQ     67$             ;;YES,USE NON-APT SWITCH
1168  002406  012767  001550  177024               MOV     #$SWREG,SWR     ;;NO,USE APT SWITCH REGISTER
1169  002414                          67$:
1170  002414  012706  001100                       MOV     #STACK,SP               ;SET STACK
1171  002420  106427  000340                       MTPS    #340            ;LOCK INTERRUPTS
1172  002424  012737  015004  000024               MOV     #.PFAIL,@#24            ;SET UP POWER FAIL VECTOR
1173  002432  105067  176535                       CLRB    STFLG           ;CLEAR START FLAG
```

```
1174  002436  005067  176450                CLR     PASCNT                  ;CLEAR PASS COUNT
1175  002442  105067  176735                CLRB    $ERFLG                  ;CLEAR ERROR FLAG
1176  002446  005067  176740                CLR     $ERTTL                  ;CLEAR ERROR COUNT
1177  002452  005067  176740                CLR     $ERRPC                  ;CLEAR LAST ERROR POINTER
1178  002456  012767  000001  176716        MOV     #1,$TSTNM               ;SET UP FOR TEST 1
1179  002464  012767  002152  176412        MOV     #.START,RETURN          ;SET UP FOR POWER FAIL BEFORE
1180                                                                        ;TESTING STARTS
1181  002472  013746  000006                MOV     @#6,-(SP)
1182  002476  013746  000004                MOV     @#4,-(SP)
1183  002502  012737  002516  000004        MOV     #1$,@#4
1184  002510  005777  176724                TST     @SWR
1185  002514  000407                        BR      2$
1186  002516  012767  000176  176714  1$:   MOV     #SWREG,SWR
1187  002524  012767  000174  176710        MOV     #DISPREG,DISPLAY
1188  002532  022626                        CMP     (SP)+,(SP)+
1189  002534  012637  000004          2$:   MOV     (SP)+,@#4
1190  002540  012637  000006                MOV     (SP)+,@#6
1191  002544  022767  000176  176666        CMP     #SWREG,SWR
1192  002552  001007                        BNE     3$
1193  002554  005737  000042                TST     @#42                    ;CHECK FOR CHAIN
1194  002560  001402                        BEQ     33$
1195  002562  000167  000522                JMP     .BEGIN
1196  002566  004767  010176          33$:  JSR     PC,CNTLU
1197  002572  105767  176374          3$:   TSTB    INIFLG                  ;HAS INITIALIZATION BEEN PERFORMED
1198  002576  001004                        BNE     ONCE
1199  002600  104401  015144                TYPE    ,MTITLE                 ;TYPE TITLE MESSAGE
1200  002604  105167  176362                COMB    INIFLG                  ;IF NOT SET FLAG AND DO
1201  002610  105767  176732          ONCE: TSTB    $ENV            ;APT CONTROL?
1202  002614  001410                        BEQ     11$             ;BR IF NO
1203  002616  032767  000001  176726        BIT     #1,$USWR        ;EXTENAL JUMPER ON?
1204  002624  001002                        BNE     12$             ;NO
1205  002626  105067  176321                CLRB    JMRBY           ;CLEAR FLAG
1206  002632  000167  000452          12$:  JMP     .BEGIN          ;GO DO IT
1207  002636  032777  000001  176574  11$:  BIT     #SW00,@SWR      ;RESELECT VECTOR & CONTROL REG?
1208  002644  001002                        BNE     1$
1209  002646  000167  000436                JMP     .BEGIN
1210  002652  012700  000300          1$:   MOV     #300,R0 ;RESTORE VECTOR AREA TO TRAPCATCHER
1211  002656  012701  000302                MOV     #302,R1 ;START AT LOCATION 300
1212  002662  012702  000004                MOV     #4,R2
1213  002666  010110                  2$:   MOV     R1,(R0)
1214  002670  005011                        CLR     (R1)
1215  002672  060200                        ADD     R2,R0
1216  002674  060201                        ADD     R2,R1
1217  002676  022701  001000                CMP     #1000,R1        ;END AT LOCATION 776
1218  002702  002771                        BLT     2$
1219  002704  104406                        INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1220  002706  015212                        MREGAD  ;MESSAGE
1221  002710  104410                        PARAM   ;CONVERT STRING
1222  002712  160000                        160000  ;LOW LIMIT
1223  002714  167776                        167776  ;HIGH LIMIT
1224  002716  017124                        DUBASE  ;STORE AT THIS LOCATION
1225  002720     001                .BYTE   1       ;MASK
1226  002721     001                .BYTE   1       ;HOW MANY TIMES + 2
1227  002722  016767  014176  176226        MOV     DUBASE,KEEPADD  ;SAVE
1228  002730  004767  014036                JSR     PC,DUADDR
1229  002734  016767  176216  176212        MOV     KEEPADD,BASEADD ;RESTORE FOR ROTATION
```

```
1230  002742  104406                                INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1231  002744  015177                                MVECTO  ;MESSAGE
1232  002746  104410                                PARAM   ;CONVERT STRING
1233  002750  000300                                300     ;LOW LIMIT
1234  002752  000776                                776     ;HIGH LIMIT
1235  002754  001736                                DURIV   ;STORE AT THIS LOCATION
1236  002756     001                        .BYTE    1       ;MASK
1237  002757     004                        .BYTE    4       ;HOW MANY TIMES + 2
1238  002760  016767  176752  176176                MOV     DURIV,KEEPIV    ;SAVE
1239  002766  016767  176744  176166                MOV     DURIV,BASEIV    ;SET UP FOR ROTATION
1240  002774  104406                                INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1241  002776  015242                                MMULT   ;MESSAGE
1242  003000  104414                                SETFLG  ;SET FLAG BASED UPON INPUT STRING
1243  003002  001152                                MULTD   ;THIS FLAG
1244  003004  105767  176142                       TSTB    MULTD   ;ARE THERE MULTIPLE DEVICES
1245                                                                 ;ON THE SYSTEM ?
1246  003010  100406                                BMI     BBB     ;YES,ASK NEXT QUESTION
1247  003012  005067  176150                       CLR     ACTREG
1248  003016  005067  176146                       CLR     ROTADD
1249  003022  000167  000140                       JMP     OUTMUL  ;JUMP AROUND NEXT QUESTION
1250  003026                             BBB:
1251  003026  104406                                INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1252  003030  015271                                MLASTD  ;MESSAGE
1253  003032  104410                                PARAM   ;CONVERT STRING
1254  003034  160000                                160000  ;LOW LIMIT
1255  003036  167776                                167776  ;HIGH LIMIT
1256  003040  001160                                LASTADD ;STORE AT THIS LOCATION
1257  003042     001                        .BYTE    1       ;MASK
1258  003043     001                        .BYTE    1       ;HOW MANY TIMES + 2
1259                                         ;THE FOLLOWING ROUTINE SETS UP ACTREG FOR THE FIRST TIME
1260  003044  012767  000001  176116  1$:    MOV     #1,ROTADD       ;SET UP POINTER
1261  003052  005067  176110                       CLR     ACTREG  ;CLR ACTIVE REGISTER
1262  003056  056767  176106  176102  2$:    BIS     ROTADD,ACTREG   ;MAKE THIS DEVICE ACTIVE
1263  003064  000241                                CLC
1264  003066  006167  176076                       ROL     ROTADD  ;SET UP POINTER
1265  003072  103421                                BCS     3$      ;ARE YOU OUT OF RANGE ?
1266  003074  062767  000010  176052                ADD     #10,BASEADD     ;SET UP BASE ADDRESS
1267  003102  026767  176052  176044                CMP     LASTADD,BASEADD ;IS THIS THE LAST DEVICE ?
1268  003110  101362                                BHI     2$      ;NO DO IT AGAIN
1269  003112  056767  176052  176046                BIS     ROTADD,ACTREG   ;THIS ASSUMES THAT THERE ARE AT
1270                                                       ;LEAST TWO DEVICES WHEN YOU ANSWER YES TO
1271                                                       ;MULTIPLE DEVICE QUESTION
1272  003120  012767  000001  176042  4$:    MOV     #1,ROTADD       ;SET UP FOR LATER USE IN END OF PASS ROUTINE
1273  003126  016767  176024  176020                MOV     KEEPADD,BASEADD ;DITTO
1274  003134  000414                                BR      OUTMUL  ;CONTINUE QUESTIONS
1275  003136  016767  176014  176010  3$:    MOV     KEEPADD,BASEADD ;RESTORE
1276  003144  104406                                INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1277  003146  015365                                MRANGE  ;MESSAGE
1278  003150  104410                                PARAM   ;CONVERT STRING
1279  003152  160000                                160000  ;LOW LIMIT
1280  003154  167776                                167776  ;HIGH LIMIT
1281  003156  001160                                LASTADD ;STORE AT THIS LOCATION
1282  003160     001                        .BYTE    1       ;MASK
1283  003161     001                        .BYTE    1       ;HOW MANY TIMES + 2
1284  003162  000167  177656                       JMP     1$      ;DO IT AGAIN
1285  003166  012767  000340  013572  OUTMUL: MOV     #340,DUPRT
```

INITIALIZE THE COMMON TAGS

```
                                                    JSR     PC,DULEV
                                                    ;COMPARE THE FIRST CHARACTER IN THE TELETYPE INPUT
                                                    ;BUFFER TO THE CHARACTERS "1" AND "2".
                                                    ;IF THE CHARACTER IS "1" CLEAR THE FLAG
                                                    ;IF THE CHARACTER IS "2" SET THE FLAG
003200                                      AAA:
003200  104406                                     INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
003202  015603                                     MSYNC   ;MESSAGE
003204  122767  000061  012732            3$:     CMPB    #'1,INBUF       ;IS IT "1" ?
003212  001003                                     BNE     1$
003214  105067  175726                             CLRB    SYNCNO  ;000
003220  000412                                     BR      4$
003222  122767  000062  012714            1$:     CMPB    #'2,INBUF       ;IS IT "2" ?
003230  001004                                     BNE     2$
003232  112767  177777  175706                     MOVB    #-1,SYNCNO      ;377
003240  000402                                     BR      4$
003242  104407                            2$:     INSTER  ;RETRY
003244  000757                                     BR      3$
003246  000240                            4$:     NOP
003250  104406                                     INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
003252  015651                                     MWIRE6  ;MESSAGE
003254  104414                                     SETFLG  ;SET FLAG BASED UPON INPUT STRING
003256  001147                                     SEXMIT  ;THIS FLAG
003260  104406                                     INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
003262  015722                                     MWIRE5  ;MESSAGE
003264  104414                                     SETFLG  ;SET FLAG BASED UPON INPUT STRING
003266  001150                                     SEREC   ;THIS FLAG
003270  104406                                     INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
003272  015772                                     MWIRE4  ;MESSAGE
003274  104414                                     SETFLG  ;SET FLAG BASED UPON INPUT STRING
003276  001151                                     OPTCLR  ;THIS FLAG
003300  104406                                     INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
003302  016051                                     MEXTJ   ;MESSAGE
003304  104414                                     SETFLG  ;SET FLAG BASED UPON INPUT STRING
003306  001153                                     JMRBY   ;THIS FLAG

                                                    ;TEST START AND RESTART

003310  012706  001100            .BEGIN: MOV     #STACK,SP               ;SET UP STACK
003314  106427  000340                    MTPS    #340                    ;LOCK OUT INTERRUPTS
003320  032777  000002  176112            BIT     #SW01,@SWR              ;IF SW01=1, GET STARTING PC
003326  001406                            BEQ     3$
003330  104406                            INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
003332  015535                            MTSTPC  ;MESSAGE
003334  104410                            PARAM   ;CONVERT STRING
003336  003362                            TST1    ;LOW LIMIT
                                                    ;HIGH LIMIT
                                                    ;STORE AT THIS LOCATION
003340     001                    .BYTE   1       ;MASK
003341     001                    .BYTE   i       ;HOW MANY TIMES + 2
003342  000403                            BR      4$
003344  012767  003362  175532    3$:     MOV     #TST1,RETURN            ;START AT TEST 1
003352  104401  015531            4$:     TYPE    ,MR                     ;TYPE R
003356  000177  175522                    JMP     @RETURN                 ;START TESTING
```

INITIALIZE THE COMMON TAGS

```
                                        ;;THIS TEST VERIFYS THAT RXDONE CAUSES AN INTERRUPT
                                        ;;MODE:  SYNC EXTERNAL
                                        ;;INTERRUPT VECTOR:  DURIV
                                        ;;LENGTH:  EIGHT
                                        ;;*****************************************************************
003362  000004                        TST1:   SCOPE

003364  052777  000400  176334                BIS     #MRESET,@TXCSR  ;MASTER RESET
003372  012777  020000  176322                MOV     #SYNEXT,@PARCSR ;SET THE MODE
003400  052777  000400  176320                BIS     #MRESET,@TXCSR  ;MASTER RESET

                                        ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
003406  012777  064001  176312                MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR

                                        ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
003414  012777  026026  176300                MOV     #SYNEXT!EIGHT!NOPAR!26,@PARCSR
003422  052777  000020  176262                BIS     #SYNSCH,@RXCSR  ;SET SEARCH SYNC
                                        ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
003430  042777  020000  176270                BIC     #CLK,@TXCSR     ;POKE CLK DOWN
003436  052777  020000  176262                BIS     #CLK,@TXCSR     ;POKE CLK UP
003444  012777  003466  176264                MOV     #1$,@DURIV      ;SET UP TRAPCATCHER
003452  016777  013310  176260                MOV     DUPRT,@DURIS    ;
003460  106427  000000                        MTPS    #0      ;ALLOW INTERRUPTS
003464  000424                              BR      2$      ;JUMP AROUND INTERRUPT SVC ROUTINE
                                        ;THE FOLLOWING IS THE INTERRUPT SVC ROUTINE
003466  106427  000340                1$:     MTPS    #340    ;DON'T ALLOW ANYMORE INTERRUPTS
003472  042777  000100  176212                BIC     #RINTEN,@RXCSR  ;CLEAR INTERRUPT ENABLE
003500  105777  176206                        TSTB    @RXCSR          ;RXDONE=1?
003504  100401                              BMI     .+4
003506  104004                              ERROR   4                       ;FALSE INTERRUPT
003510  012716  003702                        MOV     #3$,(SP)        ;SET UP RETURN LOCATION
003514  016777  176220  176214                MOV     DURIS,@DURIV    ;RESTORE TRAPCATCHER
003522  012777  000000  176210                MOV     #0,@DURIS       ;
003530  017701  176162                        MOV     @RXDBUF,R1      ;CLEAR INTERRUPT
003534  000002                              RTI

003536  052777  000100  176146  2$:     BIS     #RINTEN,@RXCSR  ;SET INTERRUPT ENABLE
003544  012767  000010  175350                MOV     #8.,SHIFT       ;# OF SHIFTS
003552  012767  000025  175720                MOV     #25,$TMP1       ;TO BE SHIFTED CHARACTER
                                        ;THE FOLLOWING POKES THE MAINT DATA BASED UPON THE
                                        ;INFORMATION CONTAINED IN $TMP1 AND IT IS
                                        ;SHIFTED IN BY THE CONTENTS OF SHIFT
003560  042777  040000  176140  5$:     BIC     #MTDATA,@TXCSR
003566  000241                        CLC
003570  006067  175704                ROR     $TMP1   ;FORCE CARRY
003574  103003                        BCC     4$
003576  052777  040000  176122        BIS     #MTDATA,@TXCSR
003604  042777  020000  176114  4$:     BIC     #CLK,@TXCSR
003612  052777  020000  176106        BIS     #CLK,@TXCSR
003620  005367  175276                DEC     SHIFT
003624  001355                        BNE     5$
                                        ;INTERRUPT SHOULD NOW OCCUR
003626  005000                        CLR     R0
003630  005200                        INC     R0              ;WAIT FOR INTERRUPT
003632  001376                        BNE     .-2
003634  016777  176100  176074        MOV     DURIS,@DURIV    ;RESTORE TRAPCATCHER
```

INITIALIZE THE COMMON TAGS

```
1398  003642  012777  000000  176070          MOV     #0,@DURIS       ;
1399  003650  016703  176042                  MOV     RXDBUF,R3       ;FOR ERROR MESSAGE
1400  003654  012700  000025                  MOV     #25,R0          ;EXPECTED
1401  003660  017701  176032                  MOV     @RXDBUF,R1
1402  003664  042777  000100  176020          BIC     #RINTEN,@RXCSR  ;CLR INTR ENABLE
1403  003672  020001                          CMP     R0,R1
1404  003674  001401                          BEQ     .+4
1405  003676  104002                          ERROR   2               ;CHARACTERS SHOULD COMPARE
1406  003700  104004                          ERROR   4                       ;INTERRUPT FAILED TO OCCUR
1407
1408  003702  106427  000340          3$:     MTPS    #340
1409
1410
1411
1412                                  ;;THIS TEST VERIFYS THAT TWO INTERRUPTS THAT TRAP TO
1413                                  ;;THE SAME VECTOR ARE BOTH EXECUTED
1414                                  ;;INTERRUPT VECTOR:  DURIV
1415                                  ;;THIS TEST ONLY WORKS IN MAINT EXTERNAL MODE
1416
1417                                  ;;*****************************************************************
1418  003706  000004                  TST2:   SCOPE
1419  003710  105767  175237                  TSTB    JMRBY           ;IN MAINT. EXTERNAL?
1420  003714  100402                          BMI     .+6     ;IF ANSWER WAS YES DO THIS TEST
1421  003716  000167  000402                  JMP     1$      ;IF ANSWER WAS NO JUMP AROUND TEST
1422  003722  052777  000400  175776          BIS     #MRESET,@TXCSR  ;MASTER RESET
1423  003730  012777  020000  175764          MOV     #SYNEXT,@PARCSR ;SET THE MODE
1424  003736  052777  000400  175762          BIS     #MRESET,@TXCSR  ;MASTER RESET
1425
1426                                  ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
1427  003744  012777  064001  175754          MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
1428
1429                                  ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
1430  003752  012777  026026  175742          MOV     #SYNEXT!EIGHT!NOPAR!26,@PARCSR
1431  003760  052777  000020  175724          BIS     #SYNSCH,@RXCSR  ;SET SEARCH SYNC
1432                                  ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
1433  003766  042777  020000  175732          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
1434  003774  052777  020000  175724          BIS     #CLK,@TXCSR     ;POKE CLK UP
1435  004002  012777  004024  175726          MOV     #2$,@DURIV      ;SET UP TRAPCATCHER
1436  004010  016777  012752  175722          MOV     DUPRT,@DURIS    ;
1437  004016  106427  000000                  MTPS    #0      ;ALLOW INTERRUPT
1438  004022  000454                          BR      3$      ;JUMP AROUND SVC ROUTINE
1439
1440                                  ;THE FOLLOWING IS THE 1ST INTERRUPT SVC ROUTINE
1441  004024  106427  000340          2$:     MTPS    #340    ;DON'T ALLOW ANY MORE INTERRUPTS
1442  004030  105777  175656                  TSTB    @RXCSR          ;RXDONE = 1 ?
1443  004034  100401                          BMI     .+4
1444  004036  104004                          ERROR   4                       ;FALSE INTERRUPT
1445  004040  012716  004320                  MOV     #5$,(SP)        ;SET UP RETURN LOCATION
1446  004044  012777  004124  175664          MOV     #4$,@DURIV      ;SET UP TRAPCATCHER FOR SECOND
1447                                                                  ;INTERRUPT
1448  004052  052777  000002  175632          BIS     #DTR,@RXCSR     ;TRY TO CAUSE SECOND INTERRUPT
1449  004060  017701  175632                  MOV     @RXDBUF,R1      ;JUST READ RXDBUF TO CLR RXDONE
1450                                                                  ;TO ALLOW SECOND INTERRUPT
1451  004064  106427  000000                  MTPS    #0      ;ALLOW INTERRUPT
1452  004070  005000                          CLR     R0
1453  004072  005200                          INC     R0              ;WAIT FOR INTERRUPT
```

```
                                        INITIALIZE THE COMMON TAGS

1454  004074  001376                            BNE     .-2
1455  004076  042777  000140  175606            BIC     #RINTEN!DSINTE,@RXCSR   ;CLR INTR ENABLES
1456  004104  104004                            ERROR   4                       ;2ND INTERRUPT FAILED TO OCCUR
1457
1458  004106  016777  175626  175622  6$:       MOV     DURIS,@DURIV    ;RESTORE TRAPCATCHER
1459  004114  012777  000000  175616            MOV     #0,@DURIS       ;
1460  004122  000002                            RTI
1461
1462                                    ;THE FOLLOWING IS THE 2ND INTERRUPT SVC ROUTINE
1463  004124  106427  000340            4$:     MTPS    #340    ;DON'T ALLOW ANYMORE INTERRUPTS
1464  004130  005777  175556                    TST     @RXCSR          ;DSC = 1 ?
1465  004134  100401                            BMI     .+4
1466  004136  104004                            ERROR   4                       ;FALSE INTERRUPT
1467  004140  042777  000140  175544            BIC     #RINTEN!DSINTE,@RXCSR   ;CLR BOTH INTR ENABLES
1468  004146  012716  004106                    MOV     #6$,(SP)        ;SET UP RETURN LOCATION
1469  004152  000002                            RTI
1470
1471  004154  052777  000140  175530  3$:       BIS     #RINTEN!DSINTE,@RXCSR ;SET INTERRUPT ENABLES
1472  004162  012767  000010  174732            MOV     #8.,SHIFT       ;# OF SHIFTS
1473  004170  012767  000025  175302            MOV     #25,$TMP1
1474                                    ;THE FOLLOWING POKES THE MAINT DATA BASED UPON THE
1475                                    ;INFORMATION CONTAINED IN $TMP1 AND IT IS
1476                                    ;SHIFTED IN BY THE CONTENTS OF SHIFT
1477  004176  042777  040000  175522  8$:       BIC     #MTDATA,@TXCSR
1478  004204  000241                            CLC
1479  004206  006067  175266                    ROR     $TMP1   ;FORCE CARRY
1480  004212  103003                            BCC     7$
1481  004214  052777  040000  175504            BIS     #MTDATA,@TXCSR
1482  004222  042777  020000  175476  7$:       BIC     #CLK,@TXCSR
1483  004230  052777  020000  175470            BIS     #CLK,@TXCSR
1484  004236  005367  174660                    DEC     SHIFT
1485  004242  001355                            BNE     8$
1486                                    ;1ST INTERRUPT SHOULD NOW OCCUR
1487  004244  005000                            CLR     R0
1488  004246  005200                            INC     R0              ;WAIT FOR INTERRUPT
1489  004250  001376                            BNE     .-2             ;
1490  004252  016777  175462  175456            MOV     DURIS,@DURIV    ;RESTORE TRAPCATCHER
1491  004260  012777  000000  175452            MOV     #0,@DURIS       ;
1492  004266  016703  175424                    MOV     RXDBUF,R3       ;FOR ERROR MESSAGE
1493  004272  012700  000025                    MOV     #25,R0          ;EXPECTED
1494  004276  017701  175414                    MOV     @RXDBUF,R1
1495  004302  042777  000140  175402            BIC     #RINTEN!DSINTE,@RXCSR   ;CLR INTERRUPT ENABLES
1496  004310  020001                            CMP     R0,R1
1497  004312  001401                            BEQ     .+4
1498  004314  104002                            ERROR   2               ;CHARACTERS SHOULD COMPARE
1499  004316  104004                            ERROR   4                       ;INTERRUPT FAILED TO OCCUR
1500
1501  004320  106427  000340            5$:     MTPS    #340    ;DON'T ALLOW ANY MORE INTERRUPTS
1502  004324                            1$:
1503
1504                                    ;;THIS TEST VERIFYS THAT DNA CAUSES AN INTERRUPT
1505                                    ;;MODE:  SYNC EXTERNAL
1506                                    ;;INTERRUPT VECTOR:  DUTIV
1507
1508                                    ;;*****************************************************************
1509  004324  000004                    TST3:   SCOPE
```

```
DZDUV-A MACY11 27(1006)  03-FEB-77  08:30  PAGE 35
DZDUVA.M11    13-OCT-76 08:26          INITIALIZE THE COMMON TAGS

 1510
 1511  004326  052777  000400  175372          BIS     #MRESET,@TXCSR  ;MASTER RESET
 1512  004334  012777  020000  175360          MOV     #SYNEXT,@PARCSR ;SET THE MODE
 1513  004342  052777  000400  175356          BIS     #MRESET,@TXCSR  ;MASTER RESET
 1514
 1515                                  ;SET MAINTENANCE MODE & SEND
 1516                                          ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
 1517  004350  012777  004020  175350          MOV     #MINT!SEND,@TXCSR
 1518
 1519                                  ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
 1520  004356  012777  026026  175336          MOV     #SYNEXT!EIGHT!NOPAR!26,@PARCSR
 1521  004364  112777  000025  175340          MOVB    #25,@TXDBUF     ;LOAD CHARACTER
 1522  004372  012767  000010  174522          MOV     #8.,SHIFT
 1523                                  ;POKE CLK TO GET INTO SYNCRONIZATION
 1524  004400  052777  020000  175320          BIS     #CLK,@TXCSR     ;POKE CLK UP
 1525  004406  042777  020000  175312          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
 1526
 1527  004414                                  1$:
 1528  004414  052777  020000  175304          BIS     #CLK,@TXCSR     ;POKE CLK UP
 1529  004422  042777  020000  175276          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
 1530  004430  005367  174466                  DEC     SHIFT           ;LAST SHIFT?
 1531  004434  001367                          BNE     1$
 1532  004436  012777  004504  175276          MOV     #2$,@DUTIV      ;SET UP TRAPCATCHER
 1533  004444  016777  012316  175272          MOV     DUPRT,@DUTIS    ;
 1534  004452  106427  000000                  MTPS    #0      ;ALLOW INTERUPTS
 1535  004456  052777  000040  175242          BIS     #DNAINTE,@TXCSR ;ENABLE INTERRUPT
 1536                                          ;NOW POKE CLK TO GET DNA
 1537  004464  052777  020000  175234          BIS     #CLK,@TXCSR     ;POKE CLK
 1538  004472  005000                          CLR     R0
 1539  004474  005200                          INC     R0              ;WAIT FOR INTERRUPT
 1540  004476  001376                          BNE     .-2
 1541  004500  104004                          ERROR   4                       ;INTERRUPT FAILED TO OCCUR
 1542  004502  000422                          BR      3$      ;JUMP AROUND SVC ROUTINE
 1543                                  ;THE FOLLOWING IS THE INTERRUPT SERVICE ROUTINE
 1544  004504  106427  000340          2$:     MTPS    #340    ;DON'T ALLOW ANYMORE INTERRUPTS
 1545  004510  005777  175212                  TST     @TXCSR          ;DNA?
 1546  004514  100401                          BMI     .+4
 1547  004516  104004                          ERROR   4                       ;FALSE INTERRUPT
 1548  004520  042777  000040  175200          BIC     #DNAINTE,@TXCSR ;CLR INTR ENABLE
 1549  004526  012716  004572                  MOV     #4$,(SP)        ;SET UP RETURN LOCATION
 1550  004532  016777  175206  175202          MOV     DUTIS,@DUTIV    ;RESTORE TRAPCATCHER
 1551  004540  012777  000000  175176          MOV     #0,@DUTIS       ;
 1552  004546  000002                          RTI
 1553
 1554  004550  016777  175170  175164  3$:     MOV     DUTIS,@DUTIV    ;RESTORE TRAPCATCHER
 1555  004556  012777  000000  175160          MOV     #0,@DUTIS       ;
 1556
 1557  004564  042777  000040  175134          BIC     #DNAINTE,@TXCSR ;CLR INTERRUPT ENABLE
 1558  004572  106427  000340          4$:     MTPS    #340    ;RESTORE NO INTERRUPT STATUS
 1559
 1560
 1561                                  ;;THIS TEST VERIFYS THAT TXDONE CAUSES AN INTERRUPT
 1562                                  ;;INTERRUPT VECTOR:  DUTIV
 1563                                  ;;NOTE: TXDONE = 1          AFTER A MASTER RESET
 1564                                  ;;
 1565                                  ;;*****************************************************************
```

```
                                        INITIALIZE THE COMMON TAGS

1566  004576  000004                    TST4:   SCOPE
1567
1568  004600  052777  000400  175120            BIS     #MRESET,@TXCSR  ;MASTER RESET
1569  004606  012777  004654  175126            MOV     #1$,@DUTIV      ;SET UP TRAPCATCHER
1570  004614  016777  012146  175122            MOV     DUPRT,@DUTIS    ;
1571  004622  106427  000000                    MTPS    #0      ;ALLOW INTERPUTS
1572  004626  052777  000100  175072            BIS     #TXINTE,@TXCSR  ;ENABLE INTERRUPT
1573  004634  005000                            CLR     R0
1574  004636  005200                            INC     R0              ;WAIT FOR INTERRUPT
1575  004640  001376                            BNE     .-2             ;
1576  004642  042777  000100  175056            BIC     #TXINTE,@TXCSR  ;CLR INTERRUPT ENABLE
1577  004650  104004                            ERROR   4                       ;INTERRUPT FAILED TO OCCUR
1578  004652  000422                            BR      2$      ;JUMP AROUND SVC ROUTINE
1579
1580                                    ;THE FOLLOWING IS THE INTERRUPT SERVICE ROUTINE
1581  004654  106427  000340            1$:     MTPS    #340    ;DON'T ALLOW ANYMORE INTERRUPTS
1582  004660  042777  000100  175040            BIC     #TXINTE,@TXCSR  ;CLR INTR ENABLE
1583  004666  105777  175034                    TSTB    @TXCSR          ;TXDONE?
1584  004672  100401                            BMI     .+4
1585  004674  104004                            ERROR   4                       ;FALSE INTERRUPT
1586  004676  012716  004734                    MOV     #3$,(SP)        ;SET UP RETURN LOCATION
1587  004702  016777  175036  175032            MOV     DUTIS,@DUTIV    ;RESTORE TRAPCATCHER
1588  004710  012777  000000  175026            MOV     #0,@DUTIS       ;
1589  004716  000002                            RTI
1590
1591  004720  016777  175020  175014  2$:       MOV     DUTIS,@DUTIV    ;RESTORE TRAPCATCHER
1592  004726  012777  000000  175010            MOV     #0,@DUTIS       ;
1593
1594  004734  106427  000340            3$:     MTPS    #340    ;RESTORE NO INTERRUPT STATUS
1595
1596
1597
1598                                    ;;THIS TEST VERIFYS THAT TXDONE DOES NOT CAUSE AN INTERRUPT
1599                                    ;;WHEN PROCESSOR PRIORITY LEVEL IS TOO HIGH
1600                                    ;;INTERRUPT VECTOR: DUTIV
1601                                    ;;NOTE: TXDONE = 1 AFTER A MASTER RESET
1602                                    ;;
1603                                    ;;**************************************************************************
1604  004740  000004                    TST5:   SCOPE
1605  004742  052777  000400  174756            BIS     #MRESET,@TXCSR  ;MASTER RESET
1606  004750  012777  005034  174764            MOV     #1$,@DUTIV      ;SET UP TRAPCATCHER
1607  004756  016777  012004  174760            MOV     DUPRT,@DUTIS    ;
1608  004764  106427  000340                    MTPS    #340            ;SET PS LEVEL TOO HIGH
1609  004770  052777  000100  174730            BIS     #TXINTE,@TXCSR  ;ENABLE INTERRRUPT
1610  004776  005000                            CLR     R0      ;WAIT FOR INTERRUPT
1611  005000  005200                            INC     R0      ;
1612  005002  001376                            BNE     .-2     ;
1613  005004  042777  000100  174714            BIC     #TXINTE,@TXCSR  ;CLR INTR ENABLE
1614  005012  106427  000340                    MTPS    #340    ;DON'T ALLOW INTERRUPTS
1615  005016  016777  174722  174716            MOV     DUTIS,@DUTIV    ;RESTORE TRAPCATCHER
1616  005024  012777  000000  174712            MOV     #0,@DUTIS       ;
1617  005032  000421                            BR      2$      ;TEST IS OK....GET OUT OF TEST
1618                                    ;THE FOLLOWING IS THE INTERRUPT SVC ROUTINE
1619  005034  106427  000340            1$:     MTPS    #340    ;DONT ALLOW ANYMORE INTERRUPTS
1620  005040  042777  000100  174660            BIC     #TXINTE,@TXCSR  ;CLR INTR ENABLE
1621  005046  012716  005070                    MOV     #3$,(SP)        ;SET UP RETURN LOCATION
```

INITIALIZE THE COMMON TAGS

```
                                                                ;TO REPORT ERROR
005052  016777  174666  174662           MOV     DUTIS,@DUTIV   ;RESTORE TRAPCATCHER
005060  012777  000000  174656           MOV     #0,@DUTIS      ;
005066  000002                           RTI
                                ;END OF INTERRUPT SVC ROUTINE



                                ;YOU SHOULD NOT GET INTO THIS FOLLOWING CODE UNLESS THERE
                                ;WAS AN ERROR
005070  106427  000340           3$:     MTPS    #340    ;DON'T ALLOW ANYMORE INTERRUPTS
005074  104004                           ERROR   4       ;INTERRUPT SHOULD NOT OF OCCURED,CHECK
                                                         ;THE INTERRUPT LEVEL SELECTED OR CHECK
                                                         ;INTERRUPT LOGIC OR BOTH
005076                          2$:

                                ;;THIS TEST VERIFYS THAT TXDONE CAUSES ONLY ONE INTERRUPT
                                ;;PROVIDING THAT TXCSR IS NOT READ
                                ;;AND TXDBUF IS NOT LOADED (WRITTEN)
                                ;;THIS TEST CHECKS THE ONCE ONLY FLIP/FLOP (V2)
                                ;;OF THE INTERRUPT CONTROL LOGIC
                                ;;INTERRUPT VECTOR: DUTIV
                                ;;NOTE: TXDONE = 1    AFTER A MASTER RESET
                                ;;
                                ;;*****************************************************************
005076  000004                   TST6:   SCOPE
005100  052777  000400  174620           BIS     #MRESET,@TXCSR  ;MASTER RESET
005106  012777  005146  174626           MOV     #1$,@DUTIV      ;SET UP TRAPCATCHER
005114  016777  011646  174622           MOV     DUPRT,@DUTIS    ;
005122  106427  000000                   MTPS    #0      ;ALLOW INTERRUPTS
005126  052777  000100  174572           BIS     #TXINTE,@TXCSR  ;ENABLE INTR ENABLE
005134  005000                           CLR     R0
005136  005200                           INC     R0
005140  001376                           BNE     .-2
005142  104004                           ERROR   4       ;INTERRUPT FAILED TO OCCUR
005144  000425                           BR      4$
                                ;THE FOLLOWING IS THE INTR SVC ROUTINE
005146  106427  000340           1$:     MTPS    #340    ;DON'T ALLOW ANYMORE INTR
005152  012716  005212                   MOV     #3$,(SP)        ;SET UP RETURN LOCATION
005156  012777  005166  174556           MOV     #2$,@DUTIV      ;SET UP TRAPCATCHER TO
                                                         ;PROVE THAT THE INTERRUPT DOES NOT OCCUR
                                                         ;TWICE (AFTER RTI 'ING FROM THIS
                                                         ;SVC ROUTINE
005164  000002                           RTI
                                ;THE FOLLOWING INTERRUPT SVC ROUTINE WILL CATCH THE SECOND INTR
005166  106427  000340           2$:     MTPS    #340    ;DON'T ALLOW INTER
005172  012716  005220                   MOV     #4$,(SP)        ;SET UP RETURN LOCATION
005176  105777  174524                   TSTB    @TXCSR  ;TXDONE = 1?
005202  100401                           BMI     .+4
005204  104004                           ERROR   4       ;TXDONE SHOULD BE SET
005206  104004                           ERROR   4       ;THE INTERRUPT WAS TAKEN TWICE.....
                                                         ;CHECK OUT THE V2 FLIP/FLOP LOGIC
                                                         ;IN THE INTERRUPT CONTROL LOGIC
005210  000002                           RTI
005212  005000                   3$:     CLR     R0      ;ALLOW TIME TO CATCH SECOND
005214  005200                           INC     R0              ;IF IT WERE TO OCCUR
```

```
                                        INITIALIZE THE COMMON TAGS

1678  005216  001376                            BNE     .-2             ;
1679  005220  016777  174520  174514  4$:       MOV     DUTIS,@DUTIV    ;RESTORE TRAPCATCHER
1680  005226  012777  000000  174510            MOV     #0,@DUTIS       ;
1681  005234  042777  000100  174464            BIC     #TXINTE,@TXCSR  ;CLR INTERRUPT ENABLE
1682  005242  106427  000340                    MTPS    #340    ;RESTORE NO INTERRUPT STATUS
1683
1684
1685                                    ;;THIS TEST VERIFYS THAT TWO INTERRUPTS THAT TRAP
1686                                    ;;TO THE SAME VECTOR ARE BOTH EXECUTED
1687                                    ;;INTERRUPT VECTOR:  DUTIV
1688                                    ;;MODE:  SYNC EXTERNAL
1689
1690                                    ;;*****************************************************************
1691  005246  000004                    TST7:   SCOPE
1692
1693  005250  052777  000400  174450            BIS     #MRESET,@TXCSR  ;MASTER RESET
1694  005256  012777  020000  174436            MOV     #SYNEXT,@PARCSR ;SET THE MODE
1695  005264  052777  000400  174434            BIS     #MRESET,@TXCSR  ;MASTER RESET
1696
1697                                    ;SET MAINTENANCE MODE & SEND
1698                                            ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
1699  005272  012777  004020  174426            MOV     #MINT!SEND,@TXCSR
1700
1701                                    ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
1702  005300  012777  026026  174414            MOV     #SYNEXT!EIGHT!NOPAR!26,@PARCSR
1703  005306  112777  000025  174416            MOVB    #25,@TXDBUF     ;LOAD CHARACTER
1704  005314  012767  000010  173600            MOV     #8.,SHIFT
1705                                    ;POKE CLK TO GET INTO SYNCRONIZATION
1706  005322  052777  020000  174376            BIS     #CLK,@TXCSR     ;POKE CLK UP
1707  005330  042777  020000  174370            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
1708
1709  005336                                    1$:
1710  005336  052777  020000  174362            BIS     #CLK,@TXCSR     ;POKE CLK UP
1711  005344  042777  020000  174354            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
1712  005352  005367  173544                    DEC     SHIFT           ;LAST SHIFT?
1713  005356  001367                            BNE     1$
1714  005360  012777  005420  174354            MOV     #2$,@DUTIV      ;SET UP TRAPCATCHER
1715  005366  016777  011374  174350            MOV     DUPRT,@DUTIS    ;
1716  005374  106427  000000                    MTPS    #0      ;ALLOW INTERRUPTS
1717  005400  052777  000140  174320            BIS     #TXINTE!DNAINTE,@TXCSR  ;ENABLE INTERRUPTS
1718  005406  005000                            CLR     R0
1719  005410  005200                            INC     R0              ;WAIT FOR INTERRUPT
1720  005412  001376                            BNE     .-2             ;
1721  005414  104004                            ERROR   4                       ;INTERRUPT FAILED TO OCCUR
1722  005416  000461                            BR      3$      ;JUMP AROUND SVC ROUTINES
1723
1724                                    ;THE FOLLOWING IS THE 1ST INTERRUPT SVC ROUTINE
1725  005420  106427  000340            2$:     MTPS    #340    ;DON'T ALLOW ANYMORE INTERRUPTS
1726  005424  005777  174276                    TST     @TXCSR  ;DNA=0 ?
1727  005430  100001                            BPL     .+4
1728  005432  104004                            ERROR   4       ;DNA SHOULD NOT BE ASSERTED
1729  005434  105777  174266                    TSTB    @TXCSR  ;TXDONE = 1?
1730  005440  100401                            BMI     .+4
1731  005442  104004                            ERROR   4               ;FALSE INTERRUPT
1732  005444  012716  005604                    MOV     #4$,(SP)        ;SET UP RETURN LOCATION
1733  005450  012777  005532  174264            MOV     #5$,@DUTIV      ;SET UP TRAPCATCHER
```

```
1734                                                    ;NOW POKE CLK TO BRING UP DNA
1735  005456  052777  020000  174242          BIS     #CLK,@TXCSR     ;POKE CLK
1736  005464  112777  000025  174240          MOVB    #25,@TXDBUF     ;JUST LOAD ANY CHAR TO CLR
1737                                                            ;TXDONE TO ALLOW SECOND INTERRUPT
1738  005472  106427  000000                  MTPS    #0      ;ALLOW INTERRUPTS
1739  005476  005000                          CLR     R0
1740  005500  005200                          INC     R0              ;WAIT FOR INTERRUPT
1741  005502  001376                          BNE     .-2
1742  005504  042777  000140  174214          BIC     #DNAINTE!TXINTE,@TXCSR  ;CLR INTR ENABLES
1743  005512  104004                          ERROR   4                       ;2ND INTERRUPT FAILED TO OCCUR
1744
1745  005514  016777  174224  174220  6$:     MOV     DUTIS,@DUTIV    ;RESTORE TRAPCATCHER
1746  005522  012777  000000  174214          MOV     #0,@DUTIS       ;
1747  005530  000002                          RTI
1748
1749                                  ;THE FOLLOWING IS THE 2ND INTERRUPT SVC ROUTINE
1750  005532  106427  000340          5$:     MTPS    #340
1751  005536  005777  174164                  TST     @TXCSR          ;DNA
1752  005542  100401                          BMI     .+4
1753  005544  104004                          ERROR   4                       ;FALSE INTERRUPT
1754  005546  042777  000140  174152          BIC     #DNAINTE!TXINTE,@TXCSR  ;CLR BOTH INTR ENABLES
1755  005554  012716  005514                  MOV     #6$,(SP)                ;SETUP RETURN LOCATION
1756  005560  000002                          RTI
1757
1758  005562  016777  174156  174152  3$:     MOV     DUTIS,@DUTIV    ;RESTORE TRAPCATCHER
1759  005570  012777  000000  174146          MOV     #0,@DUTIS
1760
1761  005576  042777  000140  174122          BIC     #DNAINTE!TXINTE,@TXCSR ;CLR BOTH INTERRUPT
1762                                                                  ;ENABLES
1763  005604  106427  000340          4$:     MTPS    #340    ;RESTORE NO INTERRUPT STATUS
1764
1765
1766
1767                                  ;;THIS TEST VERIFYS CTP MODE (IE SYSTST MODE)
1768                                  ;;IT BASICALLY CHECKS THE EXISTANCE OF
1769                                  ;;THE FREE RUNNING OSCILLATOR
1770                                  ;;MODE:  SYNEXT
1771                                  ;;LENGTH:  EIGHT
1772                                  ;;THIS TEST USES BOTH THE RECEIVER & TRANSMITTER LOGIC
1773
1774                                  ;;*****************************************************************
1775  005610  000004                  TST10:  SCOPE
1776                                  ;************************
1777  005612  000167  000262                  JMP     1$      ;NOP THIS TEST
1778                                  ;************************
1779  005616  052777  000400  174102          BIS     #MRESET,@TXCSR  ;MASTER RESET
1780  005624  012777  020000  174070          MOV     #SYNEXT,@PARCSR ;LOAD THE MODE
1781  005632  052777  000400  174066          BIS     #MRESET,@TXCSR  ;MASTER RESET
1782  005640  012777  026026  174054          MOV     #SYNEXT!EIGHT!NOPAR!26,@PARCSR  ;LOAD THE MODE,
1783                                                  ;# OF BITS PER CHAR,PARITY SENSE(NO PARITY),
1784                                                  ;&SYNC CHARACTER (26)
1785  005646  112777  000025  174056          MOVB    #25,@TXDBUF     ;LOAD THE CHAR
1786  005654  012777  005752  174054          MOV     #2$,@DURIV      ;SET UP TRAPCATCHER
1787  005662  016777  011100  174050          MOV     DUPRT,@DURIS    ;
1788  005670  106427  000000                  MTPS    #0      ;ALLOW INTERRUPTS
1789  005674  016703  174016                  MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
```

```
DZDUV-A MACY11 27(1006)  03-FEB-77  08:30  PAGE 40
DZDUVA.M11    13-OCT-76 08:26          INITIALIZE THE COMMON TAGS

 1790  005700  012700  000025              MOV     #25,R0          ;EXPECTED
 1791  005704  012777  014020  174014      MOV     #SYSTST!SEND,@TXCSR     ;OK  NOW LOAD SEND &
 1792                                                              ;MAINT. MODE
 1793  005712  052777  000120  173772      BIS     #SYNSCH!RINTEN,@RXCSR   ;SET SEARCH SYNC &
 1794                                                              ;RECEIVER INTERRUPT
 1795                                                              ;ENABLE & WAIT FOR INTERRUPT
 1796  005720  005067  173564              CLR     $TMP5
 1797  005724  005002                3$:   CLR     R2
 1798  005726  005202                      INC     R2              ;WAIT FOR INTERRUPT
 1799  005730  001376                      BNE     .-2
 1800  005732  005267  173552              INC     $TMP5
 1801  005736  022767  000003  173544      CMP     #3,$TMP5
 1802  005744  002367                      BGE     3$
 1803  005746  104004                      ERROR   4                       ;INTERRUPT DID NOT OCCUR
 1804  005750  000422                      BR      4$
 1805
 1806                                ;THE FOLLOWING IS THE INTERRUPT SVC ROUTINE
 1807  005752  106427  000340        2$:   MTPS    #340    ;PREVENT INTERRUPTS
 1808  005756  017704  173730              MOV     @RXCSR,R4       ;SAVE
 1809  005762  017701  173730              MOV     @RXDBUF,R1      ;ACTUAL
 1810  005766  016777  173746  173742      MOV     DURIS,@DURIV    ;RESTORE TRAPCATCHER
 1811  005774  012777  000000  173736      MOV     #0,@DURIS       ;
 1812  006002  012716  006046              MOV     #5$,(SP)        ;SET UP RETURN
 1813  006006  042777  000100  173676      BIC     #RINTEN,@RXCSR  ;CLR INTERRUPT ENABLE
 1814  006014  000002                      RTI
 1815
 1816  006016  042777  000100  173666  4$: BIC     #RINTEN,@RXCSR  ;CLR INTERRUPT ENABLE
 1817  006024  106427  000340              MTPS    #340    ;PREVENT INTERRUPTS
 1818  006030  016777  173704  173700      MOV     DURIS,@DURIV    ;RESTORE TRAPCATCHER
 1819  006036  012777  000000  173674      MOV     #0,@DURIS       ;
 1820  006044  000415                      BR      1$
 1821
 1822  006046  020001                5$:   CMP     R0,R1
 1823  006050  001401                      BEQ     .+4
 1824  006052  104002                      ERROR   2                       ;CHARACTERS DID NOT MATCH
 1825  006054  016703  173632              MOV     RXCSR,R3        ;SETUP FOR ERROR MESSAGE
 1826  006060  012700  000200              MOV     #200,R0         ;EXPECTED
 1827  006064  010401                      MOV     R4,R1           ;ACTUAL
 1828  006066  042701  177577              BIC     #177577,R1      ;SAVE ONLY RXDONE
 1829  006072  020001                      CMP     R0,R1
 1830  006074  001401                      BEQ     .+4
 1831  006076  104001                      ERROR   1       ;FALSE INTERRUPT
 1832
 1833  006100                        1$:
 1834                                ;;THIS TEST VERIFYS CTP MODE (IE SYSTST MODE)
 1835                                ;;IT BASICALLY CHECKS THE EXISTANCE OF
 1836                                ;;THE FREE RUNNING OSCILLATOR
 1837                                ;;MODE: SYNINT
 1838                                ;;LENGTH: EIGHT
 1839                                ;;THIS TEST USES BOTH THE RECEIVER & TRANSMITTER LOGIC
 1840                                ;;
 1841                                ;;*****************************************************************
 1842  006100  000004                TST11:  SCOPE
 1843  006102  052777  000400  173616      BIS     #MRESET,@TXCSR  ;MASTER RESET
 1844  006110  012777  030000  173604      MOV     #SYNINT,@PARCSR ;SET THE MODE
 1845  006116  052777  000400  173602      BIS     #MRESET,@TXCSR  ;MASTER RESET
```

INITIALIZE THE COMMON TAGS

```
1846
1847                                        ;SET MAINTENANCE MODE & SEND
1848                                            ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
1849  006124  012777  014020  173574              MOV     #SYSTST!SEND,@TXCSR
1850
1851                                        ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
1852  006132  012777  036026  173562              MOV     #SYNINT!EIGHT!NOPAR!26,@PARCSR
1853  006140  052777  000420  173544              BIS     #SYNSCH!STPSYN,@RXCSR   ;SET SEARCH SYNC &
1854                                              ;STRIP SYNC SO THAT RXDONE ASSERTS
1855                                              ;WHEN CHAR "26" ARRIVES AND NOT BEFORE...
1856                                              ; ,,,THEREFORE,SET STRIP SYNC
1857                                          ;.............WAIT FOR SYNSCH TO BE
1858                                          ;CLOCKED IN BY SYSTST CLK
1859  006146  005067  173336                  CLR     $TMP5
1860  006152  005002                          CLR     R2
1861  006154  005202                          INC     R2      ;WAIT
1862  006156  001376                          BNE     .-2
1863  006160  005267  173324                  INC     $TMP5
1864  006164  022767  000003  173316          CMP     #3,$TMP5
1865  006172  002367                          BGE     .-20    ;GO BACK TO CLR R2 AND WAIT SOME MORE
1866  006174  012777  006410  173534          MOV     #2$,@DURIV      ;SET UP TRAPCATCHER
1867  006202  016777  010560  173530          MOV     DUPRT,@DURIS    ;
1868  006210  012777  006502  173524          MOV     #3$,@DUTIV      ;
1869  006216  016777  010544  173520          MOV     DUPRT,@DUTIS    ;
1870  006224  106427  000000                  MTPS    #0      ;ALLOW INTERRUPTS
1871  006230  016703  173462                  MOV     RXDBUF,R3       ;SET UP FOR ERROR MSG
1872  006234  012700  000025                  MOV     #25,R0  ;EXPECTED CHAR
1873  006240  012767  000002  172656          MOV     #2,COUNT        ;# OF SYNC CHARS TO GET INTO
1874                                          ;SYNCRONIZATION
1875  006246  105767  172674                  TSTB    SYNCNO  ;TEST TO SEE HOW MANY SYNC CHARS NEEDED
1876  006252  100402                          BMI     9$
1877  006254  005367  172644                  DEC     COUNT   ;MAKE IT ONE LESS
1878  006260  052777  000100  173424  9$:     BIS     #RINTEN,@RXCSR  ;SET INTERRUPT ENABLES
1879  006266  052777  000100  173432          BIS     #TXINTE,@TXCSR  ;
1880  006274  000167  000012                  JMP     8$      ;THE FIRST XMIT INTERRUPT SHOULD COME
1881                                          ;FROM TXDONE = 1 AFTER A MASTER RESET
1882  006300  112777  000026  173424  1$:     MOVB    #26,@TXDBUF     ;LOAD SYNC CHAR
1883  006306  005067  173176                  CLR     $TMP5
1884  006312  005002                  8$:     CLR     R2      ;WAIT FOR INTERRUPT
1885  006314  005202                          INC     R2
1886  006316  001376                          BNE     .-2     ;
1887  006320  005267  173164                  INC     $TMP5
1888  006324  022767  000003  173156          CMP     #3,$TMP5
1889  006332  002367                          BGE     8$
1890  006334  106427  000340                  MTPS    #340    ;PREVENT INTERRUPTS
1891  006340  042777  000100  173360          BIC     #TXINTE,@TXCSR  ;CLR INTR ENABLES
1892  006346  042777  000100  173336          BIC     #RINTEN,@RXCSR  ;
1893  006354  016777  173360  173354          MOV     DURIS,@DURIV    ;RESTORE TRAPCATCHER
1894  006362  012777  000000  173350          MOV     #0,@DURIS       ;
1895  006370  016777  173350  173344          MOV     DUTIS,@DUTIV    ;
1896  006376  012777  000000  173340          MOV     #0,@DUTIS       ;
1897  006404  104004                          ERROR   4       ;TXDONE INTERRUPT FAILED TO OCCUR
1898  006406  000540                          BR      7$      ;GET OUT OF THE TEST
1899
1900                                      ;THE FOLLOWING IS THE RECEIVER INTERRUPT SVC ROUTINE
1901  006410  106427  000340          2$:     MTPS    #340    ;PREVENT INTERRUPTS
```

INITIALIZE THE COMMON TAGS

```
1902  006414  017704  173272                  MOV     @RXCSR,R4       ;SAVE
1903  006420  017701  173272                  MOV     @RXDBUF,R1      ;ACTUAL
1904  006424  016777  173310  173304          MOV     DURIS,@DURIV    ;RESTORE TRAPCATCHER
1905  006432  012777  000000  173300          MOV     #0,@DURIS       ;
1906  006440  016777  173300  173274          MOV     DUTIS,@DUTIV    ;
1907  006446  012777  000000  173270          MOV     #0,@DUTIS       ;
1908  006454  012716  006634                  MOV     #4$,(SP)        ;SET UP RETURN LOCATION
1909  006460  042777  000100  173224          BIC     #RINTEN,@RXCSR  ;CLR INTERRUPT ENABLES
1910  006466  042777  000100  173232          BIC     #TXINTE,@TXCSR  ;
1911  006474  016705  172424                  MOV     COUNT,R5        ;SAVE COUNT
1912  006500  000002                          RTI
1913                                  ;END OF RECEIVER INTERRUPT SVC ROUTINE
1914                                  ;....THE FOLLOWING IS THE XMITTER INTERRUPT SVC ROUTINE
1915  006502  005367  172416          3$:     DEC     COUNT
1916  006506  100403                          BMI     5$
1917  006510  012716  006300                  MOV     #1$,(SP)        ;SET UP RETURN LOCATION
1918                                                                  ;(LOAD SYNC CHARACTER AGAIN)
1919  006514  000002                          RTI
1920  006516  012716  006524          5$:     MOV     #6$,(SP)        ;SET UP RETURN LOCATION
1921  006522  000002                          RTI
1922                                  ;END OF XMITTER INTERRUPT SVC ROUTINE
1923  006524  112777  000025  173200  6$:     MOVB    #25,@TXDBUF     ;LOAD CHARACTER
1924  006532  042777  000100  173166          BIC     #TXINTE,@TXCSR  ;CLR INTR ENABLE
1925  006540  005067  172744                  CLR     $TMP5
1926  006544  005002                  10$:    CLR     R2      ;WAIT FOR INTERRUPT(RECEIVER)
1927  006546  005202                          INC     R2
1928  006550  001376                          BNE     .-2     ;
1929  006552  005267  172732                  INC     $TMP5
1930  006556  022767  000003  172724          CMP     #3,$TMP5
1931  006564  002367                          BGE     10$
1932  006566  106427  000340                  MTPS    #340    ;PREVENT INTERRUPTS
1933  006572  042777  000100  173112          BIC     #RINTEN,@RXCSR  ;CLR INTR ENABLE
1934  006600  016777  173134  173130          MOV     DURIS,@DURIV    ;RESTORE TRAPCATCHER
1935  006606  012777  000000  173124          MOV     #0,@DURIS       ;
1936  006614  016777  173124  173120          MOV     DUTIS,@DUTIV    ;
1937  006622  012777  000000  173114          MOV     #0,@DUTIS       ;
1938  006630  104004                          ERROR   4       ;RECEIVER INTR FAILED TO OCCUR
1939  006632  000426                          BR      7$      ;GET OUT OF TEST
1940  006634  020001                  4$:     CMP     R0,R1
1941  006636  001401                          BEQ     .+4
1942  006640  104002                          ERROR   2       ;CHARACTERS DID NOT MATCH
1943  006642  016703  173044                  MOV     RXCSR,R3        ;SET UP FOR ERROR MSG
1944  006646  012700  000200                  MOV     #200,R0 ;EXPECTED RXDONE
1945  006652  010401                          MOV     R4,R1   ;ACTUAL
1946  006654  042701  177577                  BIC     #177577,R1      ;SAVE ONLY RXDONE
1947  006660  020001                          CMP     R0,R1
1948  006662  001401                          BEQ     .+4
1949  006664  104001                          ERROR   1       ;FALSE INTERRUPT
1950  006666  020527  177777                  CMP     R5,#-1  ;WAS COUNT =-1   WHEN RECEIVER
1951                                                          ;INTERRUPTED ?
1952  006672  001401                          BEQ     .+4
1953  006674  104004                          ERROR   4       ;IF R5 IS GREATER THAN -1.....
1954                                  ;THEN EITHER THE # OF SYNC STRAP IS WRONG
1955                                  ;OR RXDONE IS OCCURING TOO SOON
1956  006676  026727  172222  177777          CMP     COUNT,#-1
1957  006704  001401                          BEQ     .+4
```

```
                                        INITIALIZE THE COMMON TAGS

1958  006706  104004                            ERROR   4       ;IF THIS TEST FAILS,BUT THE ABOVE TEST
1959                                                            ;DOESN'T.....IT MAY BE THAT CLEARING
1960                                                            ;TXINTE IN THE RECEIVER SVC ROUTINE
1961                                                            ;IS NOT STOPPING TXDONE INTERRUPTS
1962  006710  106427  000340          7$:       MTPS    #340    ;INHIBIT INTERRUPTS
1963
1964
1965                                            ;;THIS TEST VERIFYS MATCH DETECT & DATA RDY
1966                                            ;;FLAGS FOR EVERY POSSIBLE MATCH CHARACTER
1967                                            ;;BY OBSERVING RECACT BIT
1968                                            ;;IT WILL TAKE TWO SYNC * CHARACTERS TO GET RECACT BIT
1969                                            ;;*:    DEPENDENT ON MONITOR .............
1970                                            ;;IF ONE SYNC STRAP IS SELECTED ,IT WILL
1971                                            ;;ONLY TAKE ONE SYNC CHARACTER BEFORE RECACT TO
1972                                            ;;ASSERT
1973                                            ;;MODE: SYNC INTERNAL
1974                                            ;;LENGTH: FIVE
1975                                            ;;SYNC CHARACTER FOR MATCH: B/C
1976                                            ;;THIS TEST USES THE TRANSMITTER AND RECEIVER CHIPS
1977                                            ;;
1978                                    ;;**************************************************************
1979  006714  000004                    TST12:  SCOPE
1980  006716  052777  000400  173002            BIS     #MRESET,@TXCSR  ;MASTER RESET
1981  006724  016703  172766                    MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
1982                                    ;SET SYNC INTERNAL,FIVE,NO PARITY,0 SYNC REGISTER
1983  006730  012704  030000                    MOV     #SYNINT!FIVE!NOPAR,R4   ;CREATE PARAMETERS
1984  006734  012777  004020  172764  6$:       MOV     #MINT!SEND,@TXCSR       ;SET SEND & MAINT INTER
1985  006742  010477  172754                    MOV     R4,@PARCSR      ;LOAD CSR
1986  006746  052777  000020  172736            BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
1987                                    ;POKE CLK TO GET INTO SYNCRONIZATION
1988                                    ;BOTH THE LOGIC & RECEIVER
1989  006754  052777  020000  172744            BIS     #CLK,@TXCSR     ;POKE CLK UP
1990  006762  042777  020000  172736            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
1991  006770  110477  172736                    MOVB    R4,@TXDBUF      ;LOAD DATA CHARACTER
1992                                    ;POKE CLK TO GET TRANSMITTER & RECEIVER INTO SYNCRONIZATION
1993  006774  052777  020000  172724            BIS     #CLK,@TXCSR     ;POKE CLK UP
1994  007002  042777  020000  172716            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
1995  007010  032777  004000  172674            BIT     #RECACT,@RXCSR  ;RECACT ?
1996  007016  001401                            BEQ     .+4
1997  007020  104004                            ERROR   4       ;RECACT SHOULD NOT BE SET
1998  007022  000404                            BR      4$
1999  007024  010477  172672          5$:       MOV     R4,@PARCSR      ;LOAD PARCSR WITH PARAMETERS
2000  007030  110477  172676                    MOVB    R4,@TXDBUF      ;LOAD SYNC CHAR
2001  007034  012767  000002  172062  4$:       MOV     #2,COUNT        ;# OF SYNC CHARS
2002  007042  005777  172660          2$:       TST     @TXCSR  ;DNA ?
2003  007046  100001                            BPL     .+4     ;BR IF NOT SET
2004  007050  104004                            ERROR   4       ;DNA SHOULD NOT BE SET OR....
2005                                            ;IT SHOULD BE CLEARED FROM PREVIOUS READ
2006  007052  012767  000005  172042            MOV     #5,SHIFT        ;# OF SHIFTS
2007  007060                            1$:
2008  007060  052777  020000  172640            BIS     #CLK,@TXCSR     ;POKE CLK UP
2009  007066  042777  020000  172632            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2010  007074  005367  172022                    DEC     SHIFT   ;# OF SHIFTS
2011  007100  001367                            BNE     1$
2012  007102  005367  172016                    DEC     COUNT   ;# OF SYNC CHARS
2013  007106  001403                            BEQ     3$
```

```
                                        INITIALIZE THE COMMON TAGS

                                ;TEST SYNCNO TO SEE HOW MANY SYNC CHARACTERS NEEDED
007110  105767  172032                TSTB    SYNCNO
007114  100752                        BMI     2$          ;TWO SYNC CHARACTERS..
007116  032777  004000  172566  3$:   BIT     #RECACT,@RXCSR  ;RECACT ?
007124  001001                        BNE     .+4
007126  104004                        ERROR   4                   ;RECACT FAILED TO SET,POSSIBLE
                                                            ;THAT THE RECEIVER FAILED TO MATCH
                                                            ;THE SYNC CHARACTER
007130  017701  172562                MOV     @RXDBUF,R1          ;SAVE ACTUAL
007134  010400                        MOV     R4,R0               ;SAVE EXPECTED
007136  042700  177400                BIC     #177400,R0          ;CLR UPPER BYTE
007142  020001                        CMP     R0,R1   ;DO THEY COMPARE ?
007144  001401                        BEQ     .+4
007146  104002                        ERROR   2           ;IF RECACT FAILED ALONG WITH THIS
                                                            ;...IT PROBABLY IS A TRANSMITTER ERROR
                                                            ;HOWEVER,...IF ONLY THIS FAILED IT
                                                            ;PROBABLY IS A RECEIVER ERROR
007150  104405                        SCOP1
                                ;POKE CLK TO SEE DNA...DNA COMES UP ON THE FIRST
                                ;BIT OF THE NEXT CHARACTER IF NO CHARACTER IS LOADED INTO
                                ;TXDBUF
007152  052777  020000  172546        BIS     #CLK,@TXCSR         ;POKE CLK UP
007160  005777  172542                TST     @TXCSR  ;DNA?
007164  100401                        BMI     .+4
007166  104004                        ERROR   4           ;DNA DID NOT ASSERT
                                        ;SET UP CONDITIONS FOR NEXT SYNC CHARACTER MATCH
007170  052777  000400  172530        BIS     #MRESET,@TXCSR  ;MASTER RESET
007176  032777  000020  172506        BIT     #SYNSCH,@RXCSR  ;SYNC SEARCH = 0 ?
007204  001401                        BEQ     .+4
007206  104004                        ERROR   4           ;SYNC SEARCH SHOULD BE NOT SET
007210  005204                        INC     R4
007212  122704  000040                CMPB    #40,R4  ;IS THIS THE LAST CHARACTER ?
007216  001246                        BNE     6$          ;NO

                                        ;;THIS TEST VERIFYS MATCH DETECT & DATA RDY
                                        ;;FLAGS FOR EVERY POSSIBLE MATCH CHARACTER
                                        ;;BY OBSERVING RECACT BIT
                                        ;;IT WILL TAKE TWO SYNC # CHARACTERS TO GET RECACT BIT
                                        ;;*:    DEPENDENT ON MONITOR ..............
                                        ;;IF ONE SYNC STRAP IS SELECTED ,IT WILL
                                        ;;ONLY TAKE ONE SYNC CHARACTER BEFORE RECACT TO
                                        ;;ASSERT
                                        ;;MODE: SYNC INTERNAL
                                        ;;LENGTH: SIX
                                        ;;SYNC CHARACTER FOR MATCH: B/C
                                        ;;THIS TEST USES THE TRANSMITTER AND RECEIVER CHIPS
                                        ;;
                                ;;**************************************************************
007220  000004                ;ST13:  SCOPE
007222  052777  000400  172476        BIS     #MRESET,@TXCSR  ;MASTER RESET
007230  016703  172462                MOV     RXDBUF,R3           ;SET UP FOR ERROR MESSAGE
                                ;SET SYNC INTERNAL,SIX,NO PARITY,0 SYNC REGISTER
007234  012704  032000                MOV     #SYNINT!SIX!NOPAR,R4    ;CREATE PARAMETERS
007240  012777  004020  172460  6$:   MOV     #MINT!SEND,@TXCSR       ;SET SEND & MAINT INTER
007246  010477  172450                MOV     R4,@PARCSR          ;LOAD CSR
007252  052777  000020  172432        BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
```

INITIALIZE THE COMMON TAGS

```
2070                                    ;POKE CLK TO GET INTO SYNCRONIZATION
2071                                    ;BOTH THE LOGIC & RECEIVER
2072  007260  052777  020000  172440            BIS     #CLK,@TXCSR     ;POKE CLK UP
2073  007266  042777  020000  172432            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2074  007274  110477  172432                    MOVB    R4,@TXDBUF      ;LOAD DATA CHARACTER
2075                                    ;POKE CLK TO GET TRANSMITTER & RECEIVER INTO SYNCRONIZATION
2076  007300  052777  020000  172420            BIS     #CLK,@TXCSR     ;POKE CLK UP
2077  007306  042777  020000  172412            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2078  007314  032777  004000  172370            BIT     #RECACT,@RXCSR  ;RECACT ?
2079  007322  001401                            BEQ     .+4
2080  007324  104004                            ERROR   4       ;RECACT SHOULD NOT BE SET
2081  007326  000404                            BR      4$
2082  007330  010477  172366          5$:       MOV     R4,@PARCSR      ;LOAD PARCSR WITH PARAMETERS
2083  007334  110477  172372                    MOVB    R4,@TXDBUF      ;LOAD SYNC CHAR
2084  007340  012767  000002  171556  4$:       MOV     #2,COUNT        ;# OF SYNC CHARS
2085  007346  005777  172354          2$:       TST     @TXCSR  ;DNA ?
2086  007352  100001                            BPL     .+4     ;BR IF NOT SET
2087  007354  104004                            ERROR   4       ;DNA SHOULD NOT BE SET OR....
2088                                            ;IT SHOULD BE CLEARED FROM PREVIOUS READ
2089  007356  012767  000006  171536            MOV     #6,SHIFT        ;# OF SHIFTS
2090  007364                          1$:
2091  007364  052777  020000  172334            BIS     #CLK,@TXCSR     ;POKE CLK UP
2092  007372  042777  020000  172326            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2093  007400  005367  171516                    DEC     SHIFT   ;# OF SHIFTS
2094  007404  001367                            BNE     1$
2095  007406  005367  171512                    DEC     COUNT   ;# OF SYNC CHARS
2096  007412  001403                            BEQ     3$
2097                                    ;TEST SYNCNO TO SEE HOW MANY SYNC CHARACTERS NEEDED
2098  007414  105767  171526                    TSTB    SYNCNO
2099  007420  100752                            BMI     2$      ;TWO SYNC CHARACTERS..
2100  007422  032777  004000  172262  3$:       BIT     #RECACT,@RXCSR  ;RECACT ?
2101  007430  001001                            BNE     .+4
2102  007432  104004                            ERROR   4               ;RECACT FAILED TO SET,POSSIBLE
2103                                                    ;THAT THE RECEIVER FAILED TO MATCH
2104                                                    ;THE SYNC CHARACTER
2105  007434  017701  172256                    MOV     @RXDBUF,R1      ;SAVE ACTUAL
2106  007440  010400                            MOV     R4,R0           ;SAVE EXPECTED
2107  007442  042700  177400                    BIC     #177400,R0      ;CLR UPPER BYTE
2108  007446  020001                            CMP     R0,R1   ;DO THEY COMPARE ?
2109  007450  001401                            BEQ     .+4
2110  007452  104002                            ERROR   2       ;IF RECACT FAILED ALONG WITH THIS
2111                                                    ;...IT PROBABLY IS A TRANSMITTER ERROR
2112                                                    ;HOWEVER,...IF ONLY THIS FAILED IT
2113                                                    ;PROBABLY IS A RECEIVER ERROR
2114  007454  104405                            SCOP1
2115                                    ;POKE CLK TO SEE DNA...DNA COMES UP ON THE FIRST
2116                                    ;BIT OF THE NEXT CHARACTER IF NO CHARACTER IS LOADED INTO
2117                                    ;TXDBUF
2118  007456  052777  020000  172242            BIS     #CLK,@TXCSR     ;POKE CLK UP
2119  007464  005777  172236                    TST     @TXCSR  ;DNA?
2120  007470  100401                            BMI     .+4
2121  007472  104004                            ERROR   4       ;DNA DID NOT ASSERT
2122                                            ;SET UP CONDITIONS FOR NEXT SYNC CHARACTER MATCH
2123  007474  052777  000400  172224            BIS     #MRESET,@TXCSR  ;MASTER RESET
2124  007502  032777  000020  172202            BIT     #SYNSCH,@RXCSR  ;SYNC SEARCH = 0 ?
2125  007510  001401                            BEQ     .+4
```

```
2126  007512  104004                          ERROR   4       ;SYNC SEARCH SHOULD BE NOT SET
2127  007514  005204                          INC     R4
2128  007516  122704  000100                  CMPB    #100,R4 ;IS THIS THE LAST CHARACTER ?
2129  007522  001246                          BNE     6$      ;NO
2130
2131                                          ;;THIS TEST VERIFYS MATCH DETECT & DATA RDY
2132                                          ;;FLAGS FOR EVERY POSSIBLE MATCH CHARACTER
2133                                          ;;BY OBSERVING RECACT BIT
2134                                          ;;IT WILL TAKE TWO SYNC * CHARACTERS TO GET RECACT BIT
2135                                          ;;*:    DEPENDENT ON MONITOR ..............
2136                                          ;;IF ONE SYNC STRAP IS SELECTED ,IT WILL
2137                                          ;;ONLY TAKE ONE SYNC CHARACTER BEFORE RECACT TO
2138                                          ;;ASSERT
2139                                          ;;MODE: SYNC INTERNAL
2140                                          ;;LENGTH: SEVEN
2141                                          ;;SYNC CHARACTER FOR MATCH: B/C
2142                                          ;;THIS TEST USES THE TRANSMITTER AND RECEIVER CHIPS
2143                                          ;;
2144                                  ;;**************************************************************
2145  007524  000004                  ↑ST14:  SCOPE
2146  007526  052777  000400  172172          BIS     #MRESET,@TXCSR  ;MASTER RESET
2147  007534  016703  172156                  MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
2148                                  ;SET SYNC INTERNAL,SEVEN,NO PARITY,0 SYNC REGISTER
2149  007540  012704  034000                  MOV     #SYNINT!SEVEN!NOPAR,R4  ;CREATE PARAMETERS
2150  007544  012777  004020  172154  6$:     MOV     #MINT!SEND,@TXCSR       ;SET SEND & MAINT INTER
2151  007552  010477  172144                  MOV     R4,@PARCSR      ;LOAD CSR
2152  007556  052777  000020  172126          BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
2153                                  ;POKE CLK TO GET INTO SYNCRONIZATION
2154                                  ;BOTH THE LOGIC & RECEIVER
2155  007564  052777  020000  172134          BIS     #CLK,@TXCSR     ;POKE CLK UP
2156  007572  042777  020000  172126          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2157  007600  110477  172126                  MOVB    R4,@TXDBUF      ;LOAD DATA CHARACTER
2158                                  ;POKE CLK TO GET TRANSMITTER & RECEIVER INTO SYNCRONIZATION
2159  007604  052777  020000  172114          BIS     #CLK,@TXCSR     ;POKE CLK UP
2160  007612  042777  020000  172106          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2161  007620  032777  004000  172064          BIT     #RECACT,@RXCSR  ;RECACT ?
2162  007626  001401                          BEQ     .+4
2163  007630  104004                          ERROR   4       ;RECACT SHOULD NOT BE SET
2164  007632  000404                          BR      4$
2165  007634  010477  172062          5$:     MOV     R4,@PARCSR      ;LOAD PARCSR WITH PARAMETERS
2166  007640  110477  172066                  MOVB    R4,@TXDBUF      ;LOAD SYNC CHAR
2167  007644  012767  000002  171252  4$:     MOV     #2,COUNT        ;# OF SYNC CHARS
2168  007652  005777  172050          2$:     TST     @TXCSR  ;DNA ?
2169  007656  100001                          BPL     .+4     ;BR IF NOT SET
2170  007660  104004                          ERROR   4       ;DNA SHOULD NOT BE SET OR....
2171                                          ;IT SHOULD BE CLEARED FROM PREVIOUS READ
2172  007662  012767  000007  171232          MOV     #7,SHIFT        ;# OF SHIFTS
2173  007670                          1$:
2174  007670  052777  020000  172030          BIS     #CLK,@TXCSR     ;POKE CLK UP
2175  007676  042777  020000  172022          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2176  007704  005367  171212                  DEC     SHIFT   ;# OF SHIFTS
2177  007710  001367                          BNE     1$
2178  007712  005367  171206                  DEC     COUNT   ;# OF SYNC CHARS
2179  007716  001403                          BEQ     3$
2180                                  ;TEST SYNCNO TO SEE HOW MANY SYNC CHARACTERS NEEDED
2181  007720  105767  171222                  TSTB    SYNCNO
```

INITIALIZE THE COMMON TAGS

```
2182  007724  100752                          BMI     2$          ;TWO SYNC CHARACTERS..
2183  007726  032777  004000  171756  3$:     BIT     #RECACT,@RXCSR  ;RECACT ?
2184  007734  001001                          BNE     .+4
2185  007736  104004                          ERROR   4               ;RECACT FAILED TO SET,POSSIBLE
2186                                                                  ;THAT THE RECEIVER FAILED TO MATCH
2187                                                                  ;THE SYNC CHARACTER
2188  007740  017701  171752                  MOV     @RXDBUF,R1      ;SAVE ACTUAL
2189  007744  010400                          MOV     R4,R0           ;SAVE EXPECTED
2190  007746  042700  177400                  BIC     #177400,R0      ;CLR UPPER BYTE
2191  007752  020001                          CMP     R0,R1   ;DO THEY COMPARE ?
2192  007754  001401                          BEQ     .+4
2193  007756  104002                          ERROR   2               ;IF RECACT FAILED ALONG WITH THIS
2194                                                                  ;...IT PROBABLY IS A TRANSMITTER ERROR
2195                                                                  ;HOWEVER,...IF ONLY THIS FAILED IT
2196                                                                  ;PROBABLY IS A RECEIVER ERROR
2197  007760  104405                          SCOP1
2198                                ;POKE CLK TO SEE DNA...DNA COMES UP ON THE FIRST
2199                                ;BIT OF THE NEXT CHARACTER IF NO CHARACTER IS LOADED INTO
2200                                ;TXDBUF
2201  007762  052777  020000  171736          BIS     #CLK,@TXCSR     ;POKE CLK UP
2202  007770  005777  171732                  TST     @TXCSR  ;DNA?
2203  007774  100401                          BMI     .+4
2204  007776  104004                          ERROR   4               ;DNA DID NOT ASSERT
2205                                ;SET UP CONDITIONS FOR NEXT SYNC CHARACTER MATCH
2206  010000  052777  000400  171720          BIS     #MRESET,@TXCSR  ;MASTER RESET
2207  010006  032777  000020  171676          BIT     #SYNSCH,@RXCSR  ;SYNC SEARCH = 0 ?
2208  010014  001401                          BEQ     .+4
2209  010016  104004                          ERROR   4               ;SYNC SEARCH SHOULD BE NOT SET
2210  010020  005204                          INC     R4
2211  010022  122704  000200                  CMPB    #200,R4 ;IS THIS THE LAST CHARACTER ?
2212  010026  001246                          BNE     6$      ;NO
2213
2214                                ;;THIS TEST VERIFYS MATCH DETECT & DATA RDY
2215                                ;;FLAGS FOR EVERY POSSIBLE MATCH CHARACTER
2216                                ;;BY OBSERVING RECACT BIT
2217                                ;;IT WILL TAKE TWO SYNC # CHARACTERS TO GET RECACT BIT
2218                                ;;*:    DEPENDENT ON MONITOR ..............
2219                                ;;IF ONE SYNC STRAP IS SELECTED ,IT WILL
2220                                ;;ONLY TAKE ONE SYNC CHARACTER BEFORE RECACT TO
2221                                ;;ASSERT
2222                                ;;MODE: SYNC INTERNAL
2223                                ;;LENGTH: EIGHT
2224                                ;;SYNC CHARACTER FOR MATCH: B/C
2225                                ;;THIS TEST USES THE TRANSMITTER AND RECEIVER CHIPS
2226                                ;;
2227                          ;;*****************************************************************
2228  010030  000004          TST15:  SCOPE
2229  010032  052777  000400  171666          BIS     #MRESET,@TXCSR  ;MASTER RESET
2230  010040  016703  171652                  MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
2231                                ;SET SYNC INTERNAL,EIGHT,NO PARITY,0 SYNC REGISTER
2232  010044  012704  036000                  MOV     #SYNINT!EIGHT!NOPAR,R4  ;CREATE PARAMETERS
2233  010050  012777  004020  171650  6$:     MOV     #MINT!SEND,@TXCSR       ;SET SEND & MAINT INTER
2234  010056  010477  171640                  MOV     R4,@PARCSR      ;LOAD CSR
2235  010062  052777  000020  171622          BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
2236                                ;POKE CLK TO GET INTO SYNCRONIZATION
2237                                ;BOTH THE LOGIC & RECEIVER
```

```
                                        INITIALIZE THE COMMON TAGS

2238  010070  052777  020000  171630          BIS     #CLK,@TXCSR     ;POKE CLK UP
2239  010076  042777  020000  171622          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2240  010104  110477  171622                  MOVB    R4,@TXDBUF      ;LOAD DATA CHARACTER
2241                                  ;POKE CLK TO GET TRANSMITTER & RECEIVER INTO SYNCRONIZATION
2242  010110  052777  020000  171610          BIS     #CLK,@TXCSR     ;POKE CLK UP
2243  010116  042777  020000  171602          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2244  010124  032777  004000  171560          BIT     #RECACT,@RXCSR  ;RECACT ?
2245  010132  001401                          BEQ     .+4
2246  010134  104004                          ERROR   4               ;RECACT SHOULD NOT BE SET
2247  010136  000404                          BR      4$
2248  010140  010477  171556          5$:     MOV     R4,@PARCSR      ;LOAD PARCSR WITH PARAMETERS
2249  010144  110477  171562                  MOVB    R4,@TXDBUF      ;LOAD SYNC CHAR
2250  010150  012767  000002  170746  4$:     MOV     #2,COUNT        ;# OF SYNC CHARS
2251  010156  005777  171544          2$:     TST     @TXCSR  ;DNA ?
2252  010162  100001                          BPL     .+4     ;BR IF NOT SET
2253  010164  104004                          ERROR   4       ;DNA SHOULD NOT BE SET OR....
2254                                          ;IT SHOULD BE CLEARED FROM PREVIOUS READ
2255  010166  012767  000010  170726          MOV     #8.,SHIFT       ;# OF SHIFTS
2256  010174                          1$:
2257  010174  052777  020000  171524          BIS     #CLK,@TXCSR     ;POKE CLK UP
2258  010202  042777  020000  171516          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2259  010210  005367  170706                  DEC     SHIFT   ;# OF SHIFTS
2260  010214  001367                          BNE     1$
2261  010216  005367  170702                  DEC     COUNT   ;# OF SYNC CHARS
2262  010222  001403                          BEQ     3$
2263                                  ;TEST SYNCNO TO SEE HOW MANY SYNC CHARACTERS NEEDED
2264  010224  105767  170716                  TSTB    SYNCNO
2265  010230  100752                          BMI     2$      ;TWO SYNC CHARACTERS..
2266  010232  032777  004000  171452  3$:     BIT     #RECACT,@RXCSR  ;RECACT ?
2267  010240  001001                          BNE     .+4
2268  010242  104004                          ERROR   4               ;RECACT FAILED TO SET,POSSIBLE
2269                                                                  ;THAT THE RECEIVER FAILED TO MATCH
2270                                                                  ;THE SYNC CHARACTER
2271  010244  017701  171446                  MOV     @RXDBUF,R1      ;SAVE ACTUAL
2272  010250  010400                          MOV     R4,R0           ;SAVE EXPECTED
2273  010252  042700  177400                  BIC     #177400,R0      ;CLR UPPER BYTE
2274  010256  020001                          CMP     R0,R1   ;DO THEY COMPARE ?
2275  010260  001401                          BEQ     .+4
2276  010262  104002                          ERROR   2               ;IF RECACT FAILED ALONG WITH THIS
2277                                                                  ;...IT PROBABLY IS A TRANSMITTER ERROR
2278                                                                  ;HOWEVER,...IF ONLY THIS FAILED IT
2279                                                                  ;PROBABLY IS A RECEIVER ERROR
2280  010264  104405                          SCOPI
2281                                  ;POKE CLK TO SEE DNA...DNA COMES UP ON THE FIRST
2282                                  ;BIT OF THE NEXT CHARACTER IF NO CHARACTER IS LOADED INTO
2283                                  ;TXDBUF
2284  010266  052777  020000  171432          BIS     #CLK,@TXCSR     ;POKE CLK UP
2285  010274  005777  171426                  TST     @TXCSR  ;DNA?
2286  010300  100401                          BMI     .+4
2287  010302  104004                          ERROR   4       ;DNA DID NOT ASSERT
2288                                          ;SET UP CONDITIONS FOR NEXT SYNC CHARACTER MATCH
2289  010304  052777  000400  171414          BIS     #MRESET,@TXCSR  ;MASTER RESET
2290  010312  032777  000020  171372          BIT     #SYNSCH,@RXCSR  ;SYNC SEARCH = 0 ?
2291  010320  001401                          BEQ     .+4
2292  010322  104004                          ERROR   4       ;SYNC SEARCH SHOULD BE NOT SET
2293  010324  005204                          INC     R4
```

```
DZDUV-A MACY11 27(1006)  03-FEB-77  08:30  PAGE 49
DZDUVA.M11    13-OCT-76 08:26          INITIALIZE THE COMMON TAGS

  2294  010326  122704  000000                  CMPB    #0,R4   ;IS THIS THE LAST CHARACTER ?
  2295  010332  001246                          BNE     6$      ;NO
  2296
  2297                                          ;;THIS TEST PERFORMS A BINARY COUNT DATA PATTERN ON
  2298                                          ;;BOTH THE TRANSMITTER AND RECEIVER LOGIC
  2299                                          ;;MODE:SYNC EXTERNAL (SYNEXT)
  2300                                          ;;LENGTH:EIGHT PLUS PARITY
  2301                                          ;;PARITY:EVEPAR
  2302                                          ;;MAINT. MODE:MINT
  2303                                          ;;
  2304                                  ;;**************************************************************
  2305  010334  000004                 TST16:  SCOPE
  2306  010336  052777  000400  171362          BIS     #MRESET,@TXCSR  ;MASTER RESET
  2307  010344  012777  020000  171350          MOV     #SYNEXT,@PARCSR ;SET THE MODE
  2308  010352  052777  000400  171346          BIS     #MRESET,@TXCSR  ;MASTER RESET
  2309
  2310                                  ;SET MAINTENANCE MODE & SEND
  2311                                          ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
  2312  010360  012777  004020  171340          MOV     #MINT!SEND,@TXCSR
  2313
  2314                                  ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
  2315  010366  012777  027426  171326          MOV     #SYNEXT!EIGHT!EVEPAR!26,@PARCSR
  2316  010374  016703  171316                 MOV     RXDBUF,R3       ;SETUP FOR ERROR MSG
  2317  010400  005004                         CLR     R4      ;FOR DATA CHAR CREATION
  2318  010402  110477  171324                 MOVB    R4,@TXDBUF      ;LOAD CHARACTER
  2319  010406  052777  000020  171276          BIS     #SYNSCH,@RXCSR  ;SET SEARCH SYNC
  2320                                  ;GET INTO SYNCRONIZATION
  2321  010414  052777  020000  171304          BIS     #CLK,@TXCSR     ;POKE CLK UP
  2322  010422  042777  020000  171276          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
  2323  010430  012767  000011  170464  1$:     MOV     #9.,SHIFT       ;# OF SHIFTS
  2324  010436  010400                         MOV     R4,R0   ;EXPECTED
  2325  010440                          2$:
  2326  010440  052777  020000  171260          BIS     #CLK,@TXCSR     ;POKE CLK UP
  2327  010446  042777  020000  171252          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
  2328  010454  005367  170442                 DEC     SHIFT   ;# OF SHIFTS
  2329  010460  022767  000003  170434         CMP     #3,SHIFT        ;TIME TO LOAD NEXT CHAR ?
  2330  010466  001003                         BNE     3$      ;NO ?
  2331  010470  005204                         INC     R4      ;GENERATE NEXT CHAR
  2332  010472  110477  171234                 MOVB    R4,@TXDBUF      ;LOAD NEXT CHARACTER
  2333  010476  005767  170420          3$:    TST     SHIFT   ;IS IT 0 ?
  2334  010502  001356                         BNE     2$
  2335  010504  105777  171202                 TSTB    @RXCSR  ;RXDONE = 1 ?
  2336  010510  100401                         BMI     .+4
  2337  010512  104004                         ERROR   4       ;RXDONE SHOULD BE SET
  2338  010514  017701  171176                 MOV     @RXDBUF,R1      ;ACTUAL
  2339  010520  020001                         CMP     R0,R1   ;COMPARE EXP VS ACT
  2340  010522  001401                         BEQ     .+4
  2341  010524  104002                         ERROR   2       ;CHARACTERS SHOULD COMPARE
  2342  010526  105704                         TSTB    R4      ;LAST CHARACTER ?
  2343  010530  001337                         BNE     1$      ;NO
  2344  010532                          4$:
  2345                                          ;;THIS TEST PERFORMS A BINARY COUNT DATA PATTERN ON
  2346                                          ;;BOTH THE TRANSMITTER AND RECEIVER LOGIC
  2347                                          ;;MODE:SYNC EXTERNAL (SYNEXT)
  2348                                          ;;LENGTH:EIGHT PLUS PARITY
  2349                                          ;;PARITY:ODDPAR
```

INITIALIZE THE COMMON TAGS

```
                                                ;;MAINT. MODE:MINT
                                                ;;
                                        ;;*******************************************************************
2353  010532  000004                   TST17:  SCOPE
2354  010534  052777  000400  171164           BIS     #MRESET,@TXCSR  ;MASTER RESET
2355  010542  012777  020000  171152           MOV     #SYNEXT,@PARCSR ;SET THE MODE
2356  010550  052777  000400  171150           BIS     #MRESET,@TXCSR  ;MASTER RESET
2357
2358                                    ;SET MAINTENANCE MODE & SEND
2359                                            ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
2360  010556  012777  004020  171142           MOV     #MINT!SEND,@TXCSR
2361
2362                                    ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
2363  010564  012777  027026  171130           MOV     #SYNEXT!EIGHT!ODDPAR!26,@PARCSR
2364  010572  016703  171120                   MOV     RXDBUF,R3       ;SETUP FOR ERROR MSG
2365  010576  005004                           CLR     R4      ;FOR DATA CHAR CREATION
2366  010600  110477  171126                   MOVB    R4,@TXDBUF      ;LOAD CHARACTER
2367  010604  052777  000020  171100           BIS     #SYNSCH,@RXCSR  ;SET SEARCH SYNC
2368                                    ;GET INTO SYNCRONIZATION
2369  010612  052777  020000  171106           BIS     #CLK,@TXCSR     ;POKE CLK UP
2370  010620  042777  020000  171100           BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2371  010626  012767  000011  170266  1$:      MOV     #9.,SHIFT       ;# OF SHIFTS
2372  010634  010400                           MOV     R4,R0   ;EXPECTED
2373  010636                           2$:
2374  010636  052777  020000  171062           BIS     #CLK,@TXCSR     ;POKE CLK UP
2375  010644  042777  020000  171054           BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2376  010652  005367  170244                   DEC     SHIFT   ;# OF SHIFTS
2377  010656  022767  000003  170236           CMP     #3,SHIFT        ;TIME TO LOAD NEXT CHAR ?
2378  010664  001003                           BNE     3$      ;NO ?
2379  010666  005204                           INC     R4      ;GENERATE NEXT CHAR
2380  010670  110477  171036                   MOVB    R4,@TXDBUF      ;LOAD NEXT CHARACTER
2381  010674  005767  170222           3$:     TST     SHIFT   ;IS IT 0 ?
2382  010700  001356                           BNE     2$
2383  010702  105777  171004                   TSTB    @RXCSR  ;RXDONE = 1 ?
2384  010706  100401                           BMI     .+4
2385  010710  104004                           ERROR   4       ;RXDONE SHOULD BE SET
2386  010712  017701  171000                   MOV     @RXDBUF,R1      ;ACTUAL
2387  010716  020001                           CMP     R0,R1   ;COMPARE EXP VS ACT
2388  010720  001401                           BEQ     .+4
2389  010722  104002                           ERROR   2       ;CHARACTERS SHOULD COMPARE
2390  010724  105704                           TSTB    R4      ;LAST CHARACTER ?
2391  010726  001337                           BNE     1$      ;NO
2392  010730                           4$:
2393                                          ;;THIS TEST PERFORMS A BINARY COUNT DATA PATTERN ON
2394                                          ;;BOTH THE TRANSMITTER AND RECEIVER LOGIC
2395                                          ;;MODE:SYNC EXTERNAL (SYNEXT)
2396                                          ;;LENGTH:EIGHT PLUS PARITY
2397                                          ;;PARITY:EVEPAR
2398                                          ;;MAINT. MODE:MEXT
2399                                          ;;
2400                                  ;;*******************************************************************
2401  010730  000004                   TST20:  SCOPE
2402  010732  105767  170215                   TSTB    JMRBY   ;JUMP AROUND TEST ?
2403  010736  100116                           BPL     4$      ;YES ?
2404  010740  052777  000400  170760           BIS     #MRESET,@TXCSR  ;MASTER RESET
2405  010746  012777  020000  170746           MOV     #SYNEXT,@PARCSR ;SET THE MODE
```

```
                                        INITIALIZE THE COMMON TAGS

2406  010754  052777  000400  170744            BIS     #MRESET,@TXCSR  ;MASTER RESET
2407
2408                                    ;SET MAINTENANCE MODE & SEND
2409                                        ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
2410  010762  012777  010020  170736            MOV     #MEXT!SEND,@TXCSR
2411
2412                                    ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
2413  010770  012777  027426  170724            MOV     #SYNEXT!EIGHT!EVEPAR!26,@PARCSR
2414  010776  016703  170714                    MOV     RXDBUF,R3       ;SETUP FOR ERROR MSG
2415  011002  005004                            CLR     R4      ;FOR DATA CHAR CREATION
2416  011004  110477  170722                    MOVB    R4,@TXDBUF      ;LOAD CHARACTER
2417  011010  052777  000020  170674            BIS     #SYNSCH,@RXCSR  ;SET SEARCH SYNC
2418                                    ;GET INTO SYNCRONIZATION
2419  011016  052777  020000  170702            BIS     #CLK,@TXCSR     ;POKE CLK UP
2420                                        ;WAIT FOR CABLE & DRIVER DELAYS
2421  011024  016702  170070                    MOV     HOLD,R2 ;WAIT THIS AMT
2422  011030  005302                            DEC     R2      ;WAIT
2423  011032  001376                            BNE     .-2
2424                                        ;EXIT...
2425  011034  042777  020000  170664            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2426                                        ;WAIT FOR CABLE & DRIVER DELAYS
2427  011042  016702  170052                    MOV     HOLD,R2 ;WAIT THIS AMT
2428  011046  005302                            DEC     R2      ;WAIT
2429  011050  001376                            BNE     .-2
2430                                        ;EXIT...
2431  011052  012767  000011  170042  1$:       MOV     #9.,SHIFT       ;# OF SHIFTS
2432  011060  010400                            MOV     R4,R0   ;EXPECTED
2433  011062                            2$:
2434  011062  052777  020000  170636            BIS     #CLK,@TXCSR     ;POKE CLK UP
2435                                        ;WAIT FOR CABLE & DRIVER DELAYS
2436  011070  016702  170024                    MOV     HOLD,R2 ;WAIT THIS AMT
2437  011074  005302                            DEC     R2      ;WAIT
2438  011076  001376                            BNE     .-2
2439                                        ;EXIT...
2440  011100  042777  020000  170620            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2441                                        ;WAIT FOR CABLE & DRIVER DELAYS
2442  011106  016702  170006                    MOV     HOLD,R2 ;WAIT THIS AMT
2443  011112  005302                            DEC     R2      ;WAIT
2444  011114  001376                            BNE     .-2
2445                                        ;EXIT...
2446  011116  005367  170000                    DEC     SHIFT   ;# OF SHIFTS
2447  011122  022767  000003  167772            CMP     #3,SHIFT        ;TIME TO LOAD NEXT CHAR ?
2448  011130  001003                            BNE     3$      ;NO ?
2449  011132  005204                            INC     R4      ;GENERATE NEXT CHAR
2450  011134  110477  170572                    MOVB    R4,@TXDBUF      ;LOAD NEXT CHARACTER
2451  011140  005767  167756            3$:     TST     SHIFT   ;IS IT 0 ?
2452  011144  001346                            BNE     2$
2453  011146  105777  170540                    TSTB    @RXCSR  ;RXDONE = 1 ?
2454  011152  100401                            BMI     .+4
2455  011154  104004                            ERROR   4       ;RXDONE SHOULD BE SET
2456  011156  017701  170534                    MOV     @RXDBUF,R1      ;ACTUAL
2457  011162  020001                            CMP     R0,R1   ;COMPARE EXP VS ACT
2458  011164  001401                            BEQ     .+4
2459  011166  104002                            ERROR   2       ;CHARACTERS SHOULD COMPARE
2460                                        ;CHECK OUT MODEM BYPASS JUMPER
2461  011170  105704                            TSTB    R4      ;LAST CHARACTER ?
```

```
                                        INITIALIZE THE COMMON TAGS

  2462  011172  001327                            BNE     1$      ;NO
  2463  011174                                4$:
  2464                                              ;;THIS TEST PERFORMS A BINARY COUNT DATA PATTERN ON
  2465                                              ;;BOTH THE TRANSMITTER AND RECEIVER LOGIC
  2466                                              ;;MODE:SYNC EXTERNAL (SYNEXT)
  2467                                              ;;LENGTH:EIGHT PLUS PARITY
  2468                                              ;;PARITY:ODDPAR
  2469                                              ;;MAINT. MODE:MEXT
  2470                                              ;;
  2471                                  ;;**********************************************************************
  2472  011174  000004                     TST21:  SCOPE
  2473  011176  105767  167751                     TSTB    JMRBY   ;JUMP AROUND TEST ?
  2474  011202  100116                             BPL     4$      ;YES ?
  2475  011204  052777  000400  170514             BIS     #MRESET,@TXCSR  ;MASTER RESET
  2476  011212  012777  020000  170502             MOV     #SYNEXT,@PARCSR ;SET THE MODE
  2477  011220  052777  000400  170500             BIS     #MRESET,@TXCSR  ;MASTER RESET
  2478
  2479                                  ;SET MAINTENANCE MODE & SEND
  2480                                              ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
  2481  011226  012777  010020  170472             MOV     #MEXT!SEND,@TXCSR
  2482
  2483                                  ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
  2484  011234  012777  027026  170460             MOV     #SYNEXT!EIGHT!ODDPAR!26,@PARCSR
  2485  011242  016703  170450                     MOV     RXDBUF,R3       ;SETUP FOR ERROR MSG
  2486  011246  005004                             CLR     R4      ;FOR DATA CHAR CREATION
  2487  011250  110477  170456                     MOVB    R4,@TXDBUF      ;LOAD CHARACTER
  2488  011254  052777  000020  170430             BIS     #SYNSCH,@RXCSR  ;SET SEARCH SYNC
  2489                                  ;GET INTO SYNCRONIZATION
  2490  011262  052777  020000  170436             BIS     #CLK,@TXCSR     ;POKE CLK UP
  2491                                              ;WAIT FOR CABLE & DRIVER DELAYS
  2492  011270  016702  167624                     MOV     HOLD,R2 ;WAIT THIS AMT
  2493  011274  005302                             DEC     R2      ;WAIT
  2494  011276  001376                             BNE     .-2
  2495                                              ;EXIT...
  2496  011300  042777  020000  170420             BIC     #CLK,@TXCSR     ;POKE CLK DOWN
  2497                                              ;WAIT FOR CABLE & DRIVER DELAYS
  2498  011306  016702  167606                     MOV     HOLD,R2 ;WAIT THIS AMT
  2499  011312  005302                             DEC     R2      ;WAIT
  2500  011314  001376                             BNE     .-2
  2501                                              ;EXIT...
  2502  011316  012767  000011  167576     1$:     MOV     #9.,SHIFT       ;# OF SHIFTS
  2503  011324  010400                             MOV     R4,R0   ;EXPECTED
  2504  011326                                2$:
  2505  011326  052777  020000  170372             BIS     #CLK,@TXCSR     ;POKE CLK UP
  2506                                              ;WAIT FOR CABLE & DRIVER DELAYS
  2507  011334  016702  167560                     MOV     HOLD,R2 ;WAIT THIS AMT
  2508  011340  005302                             DEC     R2      ;WAIT
  2509  011342  001376                             BNE     .-2
  2510                                              ;EXIT...
  2511  011344  042777  020000  170354             BIC     #CLK,@TXCSR     ;POKE CLK DOWN
  2512                                              ;WAIT FOR CABLE & DRIVER DELAYS
  2513  011352  016702  167542                     MOV     HOLD,R2 ;WAIT THIS AMT
  2514  011356  005302                             DEC     R2      ;WAIT
  2515  011360  001376                             BNE     .-2
  2516                                              ;EXIT...
  2517  011362  005367  167534                     DEC     SHIFT   ;# OF SHIFTS
```

```
2518  011366  022767  000003  167526          CMP     #3,SHIFT        ;TIME TO LOAD NEXT CHAR ?
2519  011374  001003                          BNE     3$      ;NO ?
2520  011376  005204                          INC     R4      ;GENERATE NEXT CHAR
2521  011400  110477  170326                  MOVB    R4,@TXDBUF      ;LOAD NEXT CHARACTER
2522  011404  005767  167512          3$:     TST     SHIFT   ;IS IT 0 ?
2523  011410  001346                          BNE     2$
2524  011412  105777  170274                  TSTB    @RXCSR  ;RXDONE = 1 ?
2525  011416  100401                          BMI     .+4
2526  011420  104004                          ERROR   4       ;RXDONE SHOULD BE SET
2527  011422  017701  170270                  MOV     @RXDBUF,R1      ;ACTUAL
2528  011426  020001                          CMP     R0,R1   ;COMPARE EXP VS ACT
2529  011430  001401                          BEQ     .+4
2530  011432  104002                          ERROR   2       ;CHARACTERS SHOULD COMPARE
2531                                          ;CHECK OUT MODEM BYPASS JUMPER
2532  011434  105704                          TSTB    R4      ;LAST CHARACTER ?
2533  011436  001327                          BNE     1$      ;NO
2534  011440                          4$:
2535                                          ;;THIS TEST VERIFYS WORD LENGTH SELECT OF THE
2536                                          ;;RECEIVER SECTION,IT USES THE ERROR FLAGS
2537                                          ;;TO DETERMINE THAT IT WAS SELECTED CORRECTLY
2538                                          ;;(OVRRUN,RXERR)
2539                                          ;;MODE:ISYMOD
2540                                          ;;LENGTH:FIVE
2541                                          ;;CHAR:12
2542                                          ;;
2543                                  ;;**************************************************************
2544  011440  000004                  TST22:  SCOPE
2545  011442  052777  000400  170256          BIS     #MRESET,@TXCSR  ;MASTER RESET
2546  011450  012777  000000  170244          MOV     #ISYMOD,@PARCSR ;SET THE MODE
2547  011456  052777  000400  170242          BIS     #MRESET,@TXCSR  ;MASTER RESET
2548
2549                                  ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
2550  011464  012777  064001  170234          MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
2551
2552                                  ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
2553  011472  012777  000000  170222          MOV     #ISYMOD!FIVE!NOPAR!0,@PARCSR
2554  011500  052777  000020  170204          BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
2555                                          ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
2556  011506  042777  020000  170212          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2557  011514  052777  020000  170204          BIS     #CLK,@TXCSR     ;POKE CLK UP
2558                                  ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
2559  011522  042777  020000  170176          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2560  011530  052777  020000  170170          BIS     #CLK,@TXCSR     ;POKE CLK UP
2561  011536  016703  170154                  MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
2562  011542  012700  000012                  MOV     #12,R0  ;EXPECTED
2563  011546  012767  000007  167346          MOV     #7,$HIFT        ;# OF SHIFTS
2564  011554  012767  000124  167716          MOV     #124,$TMP1      ;DATA CHAR
2565  011562  004767  005340                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
2566  011566  105777  170120                  TSTB    @RXCSR  ;RXDONE ?
2567  011572  100401                          BMI     .+4
2568  011574  104004                          ERROR   4       ;RXDONE SHOULD BE SET
2569  011576  017701  170114                  MOV     @RXDBUF,R1      ;ACTUAL
2570  011602  020001                          CMP     R0,R1   ;COMPARE EXPECTED VS. ACTUAL
2571  011604  001401                          BEQ     .+4
2572  011606  104002                          ERROR   2       ;RECEIVED DATA DID NOT MATCH
2573                                                          ;EXPECTED DATA - CHECK MAINT DATA
```

```
2574                                                            ;OR RECEIVER LOGIC
2575  011610  012767  000007  167304          MOV     #7,SHIFT          ;# OF SHIFTS
2576  011616  012767  000124  167654          MOV     #124,$TMP1        ;DATA CHAR
2577  011624  004767  005276                  JSR     PC,RPOKE          ;SHIFT IN THIS CHAR
2578                          ;NOW SHIFT IN A SECOND CHARACTER WITHOUT READING RXDBUF
2579  011630  012767  000007  167264          MOV     #7,SHIFT          ;# OF SHIFTS
2580  011636  012767  000124  167634          MOV     #124,$TMP1        ;DATA CHAR
2581  011644  004767  005256                  JSR     PC,RPOKE          ;SHIFT IN THIS CHAR
2582  011650  012700  140012                  MOV     #140000!12,R0     ;EXPECTED DATA PLUS
2583                                                                    ;RXERR & OVRRUN
2584  011654  017701  170036                  MOV     @RXDBUF,R1        ;ACTUAL
2585  011660  020001                          CMP     R0,R1   ;COMPARE EXP VS. ACT
2586  011662  001401                          BEQ     .+4
2587  011664  104002                          ERROR   2               ;SPECIFICALLY LOOK AT RXERR &
2588                                                                    ;OVRRUN BITS...THEY BOTH SHOULD BE SET
2589
2590                                          ;;THIS TEST VERIFYS WORD LENGTH SELECT OF THE
2591                                          ;;RECEIVER SECTION,IT USES THE ERROR FLAGS
2592                                          ;;TO DETERMINE THAT IT WAS SELECTED CORRECTLY
2593                                          ;;(OVRRUN,RXERR)
2594                                          ;;MODE:ISYMOD
2595                                          ;;LENGTH:FIVE
2596                                          ;;CHAR:37
2597                                          ;;
2598                          ;;**************************************************************
2599  011666  000004          TST23:  SCOPE
2600  011670  052777  000400  170030          BIS     #MRESET,@TXCSR  ;MASTER RESET
2601  011676  012777  000000  170016          MOV     #ISYMOD,@PARCSR ;SET THE MODE
2602  011704  052777  000400  170014          BIS     #MRESET,@TXCSR  ;MASTER RESET
2603
2604                          ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
2605  011712  012777  064001  170006          MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
2606
2607                          ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
2608  011720  012777  000000  167774          MOV     #ISYMOD!FIVE!NOPAR!0,@PARCSR
2609  011726  052777  000020  167756          BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
2610                                          ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
2611  011734  042777  020000  167764          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2612  011742  052777  020000  167756          BIS     #CLK,@TXCSR     ;POKE CLK UP
2613                          ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
2614  011750  042777  020000  167750          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2615  011756  052777  020000  167742          BIS     #CLK,@TXCSR     ;POKE CLK UP
2616  011764  016703  167726                  MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
2617  011770  012700  000037                  MOV     #37,R0  ;EXPECTED
2618  011774  012767  000007  167120          MOV     #7,SHIFT        ;# OF SHIFTS
2619  012002  012767  000176  167470          MOV     #176,$TMP1      ;DATA CHAR
2620  012010  004767  005112                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
2621  012014  105777  167672                  TSTB    @RXCSR  ;RXDONE ?
2622  012020  100401                          BMI     .+4
2623  012022  104004                          ERROR   4               ;RXDONE SHOULD BE SET
2624  012024  017701  167666                  MOV     @RXDBUF,R1      ;ACTUAL
2625  012030  020001                          CMP     R0,R1   ;COMPARE EXPECTED VS. ACTUAL
2626  012032  001401                          BEQ     .+4
2627  012034  104002                          ERROR   2               ;RECEIVED DATA DID NOT MATCH
2628                                                                    ;EXPECTED DATA - CHECK MAINT DATA
2629                                                                    ;OR RECEIVER LOGIC
```

```
2630  012036  012767  000007  167056          MOV     #7,SHIFT        ;# OF SHIFTS
2631  012044  012767  000176  167426          MOV     #176,$TMP1      ;DATA CHAR
2632  012052  004767  005050                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
2633                                  ;NOW SHIFT IN A SECOND CHARACTER WITHOUT READING RXDBUF
2634  012056  012767  000007  167036          MOV     #7,SHIFT        ;# OF SHIFTS
2635  012064  012767  000176  167406          MOV     #176,$TMP1      ;DATA CHAR
2636  012072  004767  005030                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
2637  012076  012700  140037                  MOV     #140000!37,R0   ;EXPECTED DATA PLUS
2638                                                                  ;RXERR & OVRRUN
2639  012102  017701  167610                  MOV     @RXDBUF,R1      ;ACTUAL
2640  012106  020001                          CMP     R0,R1   ;COMPARE EXP VS. ACT
2641  012110  001401                          BEQ     .+4
2642  012112  104002                          ERROR   2               ;SPECIFICALLY LOOK AT RXERR &
2643                                                                  ;OVRRUN BITS...THEY BOTH SHOULD BE SET
2644
2645                                          ;;THIS TEST VERIFYS WORD LENGTH SELECT OF THE
2646                                          ;;RECEIVER SECTION,IT USES THE ERROR FLAGS
2647                                          ;;TO DETERMINE THAT IT WAS SELECTED CORRECTLY
2648                                          ;;(OVRRUN,RXERR)
2649                                          ;;MODE:ISYMOD
2650                                          ;;LENGTH:FIVE
2651                                          ;;CHAR:0
2652                                          ;;
2653                                  ;;*****************************************************************
2654  012114  000004                  TST24:  SCOPE
2655  012116  052777  000400  167602          BIS     #MRESET,@TXCSR  ;MASTER RESET
2656  012124  012777  000000  167570          MOV     #ISYMOD,@PARCSR ;SET THE MODE
2657  012132  052777  000400  167566          BIS     #MRESET,@TXCSR  ;MASTER RESET
2658
2659                                  ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
2660  012140  012777  064001  167560          MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
2661
2662                                  ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
2663  012146  012777  000000  167546          MOV     #ISYMOD!FIVE!NOPAR!0,@PARCSR
2664  012154  052777  000020  167530          BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
2665                                          ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
2666  012162  042777  020000  167536          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2667  012170  052777  020000  167530          BIS     #CLK,@TXCSR     ;POKE CLK UP
2668                                  ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
2669  012176  042777  020000  167522          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2670  012204  052777  020000  167514          BIS     #CLK,@TXCSR     ;POKE CLK UP
2671  012212  016703  167500                  MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
2672  012216  012700  000000                  MOV     #0,R0   ;EXPECTED
2673  012222  012767  000007  166672          MOV     #7,SHIFT        ;# OF SHIFTS
2674  012230  012767  000100  167242          MOV     #100,$TMP1      ;DATA CHAR
2675  012236  004767  004664                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
2676  012242  105777  167444                  TSTB    @RXCSR  ;RXDONE ?
2677  012246  100401                          BMI     .+4
2678  012250  104004                          ERROR   4               ;RXDONE SHOULD BE SET
2679  012252  017701  167440                  MOV     @RXDBUF,R1      ;ACTUAL
2680  012256  020001                          CMP     R0,R1   ;COMPARE EXPECTED VS. ACTUAL
2681  012260  001401                          BEQ     .+4
2682  012262  104002                          ERROR   2               ;RECEIVED DATA DID NOT MATCH
2683                                                                  ;EXPECTED DATA - CHECK MAINT DATA
2684                                                                  ;OR RECEIVER LOGIC
2685  012264  012767  000007  166630          MOV     #7,SHIFT        ;# OF SHIFTS
```

INITIALIZE THE COMMON TAGS

```
2686  012272  012767  000100  167200          MOV     #100,$TMP1      ;DATA CHAR
2687  012300  004767  004622                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
2688                                  ;NOW SHIFT IN A SECOND CHARACTER WITHOUT READING RXDBUF
2689  012304  012767  000007  166610          MOV     #7,SHIFT        ;# OF SHIFTS
2690  012312  012767  000100  167160          MOV     #100,$TMP1      ;DATA CHAR
2691  012320  004767  004602                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
2692  012324  012700  140000                  MOV     #140000!0,R0    ;EXPECTED DATA PLUS
2693                                                                  ;RXERR & OVRRUN
2694  012330  017701  167362                  MOV     @RXDBUF,R1      ;ACTUAL
2695  012334  020001                          CMP     R0,R1   ;COMPARE EXP VS. ACT
2696  012336  001401                          BEQ     .+4
2697  012340  104002                          ERROR   2               ;SPECIFICALLY LOOK AT RXERR &
2698                                                                  ;OVRRUN BITS...THEY BOTH SHOULD BE SET
2699
2700
2701                                          ;END OF PASS
2702                                          ;TYPE NAME OF TEST
2703                                          ;UPDATE PASS COUNT
2704                                          ;CHECK FOR EXIT TO ACT-11
2705                                          ;RESTART TEST
2706
2707  012342  000004                  .EOP:   SCOPE
2708  012344  004767  000344                  JSR     PC,CKSWR
2709  012350  104401                          TYPE                                    ;TYPE NAME OF TEST
2710  012352  015504                          MEPASS
2711  012354  104413  012606                  CONVRT  ,OUTCRY
2712  012360  104401  015323                  TYPE    ,DEVICE
2713  012364  105767  166562                  TSTB    MULTD   ;ARE YOU RUNNING MULTIPLE DEVICES ?
2714  012370  001511                          BEQ     CCC     ;NO,JUMP AROUND
2715  012372  005767  166570                  TST     ACTREG  ;ARE ANY DEVICES ACTIVE ?
2716  012376  001007                          BNE     RUNIT   ;YES
2717  012400  104401  015335                  TYPE    ,MCOW   ;NO
2718  012404  016700  166556                  MOV     ACTREG,R0       ;DISPLAY ACTREG
2719  012410  000000                          HALT                    ;SELECT SOMETHING TO RUN @ ACTREG:
2720                                          ;SELECT SWITCHES & HIT CONTINUE (PUT SW00 =1)
2721  012412  000167  167534                  JMP     .START  ;START OVER AGAIN.....YOU DESELECTED EVERYTHING
2722  012416  062767  000010  166530  RUNIT:  ADD     #10,BASEADD     ;NEXT BLOCK (ADDRESSES)
2723  012424  062767  000010  166530  ZERO:   ADD     #10,BASEIV      ;NEXT BLOCK (VECTORS)
2724  012432  000241                          CLC
2725  012434  006167  166530                  ROL     ROTADD  ;UP DATE ROTATING POINTER
2726  012440  103410                          BCS     2$      ;IS IT THE LAST DEVICE
2727                                                          ;TO BE TESTED IN THIS PASS ?
2728  012442  036767  166522  166516          BIT     ROTADD,ACTREG   ;TEST THIS DEVICE FOR ACTIVE STATUS
2729  012450  001762                          BEQ     RUNIT   ;IF NOT ACTIVE, TRY NEXT ADDRESS
2730  012452  004767  000034                  JSR     PC,REPLAY       ;CALCULATE NEW PARAMETERS
2731  012456  000167  000210                  JMP     RESTRT  ;YES IT WAS ACTIVE,TEST THIS DEVICE
2732  012462  012767  000001  166500  2$:     MOV     #1,ROTADD       ;OK!,NOW SET UP  ROTATING
2733                                                          ;POINTER FOR NEXT MULTIPLE PASS
2734  012470  016767  166462  166456          MOV     KEEPADD,BASEADD ;RESTORE BASE ADDRESS
2735  012476  016767  166462  166456          MOV     KEEPIV,BASEIV   ;RESTORE BASE INTERRUPT VECTORS
2736  012504  004767  000002                  JSR     PC,REPLAY       ;CALC NEW PARAMETERS
2737  012510  000441                          BR      CCC     ;JUMP AROUND REPLAY
2738  012512  016767  166436  004404  REPLAY: MOV     BASEADD,DUBASE  ;SET UP FOR NEW ADDRESSES
2739  012520  004767  004246                  JSR     PC,DUADDR       ;CREATE NEW ADDRESSES
2740  012524  016767  166432  167204          MOV     BASEIV,DURIV    ;CREATE DURIV
2741  012532  062767  000002  166422          ADD     #2,BASEIV
```

INITIALIZE THE COMMON TAGS

```
2742  012540  016767  166416  167172          MOV     BASEIV,DURIS    ;CREATE DURIS
2743  012546  062767  000002  166406          ADD     #2,BASEIV
2744  012554  016767  166402  167160          MOV     BASEIV,DUTIV    ;CREATE DUTIV
2745  012562  062767  000002  166372          ADD     #2,BASEIV
2746  012570  016767  166366  167146          MOV     BASEIV,DUTIS    ;CREATE DUTIS
2747  012576  016767  167134  166356          MOV     DURIV,BASEIV    ;RESTORE
2748  012604  000207                          RTS     PC
2749
2750  012606  000001                  OUTCRY: 1
2751  012610     006      002                 .BYTE   6,2
2752  012612  001712                          RXCSR
2753
2754  012614                          CCC:
2755  012614  005067  166562                  CLR     $TSTNM                  ;CLEAR TEST NUMBER
2756  012620  005067  166572                  CLR     $ERRPC                  ;CLEAR LAST ERROR PC
2757  012624  005067  166553                  CLR     $ERFLG                  ;CLEAR ERROR FLAG
2758  012630  005267  166256                  INC     PASCNT                  ;UPDATE PASS COUNT
2759  012634  016767  166252  166240          MOV     PASCNT,LIGHTS           ;DISPLAY PASS COUNT
2760  012642  016767  166244  166664          MOV     PASCNT,$PASS            ;PASS COUNT TO APT
2761  012650  013701  000042                  MOV     @#42,R1                 ;CHECK FOR ACT-11 OR DDP
2762  012654  001406                          BEQ     RESTRT          ;IF NO CONTINUE TESTING
2763  012656  000005                          RESET
2764  012660  000005                          RESET
2765  012662  004711                  $ENDAD: JSR     PC,(R1)
2766  012664  000240                          NOP
2767  012666  000240                          NOP
2768  012670  000240                          NOP
2769  012672  106427  000340          RESTRT: MTPS    #340    ;PREVENT INTERRUPTS (PRIO: 7)
2770  012676  004767  000012                  JSR     PC,CKSWR
2771  012702  012767  003364  166476          MOV     #TST1+2,$LPADR          ;SET LAST ADDRESS POINTER
2772  012710  000167  170446                  JMP     TST1
2773
2774                                          ;CHECK SWITCH REGISTER ROUTINE.
2775                                          ;CHECKS TO ALLOW FOR <↑G> TO ALLOW
2776                                          ;THE CHANGING OF LOCATION 176
2777
2778  012714  005737  000042          CKSWR:  TST     @#42
2779  012720  001040                          BNE     OUT
2780  012722  022767  000176  166510          CMP     #SWREG,SWR      ;SOFTWARE SWR PRESENT?
2781  012730  001034                          BNE     OUT             ;NO--LEAVE
2782  012732  105777  166506                  TSTB    @$TKS           ;CHECK TTY READY
2783  012736  100031                          BPL     OUT             ;NO--LEAVE
2784  012740  017767  166502  000422          MOV     @$TKB,.MSG      ;GET CHARACTER
2785  012746  042767  177600  000414          BIC     #177600,.MSG    ;STRIP JUNK
2786  012754  122767  000007  000406          CMPB    #7,.MSG         ;IS IT <↑G> ?
2787  012762  001017                          BNE     OUT             ;NO
2788  012764  104401  016111                  TYPE    ,MCNTG
2789  012770  005137  013030          CNTLU:  COM     @#RDSW
2790  012774  104401  016121                  TYPE    ,MMSWR
2791  013000  104413                          CONVRT
2792  013002  013032                          SWREGL
2793  013004  104406  016132                  INSTR,MMNEW
2794  013010  104410                          PARAM
2795  013012  000000                          0
2796  013014  177777                          177777
2797  013016  000176                          SWREG
```

```
                                        INITIALIZE THE COMMON TAGS

 2798  013020      000      001          .BYTE   0,1
 2799  013022  005037  013030           OUT:    CLR     @#RDSW
 2800  013026  000207                           RTS     PC
 2801  013030  000000                   RDSW:   .WORD   0
 2802  013032  000001                   SWREGL: 1
 2803  013034      006      002                  .BYTE   6,2
 2804  013036  000176                           SWREG
 2805
 2806  013040  000005                           5
 2807
 2808                                           ;CHECK FOR FREEZE ON CURRENT DATA
 2809
 2810  013042  004767  177646         .SCOP1: JSR     PC,CKSWR
 2811  013046  032777  001000  166364         BIT     #SW09,@SWR
 2812  013054  001402                         BEQ     1$
 2813  013056  016716  166026                 MOV     LOCK,(SP)
 2814  013062  000002                   1$:     RTI
 2815                                   .SBTTL  TYPE ROUTINE
 2816
 2817                                   ;;**********************************************************************
 2818                                   ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
 2819                                   ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
 2820                                   ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
 2821                                   ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
 2822                                   ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
 2823                                   ;*
 2824                                   ;*CALL:
 2825                                   ;*1) USING A TRAP INSTRUCTION
 2826                                   ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
 2827                                   ;*OR
 2828                                   ;*      TYPE
 2829                                   ;*      MESADR
 2830                                   ;*
 2831
 2832  013064  105767  166367   $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
 2833  013070  100002                   BPL     1$              ;;BR IF YES
 2834  013072  000000                   HALT                    ;;HALT HERE IF NO TERMINAL
 2835  013074  000430                   BR      3$              ;;LEAVE
 2836  013076  010046           1$:     MOV     R0,-(SP)        ;;SAVE R0
 2837  013100  017600  000002           MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
 2838  013104  122767  000001  166434   CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
 2839  013112  001011                   BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
 2840  013114  132767  000100  166425   BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
 2841  013122  001405                   BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
 2842  013124  010067  000004           MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
 2843  013130  004767  000006'          JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
 2844  013134  000000           61$:    .WORD   0               ;;MESSAGE ADDRESS
 2845  013136  132767  000040  166403   62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
 2846  013144  001003                   BNE     60$             ;;YES,SKIP TYPE OUT
 2847  013146  112046           2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
 2848  013150  001005                   BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
 2849  013152  005726                   TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
 2850  013154  012600           60$:    MOV     (SP)+,R0        ;;RESTORE R0
 2851  013156  062716  000002   3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
 2852  013162  000002                   RTI                     ;;RETURN
 2853  013164  122716  000011   4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
```

```
 2854  013170  001430                          BEQ     8$
 2855  013172  122716  000200                  CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
 2856  013176  001006                          BNE     5$
 2857  013200  005726                          TST     (SP)+           ;;POP  <CR><LF> EQUIV
 2858  013202  104401                          TYPE                    ;;TYPE A CR AND LF
 2859  013204  001523                          $CRLF
 2860  013206  105067  000130                  CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
 2861  013212  000755                          BR      2$              ;;GET NEXT CHARACTER
 2862  013214  004767  000056          5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
 2863  013220  126726  166232          6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
 2864  013224  001350                          BNE     2$              ;;IF NO GO GET NEXT CHAR.
 2865  013226  016746  166222                  MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
 2866                                                                  ;;AND THE NULL CHAR.
 2867  013232  105366  000001          7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
 2868  013236  002770                          BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
 2869  013240  004767  000032                  JSR     PC,$TYPEC       ;;GO TYPE A NULL
 2870  013244  105367  000072                  DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
 2871  013250  000770                          BR      7$              ;;LOOP
 2872
 2873                                  ;HORIZONTAL TAB PROCESSOR
 2874
 2875  013252  112716  000040          8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
 2876  013256  004767  000014          9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
 2877  013262  132767  000007  000052          BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
 2878  013270  001372                          BNE     9$              ;;TAB STOP
 2879  013272  005726                          TST     (SP)+           ;;POP SPACE OFF STACK
 2880  013274  000724                          BR      2$              ;;GET NEXT CHARACTER
 2881  013276  105777  166146          $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
 2882  013302  100375                          BPL     $TYPEC
 2883  013304  116677  000002  166140          MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
 2884  013312  122766  000015  000002          CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
 2885  013320  001003                          BNE     1$              ;;BRANCH IF NO
 2886  013322  105067  000014                  CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
 2887  013326  000406                          BR      $TYPEX          ;;EXIT
 2888  013330  122766  000012  000002  1$:     CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
 2889  013336  001402                          BEQ     $TYPEX          ;;BRANCH IF YES
 2890  013340  105227                          INCB    (PC)+           ;;COUNT THE CHARACTER
 2891  013342  000000          $CHARCNT:.WORD  0                       ;;CHARACTER COUNT STORAGE
 2892  013344  000207          $TYPEX: RTS     PC
 2893
 2894
 2895                                  ;ASCII STRING INPUT ROUTINE
 2896
 2897  013346  017667  000000  000014  .INSTR: MOV     @(SP),.MSG      ;PICK UP MESSAGE
 2898  013354  062716  000002                  ADD     #2,(SP)         ;JUMP AROUND MESSAGE FOR RTI
 2899  013360  105767  166162                  TSTB    $ENV            ;APT CONTROL
 2900  013364  001036                          BNE     INSTR2          ;YES NO TYPE
 2901  013366  104401          .INST1: TYPE
 2902  013370  000000          .MSG:   0
 2903  013372  012704  016144                  MOV     #INBUF,R4       ;GET STARTING LOC OF INBUF
 2904  013376  012703  000007                  MOV     #7,R3           ;MAX # OF CHARS
 2905  013402  105777  166036          1$:     TSTB    @$TKS   ;TTY FLAG
 2906  013406  100375                          BPL     1$
 2907  013410  117714  166032                  MOVB    @$TKB,(R4)      ;TAKE CHAR
 2908  013414  142714  000200                  BICB    #200,(R4)       ;STRIP
 2909  013420  121427  000025                  CMPB    (R4),#25        ;IS IT <↑G>
```

```
                                        TYPE ROUTINE

2910  013424  001760                            BEQ     .INST1
2911  013426  122427  000015                    CMPB    (R4)+,#15       ;CHECK FOR CR
2912  013432  001413                            BEQ     INSTR2
2913  013434  105777  166010          2$:       TSTB    @$TPS   ;TEST FLAG
2914  013440  100375                            BPL     2$
2915  013442  117777  166000  166002            MOVB    @$TKB,@$TPB     ;ECHO CHARACTER
2916  013450  005303                            DEC     R3      ;DID YOU TYPE TOO MANY CHARS ?
2917  013452  001353                            BNE     1$
2918  013454  104401                .INSTE:     TYPE
2919  013456  015431                            MQM     ;?
2920  013460  000742                            BR      .INST1  ;RETRY
2921  013462  000002                INSTR2:     RTI
2922
2923                                            ;CONVERT ASCII STRING TO OCTAL
2924
2925  013464  011605                .PARAM:     MOV     (SP),R5 ;PUT CONTENTS OF SP INTO R5
2926  013466  012567  000162                    MOV     (R5)+,LOLIM     ;PUT LOW LIMIT INTO LOLIM
2927  013472  012567  000160                    MOV     (R5)+,HILIM     ;PUT HIGH LIMIT INTO HILIM
2928  013476  012567  000156                    MOV     (R5)+,DEVADR    ;PUT STORE LOC INTO DEVADR
2929  013502  112567  000154                    MOVB    (R5)+,LOBITS    ;PUT MASK INTO LOBITS
2930  013506  112567  000151                    MOVB    (R5)+,ADRCNT    ;PUT COUNT INTO ADRCNT
2931  013512  010516                            MOV     R5,(SP) ;RESTORE RETURN ADDR ON STACK FOR RTI
2932  013514  005005                PARAM1:     CLR     R5
2933  013516  012704  016144                    MOV     #INBUF,R4
2934  013522  122714  000015                    CMPB    #15,(R4)        ;CR ?
2935  013526  001420                            BEQ     PARERR  ;YOU TYPED CR TOO SOON !
2936  013530  121427  000060          1$:       CMPB    (R4),#60        ;LOW LIMIT ASCII 0
2937  013534  002415                            BLT     PARERR
2938  013536  121427  000067                    CMPB    (R4),#67        ;HIGH LIMIT ASCII 7
2939  013542  003012                            BGT     PARERR
2940  013544  142714  000060                    BICB    #60,(R4)        ;CONVERT TO OCTAL
2941  013550  152405                            BISB    (R4)+,R5        ;STORE AWAY ITS AN OK CHAR
2942  013552  122714  000015                    CMPB    #15,(R4)        ;CR ?
2943  013556  001414                            BEQ     LIMITS  ;NOW CHECK FOR HIGH &LOW LIMIT CONDS
2944  013560  006305                            ASL     R5      ;ALLOCATE ROOM FOR NEXT CHAR
2945  013562  006305                            ASL     R5
2946  013564  006305                            ASL     R5
2947  013566  000760                            BR      1$
2948  013570  122714  000015          PARERR:   CMPB    #15,(R4)        ;CR?
2949  013574  001003                            BNE     120$
2950  013576  005737  013030                    TST     @#RDSW          ;CK SWR USED
2951  013602  001023                            BNE     PARTI
2952  013604  104407                120$:       INSTER  ;RETRY
2953  013606  000742                            BR      PARAM1
2954
2955                                            ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
2956
2957  013610  020567  000042          LIMITS:   CMP     R5,HILIM
2958  013614  101365                            BHI     PARERR  ;THE # IS TOO HIGH
2959  013616  020567  000032                    CMP     R5,LOLIM
2960  013622  103762                            BLO     PARERR  ;THE # IS TOO LOW
2961  013624  136705  000032                    BITB    LOBITS,R5       ;TEST BY MASKINGTHE #
2962  013630  001357                            BNE     PARERR
2963
2964                                            ;STORE NUMBER AT SPECIFIED ADDRESS
2965
```

```
DZDUV-A MACY11 27(1006)  03-FEB-77  08:30  PAGE 61
DZDUVA.M11    13-OCT-76 08:26              TYPE ROUTINE

 2966  013632  016704  000022                    MOV     DEVADR,R4       ;GET STARTING ADDR OF
 2967  013636  010524                      1$:   MOV     R5,(R4)+        ;STORE AT THIS ADDR
 2968  013640  062705  000002                    ADD     #2,R5
 2969  013644  105367  000013                    DECB    ADRCNT  ;HOW MANY TIMES + 2 ?
 2970  013650  001372                            BNE     1$
 2971  013652  000002                    PARTI:  RTI
 2972  013654  000000                    LOLIM:  0
 2973  013656  000000                    HILIM:  0
 2974  013660  000000                    DEVADR: 0
 2975  013662  000000                    LOBITS: 0
 2976          013663                    ADRCNT=LOBITS+1
 2977
 2978                                            ;SAVE PC OF TEST THAT FAILED AND R0-R5
 2979
 2980  013664  016667  000004  165234    .SAV05: MOV     4(SP),SAVPC
 2981
 2982                                            ;SAVE R0-R5
 2983
 2984  013672  010567  165576            SV05:   MOV     R5,$REG5
 2985  013676  010467  165570                    MOV     R4,$REG4
 2986  013702  010367  165562                    MOV     R3,$REG3
 2987  013706  010267  165554                    MOV     R2,$REG2
 2988  013712  010167  165546                    MOV     R1,$REG1
 2989  013716  010067  165540                    MOV     R0,$REG0
 2990  013722  000002                            RTI
 2991
 2992                                            ;RESTORE R0-R5
 2993
 2994  013724  016700  165532            .RES05: MOV     $REG0,R0
 2995  013730  016701  165530                    MOV     $REG1,R1
 2996  013734  016702  165526                    MOV     $REG2,R2
 2997  013740  016703  165524                    MOV     $REG3,R3
 2998  013744  016704  165522                    MOV     $REG4,R4
 2999  013750  016705  165520                    MOV     $REG5,R5
 3000  013754  000002                            RTI
 3001
 3002                                            ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
 3003
 3004  013756  104401            .CONVR: TYPE
 3005  013760  015435                    MCRLF   ;CR  LF
 3006  013762  017601  000000            MOV     @(SP),R1        ;PICK UP DATA POINTER
 3007  013766  062716  000002            ADD     #2,(SP) ;SET UP SP FOR RTI
 3008  013772  012167  000130            MOV     (R1)+,WRDCNT    ;PICK UP # OF WORDS FROM TABLE
 3009  013776  112167  000126    1$:     MOVB    (R1)+,CHRCNT    ;PICK UP # OF CHARS FROM TABLE
 3010  014002  112167  000123            MOVB    (R1)+,SPACNT    ;PICK UP # OF SPACES FROM TABLE
 3011  014006  013167  000120            MOV     @(R1)+,BINWRD   ;PICK UP ADDRESS OF  MSG
 3012                                                            ;FROM TABLE
 3013  014012  016704  000114    2$:     MOV     BINWRD,R4       ;SAVE
 3014  014016  116705  000106            MOVB    CHRCNT,R5       ;SAVE
 3015  014022  012700  016206            MOV     #TEMP,R0        ;STARTING ADDRESS OF TEMP BLOCK
 3016  014026  010403            3$:     MOV     R4,R3           ;SAVE
 3017  014030  042703  177770            BIC     #177770,R3      ;CLR OUT UPPER BITS .. SAVE CHAR
 3018  014034  062703  000260            ADD     #260,R3 ;CONVERT TO ASCII
 3019  014040  110320                    MOVB    R3,(R0)+        ;STORE AWAY
 3020  014042  006204                    ASR     R4      ;SHIFT FOR NEXT #
 3021  014044  006204                    ASR     R4      ;DITTO
```

```
3022  014046  006204                          ASR     R4      ;DITTO
3023  014050  005305                          DEC     R5      ;DEC CHAR COUNT
3024  014052  001365                          BNE     3$      ;DO IT AGAIN ?
3025  014054  012703  016250                  MOV     #MDATA,R3       ;STARTING ADDRESS OF MDATA BLOCK
3026  014060  114023                  4$:     MOVB    -(R0),(R3)+     ;REVERSE THE ORDER OF NUMBERS
3027  014062  105367  000042                  DECB    CHRCNT  ;DEC CHAR COUNT
3028  014066  001374                          BNE     4$      ;DO IT AGAIN ?
3029  014070  105767  000035                  TSTB    SPACNT  ;HOW MANY SPACES ?
3030  014074  001405                          BEQ     6$      ;TYPE # IF BR =0
3031  014076  112723  000240          5$:     MOVB    #240,(R3)+      ;"SPACE" IN ASCII
3032  014102  105367  000023                  DECB    SPACNT  ;DEC # OF SPACE COUNT
3033  014106  001373                          BNE     5$      ;DO IT AGAIN ?
3034  014110  105013                  6$:     CLRB    (R3)    ;INSERT "0" FOR TTY OUTPUT ROUTINE
3035  014112  104401                          TYPE
3036  014114  016250                          MDATA   ;THIS MESSAGE
3037  014116  005367  000004                  DEC     WRDCNT  ;HOW MANY #'S ?
3038  014122  001325                          BNE     1$      ;DO THIS ROUTINE AGAIN IF NOT EQUAL TO 0
3039  014124  000002                          RTI     ;RETURN TO PROGRAM
3040  014126  000000                  WRDCNT: 0
3041  014130  000000                  CHRCNT: 0
3042          014131                  SPACNT=CHRCNT+1
3043  014132  000000                  BINWRD: 0
3044
3045                                          ;COMPARE THE FIRST CHARACTER IN THE TELETYPE INPUT
3046                                          ;BUFFER TO THE CHARACTERS "N" AND "Y".
3047                                          ;IF THE CHARACTER IS "N" CLEAR THE FLAG
3048                                          ;IF THE CHARACTER IS "Y" SET THE FLAG
3049
3050  014134  017605  000000          .SETFLG:MOV     @(SP),R5
3051  014140  122767  000116  001776          CMPB    #'N,INBUF       ;IS IT "N" ?
3052  014146  001002                          BNE     1$
3053  014150  105015                          CLRB    (R5)    ;000
3054  014152  000406                          BR      2$
3055  014154  122767  000131  001762  1$:     CMPB    #'Y,INBUF       ;IS IT "Y" ?
3056  014162  001005                          BNE     3$
3057  014164  112715  177777                  MOVB    #-1,(R5)        ;377
3058  014170  062716  000002          2$:     ADD     #2,(SP)
3059  014174  000002                          RTI
3060  014176  104407                  3$:     INSTER  ;RETRY
3061  014200  000755                          BR      .SETFLG
3062                                  .SBTTL  ERROR HANDLER ROUTINE
3063
3064                                  ;;**********************************************************************
3065                                  ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
3066                                  ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
3067                                  ;*AND GO TO SAVIT ON ERROR
3068                                  ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
3069                                  ;*SW15=1         HALT ON ERROR
3070                                  ;*SW13=1         INHIBIT ERROR TYPEOUTS
3071                                  ;*SW10=1         BELL ON ERROR
3072                                  ;*SW09=1         LOOP ON ERROR
3073                                  ;*CALL
3074                                  ;*      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER
3075
3076  014202                          $ERROR:
3077  014202  105267  165175          7$:     INCB    $ERFLG          ;;SET THE ERROR FLAG
```

```
3078  014206  001775                        BEQ     7$                ;;DON'T LET THE FLAG GO TO ZERO
3079  014210  016777  165166  165224        MOV     $TSTNM,@DISPLAY   ;;DISPLAY TEST NUMBER AND ERROR FLAG
3080  014216  032777  002000  165214        BIT     #BIT10,@SWR       ;;BELL ON ERROR?
3081  014224  001402                        BEQ     1$                ;;NO - SKIP
3082  014226  104401  001516                TYPE    ,$BELL            ;;RING BELL
3083  014232  005267  165154          1$:   INC     $ERTTL            ;;COUNT THE NUMBER OF ERRORS
3084  014236  011667  165154                MOV     (SP),$ERRPC       ;;GET ADDRESS OF ERROR INSTRUCTION
3085  014242  162767  000002  165146        SUB     #2,$ERRPC
3086  014250  117767  165142  165136        MOVB    @$ERRPC,$ITEMB    ;;STRIP AND SAVE THE ERROR ITEM CODE
3087  014256  032777  020000  165154        BIT     #BIT13,@SWR       ;;SKIP TYPEOUT IF SET
3088  014264  001004                        BNE     20$               ;;SKIP TYPEOUTS
3089  014266  004767  000072                JSR     PC,SAVIT          ;;GO TO USER ERROR ROUTINE
3090  014272  104401  001523                TYPE    ,$CRLF
3091  014276                          20$:
3092  014276  122767  000001  165242        CMPB    #APTENV,$ENV      ;;RUNNING IN APT MODE
3093  014304  001007                        BNE     2$                ;;NO,SKIP APT ERROR REPORT
3094  014306  116767  165102  000004        MOVB    $ITEMB,21$        ;;SET ITEM NUMBER AS ERROR NUMBER
3095  014314  004767  000016'               JSR     PC,$ATY4          ;;REPORT FATAL ERROR TO APT
3096  014320     000                  21$:   .BYTE   0
3097  014321     000                         .BYTE   0
3098  014322  000777                  22$:   BR      22$               ;;APT ERROR LOOP
3099  014324  005777  165110           2$:   TST     @SWR              ;;HALT ON ERROR
3100  014330  100001                        BPL     3$                ;;SKIP IF CONTINUE
3101  014332  000000                        HALT                      ;;HALT ON ERROR!
3102  014334  032777  001000  165076   3$:   BIT     #BIT09,@SWR       ;;LOOP ON ERROR SWITCH SET?
3103  014342  001402                        BEQ     4$                ;;BR IF NO
3104  014344  016716  165040                MOV     $LPERR,(SP)       ;;FUDGE RETURN FOR LOOPING
3105  014350  005767  165140           4$:   TST     $ESCAPE           ;;CHECK FOR AN ESCAPE ADDRESS
3106  014354  001402                        BEQ     5$                ;;BR IF NONE
3107  014356  016716  165132                MOV     $ESCAPE,(SP)      ;;FUDGE RETURN ADDRESS FOR ESCAPE
3108  014362                          5$:
3109  014362  000002                        RTI                       ;;RETURN
3110  014364  010067  164540          SAVIT: MOV     R0,HLD0
3111  014370  010167  164536                 MOV     R1,HLD1
3112  014374  010267  164534                 MOV     R2,HLD2
3113  014400  010367  164532                 MOV     R3,HLD3
3114  014404  010467  164530                 MOV     R4,HLD4
3115  014410  010567  164526                 MOV     R5,HLD5
3116  014414  016767  164762  164522        MOV     $TSTNM,HLD6
3117
3118                                  .SBTTL  ERROR MESSAGE TYPEOUT ROUTINE
3119
3120                                  ;;**********************************************************************
3121                                  ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
3122                                  ;*ERROR IS TO BE REPORTED. IT THEN OBTAINS, FROM THE "ERROR TABLE" ($ERRTB),
3123                                  ;*AND REPORTS THE APPROPRIATE INFORMATION CONCERNING THE ERROR.
3124
3125  014422                          $ERRTYP:
3126  014422  104401  001523                TYPE    ,$CRLF            ;;"CARRIAGE RETURN" & "LINE FEED"
3127  014426  010046                        MOV     R0,-(SP)          ;;SAVE R0
3128  014430  005000                        CLR     R0                ;;PICKUP THE ITEM INDEX
3129  014432  153700  001414                BISB    @#$ITEMB,R0
3130  014436  001004                        BNE     1$                ;;IF ITEM NUMBER IS ZERO, JUST
3131                                                                  ;;TYPE THE PC OF THE ERROR
3132  014440  016746  164752                MOV     $ERRPC,-(SP)      ;;SAVE $ERRPC FOR TYPEOUT
3133                                                                  ;;ERROR ADDRESS
```

```
3134  014444  104402                        TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
3135  014446  000426                        BR      6$              ;;GET OUT
3136  014450  005300                1$:     DEC     R0              ;;ADJUST THE INDEX SO THAT IT WILL
3137  014452  006300                        ASL     R0              ;;      WORK FOR THE ERROR TABLE
3138  014454  006300                        ASL     R0
3139  014456  006300                        ASL     R0
3140  014460  062700  001652              ADD     #$ERRTB,R0      ;;FORM TABLE POINTER
3141  014464  012067  000004              MOV     (R0)+,2$        ;;PICKUP "ERROR MESSAGE" POINTER
3142  014470  001404                      BEQ     3$              ;;SKIP TYPEOUT IF NO POINTER
3143  014472  104401                      TYPE                    ;;TYPE THE "ERROR MESSAGE"
3144  014474  000000                2$:     .WORD   0               ;;"ERROR MESSAGE" POINTER GOES HERE
3145  014476  104401  001523              TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
3146  014502  012067  000004        3$:     MOV     @(R0)+,4$       ;;PICKUP "DATA HEADER" POINTER
3147  014506  001404                      BEQ     5$              ;;SKIP TYPEOUT IF 0
3148  014510  104401                      TYPE                    ;;TYPE THE "DATA HEADER"
3149  014512  000000                4$:     .WORD   0               ;;"DATA HEADER" POINTER GOES HERE
3150  014514  104401  001523              TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
3151  014520  011000                5$:     MOV     @(R0),R0        ;;PICKUP "DATA TABLE" POINTER
3152  014522  001004                      BNE     7$              ;;GO TYPE THE DATA
3153  014524  012600                6$:     MOV     (SP)+,R0        ;;RESTORE R0
3154  014526  104401  001523              TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
3155  014532  000207                      RTS     PC              ;;RETURN
3156  014534                        7$:
3157  014534  013046                      MOV     @(R0)+,-(SP)    ;;SAVE @(R0)+ FOR TYPEOUT
3158  014536  104402                      TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
3159  014540  005710                      TST     (R0)            ;;IS THERE ANOTHER NUMBER?
3160  014542  001770                      BEQ     6$              ;;BR IF NO
3161  014544  104401  014552              TYPE    ,8$             ;;TYPE TWO(2) SPACES
3162  014550  000771                      BR      7$              ;;LOOP
3163  014552  020040      000       8$:     .ASCIZ  /  /            ;;TWO(2) SPACES
3164          014556                      .EVEN
3165                                .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
3166
3167                                ;;**************************************************************
3168                                ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
3169                                ;*OCTAL (ASCII) NUMBER AND TYPE IT.
3170                                ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
3171                                ;*CALL:
3172                                ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
3173                                ;*      TYPOS                   ;;CALL FOR TYPEOUT
3174                                ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
3175                                ;*      .BYTE   M               ;;M=1 OR 0
3176                                ;*                                      ;;1=TYPE LEADING ZEROS
3177                                ;*                                      ;;0=SUPPRESS LEADING ZEROS
3178                                ;*
3179                                ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
3180                                ;*$TYPOS OR $TYPOC
3181                                ;*CALL:
3182                                ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
3183                                ;*      TYPON                   ;;CALL FOR TYPEOUT
3184                                ;*
3185                                ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
3186                                ;*CALL:
3187                                ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
3188                                ;*      TYPOC                   ;;CALL FOR TYPEOUT
3189
```

```
3190  014556  017646  000000          $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
3191  014562  116667  000001  000211          MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
3192  014570  112667  000207                  MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
3193  014574  062716  000002                  ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
3194  014600  000406                          BR      $TYPON
3195  014602  112767  000001  000171  $TYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
3196  014610  112767  000006  000165          MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
3197  014616  112767  000005  000154  $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
3198  014624  010346                          MOV     R3,-(SP)        ;;SAVE R3
3199  014626  010446                          MOV     R4,-(SP)        ;;SAVE R4
3200  014630  010546                          MOV     R5,-(SP)        ;;SAVE R5
3201  014632  116704  000145                  MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
3202  014636  005404                          NEG     R4
3203  014640  062704  000006                  ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
3204  014644  110467  000132                  MOVB    R4,$OMODE       ;;SAVE IT FOR USE
3205  014650  116704  000125                  MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
3206  014654  016605  000012                  MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
3207  014660  005003                          CLR     R3              ;;CLEAR THE OUTPUT WORD
3208  014662  006105                  1$:     ROL     R5              ;;ROTATE MSB INTO "C"
3209  014664  000404                          BR      3$              ;;GO DO MSB
3210  014666  006105                  2$:     ROL     R5              ;;FORM THIS DIGIT
3211  014670  006105                          ROL     R5
3212  014672  006105                          ROL     R5
3213  014674  010503                          MOV     R5,R3
3214  014676  006103                  3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
3215  014700  105367  000076                  DECB    $OMODE          ;;TYPE THIS DIGIT?
3216  014704  100016                          BPL     7$              ;;BR IF NO
3217  014706  042703  177770                  BIC     #177770,R3      ;;GET RID OF JUNK
3218  014712  001002                          BNE     4$              ;;TEST FOR 0
3219  014714  005704                          TST     R4              ;;SUPPRESS THIS 0?
3220  014716  001403                          BEQ     5$              ;;BR IF YES
3221  014720  005204                  4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
3222  014722  052703  000060                  BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
3223  014726  052703  000040          5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
3224  014732  110367  000040                  MOVB    R3,8$           ;;SAVE FOR TYPING
3225  014736  104401  014776                  TYPE    ,8$             ;;GO TYPE THIS DIGIT
3226  014742  105367  000032          7$:     DECB    $OCNT           ;;COUNT BY 1
3227  014746  003347                          BGT     2$              ;;BR IF MORE TO DO
3228  014750  002402                          BLT     6$              ;;BR IF DONE
3229  014752  005204                          INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
3230  014754  000744                          BR      2$              ;;GO DO THE LAST DIGIT
3231  014756  012605                  6$:     MOV     (SP)+,R5        ;;RESTORE R5
3232  014760  012604                          MOV     (SP)+,R4        ;;RESTORE R4
3233  014762  012603                          MOV     (SP)+,R3        ;;RESTORE R3
3234  014764  016666  000002  000004          MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
3235  014772  012616                          MOV     (SP)+,(SP)
3236  014774  000002                          RTI                     ;;RETURN
3237  014776     000          8$:     .BYTE   0                       ;;STORAGE FOR ASCII DIGIT
3238  014777     000                  .BYTE   0                       ;;TERMINATOR FOR TYPE ROUTINE
3239  015000     000          $OCNT:  .BYTE   0                       ;;OCTAL DIGIT COUNTER
3240  015001     000          $OFILL: .BYTE   0                       ;;ZERO FILL SWITCH
3241  015002  000000          $OMODE: .WORD   0                       ;;NUMBER OF DIGITS TO TYPE
3242                                  ;ENTER HERE ON POWER FAILURE
3243
3244
3245  015004                  $PWRDN:
```

```
3246  015004  010046                  .PFAIL: MOV     R0,-(SP)                ;SAVE R0-R5 ON PROCESSOR STACK
3247  015006  010146                          MOV     R1,-(SP)
3248  015010  010246                          MOV     R2,-(SP)
3249  015012  010346                          MOV     R3,-(SP)
3250  015014  010446                          MOV     R4,-(SP)
3251  015016  010546                          MOV     R5,-(SP)
3252  015020  016746  163000                  MOV     24,-(SP)
3253  015024  010667  164066                  MOV     SP,SAVSP                ;SAVE STACK POINTER
3254  015030  012767  015042  162766          MOV     #RESTART,24             ;SET UP FOR POWER UP TRAP
3255  015036  000000                          HALT                            ;HALT ON POWER DOWN NORMAL
3256  015040  000777                          BR      .
3257
3258                                          ;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED
3259
3260  015042  016706  164050          RESTAR: MOV     SAVSP,SP                ;RESTORE STACK POINTER
3261  015046  012605                          MOV     (SP)+,R5                ;RESTORE R0-R5
3262  015050  012604                          MOV     (SP)+,R4
3263  015052  012603                          MOV     (SP)+,R3
3264  015054  012602                          MOV     (SP)+,R2
3265  015056  012601                          MOV     (SP)+,R1
3266  015060  012600                          MOV     (SP)+,R0
3267  015062  012767  015004  162734          MOV     #.PFAIL,24              ;SET UP FOR POWER FAILURE
3268  015070  106427  000340                  MTPS    #340
3269  015074  012706  001100                  MOV     #STACK,SP
3270  015100  005067  001102                  CLR     TEMP
3271  015104  005267  001076                  INC     TEMP
3272  015110  001375                          BNE     .-4
3273  015112  104413                          CONVRT
3274  015114  015136                          PFTAB
3275  015116  104401                          TYPE
3276  015120  015440                          MPFAIL
3277  015122  005067  164255                  CLR     $ERFLG
3278  015126  005067  164264                  CLR     $ERRPC
3279  015132  000177  163746                  JMP     @RETURN
3280  015136  000001                  PFTAB:  1
3281  015140     006     002                  .BYTE   6,2
3282  015142  000207                          RETURN
3283  015144  005015  042012  053125  MTITLE: .ASCIZ  <15><12><12>/DUV11 DZDUV-A TAPE F /<15><12>
3284  015152  030461  042040  042132
3285  015160  053125  040455  052040
3286  015166  050101  020105  020106
3287  015174  005015     000
3288  015177     015  053012  041505  MVECTO: .ASCIZ  <15><12>/VEC ADD-/
3289  015204  040440  042104  000055
3290  015212  005015  051461  020124  MREGAD: .ASCIZ  <15><12>/1ST DEV: REC CSR ADD-/
3291  015220  042504  035126  051040
3292  015226  041505  041440  051123
3293  015234  040440  042104  000055
3294  015242  005015  052515  052114  MMULT:  .ASCIZ  <15><12>/MULT DEV ? (Y OR N)-/
3295  015250  042040  053105  037440
3296  015256  024040  020131  051117
3297  015264  047040  026451     000
3298  015271     015  046012  051501  MLASTD: .ASCIZ  <15><12>/LAST DEV: REC CSR ADDR-/
3299  015276  020124  042504  035126
3300  015304  051040  041505  041440
3301  015312  051123  040440  042104
```

```
3302  015320  026522     000
3303  015323     075  042504  044526  DEVICE: .ASCIZ  /=DEVICE  /
3304  015330  042503  020040     000
3305  015335     015  051412  046105  MCOW:   .ASCIZ  <15><12>/SELECT TO RUN @ACTREG/
3306  015342  041505  020124  047524
3307  015350  051040  047125  040040
3308  015356  041501  051124  043505
3309  015364     000
3310  015365     015  047412  043126  MRANGE: .ASCIZ  <15><12>/OVFLO:RETYPE LAST DEV RXCSR ADDS-/
3311  015372  047514  051072  052105
3312  015400  050131  020105  040514
3313  015406  052123  042040  053105
3314  015414  051040  041530  051123
3315  015422  040440  042104  026523
3316  015430     000
3317  015431     040  037440     000  MQM:    .ASCIZ  /  ?/
3318  015435     015  000012          MCRLF:  .ASCIZ   <15><12>
3319  015440  043120  044501  026114  MPFAIL: .ASCIZ  /PFAIL,  RESTART AT TEST IN PROGRESS/
3320  015446  020040  042522  052123
3321  015454  051101  020124  052101
3322  015462  052040  051505  020124
3323  015470  047111  050040  047522
3324  015476  051107  051505  000123
3325  015504  005015  047105  020104  MEPASS: .ASCIZ  <15><12>/END OF PASS TAPE F/
3326  015512  043117  050040  051501
3327  015520  020123  040524  042520
3328  015526  043040     000
3329  015531     015  051012     000  MR:     .ASCIZ  <15><12>/R/
3330  015535     015  052012  051505  MTSTPC: .ASCIZ  <15><12>/TEST PC-/
3331  015542  020124  041520  000055
3332  015550  005015  047514  045503  MLOCK:  .ASCIZ  <15><12>/LOCK ON  TEST? (Y OR N)-/
3333  015556  047440  020116  052040
3334  015564  051505  037524  024040
3335  015572  020131  051117  047040
3336  015600  026451     000
3337  015603     015  021412  047440  MSYNC:  .ASCIZ  <15><12>/# OF SYNC CHARS SELECTED ( 1 OR 2)-/
3338  015610  020106  054523  041516
3339  015616  041440  040510  051522
3340  015624  051440  046105  041505
3341  015632  042524  020104  020050
3342  015640  020061  051117  031040
3343  015646  026451     000
3344  015651     015  044412  020123  MWIRE6: .ASCIZ  <15><12>/IS SEC XMIT SWITCH E55-2 IN? (Y OR N)-/
3345  015656  042523  020103  046530
3346  015664  052111  051440  044527
3347  015672  041524  020110  032505
3348  015700  026465  020062  047111
3349  015706  020077  054450  047440
3350  015714  020122  024516  000055
3351  015722  005015  051511  051440  MWIRE5: .ASCIZ  <15><12>/IS SEC REC SWITCH E55-3 IN? (Y OR N)-/
3352  015730  041505  051040  041505
3353  015736  051440  044527  041524
3354  015744  020110  032505  026465
3355  015752  020063  047111  020077
3356  015760  054450  047440  020122
3357  015766  024516  000055
```

```
  3358  015772  005015  051511  047440  MWIRE4: .ASCIZ  <15><12>/IS OPT CLR ENABLE SWITCH E55-1 IN? (Y OR N)-/
  3359  016000  052120  041440  051114
  3360  016006  042440  040516  046102
  3361  016014  020105  053523  052111
  3362  016022  044103  042440  032465
  3363  016030  030455  044440  037516
  3364  016036  024040  020131  051117
  3365  016044  047040  026451     000
  3366  016051     015  005012  031510  MEXTJ:  .ASCIZ  <15><12><12>/H315 CONNECTOR ON ?(Y OR N)-/
  3367  016056  032461  041440  047117
  3368  016064  042516  052103  051117
  3369  016072  047440  020116  024077
  3370  016100  020131  051117  047040
  3371  016106  026451     000
  3372  016111     015  020012  043536  MCNTG:  .ASCIZ  <15><12>/ ↑G  /
  3373  016116  020040     000
  3374  016121     040  053523  036522  MMSWR:  .ASCIZ  / SWR=   /
  3375  016126  020040  000040
  3376  016132  020040  047040  053505  MMNEW:  .ASCIZ  /   NEW=  /
  3377  016140  020075  000040
  3378                                  .EVEN
  3379
  3380                                  ;BUFFERS FOR INPUT-OUTPUT
  3381
  3382  016144  000000                  INBUF:  0
  3383          016206                  .=.+40
  3384  016206  000000                  TEMP:   0
  3385          016250                  .=.+40
  3386  016250  000000                  MDATA:  0
  3387          016312                  .=.+40
  3388                                  .SBTTL  SCOPE HANDLER ROUTINE
  3389
  3390                                  ;;*****************************************************************
  3391                                  ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
  3392                                  ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
  3393                                  ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
  3394                                  ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
  3395                                  ;*SW14=1         LOOP ON TEST
  3396                                  ;*SW11=1         INHIBIT ITERATIONS
  3397                                  ;*SW09=1         LOOP ON ERROR
  3398                                  ;*SW08=1         LOOP ON TEST IN SWR<7:0>
  3399                                  ;*CALL
  3400                                  ;*      SCOPE           ;;SCOPE=IOT
  3401
  3402  016312                          $SCOPE:
  3403
  3404                                  ;SCOPE LOOP AND INTERATION HANDLER
  3405
  3406  016312                          .SCOPE:
  3407  016312  004767  174376                 JSR     PC,CKSWR
  3408  016316  005067  163074                 CLR     $ERRPC          ;CLEAR LAST ERROR PC
  3409  016322  022716  003364                 CMP     #TST1+2,(SP)    ;IS SCOPE AT BEGINING OF TEST 1?
  3410  016326  001413                         BEQ     $XTSTR          ;YES NO LOOP.
  3411
  3412  016330  000406                  TTST:  BR      1$              ;GO TO 1$ (IF LOCK SW02=1)
  3413  016332  105777  163106                 TSTB    @$TKS           ;KEYBOARD DONE?
```

```
  3414  016336  100123                        BPL     $OVER           ;BR IF NO
  3415  016340  017766  163102  177776        MOV     @$TKB,-2(SP)    ;CLEAR DONE BIT
  3416  016346  032777  040000  163064  1$:   BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
  3417  016354  001114                        BNE     $OVER           ;;YES IF SW14=1
  3418                                        ;#####START OF CODE FOR THE XOR TESTER#####
  3419  016356  000416                  $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
  3420                                                                  ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
  3421  016360  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
  3422  016364  012737  016404  000004          MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
  3423  016372  005737  177060                  TST     @#177060        ;;TIME OUT ON XOR?
  3424  016376  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
  3425  016402  000463                          BR      $SVLAD          ;;GO TO THE NEXT TEST
  3426  016404  022626                  5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
  3427  016406  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
  3428  016412  000423                          BR      7$              ;;LOOP ON THE PRESENT TEST
  3429  016414                            6$:;#####END OF CODE FOR THE XOR TESTER#####
  3430  016414  032777  000400  163016          BIT     #BIT08,@SWR     ;;LOOP ON SPEC. TEST?
  3431  016422  001404                          BEQ     2$              ;;BR IF NO
  3432  016424  127767  163010  162750          CMPB    @SWR,$TSTNM     ;;ON THE RIGHT TEST?    SWR<7:0>
  3433  016432  001465                          BEQ     $OVER           ;;BR IF YES
  3434  016434  105767  162743          2$:     TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
  3435  016440  001421                          BEQ     3$              ;;BR IF NO
  3436  016442  126767  162747  162733          CMPB    $ERMAX,$ERFLG   ;;MAX. ERRORS FOR THIS TEST OCCURRED?
  3437  016450  101015                          BHI     3$              ;;BR IF NO
  3438  016452  032777  001000  162760          BIT     #BIT09,@SWR     ;;LOOP ON ERROR?
  3439  016460  001404                          BEQ     4$              ;;BR IF NO
  3440  016462  016767  162722  162716  7$:     MOV     $LPERR,$LPADR   ;;SET LOOP ADDRESS TO LAST SCOPE
  3441  016470  000446                          BR      $OVER
  3442  016472  105067  162705          4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
  3443  016476  005067  163010                  CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
  3444  016502  000415                          BR      1$              ;;ESCAPE TO THE NEXT TEST
  3445  016504  032777  004000  162726  3$:     BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
  3446  016512  001011                          BNE     1$              ;;BR IF YES
  3447  016514  005767  163014                  TST     $PASS           ;;IF FIRST PASS OF PROGRAM
  3448  016520  001406                          BEQ     1$              ;;      INHIBIT ITERATIONS
  3449  016522  005267  162656                  INC     $ICNT           ;;INCREMENT ITERATION COUNT
  3450  016526  026767  162760  162650          CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
  3451  016534  002024                          BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
  3452  016536  012767  000001  162640  1$:     MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
  3453  016544  016767  000056  162740          MOV     $MXCNT,$TIMES   ;;SET NUMBER OF ITERATIONS TO DO
  3454  016552  105267  162624            $SVLAD: INCB    $TSTNM          ;;COUNT TEST NUMBERS
  3455  016556  116767  162620  162746          MOVB    $TSTNM,$TESTN   ;;SET TEST NUMBER IN APT MAILBOX
  3456  016564  011667  162616                  MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
  3457  016570  011667  162614                  MOV     (SP),$LPERR     ;;SAVE ERROR LOOP ADDRESS
  3458  016574  005067  162714                  CLR     $ESCAPE         ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
  3459  016600  112767  000001  162607          MOVB    #1,$ERMAX       ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
  3460  016606  016777  162570  162626  $OVER:  MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
  3461  016614  016716  162566                  MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
  3462  016620  000002                  4$:     RTI
  3463  016622  001407                  BRW:    1407
  3464  016624  000432                  BRX:    432
  3465  016626  000005                  $MXCNT: 5                       ;;MAX. NUMBER OF ITERATIONS
  3466                                  .SBTTL  TRAP DECODER
  3467
  3468                                  ;;*****************************************************************
  3469                                  ;*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.

016630 010046           $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
016632 016600 000002            MOV     2(SP),R0        ;;GET TRAP ADDRESS
016636 005740                   TST     -(R0)           ;;BACKUP BY 2
016640 111000                   MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
016642 006300                   ASL     R0              ;;POSITION FOR INDEXING
016644 016000 016664            MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
016650 000200                   RTS     R0              ;;GO TO ROUTINE

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

016652 011646           $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
016654 016666 000004 000002     MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
016662 000002                   RTI                     ;;RESTORE THE PSW

                        .SBTTL  TRAP TABLE

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

                        ;       ROUTINE
                        ;       -------
016664 016652           $TRPAD: .WORD   $TRAP2
016666 013064                   $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
016670 014602                   $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
016672 014556                   $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
016674 014616                   $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)

016676 013042                   .SCOP1  ;;CALL=SCOP1    TRAP+5(104405)
016700 013346                   .INSTR  ;;CALL=INSTR    TRAP+6(104406)
016702 013454                   .INSTER ;;CALL=INSTER   TRAP+7(104407)
016704 013464                   .PARAM  ;;CALL=PARAM    TRAP+10(104410)
016706 013664                   .SAVOS  ;;CALL=SAVOS    TRAP+11(104411)
016710 013724                   .RESOS  ;;CALL=RESOS    TRAP+12(104412)
016712 013756                   .CONVRT ;;CALL=CONVRT   TRAP+13(104413)
016714 014134                   .SETFLG ;;CALL=SETFLG   TRAP+14(104414)
                        ;*****************************************************************
                        ;UTILITIES
                        ;*****************************************************************

                        ;THIS UTILITY CALCULATES PRIORITY LEVEL
016716 006367 000044    DULEV:  ASL     DUPRT   ;SHIFT LEFT
016722 006367 000040            ASL     DUPRT   ;
016726 006367 000034            ASL     DUPRT   ;
016732 006367 000030            ASL     DUPRT   ;
016736 006367 000024            ASL     DUPRT   ;
016742 016767 000020 000020     MOV     DUPRT,LESS1     ;MOVE THIS TO LESS1
016750 162767 000001 000012     SUB     #1,LESS1        ;CREATE LESS1
016756 042767 000037 000004     BIC     #37,LESS1       ;CLEAR TNZVC
016764 000207                   RTS     PC
016766 000240           DUPRT:  PR5
```

```
3526  016770  000200                  LESS1:  PR4     ;LEVEL TO ALLOW INTERRUPTS
3527
3528                                          ;NEW DU ADDRESSES
3529  016772  016767  000126  162712  DUADDR: MOV     DUBASE,RXCSR    ;XXX0
3530  017000  005267  000120                  INC     DUBASE
3531  017004  016767  000114  162702          MOV     DUBASE,HRXCSR   ;XXX1
3532  017012  005267  000106                  INC     DUBASE
3533  017016  016767  000102  162672          MOV     DUBASE,RXDBUF   ;XXX2
3534  017024  016767  000074  162670          MOV     DUBASE,PARCSR   ;XXX2
3535  017032  005267  000066                  INC     DUBASE
3536  017036  016767  000062  162654          MOV     DUBASE,HRXDBUF  ;XXX3
3537  017044  016767  000054  162652          MOV     DUBASE,HPARCSR  ;XXX3
3538  017052  005267  000046                  INC     DUBASE
3539  017056  016767  000042  162642          MOV     DUBASE,TXCSR    ;XXX4
3540  017064  005267  000034                  INC     DUBASE
3541  017070  016767  000030  162632          MOV     DUBASE,HTXCSR   ;XXX5
3542  017076  005267  000022                  INC     DUBASE
3543  017102  016767  000016  162622          MOV     DUBASE,TXDBUF   ;XXX6
3544  017110  005267  000010                  INC     DUBASE
3545  017114  016767  000004  162612          MOV     DUBASE,HTXDBUF  ;XXX7
3546  017122  000207                          RTS     PC
3547  017124  000000                  DUBASE: 0
3548
3549                                          ;THIS UTILITY POKES THE MAINT DATA BASED UPON THE
3550                                          ;INFORMATION CONTAINED IN $TMP1 AND IT IS
3551                                          ;SHIFTED IN BY THE CONTENTS OF SHIFT
3552  017126  042777  040000  162572  RPOKE:  BIC     #MTDATA,@TXCSR
3553  017134  005067  162342                  CLR     $TMP2
3554  017140  006067  162334                  ROR     $TMP1   ;FORCE CARRY
3555  017144  006067  162332                  ROR     $TMP2   ;PICK UP CARRY IN BIT 15
3556  017150  006267  162326                  ASR     $TMP2   ;SHIFT INTO BIT 14
3557  017154  042767  100000  162320          BIC     #BIT15,$TMP2    ;CLR BIT 15
3558  017162  056777  162314  162536          BIS     $TMP2,@TXCSR    ;POKE MAINT DATA
3559  017170  042777  020000  162530          BIC     #CLK,@TXCSR     ;POKE CLK
3560  017176  052777  020000  162522          BIS     #CLK,@TXCSR     ;
3561  017204  005367  161712                  DEC     SHIFT
3562  017210  001346                          BNE     RPOKE
3563  017212  000207                          RTS     PC
3564
3565                                          ;THIS ROUTINE CALCULATES ODD PARITY FOR AN 8 BIT CHAR
3566  017214  016767  162260  162260  ODD8:   MOV     $TMP1,$TMP2     ;SAVE TEMP1
3567  017222  005067  162256                  CLR     $TMP3
3568  017226  012727  000010                  MOV     #8.,(PC)+
3569  017232  000000                  4$:     0
3570  017234  006067  162242          1$:     ROR     $TMP2
3571  017240  005567  162240                  ADC     $TMP3
3572  017244  005367  177762                  DEC     4$
3573  017250  001371                          BNE     1$
3574  017252  006067  162226                  ROR     $TMP3
3575  017256  103404                          BCS     2$
3576  017260  052767  000400  162212          BIS     #BIT8,$TMP1     ;SET ODD PARITY
3577  017266  000403                          BR      3$
3578  017270  042767  000400  162202  2$:     BIC     #BIT8,$TMP1     ;CLR EVEN PARITY
3579                                          ;$TMP1 NOW HAS ODD PARITY CHARACTER
3580  017276  000207                  3$:     RTS     PC
3581
```

```
3582                                            ;THIS ROUTINE CALCULATES EVEN PARITY FOR AN 8 BIT CHARACTER
3583  017300  016767  162174  162174  EVEN8:    MOV     $TMP1,$TMP2     ;SAVE TEMP1
3584  017306  005067  162172                    CLR     $TMP3
3585  017312  012727  000010                    MOV     #8.,(PC)+
3586  017316  000000                  4$:       0
3587  017320  006067  162156          1$:       ROR     $TMP2
3588  017324  005567  162154                    ADC     $TMP3
3589  017330  005367  177762                    DEC     4$
3590  017334  001371                            BNE     1$
3591  017336  006067  162142                    ROR     $TMP3
3592  017342  103004                            BCC     2$
3593  017344  052767  000400  162126            BIS     #BIT8,$TMP1     ;SET EVEN PARITY
3594  017352  000403                            BR      3$
3595  017354  042767  000400  162116  2$:       BIC     #BIT8,$TMP1     ;CLR ODD PARITY
3596                                            ;$TMP1 NOW HAS EVEN PARITY CHARACTER
3597  017362  000207                  3$:       RTS     PC
3598  017364  062716  000002          TRPREG:   ADD     #2,(SP) ;ALLOW IT TO "CRUNCH" INTO HLT BACK
3599                                                            ;IN MAIN PART OF THE PROGRAM
3600  017370  000002                            RTI
3601          000001                  .END
```

```
AAA     003200            1291#
ABASE = 000000             874     915
ACDW1 = 000000             874     917
ACDW2 = 000000             874     918
ACPUOP= 000000             874     889
ACTREG  001166             733#   1247*   1261*   1262*   1269*   2715    2718    2728
ADDW0 = 000000             874     919
ADDW1 = 000000             874     920
ADDW10= 000000             874     929
ADDW11= 000000             874     930
ADDW12= 000000             874     931
ADDW13= 000000             874     932
ADDW14= 000000             874     933
ADDW15= 000000             874     934
ADDW2 = 000000             874     921
ADDW3 = 000000             874     922
ADDW4 = 000000             874     923
ADDW5 = 000000             874     924
ADDW6 = 000000             874     925
ADDW7 = 000000             874     926
ADDW8 = 000000             874     927
ADDW9 = 000000             874     928
ADEVCT= 000000             874     880
ADEVM = 000000             874     916
ADRCNT= 013663            2930*   2969*   2976#
AENV  = 000000             874     885
AENVM = 000000             874     886
AFATAL= 000000             874     877
AMADR1= 000000             874     902
AMADR2= 000000             874     906
AMADR3= 000000             874     909
AMADR4= 000000             874     912
AMAMS1= 000000             874     896
AMAMS2= 000000             874     904
AMAMS3= 000000             874     907
AMAMS4= 000000             874     910
AMSGAD= 000000             874     882
AMSGLG= 000000             874     883
AMSGTY= 000000             874     876
AMTYP1= 000000             874     897
AMTYP2= 000000             874     905
AMTYP3= 000000             874     908
AMTYP4= 000000             874     911
APASS = 000000             874     879
APRIOR= 000000             874
APTCSU= 000040             534#   2845
APTENV= 000001             534#   2838    3092
APTSIZ= 000200             534#   1166
APTSPO= 000100             534#   2840
ASWREG= 000000             874     887
ATESTN= 000000             874     878
AUNIT = 000000             874     881
AUSWR = 000000             874     888
AVECT1= 000000             874     913
AVECT2= 000000             874     914
BASEAD  001154             728#   1229*   1266*   1267    1273*   1275*   2722*   2734*   2738
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
BASEIV  001162            731#   1239#  2723#  2735#  2740   2741#  2742   2743#  2744   2745#  2746   2747#
BBB     003026           1246    1250#
BINWRD  014132           3011#   3013   3043#
BITW  = 002000            800#    993#
BIT0  = 000001            663#    776    807    969   1000
BIT00 = 000001            653#    663
BIT01 = 000002            652#    662
BIT02 = 000004            651#    661
BIT03 = 000010            650#    660
BIT04 = 000020            649#    659
BIT05 = 000040            648#    658
BIT06 = 000100            647#    657
BIT07 = 000200            646#    656
BIT08 = 000400            645#    655   3430
BIT09 = 001000            644#    654   3102   3438
BIT1  = 000002            662#    775    968
BIT10 = 002000            643#    766    800    959    993   3080
BIT11 = 004000            642#    765    958   3445
BIT12 = 010000            641#    764    781    957    974
BIT13 = 020000            640#    763    780    799    956    973   992   3087
BIT14 = 040000            639#    762    779    798    955    972   991   3416
BIT15 = 100000            638#    761    778    797    954    971   990   3557
BIT2  = 000004            661#    774    967
BIT3  = 000010            660#    773    806    966    999
BIT4  = 000020            659#    772    805    965    998
BIT5  = 000040            658#    771    804    964    997
BIT6  = 000100            657#    770    803    963    996
BIT7  = 000200            656#    769    802    962    995
BIT8  = 000400            655#    768    784    801    961   977   994   3576   3578   3593   3595
BIT9  = 001000            654#    767    783    960    976
BPTVEC= 000014            670#
BREAK = 000001            807#   1000#  1354   1427   2550   2605  2660
BRW     016622           3463#
BRX     016624           3464#
CARDET= 010000            764#    957#
CCC     012614           2714    2737   2754#
CHRCNT  014130           3009#   3014   3027#  3041#  3042
CKSWR   012714           2708    2770   2778#  2810   3407
CLK   = 020000            799#    992#  1354   1360   1361   1389  1390   1427   1433   1434   1482   1483   1524
                         1525    1528   1529   1537   1706   1707  1710   1711   1735   1989   1990   1993   1994
                         2008    2009   2035   2072   2073   2076  2077   2091   2092   2118   2155   2156   2159
                         2160    2174   2175   2201   2238   2239  2242   2243   2257   2258   2284   2321   2322
                         2326    2327   2369   2370   2374   2375  2419   2425   2434   2440   2490   2496   2505
                         2511    2550   2556   2557   2559   2560  2605   2611   2612   2614   2615   2660   2666
                         2667    2669   2670   3559   3560
CNTLU   012770           1196    2789#
CONVRT= 104413           2711    2791   3273   3509#
COUNT   001124            708#   1873#  1877#  1911   1915#  1956  2001#  2012#  2084#  2095#  2167#  2178#  2250#
                         2261#
CR    = 000015            578#   2884   2894
CRLF  = 000200            579#   2855   2894
CTS   = 020000            763#    956#
DDISP = 177570            585#    841   1154
DEVADR  013660           2928#   2966   2974#
DEVICE  015323           2712    3303#
DF1     002132           1025    1029   1033   1037   1083#
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
DH1     002067          1023    1027    1031    1072#
DISPLA  001442           841#   1154*   1162*   1187*   3079*   3460*
DISPRE  000174           682#   1162    1187
DNA    = 100000          797#    990#
DNAINT= 000040           804#    997#   1535    1548    1557    1717    1742    1754    1761
DSC    = 100000          761#    954#
DSINTE= 000040           771#    964#   1455    1467    1471    1495
DSR    = 001000          767#    960#
DSWR   = 177570          584#    840    1153
DTR    = 000002          775#    968#   1448
DT1     002116          1024    1028    1032    1078#
DT4     002126          1036    1081#
DUADDR  016772          1228    2739    3529#
DUBASE  017124          1224    1227    2738*   3529    3530*   3531    3532*   3533    3534    3535*   3536    3537    3538*
                        3539    3540*   3541    3542*   3543    3544*   3545    3547#
DULEV   016716          1286    3516#
DUPRT   016766          1285*   1363    1436    1533    1570    1607    1650    1715    1787    1867    1869    3516*   3517*
                        3518*   3519*   3520*   3521    3525#
DURIS   001740          1052#   1363*   1373    1374*   1397    1398*   1436*   1458    1459*   1490    1491*   1787*   1810
                        1811*   1818    1819*   1867*   1893    1894*   1904    1905*   1934    1935*   2742*
DURIV   001736          1051#   1235    1238    1239    1362*   1373*   1397*   1435*   1446*   1458*   1490*   1786*   1810*
                        1818*   1866*   1893*   1904*   1934*   2740*   2747
DUTIS   001744          1054#   1533*   1550    1551*   1554    1555*   1570*   1587    1588*   1591    1592*   1607*   1615
                        1616*   1623    1624*   1650*   1679    1680*   1715*   1745    1746*   1758    1759*   1869*   1895
                        1896*   1906    1907*   1936    1937*   2746*
DUTIV   001742          1053#   1532*   1550*   1554*   1569*   1587*   1591*   1606*   1615*   1623*   1649*   1661*   1679*
                        1714*   1733*   1745*   1758*   1868*   1895*   1906*   1936*   2744*
EIGHT  = 006000           792#    985#   1357    1430    1520    1702    1782    1852    2232    2315    2363    2413    2484
EMTVEC= 000030           673#   1138*   1139*
EM1     001762          1022    1058#
EM2     002022          1026    1064#
EM3     002043          1030    1067#
EM4     001746          1034    1056#
ERRCNT  001114           701#
ERRVEC= 000004           666#   1151    1152*   1163*   3421    3422*   3424*   3427*
EVEN8   017300          3583#
EVEPAR= 001400           795#    988#   2315    2413
EVPAR  = 000400           784#    977#
FIVE   = 000000           789#    982#   1983    2553    2608    2663
FRMERR= 020000           780#    973#
GNS    = ****** U       3497    3498    3499    3500    3503    3504    3505    3506    3507    3508    3509    3510
HDXEN  = 000010           806#    999#
HILIM   013656          2927*   2957    2973#
HLD0    001130           710#   1078    3110*
HLD1    001132           711#   1078    3111*
HLD2    001134           712#   3112*
HLD3    001136           713#   3113*
HLD4    001140           714#   3114*
HLD5    001142           715#   3115*
HLD6    001144           716#   3116*
HOLD    001120           706#   2421    2427    2436    2442    2492    2498    2507    2513
HPARCS  001724          1045#   3537*
HRXCSR  001714          1041#   3531*
HRXDBU  001720          1043#   3536*
HT     = 000011           576#   2853    2894
HTXCSR  001730          1047#   3541*
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
HTXDBU  001734          1049#   3545*
INBUF   016144          1294    1298    2903    2933    3051    3055    3382#
INIFLG  001172           741#   1197    1200*
INSTER= 104407          1302    2952    3060    3505#
INSTR = 104406          1219    1230    1240    1251    1276    1292    1305    1309    1313    1317    1328    2793    3504#
INSTR2  013462          2900    2912    2921#
IOTVEC= 000020           671#   1136*   1137*
ISYMOD= 000000           788#    981#   2546    2553    2601    2608    2656    2663
JMRBY   001153           724#   1205*   1320    1419    2402    2473
KEEPAD  001156           729#   1227*   1229    1273    1275    2734
KEEPIV  001164           732#   1238*   2735
LASTAD  001160           730#   1256    1267    1281
LESS1   016770          3521*   3522*   3523*   3526#
LF    = 000012           577#   2888    2894
LIGHTS  001102           691#   2759*
LIMITS  013610          2943    2957#
LOBITS  013662          2929*   2961    2975#   2976
LOCK    001110           699#   2813
LOKFLG  001174           743#
LOLIM   013654          2926*   2959    2972#
MCNTG   016111          2788    3372#
MCOW    015335          2717    3305#
MCRLF   015435          3005    3318#
MDATA   016250          3025    3036    3386#
MEPASS  015504          2710    3325#
MEXT  = 010000           811#   1004#   2410    2481
MEXTJ   016051          1318    3366#
MINT  = 004000           810#   1003#   1354    1427    1517    1699    1984    2067    2150    2233    2312    2360    2550
                        2605    2660
MLASTD  015271          1252    3298#
MLOCK   015550          3332#
MMNEW   016132          2793    3376#
MMSWR   016121          2790    3374#
MMULT   015242          1241    3294#
MPFAIL  015440          3276    3319#
MQM     015431          2919    3317#
MR      015531          1338    3329#
MRANGE  015365          1277    3310#
MREGAD  015212          1220    3290#
MRESET= 000400           801#    994#   1349    1351    1422    1424    1511    1513    1568    1605    1648    1693    1695
                        1779    1781    1843    1845    1980    2040    2063    2123    2146    2206    2229    2289    2306
                        2308    2354    2356    2404    2406    2475    2477    2545    2547    2600    2602    2655    2657
MSYNC   015603          1293    3337#
MTDATA= 040000           798#    991#   1354    1384    1388    1427    1477    1481    2550    2605    2660    3552
MTITLE  015144          1199    3283#
MTSTPC  015535          1329    3330#
MULTD   001152           723#   1243    1244    2713
MVECTO  015177          1231    3288#
MWIRE4  015772          1314    3358#
MWIRE5  015722          1310    3351#
MWIRE6  015651          1306    3344#
NEXT    001106           698#
NOPAR = 000000           793#    986#   1357    1430    1520    1702    1782    1852    1983    2066    2149    2232    2553
                        2608    2663
ODDPAR= 001000           794#    987#   2363    2484
ODDB    017214          3566#
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
ONCE    002610            1198    1201#
OPTCLR  001151             722#   1316
OUT     013022            2779    2781    2783    2787    2799#
OUTCRY  012606            2711    2750#
OUTMUL  003166            1249    1274    1285#
OVRRUN= 040000             779#    972#
PARAM = 104410            1221    1232    1253    1278    1330    2794    3506#
PARAM1  013514            2932#   2953
PARCSR  001722            1044#   1350*   1357*   1423*   1430*   1512*   1520*   1694*   1702*   1780*   1782*   1844*   1852*
                          1985*   1999*   2068*   2082*   2151*   2165*   2234*   2248*   2307*   2315*   2355*   2363*   2405*
                          2413*   2476*   2484*   2546*   2553*   2601*   2608*   2656*   2663*   3534*
PAREN = 001000             783#    976#
PARER = 010000             781#    974#
PARERR  013570            2935    2937    2939    2948#   2958    2960    2962
PARTI   013652            2951    2971#
PASCNT  001112             700#   1174*   2758*   2759    2760
PFTAB   015136            3274    3280#
PIRQ  = 177772             583#
PIRQVE= 000240             677#
POPRO = 012600             756#    949#
POP1SP= 005726             754#    947#
POP2SP= 022626             758#    951#
PR0   = 000000             600#
PR1   = 000040             601#
PR2   = 000100             602#
PR3   = 000140             603#
PR4   = 000200             604#   3526
PR5   = 000240             605#   3525
PR6   = 000300             606#
PR7   = 000340             607#
PS    = 177776             580#    581
PSW   = 177776             581#
PUSHRO= 010046             755#    948#
PUSH1S= 005746             753#    946#
PUSH2S= 024646             757#    950#
PWRVEC= 000024             672#   1142*   1143*
RDSW    013030            2789*   2799*   2801#   2950
RECACT= 004000             765#    958#   1995    2017    2078    2100    2161    2183    2244    2266
REPLAY  012512            2730    2736    2738#
RESTAR  015042            3254    3260#
RESTRT  012672            2731    2762    2769#
RESVEC= 000010             667#
RESO5 = 104412            3508#
RETURN  001104             697#   1179*   1337*   1339    3279
RING  = 040000             762#    955#
RINTEN= 000100             770#    963#   1368    1378    1402    1455    1467    1471    1495    1793    1813    1816    1878
                          1892    1909    1933
ROTADD  001170             736#   1248*   1260*   1262    1264*   1269    1272*   2725*   2728    2732*
RPOKE   017126            2565    2577    2581    2620    2632    2636    2675    2687    2691    3552#   3562
RTS   = 000004             774#    967#
RUNA  = ****** U              1      51     137     511
RUNB  = ****** U              1      51     137     511
RUNC  = ****** U              1      51     137     511
RUND  = ****** U              1      51     137     511
RUNE  = ****** U              1      51     137     511
RUNF  = 000000                1      51     137     511
```

```
RUNIT   012416          2716    2722#   2729
RXCSR   001712          1040#   1358*   1368*   1369    1378*   1402*   1431*   1442    1448*   1455*   1464    1467*   1471*
                        1495*   1793*   1808    1813*   1816*   1825    1853*   1878*   1892*   1902    1909*   1933*   1943
                        1986*   1995    2017    2041    2069*   2078    2100    2124    2152*   2161    2183    2207    2235*
                        2244    2266    2290    2319*   2335    2367*   2383    2417*   2453    2488*   2524    2554*   2566
                        2609*   2621    2664*   2676    2752    3529*
RXDBUF  001716          1042#   1375    1399    1401    1449    1492    1494    1789    1809    1871    1903    1981    2022
                        2064    2105    2147    2188    2230    2271    2316    2338    2364    2386    2414    2456    2485
                        2527    2561    2569    2584    2616    2624    2639    2671    2679    2694    3533*
RXDONE= 000200           769#    962#
RXERR = 100000           778#    971#
SAVIT   014364          3089    3110#
SAVPC   001126           709#   2980*
SAVSP   001116           702#   3253*   3260
SAVOS = 104411          3507#
SCOP1 = 104405          2031    2114    2197    2280    3503#
SEND  = 000020           805#    998#   1517    1699    1791    1849    1984    2067    2150    2233    2312    2360    2410
                        2481
SEREC   001150           721#   1312
SETFLG= 104414          1242    1307    1311    1315    1319    3510#
SEVEN = 004000           791#    984#   2149
SEXMIT  001147           720#   1308
SHIFT   001122           707#   1379*   1391*   1472*   1484*   1522*   1530*   1704*   1712*   2006*   2010*   2089*   2093*
                        2172*   2176*   2255*   2259*   2323*   2328*   2329    2333    2371*   2376*   2377    2381    2431*
                        2446*   2447    2451    2502*   2517*   2518    2522    2563*   2575*   2579*   2618*   2630*   2634*
                        2673*   2685*   2689*   3561*
SIX   = 002000           790#    983#   2066
SPACNT= 014131          3010*   3029    3032*   3042#
SRD   = 002000           766#    959#
STACK = 001100           571#   1134    1170    1324    3269
STD   = 000010           773#    966#
STFLG   001173           742#   1173*
STKLMT= 177774           582#
STPSYN= 000400           768#    961#   1853
SVOS    013672          2984#
SWR     001440           840#   1132    1153*   1155    1161*   1168*   1184    1186*   1191    1207    1326    2780    2811
                        3080    3087    3099    3102    3416    3430    3432    3438    3445
SWREG   000176           683#   1161    1186    1191    2780    2797    2804
SWREGL  013032          2792    2802#
SW0   = 000001           635#
SW00  = 000001           625#    635    1207
SW01  = 000002           624#    634    1326
SW02  = 000004           623#    633
SW03  = 000010           622#    632
SW04  = 000020           621#    631
SW05  = 000040           620#    630
SW06  = 000100           619#    629
SW07  = 000200           618#    628
SW08  = 000400           617#    627
SW09  = 001000           616#    626    2811
SW1   = 000002           634#
SW10  = 002000           615#
SW11  = 004000           614#
SW12  = 010000           613#
SW13  = 020000           612#
SW14  = 040000           611#
```

```
SW15  = 100000           610#
SW2   = 000004           633#
SW3   = 000010           632#
SW4   = 000020           631#
SW5   = 000040           630#
SW6   = 000100           629#
SW7   = 000200           628#
SW8   = 000400           627#
SW9   = 001000           626#
SYNCNO  001146           719#  1296*  1300*  1875   2015   2098   2181   2264
SYNEXT= 020000           787#   980#  1350   1357   1423   1430   1512   1520   1694   1702   1780   1782   2307
                        2315   2355   2363   2405   2413   2476   2484
SYNINT= 030000           786#   979#  1844   1852   1983   2066   2149   2232
SYNSCH= 000020           772#   965#  1358   1431   1793   1853   1986   2041   2069   2124   2152   2207   2235
                        2290   2319   2367   2417   2488   2554   2609   2664
SYSTST= 014000           812#  1005#  1791   1849
TBITVE= 000014           668#
TEMP    016206          3015   3270*  3271*  3384#
TKVEC = 000060           675#
TPVEC = 000064           676#
TRAPVE= 000034           674#  1140*  1141*
TRPREG  017364          3598#
TRTVEC= 000014           669#
TST1    003362          1331   1337   1347#  2771   2772   3409
TST10   005610          1775#
TST11   006100          1842#
TST12   006714          1979#
TST13   007220          2062#
TST14   007524          2145#
TST15   010030          2228#
TST16   010334          2305#
TST17   010532          2353#
TST2    003706          1418#
TST20   010730          2401#
TST21   011174          2472#
TST22   011440          2544#
TST23   011666          2599#
TST24   012114          2654#
TST3    004324          1509#
TST4    004576          1566#
TST5    004740          1604#
TST6    005076          1647#
TST7    005246          1691#
TTST    016330          3412#
TXCSR   001726          1046#  1349*  1351*  1354*  1360*  1361*  1384*  1388*  1389*  1390*  1422*  1424*  1427*
                        1433*  1434*  1477*  1481*  1482*  1483*  1511*  1513*  1517*  1524*  1525*  1528*  1529*
                        1535*  1537*  1545   1548*  1557*  1568*  1572*  1576*  1582*  1583   1605*  1609*  1613*
                        1620*  1648*  1652*  1669   1681*  1693*  1695*  1699*  1706*  1707*  1710*  1711*  1717*
                        1726   1729   1735*  1742*  1751   1754*  1761*  1779*  1781*  1791*  1843*  1845*  1849*
                        1879*  1891*  1910*  1924*  1980*  1984*  1989*  1990*  1993*  1994*  2002   2008*  2009*
                        2035*  2036   2040*  2063*  2067*  2072*  2073*  2076*  2077*  2085   2091*  2092*  2118*
                        2119   2123*  2146*  2150*  2155*  2156*  2159*  2160*  2168   2174*  2175*  2201*  2202
                        2206*  2229*  2233*  2238*  2239*  2242*  2243*  2251   2257*  2258*  2284*  2285   2289*
                        2306*  2308*  2312*  2321*  2322*  2326*  2327*  2354*  2356*  2360*  2369*  2370*  2374*
                        2375*  2404*  2406*  2410*  2419*  2425*  2434*  2440*  2475*  2477*  2481*  2490*  2496*
                        2505*  2511*  2545*  2547*  2550*  2556*  2557*  2559*  2560*  2600*  2602*  2605*  2611*
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
                        2612*   2614*   2615*   2655*   2657*   2660*   2666*   2667*   2669*   2670*   3539*   3552*   3558*
                        3559*   3560*
TXDBUF  001732          1048#   1521*   1703*   1736*   1785*   1882*   1923*   1991*   2000*   2074*   2083*   2157*   2166*
                        2240*   2249*   2318*   2332*   2366*   2380*   2416*   2450*   2487*   2521*   3543*
TXDONE= 000200           802#    995#
TXINTE= 000100           803#    996#   1572    1576    1582    1609    1613    1620    1652    1681    1717    1742    1754
                        1761    1879    1891    1910    1924
TYPE  = 104401          1199    1338    2709    2712    2717    2788    2790    2858    2901    2918    3004    3035    3082
                        3090    3126    3143    3145    3148    3150    3154    3161    3225    3275    3497#
TYPOC = 104402          3134    3158    3498#
TYPON = 104404          3500#
TYPOS = 104403          3499#
USER  = 000000           809#   1002#
VOID  = 000001           776#    969#
WRDCNT  014126          3008*   3037*   3040#
ZERO    012424          2723#
$APTHD  002136          1105    1111#
$ASTAT= ****** U         534
$ATYC   000024R          534#
$ATY1   000000R          534#
$ATY3   000006R          534#   2843
$ATY4   000016R          534#   3095
$AUTOB  001434           837#
$BASE   001602           915#
$BDADR  001422           832#
$BDDAT  001426           834#
$BELL   001516           866#   3082    3110
$CDW1   001606           917#
$CDW2   001610           918#
$CHARC  013342          2860*   2870*   2877    2886*   2891#
$CKSWR= ****** U        3503
$CMTAG  001400           820#   1129    1130    1138    1144    1145
$CM1  = 000006           852#    853#    854#    855#    856#    857#    858#
$CM2  = 000014           852#    853#    854#    855#    856#    857#    858#
$CM3  = 000006           850#    852
$CM4  = 000006           858#    859#    860#    861#    862#    863#    864#
$CPUOP  001554           889#
$CRLF   001523           868#   2859    2894    3090    3110    3126    3145    3150    3154
$DDW0   001612           919#
$DDW1   001614           920#
$DDW10  001636           929#
$DDW11  001640           930#
$DDW12  001642           931#
$DDW13  001644           932#
$DDW14  001646           933#
$DDW15  001650           934#
$DDW2   001616           921#
$DDW3   001620           922#
$DDW4   001622           923#
$DDW5   001624           924#
$DDW6   001626           925#
$DDW7   001630           926#
$DDW8   001632           927#
$DDW9   001634           928#
$DEVCT  001536           880#
$DEVM   001604           916#
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
$E     = 000002            532#
$ENDAD  012662            1092    2765#
$ENV    001546             534     885#   1201    2838    2899    3092
$ENVM   001547             534     886#   1166    2840    2845
$ERFLG  001403             823#   1175*   2757*   3077*   3110    3277*   3393    3434    3436    3442*   3466
$ERMAX  001415             829#   1146*   3436    3459*   3466
$ERROR  014202            1138    3076#
$ERRPC  001416             830#   1078    1081    1177*   2756*   3084*   3085*   3086    3110    3132    3278*   3408*
$ERRTB  001652            1020#   3140
$ERRTY  014422            3125#
$ERTTL  001412             827#   1176*   3083*   3110
$ESCAP  001514             865#   1145*   3105    3107    3110    3458*
$ETABL  001546             884#
$ETEND  001652             937#   1117
$FATAL  001530             534*    877#
$FFLG   000244R            534#*
$FILLC  001456             848#   2863    2894
$FILLS  001455             847#   2894
$GDADR  001420             831#
$GDDAT  001424             833#
$GTSWR= ****** U          3502
$HIBTS  002136            1112#
$ICNT   001404             824#   3449*   3450    3452*   3465
$INTAG  001435             838#
$ITEMB  001414             828#   3086*   3094    3110    3129
$LF     001524             869#   2894    3110
$LFLG   000243R            534#*
$LPADR  001406             825#   1147*   2771*   3440*   3456*   3461    3465
$LPERR  001410             826#   1148*   3104    3440    3457*   3465
$MADR1  001560             902#
$MADR2  001564             906#
$MADR3  001570             909#
$MADR4  001574             912#
$MAIL   001526             875#   1113    1117    1165    2838    3092    3455
$MAMS1  001556             896#
$MAMS2  001562             904#
$MAMS3  001566             907#
$MAMS4  001572             910#
$MBADR  002140            1113#
$MFLG   000242R            534#*
$MSGAD  001542             534*    882#
$MSGLG  001544             534*    883#
$MSGTY  001526             534*    876#
$MTYP1  001557             897#
$MTYP2  001563             905#
$MTYP3  001567             908#
$MTYP4  001573             911#
$MXCNT  016626            3453    3465#
$N     = 000000             532#   2701#
$NULL   001454             846#   2865    2894
$NWTST= 000000            1346#   1417#   1508#   1565#   1603#   1646#   1690#   1774#   1841#   1978#   2061#   2144#   2227#
                          2304#   2352#   2400#   2471#   2543#   2598#   2653#
$OCNT   015000            3197*   3226*   3239#
$OMODE  015002            3192*   3196*   3201    3204*   3215*   3241#
$OVER   016606            3414    3417    3433    3441    3451    3460#
$PASS   001534             879#   1165*   2760*   3447    3466
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
$PASTM  002144          1115#
$PWRDN  015004          1142    3245#
$QUES   001522           867#   2894    3110
$RDCHR= ****** U        3503
$RDDEC= ****** U        3503
$RDLIN= ****** U        3503
$RDOCT= ****** U        3503
$REGAD  001460           850#
$REG0   001462           852#   2989*   2994
$REG1   001464           853#   2988*   2995
$REG2   001466           854#   2987*   2996
$REG3   001470           855#   2986*   2997
$REG4   001472           856#   2985*   2998
$REG5   001474           857#   2984*   2999
$R2A  = ****** U        3503
$SAVRE= ****** U        3503
$SCOPE  016312          1136    3402#
$SETUP= 000017          1118#   1135    1136    1138    1140    1142    1144    1145    1147    3077    3102    3109    3403
$STUP = 177777          1118#
$SVLAD  016552          3425    3454#
$SVPC = 002136          1090#   1095
$SWR  = 177400           523#    864     865     866    1144    1145    1147    1148    1348    1419    1510    1567    1605
                        1648    1692    1776    1843    1980    2063    2146    2229    2306    2354    2402    2473    2545
                        2600    2655    3068    3069    3070    3071    3072    3080    3087    3099    3102    3110    3394
                        3395    3396    3397    3398    3416    3428    3430    3431    3434    3435    3436    3443    3444
                        3445    3457    3460    3465
$SWREG  001550           887#   1168
$SWRMK= 000000          3398    3399    3432
$TESTN  001532           878#   3455*
$TIMES  001512           864#   1144*   3443*   3450    3453*   3465
$TKB    001446           843#   2784    2907    2915    3415
$TKS    001444           842#   2782    2905    3413
$TMP0   001476           858#
$TMP1   001500           859#   1380*   1386*   1473*   1479*   2564*   2576*   2580*   2619*   2631*   2635*   2674*   2686*
                        2690*   3554*   3566    3576*   3578*   3583    3593*   3595*
$TMP2   001502           860#   3553*   3555*   3556*   3557*   3558    3566*   3570*   3583*   3587*
$TMP3   001504           861#   3567*   3571*   3574*   3584*   3588*   3591*
$TMP4   001506           862#
$TMP5   001510           863#   1796*   1800*   1801    1859*   1863*   1864    1883*   1887*   1888    1925*   1929*   1930
$TN   = 000025           534#   1346    1348#   1417    1419#   1508    1510#   1565    1567#   1603    1605#   1646    1648#
                        1690    1692#   1774    1776#   1841    1843#   1978    1980#   2061    2063#   2144    2146#   2227
                        2229#   2304    2306#   2352    2354#   2400    2402#   2471    2473#   2543    2545#   2598    2600#
                        2653    2655#
$TPB    001452           845#   2883*   2894    2915*
$TPFLG  001457           849#   2832    2894
$TPS    001450           844#   2881    2894    2913
$TRAP   016630          1140    3474#
$TRAP2  016652          3485#   3496
$TRP  = 000015          3489#   3498#   3499#   3500#   3501#   3503    3504#   3505#   3506#   3507#   3508#   3509#   3510#
                        3511#
$TRPAD  016664          3479    3496#
$TSTM   002142          1114#
$TSTNM  001402           822#   1178*   2755*   3079    3110    3116    3393    3432    3454*   3455    3460    3466
$TYPBN= ****** U        3501
$TYPDS= ****** U        3501
$TYPE   013064           534    2832#   3489    3497
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
$TYPEC  013276            2862    2869    2876    2881*   2882
$TYPEX  013344            2887    2889    2892*
$TYPOC  014602            3195*   3498
$TYPON  014616            3194    3197*   3500
$TYPOS  014556            3190*   3499
$UNIT   001540             881*
$UNITM  002146            1116*
$USWR   001552             888*   1203
$VECT1  001576             913*
$VECT2  001600             914*
$XTSTR  016356            3410    3419*
$OFILL  015001            3191*   3195*   3205    3240*
$40CAT= ****** U          3089    3416
.       = 017372           534*    568*    681*    684*    689*    744*    745*    819*    870    1076*   1090    1091*   1093*
                          1095*   1101    1102*   1104*   1106*   1133    1147    1148    1370    1396    1404    1420    1443
                          1454    1465    1489    1497    1540    1546    1575    1584    1612    1655    1670    1678    1720
                          1727    1730    1741    1752    1799    1823    1830    1862    1865    1886    1928    1941    1948
                          1952    1957    1996    2003    2018    2026    2037    2042    2079    2086    2101    2109    2120
                          2125    2162    2169    2184    2192    2203    2208    2245    2252    2267    2275    2286    2291
                          2336    2340    2384    2388    2423    2429    2438    2444    2454    2458    2494    2500    2509
                          2515    2525    2529    2567    2571    2586    2622    2626    2641    2677    2681    2696    2894
                          3110    3164*   3256    3272    3383*   3385*   3387*   3465    3466
.BEGIN  003310            1195    1206    1209    1324*
.CONVR  013756            3004*   3509
.EOP    012342            2707*
.INSTE  013454            2918*   3505
.INSTR  013346            2897*   3504
.INST1  013366            2901*   2910    2920
.MSG    013370            2784*   2785*   2786    2897*   2902*
.PARAM  013464            2925*   3506
.PFAIL  015004            1172    3246*   3267
.RESOS  013724            2994*   3508
.SAVOS  013664            2980*   3507
.SCOPE  016312            3406*
.SCOP1  013042            2810*   3503
.SETFL  014134            3050*   3061    3510
.START  002152             685    1127*   1179    2721
.$ASTA= ****** U           534
.$X     = 002136          1101*   1106
```

```
COMMEN    678#
ENDCOM    678#
ERROR     572#  1371  1405  1406  1444  1456  1466  1498  1499  1541  1547  1577  1585  1633  1656
         1671  1672  1721  1728  1731  1743  1753  1803  1824  1831  1897  1938  1942  1949  1953
         1958  1997  2004  2019  2027  2038  2043  2080  2087  2102  2110  2121  2126  2163  2170
         2185  2193  2204  2209  2246  2253  2268  2276  2287  2292  2337  2341  2385  2389  2455
         2459  2526  2530  2568  2572  2587  2623  2627  2642  2678  2682  2697
ESCAPE    678#
GETPRI    678#
GETSWR    678#
MULT      678#
NEWTST    678#  1346  1417  1508  1565  1603  1646  1690  1774  1841  1978  2061  2144  2227  2304
         2352  2400  2471  2543  2598  2653
POP        534   678#
PRGEND     556#  2700
PRGFRT     535#   557
PUSH       534   678#
PUSSYF     553#  2419  2433  2490  2504
REPORT     523#   678#
RSETUP     540#  1349  1422  2545  2600  2655
SC         532#  3403
SCOPE      573#  1347  1418  1509  1566  1604  1647  1691  1775  1842  1979  2062  2145  2228  2305
         2353  2401  2472  2544  2599  2654  2707
SC1        532#  3462
SETPRI     678#
SETTRA     523#  3489#  3498  3499  3500  3503  3504  3505  3506  3507  3508  3509  3510
SETUP      678#  1127
SKIP       678#
SLASH      678#
SPACE      678#
STARS      534    678#   815   870   873  1088  1098  1100  1107  1346  1417  1508  1565  1603  1646
          1690  1774  1841  1978  2061  2144  2227  2304  2352  2400  2471  2543  2598  2653  2817
          3064  3120  3167  3390  3468
SWRSU      678#  1149#
TRMTRP    3489#
TSETUP     541#  1511  1693  1843  2306  2354  2404  2475
TYPBIN     678#
TYPDEC     678#
TYPNAM     678#
TYPNUM     678#
TYPOCS     678#
TYPOCT     678#  3132  3156
TYPTXT     678#
$BEGIN     532#  1321
$BINAR     552#  2297  2345  2393  2464
$BUFFE     534#  3379
$CABLE     554#
$CATCH     526#   568
$CK        533#  2773
$CLRVE     532#  1201
$CONVR     534#  3001
$DNA       550#
$EOP       533#  2700
$GETFL     532#  1240  1305  1309  1313  1317
$GETPA     532#  1219  1230  1250  1276  1328
$GETSY     532#  1287
```

CROSS REFERENCE TABLE -- MACRO NAMES

```
$HEADE     523#    557
$INSTR     534#   2894
$ISOB      548#
$MATCH     545#   1965    2048    2131    2214
$MRR       539#
$MRRW      537#
$MRW       538#
$MSG       534#   3283
$NEED      555#   3110
$PARAM     534#   2922
$PFAIL     534#   3242
$POKE      543#   1524    1527    1706    1709    1989    1993    2007    2072    2076    2090    2155    2159    2173    2238
          2242    2256    2321    2325    2369    2373
$POKER     544#   1359    1432    2558    2613    2668
$RCNET     555#
$RECAC     543#
$REG       534#   2977
$RESET     536#   1349    1351    1422    1424    1511    1513    1568    1605    1648    1693    1695    1779    1781    1843
          1845    1980    2040    2063    2123    2146    2206    2229    2289    2306    2308    2354    2356    2404    2406
          2475    2477    2545    2547    2600    2602    2655    2657
$RXACT     542#
$SCOPE     532#   3388
$SCOPI     533#   2807
$SETFL     532#   3044
$SETVE     527#    678
$START     532#   1119
$STRIP     549#
$SYMBO     523#    746     939
$SYNCR     545#   2554    2609    2664
$TRPAR     551#
$TSTNO     532#   1346    1417    1508    1565    1603    1646    1690    1774    1841    1978    2061    2144    2227    2304
          2352    2400    2471    2543    2598    2653
$UNIBU     535#
$VARIA     530#    688
$WORDF     546#
$WORDO     545#   2535    2590    2645
$WORDP     547#
$$CMRE     813#    852     853     854     855     856     857
$$CMTM     813#    858     859     860     861     862     863
$$ESCA     678#
$$NEWT     678#   1346    1417    1508    1565    1603    1646    1690    1774    1841    1978    2061    2144    2227    2304
          2352    2400    2471    2543    2598    2653
$$SET     3489#   3498    3499    3500    3503    3504    3505    3506    3507    3508    3509    3510
$$SETM    1165#
$$SKIP     678#
.EQUAT     523#    568
.HEADE     523#
.SETUP     523#   1118
.$ACT1     523#   1086
.$APTB     523#    871#
.$APTH     523#   1096
.$APTY     523#    534
.$CATC     523#
.$CMTA     523#    813
.$EOP      523#
.$ERRO     523#   3062
```

```
DZDUV-A MACY11 27(1006)  03-FEB-77  08:30  PAGE 88
DZDUVA.M11    13-OCT-76 08:26          CROSS REFERENCE TABLE -- MACRO NAMES

.$ERRT    523#   3118
.$POWE    523#
.$SCOP    523#   3388
.$TRAP    523#   3466
.$TYPE    523#   2815
.$TYPO    523#   3165


. ABS.  017372     000


 ERRORS DETECTED:  0
 DEFAULT GLOBALS GENERATED:  0

 DZDUVA,DZDUVA.SEQ/SOL/CRF←DZDUV1/EQ:RUNF,DZDUV2,DZDUVA
 RUN-TIME: 18 12 1 SECONDS
 RUN-TIME RATIO: 150/31=4.7
 CORE USED:  31K  (62 PAGES)
```