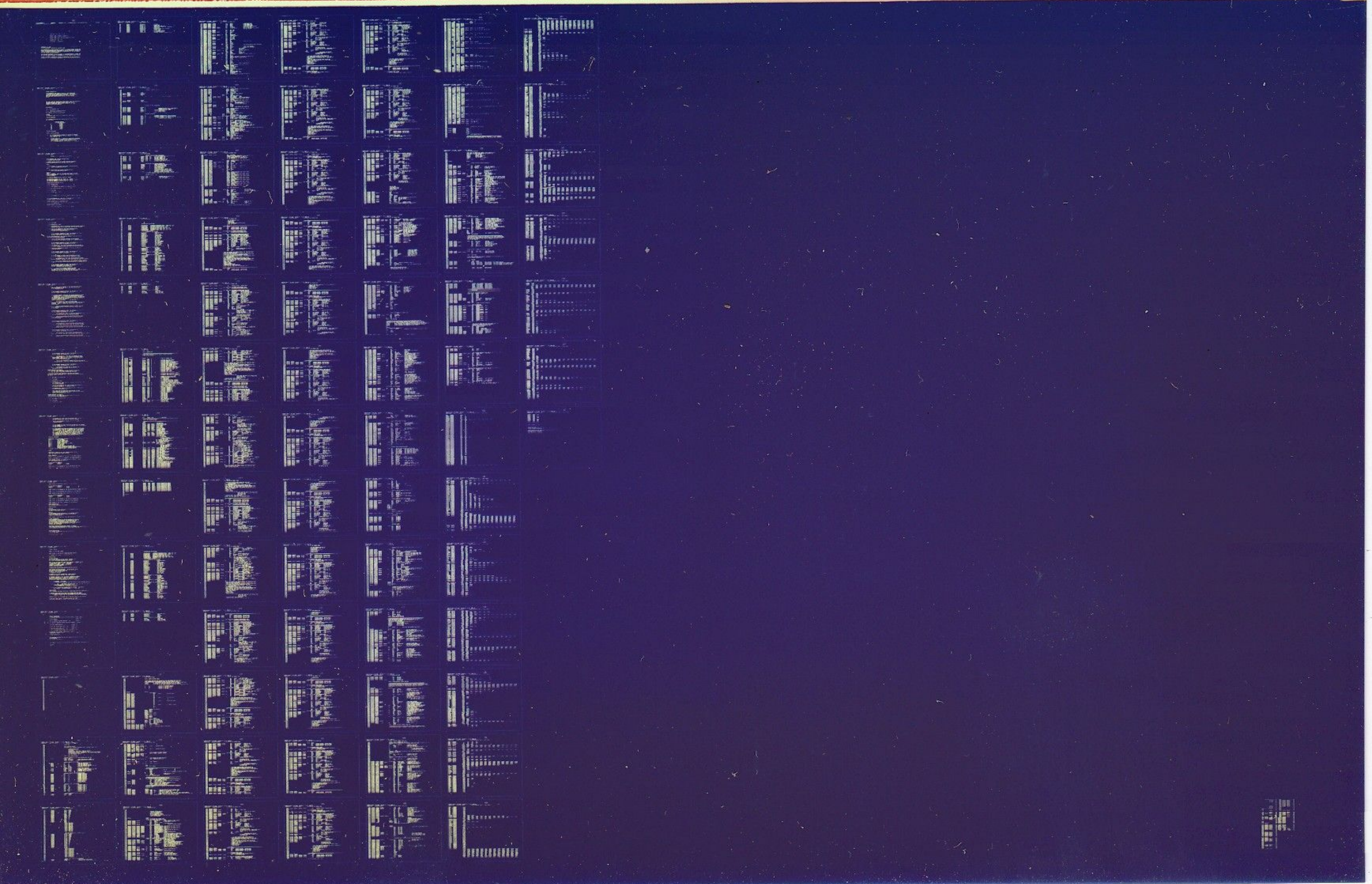
DUV/LSI-11

DUV11 OFFLINE TRANS TEST
MD-11-DZDUT-A

EP-DZDUT-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-DZDUT-A-D

PRODUCT NAME: DUV11 OFFLINE TRANSMITTER 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 TRANSMITTER TESTS VERIFY THAT THE TRANSMITTER
SECTION PROVIDES THE CORRECT ERROR FLAGS,AND THAT IT
TRANSMITS CHARACTERS THRU THE BIT WINDOW AT THE CORRECT
NUMBER OF BITS PER CHARACTER.

*
.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 DZDUT-A TAPE D" (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 IC 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 TRANSMITTER SECTION TESTING
OF THE DEVICE
SEE LISTING FOR DETAILS

*

.REM *

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

11. LISTINGS

*

```
                000001                  $TN=1
```

APT COMMUNICATIONS ROUTINE

```
                                .ENABLE ABS

                                ;DUV11 DZDUT-A TAPE D
                                ;COPYRIGHT 1977, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754

                                        ;STARTING PROCEDURE
                                        ;TYPE 200G
                                        ;PROGRAM WILL TYPE "DUV11 DZDUT-A TAPE D "
                                        ;PROGRAM WILL TYPE "R" TO INDICATE THAT TESTING HAS STARTED
                                        ;AT THE END OF A PASS, PROGRAM WILL TYPE "END OF PASS TAPE D"
                                        ;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  TOT,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
```

```
DZDUT-A MACY11 27(1006)  03-FEB-77  07:54  PAGE 15
DZDUTA.M11    13-OCT-76 08:39            BASIC DEFINITIONS

   613          020000                  SW13=   20000
   614          010000                  SW12=   10000
   615          004000                  SW11=   4000
   616          002000                  SW10=   2000
   617          001000                  SW09=   1000
   618          000400                  SW08=   400
   619          000200                  SW07=   200
   620          000100                  SW06=   100
   621          000040                  SW05=   40
   622          000020                  SW04=   20
   623          000010                  SW03=   10
   624          000004                  SW02=   4
   625          000002                  SW01=   2
   626          000001                  SW00=   1
   627                                  .EQUIV  SW09,SW9
   628                                  .EQUIV  SW08,SW8
   629                                  .EQUIV  SW07,SW7
   630                                  .EQUIV  SW06,SW6
   631                                  .EQUIV  SW05,SW5
   632                                  .EQUIV  SW04,SW4
   633                                  .EQUIV  SW03,SW3
   634                                  .EQUIV  SW02,SW2
   635                                  .EQUIV  SW01,SW1
   636                                  .EQUIV  SW00,SW0
   637
   638                                  ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
   639          100000                  BIT15=  100000
   640          040000                  BIT14=  40000
   641          020000                  BIT13=  20000
   642          010000                  BIT12=  10000
   643          004000                  BIT11=  4000
   644          002000                  BIT10=  2000
   645          001000                  BIT09=  1000
   646          000400                  BIT08=  400
   647          000200                  BIT07=  200
   648          000100                  BIT06=  100
   649          000040                  BIT05=  40
   650          000020                  BIT04=  20
   651          000010                  BIT03=  10
   652          000004                  BIT02=  4
   653          000002                  BIT01=  2
   654          000001                  BIT00=  1
   655                                  .EQUIV  BIT09,BIT9
   656                                  .EQUIV  BIT08,BIT8
   657                                  .EQUIV  BIT07,BIT7
   658                                  .EQUIV  BIT06,BIT6
   659                                  .EQUIV  BIT05,BIT5
   660                                  .EQUIV  BIT04,BIT4
   661                                  .EQUIV  BIT03,BIT3
   662                                  .EQUIV  BIT02,BIT2
   663                                  .EQUIV  BIT01,BIT1
   664                                  .EQUIV  BIT00,BIT0
   665
   666                                  ;*BASIC "CPU" TRAP VECTOR ADDRESSES
   667          000004                  ERRVEC= 4               ;;TIME OUT AND OTHER ERRORS
   668          000010                  RESVEC= 10              ;;RESERVED AND ILLEGAL INSTRUCTIONS
```

```
   669          000014                  TBITVEC=14              ;;"T" BIT
   670          000014                  TRTVEC= 14              ;;TRACE TRAP
   671          000014                  BPTVEC= 14              ;;BREAKPOINT TRAP (BPT)
   672          000020                  IOTVEC= 20              ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
   673          000024                  PWRVEC= 24              ;;POWER FAIL
   674          000030                  EMTVEC= 30              ;;EMULATOR TRAP (EMT) **ERROR**
   675          000034                  TRAPVEC=34              ;;"TRAP" TRAP
   676          000060                  TKVEC=  60              ;;TTY KEYBOARD VECTOR
   677          000064                  TPVEC=  64              ;;TTY PRINTER VECTOR
   678          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
```

```
                                        ;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
```

```
   805          000040                  DNAINTE=BIT5                ;DNA INTR ENAB
   806          000020                  SEND=BIT4                   ;SEND
   807          000010                  HDXEN=BIT3                  ;HDX/FDX
   808          000001                  BREAK=BIT0                  ;BREAK
   809                                          ;TXCSR WRD DEFINITIONS
   810          000000                  USER=0                      ;USER MODE
   811          004000                  MINT=4000                   ;MAINT INT MODE
   812          010000                  MEXT=10000                  ;MAINT EXT MODE
   813          014000                  SYSTST=14000                ;SYSTEM TEST MODE
```

COMMON TAGS

```
                                .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                $EPRPC:   .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
```

```
DZDUT-A MACY11 27(1006)  03-FEB-77  07:54  PAGE 22
DZDUTA.M11    13-OCT-76 08:39            COMMON TAGS

   870  001524  000012                  $LF:    .ASCIZ  <12>            ;;LINE FEED
   871                                  ;;*****************************************************************
   872                                  .SBTTL  APT MAILBOX-ETABLE
   873
   874                                  ;;*****************************************************************
   875                                  .EVEN
   876  001526                          $MAIL:                          ;;APT MAILBOX
   877  001526  000000                  $MSGTY: .WORD   AMSGTY   ;;MESSAGE TYPE CODE
   878  001530  000000                  $FATAL: .WORD   AFATAL   ;;FATAL ERROR NUMBER
   879  001532  000000                  $TESTN: .WORD   ATESTN   ;;TEST NUMBER
   880  001534  000000                  $PASS:  .WORD   APASS    ;;PASS COUNT
   881  001536  000000                  $DEVCT: .WORD   ADEVCT   ;;DEVICE COUNT
   882  001540  000000                  $UNIT:  .WORD   AUNIT    ;;I/O UNIT NUMBER
   883  001542  000000                  $MSGAD: .WORD   AMSGAD   ;;MESSAGE ADDRESS
   884  001544  000000                  $MSGLG: .WORD   AMSGLG   ;;MESSAGE LENGTH
   885  001546                          $ETABLE:                        ;;APT ENVIRONMENT TABLE
   886  001546     000                  $ENV:   .BYTE   AENV     ;;ENVIRONMENT BYTE
   887  001547     000                  $ENVM:  .BYTE   AENVM    ;;ENVIRONMENT MODE BITS
   888  001550  000000                  $SWREG: .WORD   ASWREG   ;;APT SWITCH REGISTER
   889  001552  000000                  $USWR:  .WORD   AUSWR    ;;USER SWITCHES
   890  001554  000000                  $CPUOP: .WORD   ACPUOP   ;;CPU TYPE,OPTIONS
   891                                  ;*                              BITS 15-11=CPU TYPE
   892                                  ;*                                      11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
   893                                  ;*                                      11/70=06,PDQ=07,Q=10
   894                                  ;*                              BIT 10=REAL TIME CLOCK
   895                                  ;*                              BIT  9=FLOATING POINT PROCESSOR
   896                                  ;*                              BIT  8=MEMORY MANAGEMENT
   897  001556     000                  $MAMS1: .BYTE   AMAMS1   ;;HIGH ADDRESS,M.S. BYTE
   898  001557     000                  $MTYP1: .BYTE   AMTYP1   ;;MEM. TYPE,BLK#1
   899                                  ;*                              MEM.TYPE BYTE   --  (HIGH BYTE)
   900                                  ;*                                      900 NSEC CORE=001
   901                                  ;*                                      300 NSEC BIPOLAR=002
   902                                  ;*                                      500 NSEC MOS=003
   903  001560  000000                  $MADR1: .WORD   AMADR1   ;;HIGH ADDRESS,BLK#1
   904                                  ;*                               MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABOVE
   905  001562     000                  $MAMS2: .BYTE   AMAMS2   ;;HIGH ADDRESS,M.S. BYTE
   906  001563     000                  $MTYP2: .BYTE   AMTYP2   ;;MEM.TYPE,BLK#2
   907  001564  000000                  $MADR2: .WORD   AMADR2   ;;MEM.LAST ADDRESS,BLK#2
   908  001566     000                  $MAMS3: .BYTE   AMAMS3   ;;HIGH ADDRESS,M.S.BYTE
   909  001567     000                  $MTYP3: .BYTE   AMTYP3   ;;MEM.TYPE,BLK#3
   910  001570  000000                  $MADR3: .WORD   AMADR3   ;;MEM.LAST ADDRESS,BLK#3
   911  001572     000                  $MAMS4: .BYTE   AMAMS4   ;;HIGH ADDRESS,M.S.BYTE
   912  001573     000                  $MTYP4: .BYTE   AMTYP4   ;;MEM.TYPE,BLK#4
   913  001574  000000                  $MADR4: .WORD   AMADR4   ;;MEM.LAST ADDRESS,BLK#4
   914  001576  000000                  $VECT1: .WORD   AVECT1   ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
   915  001600  000000                  $VECT2: .WORD   AVECT2   ;;INTERRUPT VECTOR#2BUS PRIORITY#2
   916  001602  000000                  $BASE:  .WORD   ABASE    ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
   917  001604  000000                  $DEVM:  .WORD   ADEVM    ;;DEVICE MAP
   918  001606  000000                  $CDW1:  .WORD   ACDW1    ;;CONTROLLER DESCRIPTION WORD#1
   919  001610  000000                  $CDW2:  .WORD   ACDW2    ;;CONTROLLER DESCRIPTION WORD#2
   920  001612  000000                  $DDW0:  .WORD   ADDW0    ;;DEVICE DESCRIPTOR WORD#0
   921  001614  000000                  $DDW1:  .WORD   ADDW1    ;;DEVICE DESCRIPTOR WORD#1
   922  001616  000000                  $DDW2:  .WORD   ADDW2    ;;DEVICE DESCRIPTOR WORD#2
   923  001620  000000                  $DDW3:  .WORD   ADDW3    ;;DEVICE DESCRIPTOR WORD#3
   924  001622  000000                  $DDW4:  .WORD   ADDW4    ;;DEVICE DESCRIPTOR WORD#4
   925  001624  000000                  $DDW5:  .WORD   ADDW5    ;;DEVICE DESCRIPTOR WORD#5
```

APT MAILBOX-ETABLE

```
926  001626  000000                  $DDW6:  .WORD   ADDW6   ;;DEVICE DESCRIPTOR WORD#6
927  001630  000000                  $DDW7:  .WORD   ADDW7   ;;DEVICE DESCRIPTOR WORD#7
928  001632  000000                  $DDW8:  .WORD   ADDW8   ;;DEVICE DESCRIPTOR WORD#8
929  001634  000000                  $DDW9:  .WORD   ADDW9   ;;DEVICE DESCRIPTOR WORD#9
930  001636  000000                  $DDW10: .WORD   ADDW10  ;;DEVICE DESCRIPTOR WORD#10
931  001640  000000                  $DDW11: .WORD   ADDW11  ;;DEVICE DESCRIPTOR WORD#11
932  001642  000000                  $DDW12: .WORD   ADDW12  ;;DEVICE DESCRIPTOR WORD#12
933  001644  000000                  $DDW13: .WORD   ADDW13  ;;DEVICE DESCRIPTOR WORD#13
934  001646  000000                  $DDW14: .WORD   ADDW14  ;;DEVICE DESCRIPTOR WORD#14
935  001650  000000                  $DDW15: .WORD   ADDW15  ;;DEVICE DESCRIPTOR WORD#15
936
937
938  001652                          $ETEND:
939
940
941
```

```
                                ;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

```
   998          000040                  DNAINTE=BIT5                ;DNA INTR ENAB
   999          000020                  SEND=BIT4                   ;SEND
  1000          000010                  HDXEN=BIT3                  ;HDX/FDX
  1001          000001                  BREAK=BIT0                  ;BREAK
  1002                                          ;TXCSR WRD DEFINITIONS
  1003          000000                  USER=0                      ;USER MODE
  1004          004000                  MINT=4000                   ;MAINT INT MODE
  1005          010000                  MEXT=10000                  ;MAINT EXT MODE
  1006          014000                  SYSTST=14000                ;SYSTEM TEST MODE
```

ERROR POINTER TABLE

```
1007                                    .SBTTL  ERROR POINTER TABLE
1008
1009                                    ;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
1010                                    ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
1011                                    ;*LOCATION $ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
1012                                    ;*NOTE1:        IF $ITEMB IS 0 THE ONLY PERTINENT DATA IS ($ERRPC).
1013                                    ;*NOTE2:        EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:
1014
1015                                    ;*      EM              ;;POINTS TO THE ERROR MESSAGE
1016                                    ;*      DH              ;;POINTS TO THE DATA HEADER
1017                                    ;*      DT              ;;POINTS TO THE DATA
1018                                    ;*      DF              ;;POINTS TO THE DATA FORMAT
1019
1020
1021  001652                            $ERRTB:
1022                                            ;ERROR TABLE
1023  001652  001762                                    EM1     ;ERROR 1        REGISTER ERROR
1024  001654  002067                                    DH1
1025  001656  002116                                    DT1
1026  001660  002132                                    DF1
1027  001662  002022                                    EM2     ;ERROR 2        RECEIVER ERROR
1028  001664  002067                                    DH1
1029  001666  002116                                    DT1
1030  001670  002132                                    DF1
1031  001672  002043                                    EM3     ;ERROR 3        TRANSMITTER ERROR
1032  001674  002067                                    DH1
1033  001676  002116                                    DT1
1034  001700  002132                                    DF1
1035  001702  001746                                    EM4     ;ERROR 4        BIT ERROR (GENERAL)
1036  001704  000000                                    0
1037  001706  002126                                    DT4
1038  001710  002132                                    DF1
1039
1040                                            ;DEFAULT DU ADDRESSES
1041  001712  160010                    RXCSR:  160010
1042  001714  160011                    HRXCSR: 160011
1043  001716  160012                    RXDBUF: 160012
1044  001720  160013                    HRXDBUF:        160013
1045  001722  160012                    PARCSR: 160012
1046  001724  160013                    HPARCSR:        160013
1047  001726  160014                    TXCSR:  160014
1048  001730  160015                    HTXCSR: 160015
1049  001732  160016                    TXDBUF: 160016
1050  001734  160017                    HTXDBUF:        160017
1051                                            ;DEFAULT DU VECTORS
1052  001736  000770                    DURIV:  770     ;REC INTR VECTOR
1053  001740  000772                    DURIS:  772     ;REC INTR STATUS
1054  001742  000774                    DUTIV:  774     ;XMIT INTR VECTOR
1055  001744  000776                    DUTIS:  776     ;XMIT INTR STATUS
1056                                            ;ERROR MESSAGES
1057  001746  020040  051105  047522    EM4:    .ASCIZ  /  ERROR PC /
1058  001754  020122  041520  000040
1059  001762  020040  047503  050115    EM1:    .ASCIZ /  COMPARISON ERROR ON REGISTERS/
1060  001770  051101  051511  047117
1061  001776  042440  051122  051117
1062  002004  047440  020116  042522
```

```
                                        ERROR POINTER TABLE

1063  002012  044507  052123  051105
1064  002020  000123
1065  002022  020040  042522  042503  EM2:    .ASCIZ  /  RECEIVER ERROR/
1066  002030  053111  051105  042440
1067  002036  051122  051117     000
1068  002043     040  052040  040522  EM3:    .ASCIZ  /  TRANSMITTER ERROR/
1069  002050  051516  044515  052124
1070  002056  051105  042440  051122
1071  002064  051117     000
1072                                          ;DATA HEADERS FOR ERROR MESSAGES
1073  002067     105  051122  041520  DH1:    .ASCIZ  /ERRPC  WANTED  ACTUAL/
1074  002074  020040  040527  052116
1075  002102  042105  020040  041501
1076  002110  052524  046101     000
1077          002116                  .EVEN
1078                                          ;DATA TABLES FOR ERROR MESSAGES
1079  002116  001416  001130  001132  DT1:    .WORD   $ERRPC,HLD0,HLD1,0
1080  002124  000000
1081
1082  002126  001416  100000          DT4:    .WORD   $ERRPC,0
1083
1084  002132     000     000     000  DF1:    .BYTE   0,0,0,0
1085  002135     000
1086                                  .EVEN
1087                                  .SBTTL  ACT11 HOOKS
1088
1089                                  ;;*****************************************************************
1090                                  ;HOOKS REQUIRED BY ACT11
1091          002136                          $SVPC=.                 ;SAVE PC
1092          000046                          .=46
1093  000046  012656                          $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
1094          000052                          .=52
1095  000052  000000                          .WORD   0               ;;2)SET LOC.52 TO ZERO
1096          002136                          .=$SVPC                 ;; RESTORE PC
1097                                  .SBTTL  APT PARAMETER BLOCK
1098
1099                                  ;;*****************************************************************
1100                                  ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
1101                                  ;;*****************************************************************
1102          002136                          .$X=.   ;;SAVE CURRENT LOCATION
1103          000024                          .=24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
1104  000024  000200                          200     ;;FOR APT START UP
1105          000044                          .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
1106  000044  002136                          $APTHDR ;;POINT TO APT HEADER BLOCK
1107          002136                          .=.$X   ;;RESET LOCATION COUNTER
1108                                  ;;*****************************************************************
1109                                  ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
1110                                  ;INTERFACE SPEC.
1111
1112  002136                          $APTHD:
1113  002136  000000                 $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
1114  002140  001526                 $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
1115  002142  000010                 $TSTM:  .WORD   10      ;;RUN TIM OF LONGEST TEST
1116  002144  000010                 $PASTM: .WORD   10      ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
1117  002146  000000                 $UNITM: .WORD           ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
1118  002150  000052                         .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
```

```
                                        ;PROGRAM INITIALIZATION
                                        ;LOCK OUT INTERRUPTS
                                        ;SET UP PROCESSOR STACK
                                        ;SET UP POWER FAIL VECTOR
                                        ;CLEAR PROGRAM CONTROL FLAGS AND COUNTS
                                        ;TYPE TITLE MESSAGE

002152                          .START:
                                .SBTTL  INITIALIZE THE COMMON TAGS
                                ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
002152  012706  001400                  MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
002156  005026                          CLR     (R6)+           ;;CLEAR MEMORY LOCATION
002160  022706  001440                  CMP     #SWR,R6 ;;DONE?
002164  001374                          BNE     .-6             ;;LOOP BACK IF NO
002166  012706  001100                  MOV     #@#STACK,SP             ;;SETUP THE STACK POINTER
                                ;;INITIALIZE A FEW VECTORS
002172  012737  016306  000020          MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
002200  012737  000340  000022          MOV     #340,@#IOTVEC+2 ;;LEVEL 7
002206  012737  014176  000030          MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
002214  012737  000340  000032          MOV     #340,@#EMTVEC+2 ;;LEVEL 7
002222  012737  016624  000034          MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
002230  012737  000340  000036          MOV     #340,@#TRAPVEC+2;LEVEL 7
002236  012737  015000  000024          MOV     #$PWRON,@#PWRVEC ;;POWER FAILURE VECTOR
002244  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;LEVEL 7
002252  005067  177234                  CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
002256  005067  177232                  CLR     $ESCAPE         ;;CLEAR THE ESCAPE ON ERROR ADDRESS
002262  112767  000001  177125          MOVB    #1,$ERMAX       ;;ALLOW ONE ERROR PER TEST
002270  012767  002270  177110          MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
002276  012767  002276  177104          MOV     #.,$LPERR       ;;SETUP THE ERROR LOOP ADDRESS
                                ;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
                                ;;EQUAL TO A "-1" SETUP FOR A SOFTWARE SWITCH REGISTER.
002304  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
002310  012737  002344  000004          MOV     #64$,@#ERRVEC   ;;SET UP ERROR VECTOR
002316  012767  177570  177114          MOV     #DSWR,SWR       ;;SETUP FOR A HARDWARE SWICH REGISTER
002324  012767  177570  177110          MOV     #DDISP,DISPLAY  ;;AND A HARDWARE DISPLAY REGISTER
002332  022777  177777  177100          CMP     #-1,@SWR        ;;TRY TO REFERENCE HARDWARE SWR
002340  001012                          BNE     66$             ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
                                                                ;;AND  THE HARDWARE SWR IS NOT = -1
002342  000403                          BR      65$             ;;BRANCH IF NO TIMEOUT
002344  012716  002352          64$:    MOV     #65$,(SP)       ;;SET UP FOR TRAP RETURN
002350  000002                          RTI
002352  012767  000176  177060  65$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
002360  012767  000174  177054          MOV     #DISPREG,DISPLAY
002366  012637  000004          66$:    MOV     (SP)+,@#ERRVEC  ;;RESTORE ERROR VECTOR

002372  005067  177136                  CLR     $PASS           ;;CLEAR PASS COUNT
002376  132767  000200  177143          BITB    #APTSIZE,$ENVM  ;;TEST USER SIZE UNDER APT
002404  001403                          BEQ     67$             ;;YES,USE NON-APT SWITCH
002406  012767  001550  177024          MOV     #$SWREG,SWR     ;;NO,USE APT SWITCH REGISTER
002414                          67$:
002414  012706  001100                  MOV     #STACK,SP               ;SET STACK
002420  106427  000340                  MTPS    #340                    ;LOCK INTERRUPTS
002424  012737  015000  000024          MOV     #.PFAIL,@#24            ;SET UP POWER FAIL VECTOR
002432  105067  176535                  CLRB    $TFLG                   ;CLEAR START FLAG
```

INITIALIZE THE COMMON TAGS

```
1175  002436  005067  176450                    CLR     PASCNT                  ;CLEAR PASS COUNT
1176  002442  105067  176735                    CLRB    $ERFLG                  ;CLEAR ERROR FLAG
1177  002446  005067  176740                    CLR     $ERTTL                  ;CLEAR ERROR COUNT
1178  002452  005067  176740                    CLR     $ERRPC                  ;CLEAR LAST ERROR POINTER
1179  002456  012767  000001  176716            MOV     #1,$TSTNM               ;SET UP FOR TEST 1
1180  002464  012767  002152  176412            MOV     #.START,RETURN          ;SET UP FOR POWER FAIL BEFORE
1181                                                                            ;TESTING STARTS
1182  002472  013746  000006                    MOV     @#6,-(SP)
1183  002476  013746  000004                    MOV     @#4,-(SP)
1184  002502  012737  002516  000004            MOV     #1$,@#4
1185  002510  005777  176724                    TST     @SWR
1186  002514  000407                            BR      2$
1187  002516  012767  000176  176714  1$:       MOV     #SWREG,SWR
1188  002524  012767  000174  176710            MOV     #DISPREG,DISPLAY
1189  002532  022626                            CMP     (SP)+,(SP)+
1190  002534  012637  000004          2$:       MOV     (SP)+,@#4
1191  002540  012637  000006                    MOV     (SP)+,@#6
1192  002544  022767  000176  176666            CMP     #SWREG,SWR
1193  002552  001007                            BNE     3$
1194  002554  005737  000042                    TST     @#42                    ;CHECK FOR CHAIN
1195  002560  001402                            BEQ     33$
1196  002562  000167  000522                    JMP     .BEGIN
1197  002566  004767  010172          33$:      JSR     PC,CNTLU
1198  002572  105767  176374          3$:       TSTB    INIFLG                  ;HAS INITIALIZATION BEEN PERFORMED
1199  002576  001004                            BNE     ONCE
1200  002600  104401  015140                    TYPE    ,MTITLE                 ;TYPE TITLE MESSAGE
1201  002604  105167  176362                    COMB    INIFLG                  ;IF NOT SET FLAG AND DO
1202  002610  105767  176732          ONCE:     TSTB    $ENV            ;APT CONTROL?
1203  002614  001410                            BEQ     11$             ;BR IF NO
1204  002616  032767  000001  176726            BIT     #1,$USWR        ;EXTENAL JUMPER ON?
1205  002624  001002                            BNE     12$             ;NO
1206  002626  105067  176321                    CLRB    JMPBY           ;CLEAR FLAG
1207  002632  000167  000452          12$:      JMP     .BEGIN          ;GO DO IT
1208  002636  032777  000001  176574  11$:      BIT     #SWDD,@SWR      ;RESELECT VECTOR & CONTROL REG?
1209  002644  001002                            BNE     1$
1210  002646  000167  000436                    JMP     .BEGIN
1211  002652  012700  000300          1$:       MOV     #300,R0 ;RESTORE VECTOR AREA TO TRAPCATCHER
1212  002656  012701  000302                    MOV     #302,R1 ;START AT LOCATION 300
1213  002662  012702  000004                    MOV     #4,R2
1214  002666  010110          2$:       MOV     R1,(R0)
1215  002670  005011                            CLR     (R1)
1216  002672  060200                            ADD     R2,R0
1217  002674  060201                            ADD     R2,R1
1218  002676  022701  001000                    CMP     #1000,R1        ;END AT LOCATION 776
1219  002702  002771                            BLT     2$
1220  002704  104406                            INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1221  002706  015206                            MREGAD  ;MESSAGE
1222  002710  104410                            PARAM   ;CONVERT STRING
1223  002712  160000                            160000  ;LOW LIMIT
1224  002714  167776                            167776  ;HIGH LIMIT
1225  002716  017120                            DUBASE  ;STORE AT THIS LOCATION
1226  002720     001                .BYTE   1       ;MASK
1227  002721     001                .BYTE   1       ;HOW MANY TIMES + 2
1228  002722  016767  014172  176226            MOV     DUBASE,KEEPADD  ;SAVE
1229  002730  004767  014032                    JSR     PC,DUADDR
1230  002734  016767  176216  176212            MOV     KEEPADD,BASEADD ;RESTORE FOR ROTATION
```

```
                                                INITIALIZE THE COMMON TAGS

1231  002742  104406                                    INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1232  002744  015173                                    MVECTO  ;MESSAGE
1233  002746  104410                                    PARAM   ;CONVERT STRING
1234  002750  000300                                    300     ;LOW LIMIT
1235  002752  000776                                    776     ;HIGH LIMIT
1236  002754  001736                                    DURIV   ;STORE AT THIS LOCATION
1237  002756     001                              .BYTE  1       ;MASK
1238  002757     004                              .BYTE  4       ;HOW MANY TIMES + 2
1239  002760  016767  176752  176176                    MOV     DURIV,KEEPIV    ;SAVE
1240  002766  016767  176744  176166                    MOV     DURIV,BASEIV    ;SET UP FOR ROTATION
1241  002774  104406                                    INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1242  002776  015236                                    MMULT   ;MESSAGE
1243  003000  104414                                    SETFLG  ;SET FLAG BASED UPON INPUT STRING
1244  003002  001152                                    MULTD   ;THIS FLAG
1245  003004  105767  176142                           TSTB    MULTD   ;ARE THERE MULTIPLE DEVICES
1246                                                                    ;ON THE SYSTEM ?
1247  003010  100406                                    BMI     BBB     ;YES,ASK NEXT QUESTION
1248  003012  005067  176150                           CLR     ACTREG
1249  003016  005067  176146                           CLR     ROTADD
1250  003022  000167  000140                           JMP     OUTMUL  ;JUMP AROUND NEXT QUESTION
1251  003026                                  BBB:
1252  003026  104406                                    INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1253  003030  015265                                    MLASTD  ;MESSAGE
1254  003032  104410                                    PARAM   ;CONVERT STRING
1255  003034  160000                                    160000  ;LOW LIMIT
1256  003036  167776                                    167776  ;HIGH LIMIT
1257  003040  001160                                    LASTADD ;STORE AT THIS LOCATION
1258  003042     001                              .BYTE  1       ;MASK
1259  003043     001                              .BYTE  1       ;HOW MANY TIMES + 2
1260                                                  ;THE FOLLOWING ROUTINE SETS UP ACTREG FOR THE FIRST TIME
1261  003044  012767  000001  176116  1$:       MOV     #1,ROTADD       ;SET UP POINTER
1262  003052  005067  176110                           CLR     ACTREG  ;CLR ACTIVE REGISTER
1263  003056  056767  176106  176102  2$:       BIS     ROTADD,ACTREG   ;MAKE THIS DEVICE ACTIVE
1264  003064  000241                                    CLC
1265  003066  006167  176076                           ROL     ROTADD  ;SET UP POINTER
1266  003072  103421                                    BCS     3$      ;ARE YOU OUT OF RANGE ?
1267  003074  062767  000010  176052                   ADD     #10,BASEADD     ;SET UP BASE ADDRESS
1268  003102  026767  176052  176044                   CMP     LASTADD,BASEADD ;IS THIS THE LAST DEVICE ?
1269  003110  101362                                    BHI     2$      ;NO DO IT AGAIN
1270  003112  056767  176052  176046                   BIS     ROTADD,ACTREG   ;THIS ASSUMES THAT THERE ARE AT
1271                                                                    ;LEAST TWO DEVICES WHEN YOU ANSWER YES TO
1272                                                                    ;MULTIPLE DEVICE QUESTION
1273  003120  012767  000001  176042  4$:       MOV     #1,ROTADD       ;SET UP FOR LATER USE IN END OF PASS ROUTINE
1274  003126  016767  176024  176020                   MOV     KEEPADD,BASEADD ;DITTO
1275  003134  000414                                    BR      OUTMUL  ;CONTINUE QUESTIONS
1276  003136  016767  176014  176010  3$:       MOV     KEEPADD,BASEADD ;RESTORE
1277  003144  104406                                    INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1278  003146  015361                                    MRANGE  ;MESSAGE
1279  003150  104410                                    PARAM   ;CONVERT STRING
1280  003152  160000                                    160000  ;LOW LIMIT
1281  003154  167776                                    167776  ;HIGH LIMIT
1282  003156  001160                                    LASTADD ;STORE AT THIS LOCATION
1283  003160     001                              .BYTE  1       ;MASK
1284  003161     001                              .BYTE  1       ;HOW MANY TIMES + 2
1285  003162  000167  177656                           JMP     1$      ;DO IT AGAIN
1286  003166  012767  000340  013566  OUTMUL: MOV     #340,DUPRT
```

INITIALIZE THE COMMON TAGS

```
1287  003174  004767  013512                          JSR     PC,DULEV
1288                                                  ;COMPARE THE FIRST CHARACTER IN THE TELETYPE INPUT
1289                                                  ;BUFFER TO THE CHARACTERS "1" AND "2".
1290                                                  ;IF THE CHARACTER IS "1" CLEAR THE FLAG
1291                                                  ;IF THE CHARACTER IS "2" SET THE FLAG
1292  003200                                  AAA:
1293  003200  104406                                 INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1294  003202  015577                                 MSYNC   ;MESSAGE
1295  003204  122767  000061  012726  3$:            CMPB    #'1,INBUF       ;IS IT "1" ?
1296  003212  001003                                 BNE     1$
1297  003214  105067  175726                        CLRB    SYNCNO  ;000
1298  003220  000412                                 BR      4$
1299  003222  122767  000062  012710  1$:            CMPB    #'2,INBUF       ;IS IT "2" ?
1300  003230  001004                                 BNE     2$
1301  003232  112767  177777  175706                MOVB    #-1,SYNCNO      ;377
1302  003240  000402                                 BR      4$
1303  003242  104407                          2$:    INSTER  ;RETRY
1304  003244  000757                                 BR      3$
1305  003246  000240                          4$:    NOP
1306  003250  104406                                 INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1307  003252  015645                                 MWIRE6  ;MESSAGE
1308  003254  104414                                 SETFLG  ;SET FLAG BASED UPON INPUT STRING
1309  003256  001147                                 SEXMIT  ;THIS FLAG
1310  003260  104406                                 INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1311  003262  015716                                 MWIRE5  ;MESSAGE
1312  003264  104414                                 SETFLG  ;SET FLAG BASED UPON INPUT STRING
1313  003266  001150                                 SEREC   ;THIS FLAG
1314  003270  104406                                 INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1315  003272  015766                                 MWIRE4  ;MESSAGE
1316  003274  104414                                 SETFLG  ;SET FLAG BASED UPON INPUT STRING
1317  003276  001151                                 OPTCLR  ;THIS FLAG
1318  003300  104406                                 INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1319  003302  016045                                 MEXTJ   ;MESSAGE
1320  003304  104414                                 SETFLG  ;SET FLAG BASED UPON INPUT STRING
1321  003306  001153                                 JMRBY   ;THIS FLAG
1322
1323                                                  ;TEST START AND RESTART
1324
1325  003310  012706  001100          .BEGIN: MOV     #STACK,SP               ;SET UP STACK
1326  003314  106427  000340                  MTPS    #340                    ;LOCK OUT INTERRUPTS
1327  003320  032777  000002  176112          BIT     #SW01,@SWR              ;IF SW01=1, GET STARTING PC
1328  003326  001406                          BEQ     3$
1329  003330  104406                          INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1330  003332  015531                          MTSTPC  ;MESSAGE
1331  003334  104410                          PARAM   ;CONVERT STRING
1332  003336  003362                          TST1    ;LOW LIMIT
1333                                                  ;HIGH LIMIT
1334                                                  ;STORE AT THIS LOCATION
1335  003340     001                  .BYTE   1       ;MASK
1336  003341     001                  .BYTE   1       ;HOW MANY TIMES + 2
1337  003342  000403                          BR      4$
1338  003344  012767  003362  175532  3$:     MOV     #TST1,RETURN            ;START AT TEST 1
1339  003352  104401  015525          4$:     TYPE    ,MR                     ;TYPE R
1340  003356  000177  175522                  JMP     @RETURN                 ;START TESTING
1341
1342                                                  ;;THIS TEST CHECKS THE STRIP SYNC FUNCTION
```

```
                                        INITIALIZE THE COMMON TAGS

1343                                                    ;;OF THE RECEIVER LOGIC
1344                                                    ;;MODE:SYNINT
1345                                                    ;;LENGTH:EIGHT
1346                                                    ;;NOTE: RXDONE SHOULD NEVER ASSERT
1347                                                    ;;CHAR: 26 (SYNC)
1348                                                    ;;
1349                                    ;;**************************************************************************
1350  003362  000004                    TST1:   SCOPE
1351  003364  052777  000400  176334            BIS     #MRESET,@TXCSR  ;MASTER RESET
1352  003372  012777  030000  176322            MOV     #SYNINT,@PARCSR ;SET THE MODE
1353  003400  052777  000400  176320            BIS     #MRESET,@TXCSR  ;MASTER RESET
1354
1355                                    ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
1356  003406  012777  064001  176312            MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
1357
1358                                    ;SET MODE ,# OF BITS,PARITY SENSE &LOAD SYNC REG
1359  003414  012777  036026  176300            MOV     #SYNINT!EIGHT!NOPAR!26,@PARCSR
1360  003422  052777  000020  176262            BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
1361                                            ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
1362  003430  042777  020000  176270            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
1363  003436  052777  020000  176262            BIS     #CLK,@TXCSR     ;POKE CLK UP
1364                                    ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
1365  003444  042777  020000  176254            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
1366  003452  052777  020000  176246            BIS     #CLK,@TXCSR     ;POKE CLK UP
1367  003460  052777  000400  176224            BIS     #STPSYN,@RXCSR  ;SET STRIP SYNC
1368  003466  012767  000003  175430            MOV     #3,COUNT        ;# OF SYNC CHARS
1369  003474  012767  000026  175776  1$:       MOV     #26,$TMP1       ;CHAR TO BE SHIFTED
1370  003502  012767  000010  175412            MOV     #8.,SHIFT       ;# OF SHIFTS
1371  003510  004767  013406                    JSR     PC,APOKE        ;SHIFT IN THIS CHAR
1372  003514  105777  176172                    TSTB    @RXCSR  ;RXDONE
1373  003520  100001                            BPL     .+4
1374  003522  104004                            ERROR   4       ;RXDONE SHOULD NOT BE ASSERTED
1375  003524  005367  175374                    DEC     COUNT   ;# OF SYNC CHARS
1376  003530  001361                            BNE     1$
1377
1378                                    ;;THIS TEST PROVES THAT RXERR FREEZES THE "RECEIVER RESET"
1379                                    ;;WHILE IN STRIP SYNC MODE
1380                                    ;;THIS TEST FIRST PROVES THAT AUTOMATIC RESETS OCCUR WHEN
1381                                    ;;STRIP SYNC IS SET & SYNC CHARACTERS ARE SENT
1382                                    ;;....BUT IF AN ERROR SHOULD OCCUR....THIS AUTOMATIC RESET
1383                                    ;;IS DISCOMBOBULATED
1384                                    ;;IE, FORCE PARITY ERROR WHILE STRIP SYNC IS SET
1385                                    ;;NOTE: NORMALLY THE LOGIC RESETS THE RXDONE &ERROR FLAGS
1386                                    ;;PROVIDING THAT ONLY GOOD SYNC CHARACTERS ARE SENT....
1387                                    ;;BUT, IF AN RXERR OCCURS   RXDONE PLUS RXERR ARE ASSERTED
1388                                    ;;MODE: ISOC (ISYMOD)
1389                                    ;;LENGTH: EIGHT
1390                                    ;;PARITY: EVEPAR
1391                                    ;;CHARACTER EXPECTED:26
1392                                    ;;CHARACTER SENT: SYNC CHARACTER
1393                                    ;;NOTE: THIS TEST USES ONLY THE RECEIVER LOGIC
1394                                    ;;
1395                                    ;;**************************************************************************
1396  003532  000004                    TST2:   SCOPE
1397  003534  052777  000400  176164            BIS     #MRESET,@TXCSR  ;MASTER RESET
1398  003542  012777  000000  176152            MOV     #ISYMOD,@PARCSR ;SET THE MODE
```

INITIALIZE THE COMMON TAGS

```
1399  003550  052777  000400  176150          BIS     #MRESET,@TXCSR  ;MASTER RESET
1400
1401                                  ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
1402  003556  012777  064001  176142          MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
1403
1404                                  ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
1405  003564  012777  007426  176130          MOV     #ISYNMOD!EIGHT!EVEPAR!26.,@PARCSR
1406  003572  016703  176120                  MOV     RXDBUF,R3       ;SET UP FOR ERROR MSG
1407  003576  012767  000003  175320          MOV     #3,COUNT        ;# OF TIMES SYNC CHAR WILL BE SENT
1408  003604  052777  000020  176100          BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
1409                                          ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
1410  003612  042777  020000  176106          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
1411  003620  052777  020000  176100          BIS     #CLK,@TXCSR     ;POKE CLK UP
1412                                  ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
1413  003626  042777  020000  176072          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
1414  003634  052777  020000  176064          BIS     #CLK,@TXCSR     ;POKE CLK UP
1415  003642  052777  000400  176042          BIS     #STPSYN,@RXCSR  ;SET STRIP SYNC
1416  003650  012767  000013  175244  2$:     MOV     #11.,SHIFT      ;# OF SHIFTS
1417  003656  012767  003054  175614          MOV     #3054,STMP1     ;SYNC CHAR + START&STOP+ PARITY
1418  003664  004767  013232          1$:     JSR     PC,RPOKE        ;SHIFT IN THIS CHARACTER
1419  003670  105777  176016                  TSTB    @RXCSR  ;RXDONE = 0 ?
1420  003674  100001                          BPL     .+4
1421  003676  104004                          ERROR   4       ;RXDONE SHOULD NOT BE SET
1422  003700  005367  175220                  DEC     COUNT   ;# OF  SYNC CHARS
1423  003704  001361                          BNE     2$      ;GO AGAIN ?
1424  003706  012700  000026                  MOV     #26,R0  ;EXPECTED
1425  003712  017701  176000                  MOV     @RXDBUF,R1      ;ACTUAL
1426                                          ;NOTE THAT THIS IS THE FIRST TIME
1427                                          ;RXDBUF IS READ.......THERE SHOULD BE
1428                                          ;NO OVER RUN ERROR      4S
1429  003716  020001                  CMP     R0,R1   ;COMPARE EXPECTED VS ACTUAL
1430  003720  001401                  BEQ     .+4
1431  003722  104002                  ERROR   2       ;DATA CHARS SHOULD COMPARE
1432                                          ;THERE SHOULD BE NO RXERR'S
1433  003724  012767  000004  175172          MOV     #4,COUNT        ;# OF TIMES
1434  003732  012700  110026                  MOV     #RXERR!PARER!26,R0      ;EXPECTED
1435  003736  012767  002054  175534          MOV     #2054,STMP1     ;BAD SYNC CHAR (WRONG PARITY)
1436  003744  012767  000013  175150  3$:     MOV     #11.,SHIFT      ;# OF SHIFTS
1437  003752  004767  013144                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
1438  003756  105777  175730                  TSTB    @RXCSR  ;RXDONE = 1?
1439  003762  100401                          BMI     .+4
1440  003764  104004                          ERROR   4       ;RXDONE SHOULD BE SET
1441  003766  017701  175724                  MOV     @RXDBUF,R1      ;ACTUAL DATA
1442  003772  020001                  CMP     R0,R1   ;COMPARE EXP VS ACT
1443  003774  001401                  BEQ     .+4
1444  003776  104000                  ERROR   ;DID THE RESPECTIVE ERROR       4 STOP THE
1445                                          ;AUTOMATIC RESSETING OF RXDONE & ERROR FLAGS
1446                                          ;.....CHECK THIS.....
1447  004000  005367  175120                  DEC     COUNT   ;# OF SYNC CHARS
1448  004004  001445                  BEQ     5$      ;FINISHED ? GET OUT OF TEST
1449  004006  022767  000003  175110          CMP     #3,COUNT        ;# OF SYNC CHARS
1450  004014  001423                  BEQ     6$      ;CHECK FRAME ERROR ?
1451  004016  022767  000002  175100          CMP     #2,COUNT        ;# OF SYNC CHARS
1452  004024  001426                  BEQ     7$      ;CHECK FRAME ERROR & BAD PARITY ?
1453                                  ;NOPE THEN IT (COUNT) MUST BE = 1  THEREFORE....
1454  004026  012767  000013  175066          MOV     #11.,SHIFT      ;# OF SHIFTS
```

```
                                        INITIALIZE THE COMMON TAGS

1455  004034  012767  000054  175436          MOV     #54,$TMP1       ;FRAME & PARITY ERROR
1456  004042  004767  013054                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
1457                                  ;NOW DON'T READ THE RXDBUF TO CREATE OVER RUN
1458  004046  012767  000054  175424          MOV     #54,$TMP1       ;FRAME & PARITY ERROR
1459  004054  012700  170026                  MOV     #RXERR!OVRRUN!FRMERR!PARER!26,R0        ;EXPECTED
1460  004060  000167  177660                  JMP     3$      ;DO IT AGAIN
1461  004064  012767  001054  175406  6$:     MOV     #1054,$TMP1     ;BAD STOP BIT  FOR FRAME ERROR
1462  004072  012700  120026                  MOV     #RXERR!FRMERR!26,R0     ;EXPECTED
1463  004076  000167  177642                  JMP     3$      ;DO IT AGAIN
1464  004102  012767  000054  175370  7$:     MOV     #54,$TMP1       ;BAD STOP BIT & PARITY
1465  004110  012700  130026                  MOV     #RXERR!FRMERR!PARER!26,R0       ;EXPECTED
1466  004114  000167  177624                  JMP     3$      ;DO IT AGAIN
1467  004120                                5$:
1468                                  ;;THIS TEST PROVES THAT RXERR FREEZES THE "RECEIVER RESET"
1469                                  ;;WHILE IN STRIP SYNC MODE
1470                                  ;;THIS TEST FIRST PROVES THAT AUTOMATIC RESETS OCCUR WHEN
1471                                  ;;STRIP SYNC IS SET & SYNC CHARACTERS ARE SENT
1472                                  ;;....BUT IF AN ERROR SHOULD OCCUR....THIS AUTOMATIC RESET
1473                                  ;;IS DISCOMBOBULATED
1474                                  ;;IE. FORCE PARITY ERROR WHILE STRIP SYNC IS SET
1475                                  ;;NOTE: NORMALLY THE LOGIC RESETS THE RXDONE &ERROR FLAGS
1476                                  ;;PROVIDING THAT ONLY GOOD SYNC CHARACTERS ARE SENT....
1477                                  ;;BUT, IF AN RXERR OCCURS   RXDONE PLUS RXERR ARE ASSERTED
1478                                  ;;MODE: ISOC (ISYMOD)
1479                                  ;;LENGTH: SEVEN
1480                                  ;;PARITY: EVEPAR
1481                                  ;;CHARACTER EXPECTED:226
1482                                                  ;NOTE THAT THE PARITY BIT SHOULD SHOW
1483                                                  ;UP IN THE DATA     IE. BIT SEVEN FOR
1484                                                  ;SEVEN LEVEL CODE
1485                                  ;;CHARACTER SENT: SYNC CHARACTER
1486                                  ;;NOTE: THIS TEST USES ONLY THE RECEIVER LOGIC
1487                                  ;;
1488                                  ;;*****************************************************************
1489  004120  000004                  TST3:   SCOPE
1490  004122  052777  000400  175576          BIS     #MRESET,@TXCSR  ;MASTER RESET
1491  004130  012777  000000  175564          MOV     #ISYMOD,@PARCSR ;SET THE MODE
1492  004136  052777  000400  175562          BIS     #MRESET,@TXCSR  ;MASTER RESET
1493
1494                                  ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
1495  004144  012777  064001  175554          MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
1496
1497                                  ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
1498  004152  012777  005626  175542          MOV     #ISYMOD!SEVEN!EVEPAR!226,@PARCSR
1499  004160  016703  175532                  MOV     RXDBUF,R3       ;SET UP FOR ERROR MSG
1500  004164  012767  000003  174732          MOV     #3,COUNT        ;# OF TIMES SYNC CHAR WILL BE SENT
1501  004172  052777  000020  175512          BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
1502                                          ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
1503  004200  042777  020000  175520          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
1504  004206  052777  020000  175512          BIS     #CLK,@TXCSR     ;POKE CLK UP
1505                                  ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
1506  004214  042777  020000  175504          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
1507  004222  052777  020000  175476          BIS     #CLK,@TXCSR     ;POKE CLK UP
1508  004230  052777  000400  175454          BIS     #STPSYN,@RXCSR  ;SET STRIP SYNC
1509  004236  012767  000012  174656  2$:     MOV     #10.,SHIFT      ;# OF SHIFTS
1510  004244  012767  001454  175226          MOV     #1454,$TMP1     ;SYNC CHAR + START&STOP+ PARITY
```

```
1511  004252  004767  012644          1$:     JSR     PC,RPOKE        ;SHIFT IN THIS CHARACTER
1512  004256  105777  175430                  TSTB    @RXCSR  ;RXDONE = 0 ?
1513  004262  100001                          BPL     .+4
1514  004264  104004                          ERROR   4       ;RXDONE SHOULD NOT BE SET
1515  004266  005367  174632                  DEC     COUNT   ;# OF  SYNC CHARS
1516  004272  001361                          BNE     2$      ;GO AGAIN ?
1517  004274  012700  000226                  MOV     #226,R0 ;EXPECTED
1518  004300  017701  175412                  MOV     @RXDBUF,R1      ;ACTUAL
1519                                                          ;NOTE THAT THIS IS THE FIRST TIME
1520                                                          ;RXDBUF IS READ.......THERE SHOULD BE
1521                                                          ;NO OVER RUN ERROR      4S
1522  004304  020001                          CMP     R0,R1   ;COMPARE EXPECTED VS ACTUAL
1523  004306  001401                          BEQ     .+4
1524  004310  104002                          ERROR   2       ;DATA CHARS SHOULD COMPARE
1525                                                          ;THERE SHOULD BE NO RXERR'S
1526  004312  012767  000004  174604          MOV     #4,COUNT        ;# OF TIMES
1527  004320  012700  110026                  MOV     #RXERR!PARER!26,R0      ;EXPECTED
1528  004324  012767  001054  175146          MOV     #1054,$TMP1     ;BAD SYNC CHAR (WRONG PARITY)
1529  004332  012767  000012  174562  3$:     MOV     #10.,SHIFT      ;# OF SHIFTS
1530  004340  004767  012556                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
1531  004344  105777  175342                  TSTB    @RXCSR  ;RXDONE = 1?
1532  004350  100401                          BMI     .+4
1533  004352  104004                          ERROR   4       ;RXDONE SHOULD BE SET
1534  004354  017701  175336                  MOV     @RXDBUF,R1      ;ACTUAL DATA
1535  004360  020001                          CMP     R0,R1   ;COMPARE EXP VS ACT
1536  004362  001401                          BEQ     .+4
1537  004364  104000                          ERROR   ;DID THE RESPECTIVE ERROR       4 STOP THE
1538                                                          ;AUTOMATIC RESSETING OF RXDONE & ERROR FLAGS
1539                                                          ;.....CHECK THIS.....
1540                                                          ;NOTE THAT THE PARITY BIT SHOULD
1541                                                          ;SHOW UP IN THE DATA
1542                                                          ;IE.  BIT SEVEN FOR SEVEN LEVEL CODE
1543  004366  005367  174532                  DEC     COUNT   ;# OF SYNC CHARS
1544  004372  001445                          BEQ     5$      ;FINISHED ? GET OUT OF TEST
1545  004374  022767  000003  174522          CMP     #3,COUNT        ;# OF SYNC CHARS
1546  004402  001423                          BEQ     6$      ;CHECK FRAME ERROR ?
1547  004404  022767  000002  174512          CMP     #2,COUNT        ;# OF SYNC CHARS
1548  004412  001426                          BEQ     7$      ;CHECK FRAME ERROR & BAD PARITY ?
1549                                          ;NOPE THEN IT (COUNT) MUST BE = 1  THEREFORE....
1550  004414  012767  000012  174500          MOV     #10.,SHIFT      ;# OF SHIFTS
1551  004422  012767  000054  175050          MOV     #54,$TMP1       ;FRAME & PARITY ERROR
1552  004430  004767  012466                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
1553                                  ;NOW DON'T READ THE RXDBUF TO CREATE OVER RUN
1554  004434  012767  000054  175036          MOV     #54,$TMP1       ;FRAME & PARITY ERROR
1555  004442  012700  170026                  MOV     #RXERR!OVRRUN!FRMERR!PARER!26,R0        ;EXPECTED
1556  004446  000167  177660                  JMP     3$      ;DO IT AGAIN
1557  004452  012767  000454  175020  6$:     MOV     #454,$TMP1      ;BAD STOP BIT  FOR FRAME ERROR
1558  004460  012700  120226                  MOV     #RXERR!FRMERR!226,R0    ;EXPECTED
1559  004464  000167  177642                  JMP     3$      ;DO IT AGAIN
1560  004470  012767  000054  175002  7$:     MOV     #54,$TMP1       ;BAD STOP BIT & PARITY
1561  004476  012700  130026                  MOV     #RXERR!FRMERR!PARER!26,R0       ;EXPECTED
1562  004502  000167  177624                  JMP     3$      ;DO IT AGAIN
1563  004506                          5$:
1564                                  ;;THIS TEST PROVES THAT RXERR FREEZES THE "RECEIVER RESET"
1565                                  ;;WHILE IN STRIP SYNC MODE
1566                                  ;;THIS TEST FIRST PROVES THAT AUTOMATIC RESETS OCCUR WHEN
```

```
                                        INITIALIZE THE COMMON TAGS

                                        ;;STRIP SYNC IS SET & SYNC CHARACTERS ARE SENT
                                        ;;.....BUT IF AN ERROR SHOULD OCCUR....THIS AUTOMATIC RESET
                                        ;;IS DISCOMBOBULATED
                                        ;;IE. FORCE PARITY ERROR WHILE STRIP SYNC IS SET
                                        ;;NOTE: NORMALLY THE LOGIC RESETS THE RXDONE &ERROR FLAGS
                                        ;;PROVIDING THAT ONLY GOOD SYNC CHARACTERS ARE SENT....
                                        ;;BUT, IF AN RXERR OCCURS   RXDONE PLUS RXERR ARE ASSERTED
                                        ;;MODE: ISOC (ISYMOD)
                                        ;;LENGTH: SIX
                                        ;;PARITY: EVEPAR
                                        ;;CHARACTER EXPECTED:126
                                                        ;NOTE THAT THE PARITY BIT SHOULD SHOW
                                                        ;UP IN THE DATA     IE. BIT SIX FOR
                                                        ;SIX LEVEL CODE
                                        ;;CHARACTER SENT: SYNC CHARACTER
                                        ;;NOTE: THIS TEST USES ONLY THE RECEIVER LOGIC
                                        ;;
                                        ;;*****************************************************************
004506  000004                        TST4:   SCOPE
004510  052777  000400  175210                BIS     #MRESET,@TXCSR  ;MASTER RESET
004516  012777  000000  175176                MOV     #ISYMOD,@PARCSR ;SET THE MODE
004524  052777  000400  175174                BIS     #MRESET,@TXCSR  ;MASTER RESET

                                        ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
004532  012777  064001  175166                MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR

                                        ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
004540  012777  003526  175154                MOV     #ISYMOD!SIX!EVEPAR!126,@PARCSR
004546  016703  175144                       MOV     RXDBUF,R3       ;SET UP FOR ERROR MSG
004552  012767  000003  174344                MOV     #3,COUNT        ;# OF TIMES SYNC CHAR WILL BE SENT
004560  052777  000020  175124                BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
                                                ;POKE CLK TO GET RECEIVER INTO SYNCHROIZATION....
004566  042777  020000  175132                BIC     #CLK,@TXCSR     ;POKE CLK DOWN
004574  052777  020000  175124                BIS     #CLK,@TXCSR     ;POKE CLK UP
                                        ;POKE CLK TO GET LOGIC INTO SYNCHRONIZATION
004602  042777  020000  175116                BIC     #CLK,@TXCSR     ;POKE CLK DOWN
004610  052777  020000  175110                BIS     #CLK,@TXCSR     ;POKE CLK UP
004616  052777  000400  175066                BIS     #STPSYN,@RXCSR  ;SET STRIP SYNC
004624  012767  000011  174270  2$:           MOV     #9.,SHIFT       ;# OF SHIFTS
004632  012767  000654  174640                MOV     #654,STMP1      ;SYNC CHAR + START&  OP+ PARITY
004640  004767  012256             1$:        JSR     PC,RPOKE        ;SHIFT IN THIS CHARACTER
004644  105777  175042                       TSTB    @RXCSR  ;RXDONE = 0 ?
004650  100001                             BPL     .+4
004652  104004                             ERROR   4       ;RXDONE SHOULD NOT BE SET
004654  005367  174244                     DEC     COUNT   ;# OF  SYNC CHARS
004660  001361                             BNE     2$      ;GO AGAIN ?
004662  012700  000126                     MOV     #126,R0 ;EXPECTED
004666  017701  175024                     MOV     @RXDBUF,R1      ;ACTUAL
                                                        ;NOTE THAT THIS IS THE FIRST TIME
                                                        ;RXDBUF IS READ.....THERE SHOULD BE
                                                        ;NO OVER RUN ERROR      4S
004672  020001                             CMP     R0,R1   ;COMPARE EXPECTED VS ACTUAL
004674  001401                             BEQ     .+4
004676  104002                             ERROR   2       ;DATA CHARS SHOULD COMPARE
                                                        ;THERE SHOULD BE NO RXERR'S
004700  012767  000004  174216                MOV     #4,COUNT        ;# OF TIMES
```

```
1623  004706  012700  110026                    MOV     #RXERR!PARER!26,R0      ;EXPECTED
1624  004712  012767  000454  174560            MOV     #454,$TMP1      ;BAD SYNC CHAR (WRONG PARITY)
1625  004720  012767  000011  174174  3$:       MOV     #9.,SHIFT       ;# OF SHIFTS
1626  004726  004767  012170                    JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
1627  004732  105777  174754                    TSTB    @RXCSR  ;RXDONE = 1?
1628  004736  100401                            BMI     .+4
1629  004740  104004                            ERROR   4       ;RXDONE SHOULD BE SET
1630  004742  017701  174750                    MOV     @RXDBUF,R1      ;ACTUAL DATA
1631  004746  020001                            CMP     R0,R1   ;COMPARE EXP VS ACT
1632  004750  001401                            BEQ     .+4
1633  004752  104000                            ERROR   ;DID THE RESPECTIVE ERROR       4 STOP THE
1634                                            ;AUTOMATIC RESSETING OF RXDONE & ERROR FLAGS
1635                                            ;.....CHECK THIS.....
1636                                            ;NOTE THAT THE PARITY BIT SHOULD
1637                                            ;SHOW UP IN THE DATA
1638                                            ;IE.  BIT SIX FOR SIX LEVEL CODE
1639  004754  005367  174144                    DEC     COUNT   ;# OF SYNC CHARS
1640  004760  001445                            BEQ     5$      ;FINISHED ? GET OUT OF TEST
1641  004762  022767  000003  174134            CMP     #3,COUNT        ;# OF SYNC CHARS
1642  004770  001423                            BEQ     6$      ;CHECK FRAME ERROR ?
1643  004772  022767  000002  174124            CMP     #2,COUNT        ;# OF SYNC CHARS
1644  005000  001426                            BEQ     7$      ;CHECK FRAME ERROR & BAD PARITY ?
1645                                            ;NOPE THEN IT (COUNT) MUST BE = 1  THEREFORE....
1646  005002  012767  000011  174112            MOV     #9.,SHIFT       ;# OF SHIFTS
1647  005010  012767  000054  174462            MOV     #54,$TMP1       ;FRAME & PARITY ERROR
1648  005016  004767  012100                    JSR     PC,RPOKE        ;SHIFT 1.' THIS CHAR
1649                                    ;NOW DON'T READ THE RXDBUF TO CREATE OVER RUN
1650  005022  012767  000054  174450            MOV     #54,$TMP1       ;FRAME & PARITY ERROR
1651  005030  012700  170026                    MOV     #RXERR!OVRRUN!FRMERR!PARER!26,R0        ;EXPECTED
1652  005034  000167  177660                    JMP     3$      ;DO IT AGAIN
1653  005040  012767  000254  174432  6$:       MOV     #254,$TMP1      ;BAD STOP BIT  FOR FRAME ERROR
1654  005046  012700  120126                    MOV     #RXERR!FRMERR!126,R0    ;EXPECTED
1655  005052  000167  177642                    JMP     3$      ;DO IT AGAIN
1656  005056  012767  000054  174414  7$:       MOV     #54,$TMP1       ;BAD STOP BIT & PARITY
1657  005064  012700  130026                    MOV     #RXERR!FRMERR!PARER!26,R0       ;EXPECTED
1658  005070  000167  177624                    JMP     3$      ;DO IT AGAIN
1659  005074                                5$:
1660                                        ;;THIS TEST PROVES THAT RXERR FREEZES THE "RECEIVER RESET"
1661                                        ;;WHILE IN STRIP SYNC MODE
1662                                        ;;THIS TEST FIRST PROVES THAT AUTOMATIC RESETS OCCUR WHEN
1663                                        ;;STRIP SYNC IS SET & SYNC CHARACTERS ARE SENT
1664                                        ;;.....BUT IF AN ERROR SHOULD OCCUR....THIS AUTOMATIC RESET
1665                                        ;;IS DISCOMBOBULATED
1666                                        ;;IE. FORCE PARITY ERROR WHILE STRIP SYNC IS SET
1667                                        ;;NOTE: NORMALLY THE LOGIC RESETS THE RXDONE &ERROR FLAGS
1668                                        ;;PROVIDING THAT ONLY GOOD SYNC CHARACTERS ARE SENT....
1669                                        ;;BUT, IF AN RXERR OCCURS   RXDONE PLUS RXERR ARE ASSERTED
1670                                        ;;MODE: ISOC (ISYMOD)
1671                                        ;;LENGTH: FIVE
1672                                        ;;PARITY: EVEPAR
1673                                        ;;CHARACTER EXPECTED:66
1674                                                        ;NOTE THAT THE PARITY BIT SHOULD SHOW
1675                                                        ;UP IN THE DATA     IE. BIT FIVE FOR
1676                                                        ;FIVE LEVEL CODE
1677                                        ;;CHARACTER SENT: SYNC CHARACTER
1678                                        ;;NOTE: THIS TEST USES ONLY THE RECEIVER LOGIC
```

INITIALIZE THE COMMON TAGS

```
1679                                            ;;
1680                                            ;;**************************************************************************
1681  005074  000004                            TST5:   SCOPE
1682  005076  052777  000400  174622                    BIS     #MRESET,@TXCSR  ;MASTER RESET
1683  005104  012777  000000  174610                    MOV     #ISYMOD,@PARCSR ;SET THE MODE
1684  005112  052777  000400  174606                    BIS     #MRESET,@TXCSR  ;MASTER RESET
1685
1686                                            ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
1687  005120  012777  064001  174600                    MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
1688
1689                                            ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
1690  005126  012777  001466  174566                    MOV     #ISYMOD!FIVE!EVEPAR!66,@PARCSR
1691  005134  016703  174556                          MOV     RXDBUF,R3       ;SET UP FOR ERROR MSG
1692  005140  012767  000003  173756                    MOV     #3,COUNT        ;# OF TIMES SYNC CHAR WILL BE SENT
1693  005146  052777  000020  174536                    BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
1694                                                    ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
1695  005154  042777  020000  174544                    BIC     #CLK,@TXCSR     ;POKE CLK DOWN
1696  005162  052777  020000  174536                    BIS     #CLK,@TXCSR     ;POKE CLK UP
1697                                            ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
1698  005170  042777  020000  174530                    BIC     #CLK,@TXCSR     ;POKE CLK DOWN
1699  005176  052777  020000  174522                    BIS     #CLK,@TXCSR     ;POKE CLK UP
1700  005204  052777  000400  174500                    BIS     #STPSYN,@RXCSR  ;SET STRIP SYNC
1701  005212  012767  000010  173702  2$:       MOV     #8.,SHIFT       ;# OF SHIFTS
1702  005220  012767  000354  174252                    MOV     #354,STMP1      ;SYNC CHAR + START&STOP+ PARITY
1703  005226  004767  011670                    1$:     JSR     PC,RPOKE        ;SHIFT IN THIS CHARACTER
1704  005232  105777  174454                            TSTB    @RXCSR  ;RXDONE = 0 ?
1705  005236  100001                                    BPL     .+4
1706  005240  104004                                    ERROR   4       ;RXDONE SHOULD NOT BE SET
1707  005242  005367  173656                            DEC     COUNT   ;# OF  SYNC CHARS
1708  005246  001361                                    BNE     2$      ;GO AGAIN ?
1709  005250  012700  000066                            MOV     #66,R0  ;EXPECTED
1710  005254  017701  174436                            MOV     @RXDBUF,R1      ;ACTUAL
1711                                                    ;NOTE THAT THIS IS THE FIRST TIME
1712                                                    ;RXDBUF IS READ.......THERE SHOULD BE
1713                                                    ;NO OVER RUN ERROR      4S
1714  005260  020001                                    CMP     R0,R1   ;COMPARE EXPECTED VS ACTUAL
1715  005262  001401                                    BEQ     .+4
1716  005264  104002                                    ERROR   2       ;DATA CHARS SHOULD COMPARE
1717                                                    ;THERE SHOULD BE NO RXERR'S
1718  005266  012767  000004  173630                    MOV     #4,COUNT        ;# OF TIMES
1719  005274  012700  110026                          MOV     #RXERR!PARER!26,R0      ;EXPECTED
1720  005300  012767  000254  174172                    MOV     #254,STMP1      ;BAD SYNC CHAR (WRONG PARITY)
1721  005306  012767  000010  173606  3$:       MOV     #8.,SHIFT       ;# OF SHIFTS
1722  005314  004767  011602                          JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
1723  005320  105777  174366                          TSTB    @RXCSR  ;RXDONE = 1?
1724  005324  100401                                    BMI     .+4
1725  005326  104004                                    ERROR   4       ;RXDONE SHOULD BE SET
1726  005330  017701  174362                            MOV     @RXDBUF,R1      ;ACTUAL DATA
1727  005334  020001                                    CMP     R0,R1   ;COMPARE EXP VS ACT
1728  005336  001401                                    BEQ     .+4
1729  005340  104000                                    ERROR   ;DID THE RESPECTIVE ERROR       4 STOP THE
1730                                                    ;AUTOMATIC RESSETING OF RXDONE & ERROR FLAGS
1731                                                    ;.....CHECK THIS.....
1732                                                    ;NOTE THAT THE PARITY BIT SHOULD
1733                                                    ;SHOW UP IN THE DATA
1734                                                    ;IE.  BIT FIVE FOR FIVE LEVEL CODE
```

```
                                        INITIALIZE THE COMMON TAGS

1735  005342  005367  173556                        DEC     COUNT   ;# OF SYNC CHARS
1736  005346  001445                                BEQ     5$      ;FINISHED ? GET OUT OF TEST
1737  005350  022767  000003  173546                CMP     #3,COUNT        ;# OF SYNC CHARS
1738  005356  001423                                BEQ     6$      ;CHECK FRAME ERROR ?
1739  005360  022767  000002  173536                CMP     #2,COUNT        ;# OF SYNC CHARS
1740  005366  001426                                BEQ     7$      ;CHECK FRAME ERROR & BAD PARITY ?
1741                                                ;NOPE THEN IT (COUNT) MUST BE = 1  THEREFORE....
1742  005370  012767  000010  173524                MOV     #8.,SHIFT       ;# OF SHIFTS
1743  005376  012767  000054  174074                MOV     #54,STMP1       ;FRAME & PARITY ERROR
1744  005404  004767  011512                        JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
1745                                        ;NOW DON'T READ THE RXDBUF TO CREATE OVER RUN
1746  005410  012767  000054  174062                MOV     #54,STMP1       ;FRAME & PARITY ERROR
1747  005416  012700  170026                        MOV     #RXERR!OVRRUN!FRMERR!PARER!26,R0        ;EXPECTED
1748  005422  000167  177660                        JMP     3$      ;DO IT AGAIN
1749  005426  012767  000154  174044  6$:           MOV     #154,STMP1      ;BAD STOP BIT  FOR FRAME ERROR
1750  005434  012700  120066                        MOV     #RXERR!FRMERR!66,R0     ;EXPECTED
1751  005440  000167  177642                        JMP     3$      ;DO IT AGAIN
1752  005444  012767  000054  174026  7$:           MOV     #54,STMP1       ;BAD STOP BIT & PARITY
1753  005452  012700  130026                        MOV     #RXERR!FRMERR!PARER!26,R0       ;EXPECTED
1754  005456  000167  177624                        JMP     3$      ;DO IT AGAIN
1755  005462                                5$:
1756                                                ;;THIS TEST VERIFYS WORD LENGTH SELECT OF
1757                                                ;;THE TRANSMITTER SECTION,IT USES THE DNA FLAG
1758                                                ;;AND BIT WINDOW TO DETERMINE THAT IT WAS SELECTED
1759                                                ;;CORRECTLY
1760                                                ;;NOTE: DNA COMES UP ON THE FIRST RISING BIT
1761                                                ;;EDGE OF THE NEXT CHARACTER IF NO NEW CHARACTER IS
1762                                                ;;LOADED INTO TXDBUF
1763                                                ;;MODE:SYNINT
1764                                                ;;PARITY:NO PARITY
1765                                                ;;LENGTH:FIVE
1766                                                ;;
1767                                        ;;**************************************************************
1768  005462  000004                        TST6:   SCOPE
1769  005464  052777  000400  174234                BIS     #MRESET,@TXCSR  ;MASTER RESET
1770  005472  012777  030000  174222                MOV     #SYNINT,@PARCSR ;SET THE MODE
1771  005500  052777  000400  174220                BIS     #MRESET,@TXCSR  ;MASTER RESET
1772
1773                                        ;SET MAINTENANCE MODE & SEND
1774                                                ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
1775  005506  012777  004020  174212                MOV     #MINT!SEND,@TXCSR
1776
1777                                        ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
1778  005514  012777  030026  174200                MOV     #SYNINT!FIVE!NOPAR!26,@PARCSR
1779  005522  016703  174200                        MOV     TXCSR,R3        ;SET UP FOR ERROR MSG
1780  005526  112777  000021  174176                MOVB    #21,@TXDBUF     ;LOAD CHAR
1781  005534  012767  000021  173736                MOV     #21,STMP1       ;SHIFTED CHAR
1782  005542  012767  000005  173352                MOV     #5,SHIFT        ;# OF SHIFTS
1783                                        ;POKE CLK TO GET INTO SYNCRONIZATION
1784  005550  052777  020000  174150                BIS     #CLK,@TXCSR     ;POKE CLK UP
1785  005556  042777  020000  174142                BIC     #CLK,@TXCSR     ;POKE CLK DOWN
1786  005564  005000                        1$:     CLR     R0
1787  005566  006067  173706                        ROR     STMP1   ;FORCE CARRY
1788  005572  103002                                BCC     2$
1789  005574  052700  002000                        BIS     #BITW,R0        ;EQUIV OF BIT WINDOW
1790  005600                                2$:
```

```
DZDUT-A MACY11 27(1006)  03-FEB-77  07:54  PAGE 40
DZDUTA.M11    13-OCT-76 08:39           INITIALIZE THE COMMON TAGS

  1791  005600  052777  020000  174120          BIS     #CLK,@TXCSR     ;POKE CLK UP
  1792  005606  042777  020000  174112          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
  1793  005614  017701  174106                  MOV     @TXCSR,R1       ;ACTUAL
  1794  005620  042701  075777                  BIC     #075777,R1      ;SAVE BITW & DNA
  1795  005624  020001                          CMP     R0,R1   ;COMPARE EXP VS ACT
  1796  005626  001401                          BEQ     .+4
  1797  005630  104003                          ERROR   3               ;BIT WINDOW DID NOT MATCH ACTUAL DATA
  1798                                                                  ;BIT,....ALSO CHECK DNA
  1799  005632  005367  173264                  DEC     SHIFT   ;# OF SHIFTS
  1800  005636  001352                          BNE     1$      ;DO IT AGAIN ?
  1801                                  ;NOW POKE CLK TO SEE DNA
  1802  005640  052777  020000  174060          BIS     #CLK,@TXCSR     ;POKE CLK
  1803  005646  012700  100000                  MOV     #100000,R0      ;EXPECTED
  1804  005652  017701  174050                  MOV     @TXCSR,R1       ;ACTUAL
  1805  005656  042701  077777                  BIC     #77777,R1       ;SAVE DNA ONLY
  1806  005662  020001                          CMP     R0,R1   ;COMPARE EXPECTED VS ACTUAL
  1807  005664  001401                          BEQ     .+4
  1808  005666  104003                          ERROR   3               ;DNA SHOULD BE SET
  1809                                                                  ;IF DNA DID NOT SET ,CHECK WORD LENGTH
  1810                                                                  ;SELECT LOGIC OF THE TRANSMITTER
  1811  005670  005777  174032                  TST     @TXCSR  ;DNA ?
  1812  005674  100001                          BPL     .+4
  1813  005676  104004                          ERROR   4               ;DNA SHOULD NOT BE SET
  1814                                                                  ;IT SHOULD HAVE BEEN CLEARED FROM
  1815                                                                  ;PREVIOUS READ
  1816
  1817                                          ;;THIS TEST VERIFYS WORD LENGTH SELECT OF
  1818                                          ;;THE TRANSMITTER SECTION,IT USES THE DNA FLAG
  1819                                          ;;AND BIT WINDOW TO DETERMINE THAT IT WAS SELECTED
  1820                                          ;;CORRECTLY
  1821                                          ;;NOTE: DNA COMES UP ON THE FIRST RISING BIT
  1822                                          ;;EDGE OF THE NEXT CHARACTER IF NO NEW CHARACTER IS
  1823                                          ;;LOADED INTO TXDBUF
  1824                                          ;;MODE:SYNINT
  1825                                          ;;PARITY:NO PARITY
  1826                                          ;;LENGTH:SIX
  1827                                          ;;
  1828                                  ;;*****************************************************************
  1829  005700  000004                  TST7:   SCOPE
  1830  005702  052777  000400  174016          BIS     #MRESET,@TXCSR  ;MASTER RESET
  1831  005710  012777  030000  174004          MOV     #SYNINT,@PARCSR ;SET THE MODE
  1832  005716  052777  000400  174002          BIS     #MRESET,@TXCSR  ;MASTER RESET
  1833
  1834                                  ;SET MAINTENANCE MODE & SEND
  1835                                          ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
  1836  005724  012777  004020  173774          MOV     #MINT!SEND,@TXCSR
  1837
  1838                                  ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
  1839  005732  012777  032026  173762          MOV     #SYNINT!SIX!NOPAR!26,@PARCSR
  1840  005740  016703  173762                  MOV     TXCSR,R3        ;SET UP FOR ERROR MSG
  1841  005744  112777  000021  173760          MOVB    #21,@TXDBUF     ;LOAD CHAR
  1842  005752  012767  000021  173520          MOV     #21,$TMP1       ;SHIFTED CHAR
  1843  005760  012767  000006  173134          MOV     #6,SHIFT        ;# OF SHIFTS
  1844                                  ;POKE CLK TO GET INTO SYNCRONIZATION
  1845  005766  052777  020000  173732          BIS     #CLK,@TXCSR     ;POKE CLK UP
  1846  005774  042777  020000  173724          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
```

```
                                        INITIALIZE THE COMMON TAGS

1847  006002  005000                1$:     CLR     R0
1848  006004  006067  173470                ROR     $TMP1   ;FORCE CARRY
1849  006010  103002                        BCC     2$
1850  006012  052700  002000                BIS     #BITW,R0        ;EQUIV OF BIT WINDOW
1851  006016                        2$:
1852  006016  052777  020000  173702        BIS     #CLK,@TXCSR     ;POKE CLK UP
1853  006024  042777  020000  173674        BIC     #CLK,@TXCSR     ;POKE CLK DOWN
1854  006032  017701  173670                MOV     @TXCSR,R1       ;ACTUAL
1855  006036  042701  075777                BIC     #075777,R1      ;SAVE BITW & DNA
1856  006042  020001                        CMP     R0,R1   ;COMPARE EXP VS ACT
1857  006044  001401                        BEQ     .+4
1858  006046  104003                        ERROR   3               ;BIT WINDOW DID NOT MATCH ACTUAL DATA
1859                                                                ;BIT....ALSO CHECK DNA
1860  006050  005367  173046                DEC     SHIFT   ;# OF SHIFTS
1861  006054  001352                        BNE     1$      ;DO IT AGAIN ?
1862                                ;NOW POKE CLK TO SEE DNA
1863  006056  052777  020000  173642        BIS     #CLK,@TXCSR     ;POKE CLK
1864  006064  012700  100000                MOV     #100000,R0      ;EXPECTED
1865  006070  017701  173632                MOV     @TXCSR,R1       ;ACTUAL
1866  006074  042701  077777                BIC     #77777,R1       ;SAVE DNA ONLY
1867  006100  020001                        CMP     R0,R1   ;COMPARE EXPECTED VS ACTUAL
1868  006102  001401                        BEQ     .+4
1869  006104  104003                        ERROR   3               ;DNA SHOULD BE SET
1870                                                                ;IF DNA DID NOT SET ,CHECK WORD LENGTH
1871                                                                ;SELECT LOGIC OF THE TRANSMITTER
1872  006106  005777  173614                TST     @TXCSR  ;DNA ?
1873  006112  100001                        BPL     .+4
1874  006114  104004                        ERROR   4               ;DNA SHOULD NOT BE SET
1875                                                                ;IT SHOULD HAVE BEEN CLEARED FROM
1876                                                                ;PREVIOUS READ
1877
1878                                        ;;THIS TEST VERIFYS WORD LENGTH SELECT OF
1879                                        ;;THE TRANSMITTER SECTION,IT USES THE DNA FLAG
1880                                        ;;AND BIT WINDOW TO DETERMINE THAT IT WAS SELECTED
1881                                        ;;CORRECTLY
1882                                        ;;NOTE: DNA COMES UP ON THE FIRST RISING BIT
1883                                        ;;EDGE OF THE NEXT CHARACTER IF NO NEW CHARACTER IS
1884                                        ;;LOADED INTO TXDBUF
1885                                        ;;CODE:SYNINT
1886                                        ;;PARITY:NO PARITY
1887                                        ;;LENGTH:SEVEN
1888                                        ;;
1889                                ;;*****************************************************************
1890  006116  000004                TST10:  SCOPE
1891  006120  052777  000400  173600        BIS     #MRESET,@TXCSR  ;MASTER RESET
1892  006126  012777  030000  173566        MOV     #SYNINT,@PARCSR ;SET THE MODE
1893  006134  052777  000400  173564        BIS     #MRESET,@TXCSR  ;MASTER RESET
1894
1895                                ;SET MAINTENANCE MODE & SEND
1896                                        ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
1897  006142  012777  004020  173556        MOV     #MINT!SEND,@TXCSR
1898
1899                                ;SET MODE, # OF BITS,PARITY SENSE,& LOAD SYNC REG
1900  006150  012777  034026  173544        MOV     #SYNINT!SEVEN!NOPAR!26,@PARCSR
1901  006156  016703  173544                MOV     TXCSR,R3        ;SET UP FOR ERROR MSG
1902  006162  112777  000021  173542        MOVB    #21,@TXDBUF     ;LOAD CHAR
```

```
                                        INITIALIZE THE COMMON TAGS

 1903  006170  012767  000021  173302          MOV     #21,$TMP1       ;SHIFTED CHAR
 1904  006176  012767  000007  172716          MOV     #7,$SHIFT       ;# OF SHIFTS
 1905                                  ;POKE CLK TO GET INTO SYNCRONIZATION
 1906  006204  052777  020000  173514          BIS     #CLK,@TXCSR     ;POKE CLK UP
 1907  006212  042777  020000  173506          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
 1908  006220  005000                  1$:     CLR     R0
 1909  006222  006067  173252                  ROR     $TMP1   ;FORCE CARRY
 1910  006226  103002                          BCC     2$
 1911  006230  052700  002000                  BIS     #BITW,R0        ;EQUIV OF BIT WINDOW
 1912  006234                          2$:
 1913  006234  052777  020000  173464          BIS     #CLK,@TXCSR     ;POKE CLK UP
 1914  006242  042777  020000  173456          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
 1915  006250  017701  173452                  MOV     @TXCSR,R1       ;ACTUAL
 1916  006254  042701  075777                  BIC     #075777,R1      ;SAVE BITW & DNA
 1917  006260  020001                          CMP     R0,R1   ;COMPARE EXP VS ACT
 1918  006262  001401                          BEQ     .+4
 1919  006264  104003                          ERROR   3               ;BIT WINDOW DID NOT MATCH ACTUAL DATA
 1920                                                                  ;BIT....ALSO CHECK DNA
 1921  006266  005367  172630                  DEC     SHIFT   ;# OF SHIFTS
 1922  006272  001352                          BNE     1$      ;DO IT AGAIN ?
 1923                                  ;NOW POKE CLK TO SEE DNA
 1924  006274  052777  020000  173424          BIS     #CLK,@TXCSR     ;POKE CLK
 1925  006302  012700  100000                  MOV     #100000,R0      ;EXPECTED
 1926  006306  017701  173414                  MOV     @TXCSR,R1       ;ACTUAL
 1927  006312  042701  077777                  BIC     #77777,R1       ;SAVE DNA ONLY
 1928  006316  020001                          CMP     R0,R1   ;COMPARE EXPECTED VS ACTUAL
 1929  006320  001401                          BEQ     .+4
 1930  006322  104003                          ERROR   3               ;DNA SHOULD BE SET
 1931                                                                  ;IF DNA DID NOT SET ,CHECK WORD LENGTH
 1932                                                                  ;SELECT LOGIC OF THE TRANSMITTER
 1933  006324  005777  173376                  TST     @TXCSR  ;DNA ?
 1934  006330  100001                          BPL     .+4
 1935  006332  104004                          ERROR   4                       ;DNA SHOULD NOT BE SET
 1936                                                                  ;IT SHOULD HAVE BEEN CLEARED FROM
 1937                                                                  ;PREVIOUS READ
 1938
 1939                                          ;;THIS TEST VERIFYS WORD LENGTH SELECT OF
 1940                                          ;;THE TRANSMITTER SECTION,IT USES THE DNA FLAG
 1941                                          ;;AND BIT WINDOW TO DETERMINE THAT IT WAS SELECTED
 1942                                          ;;CORRECTLY
 1943                                          ;;NOTE: DNA COMES UP ON THE FIRST RISING BIT
 1944                                          ;;EDGE OF THE NEXT CHARACTER IF NO NEW CHARACTER IS
 1945                                          ;;LOADED INTO TXDBUF
 1946                                          ;;MODE:SYNINT
 1947                                          ;;PARITY:NO PARITY
 1948                                          ;;LENGTH:EIGHT
 1949                                          ;;
 1950                                  ;;**************************************************************
 1951  006334  000004                  TST11:  SCOPE
 1952  006336  052777  000400  173362          BIS     #MRESET,@TXCSR  ;MASTER RESET
 1953  006344  012777  030000  173350          MOV     #SYNINT,@PARCSR ;SET THE MODE
 1954  006352  052777  000400  173346          BIS     #MRESET,@TXCSR  ;MASTER RESET
 1955
 1956                                  ;SET MAINTENANCE MODE & SEND
 1957                                          ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
 1958  006360  012777  004020  173340          MOV     #MINT!SEND,@TXCSR
```

INITIALIZE THE COMMON TAGS

```
1959
1960                                            ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
1961  006366  012777  036026  173326                    MOV     #SYNINT!EIGHT!NOPAR!26,@PARCSR
1962  006374  016703  173326                            MOV     TXCSR,R3        ;SET UP FOR ERROR MSG
1963  006400  112777  000021  173324                    MOVB    #21,@TXDBUF     ;LOAD CHAR
1964  006406  012767  000021  173064                    MOV     #21,$TMP1       ;SHIFTED CHAR
1965  006414  012767  000010  172500                    MOV     #8.,SHIFT       ;# OF SHIFTS
1966                                            ;POKE CLK TO GET INTO SYNCRONIZATION
1967  006422  052777  020000  173276                    BIS     #CLK,@TXCSR     ;POKE CLK UP
1968  006430  042777  020000  173270                    BIC     #CLK,@TXCSR     ;POKE CLK DOWN
1969  006436  005000                            1$:     CLR     R0
1970  006440  006067  173034                            ROR     $TMP1   ;FORCE CARRY
1971  006444  103002                                    BCC     2$
1972  006446  052700  002000                            BIS     #BITW,R0        ;EQUIV OF BIT WINDOW
1973  006452                                    2$:
1974  006452  052777  020000  173246                    BIS     #CLK,@TXCSR     ;POKE CLK UP
1975  006460  042777  020000  173240                    BIC     #CLK,@TXCSR     ;POKE CLK DOWN
1976  006466  017701  173234                            MOV     @TXCSR,R1       ;ACTUAL
1977  006472  042701  075777                            BIC     #075777,R1      ;SAVE BITW & DNA
1978  006476  020001                                    CMP     R0,R1   ;COMPARE EXP VS ACT
1979  006500  001401                                    BEQ     .+4
1980  006502  104003                                    ERROR   3               ;BIT WINDOW DID NOT MATCH ACTUAL DATA
1981                                                                            ;BIT.....ALSO CHECK DNA
1982  006504  005367  172412                            DEC     SHIFT   ;# OF SHIFTS
1983  006510  001352                                    BNE     1$      ;DO IT AGAIN ?
1984                                            ;NOW POKE CLK TO SEE DNA
1985  006512  052777  020000  173206                    BIS     #CLK,@TXCSR     ;POKE CLK
1986  006520  012700  100000                            MOV     #100000,R0      ;EXPECTED
1987  006524  017701  173176                            MOV     @TXCSR,R1       ;ACTUAL
1988  006530  042701  077777                            BIC     #77777,R1       ;SAVE DNA ONLY
1989  006534  020001                                    CMP     R0,R1   ;COMPARE EXPECTED VS ACTUAL
1990  006536  001401                                    BEQ     .+4
1991  006540  104003                                    ERROR   3               ;DNA SHOULD BE SET
1992                                                                            ;IF DNA DID NOT SET ,CHECK WORD LENGTH
1993                                                                            ;SELECT LOGIC OF THE TRANSMITTER
1994  006542  005777  173160                            TST     @TXCSR  ;DNA ?
1995  006546  100001                                    BPL     .+4
1996  006550  104004                                    ERROR   4                       ;DNA SHOULD NOT BE SET
1997                                                                            ;IT SHOULD HAVE BEEN CLEARED FROM
1998                                                                            ;PREVIOUS READ
1999
2000                                                    ;;THIS TEST VERIFYS WORD LENGTH SELECT OF
2001                                                    ;;THE TRANSMITTER SECTION,IT USES THE DNA FLAG
2002                                                    ;;AND BIT WINDOW TO DETERMINE THAT IT WAS SELECTED
2003                                                    ;;CORRECTLY
2004                                                    ;;NOTE: DNA COMES UP ON THE FIRST RISING BIT
2005                                                    ;;EDGE OF THE NEXT CHARACTER IF NO NEW CHARACTER IS
2006                                                    ;;LOADED INTO TXDBUF
2007                                                    ;;MODE:SYNEXT
2008                                                    ;;PARITY:NO PARITY
2009                                                    ;;LENGTH:FIVE
2010                                                    ;;
2011                                            ;;******************************************************************
2012  006552  000004                            TST12:  SCOPE
2013  006554  052777  000400  173144                    BIS     #MRESET,@TXCSR  ;MASTER RESET
2014  006562  012777  020000  173132                    MOV     #SYNEXT,@PARCSR ;SET THE MODE
```

```
                                        INITIALIZE THE COMMON TAGS

 2015  006570  052777  000400  173130          BIS     #MRESET,@TXCSR  ;MASTER RESET
 2016
 2017                                  ;SET MAINTENANCE MODE & SEND
 2018                                          ;NOTE:BIT WINDOWS CLK ARE CLEARED (MTDATA=0)
 2019  006576  012777  004020  173122          MOV     #MINT!SEND,@TXCSR
 2020
 2021                                  ;SET MODE, # OF BITS,PARITY SENSE & LOAD SYNC REG
 2022  006604  012777  020026  173110          MOV     #SYNEXT!FIVE!NOPAR!26,@PARCSR
 2023  006612  016703  173110                  MOV     TXCSR,R3        ;SET UP FOR ERROR MSG
 2024  006616  112777  000021  173106          MOVB    #21,@TXDBUF     ;LOAD CHAR
 2025  006624  012767  000021  172646          MOV     #21,$TMP1       ;SHIFTED CHAR
 2026  006632  012767  000005  172262          MOV     #5,SHIFT        ;# OF SHIFTS
 2027                                  ;POKE CLK TO GET INTO SYNCRONIZATION
 2028  006640  052777  020000  173060          BIS     #CLK,@TXCSR     ;POKE CLK UP
 2029  006646  042777  020000  173052          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
 2030  006654  005000                  1$:     CLR     R0
 2031  006656  006067  172616                  ROR     $TMP1   ;FORCE CARRY
 2032  006662  103002                          BCC     2$
 2033  006664  052700  002000                  BIS     #BITW,R0        ;EQUIV OF BIT WINDOW
 2034  006670                          2$:
 2035  006670  052777  020000  173030          BIS     #CLK,@TXCSR     ;POKE CLK UP
 2036  006676  042777  020000  173022          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
 2037  006704  017701  173016                  MOV     @TXCSR,R1       ;ACTUAL
 2038  006710  042701  075777                  BIC     #075777,R1      ;SAVE BITW & DNA
 2039  006714  020001                          CMP     R0,R1   ;COMPARE EXP VS ACT
 2040  006716  001401                          BEQ     .+4
 2041  006720  104003                          ERROR   3               ;BIT WINDOW DID NOT MATCH ACTUAL DATA
 2042                                                                  ;BIT....ALSO CHECK DNA
 2043  006722  005367  172174                  DEC     SHIFT   ;# OF SHIFTS
 2044  006726  001352                          BNE     1$      ;DO IT AGAIN ?
 2045                                  ;NOW POKE CLK TO SEE DNA
 2046  006730  052777  020000  172770          BIS     #CLK,@TXCSR     ;POKE CLK
 2047  006736  012700  100000                  MOV     #100000,R0      ;EXPECTED
 2048  006742  017701  172760                  MOV     @TXCSR,R1       ;ACTUAL
 2049  006746  042701  077777                  BIC     #77777,R1       ;SAVE DNA ONLY
 2050  006752  020001                          CMP     R0,R1   ;COMPARE EXPECTED VS ACTUAL
 2051  006754  001401                          BEQ     .+4
 2052  006756  104003                          ERROR   3               ;DNA SHOULD BE SET
 2053                                                                  ;IF DNA DID NOT SET ,CHECK WORD LENGTH
 2054                                                                  ;SELECT LOGIC OF THE TRANSMITTER
 2055  006760  005777  172742                  TST     @TXCSR  ;DNA ?
 2056  006764  100001                          BPL     .+4
 2057  006766  104004                          ERROR   4               ;DNA SHOULD NOT BE SET
 2058                                                                  ;IT SHOULD HAVE BEEN CLEARED FROM
 2059                                                                  ;PREVIOUS READ
 2060
 2061                                  ;;THIS TEST VERIFYS WORD LENGTH SELECT OF
 2062                                  ;;THE TRANSMITTER SECTION,IT USES THE DNA FLAG
 2063                                  ;;AND BIT WINDOW TO DETERMINE THAT IT WAS SELECTED
 2064                                  ;;CORRECTLY
 2065                                  ;;NOTE: DNA COMES UP ON THE FIRST RISING BIT
 2066                                  ;;EDGE OF THE NEXT CHARACTER IF NO NEW CHARACTER IS
 2067                                  ;;LOADED INTO TXDBUF
 2068                                  ;;MODE:SYNEXT
 2069                                  ;;PARITY:NO PARITY
 2070                                  ;;LENGTH:SIX
```

```
                                        INITIALIZE THE COMMON TAGS

2071                                                    ;;
2072                                    ;;**************************************************************
2073  006770  000004                    TST13:  SCOPE
2074  006772  052777  000400  172726            BIS     #MRESET,@TXCSR  ;MASTER RESET
2075  007000  012777  020000  172714            MOV     #SYNEXT,@PARCSR ;SET THE MODE
2076  007006  052777  000400  172712            BIS     #MRESET,@TXCSR  ;MASTER RESET
2077
2078                                    ;SET MAINTENANCE MODE & SEND
2079                                            ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
2080  007014  012777  004020  172704            MOV     #MINT!SEND,@TXCSR
2081
2082                                    ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
2083  007022  012777  022026  172672            MOV     #SYNEXT!SIX!NOPAR!26,@PARCSR
2084  007030  016703  172672                   MOV     TXCSR,R3        ;SET UP FOR ERROR MSG
2085  007034  112777  000021  172670            MOVB    #21,@TXDBUF     ;LOAD CHAR
2086  007042  012767  000021  172430            MOV     #21,$TMP1       ;SHIFTED CHAR
2087  007050  012767  000006  172044            MOV     #6,SHIFT        ;# OF SHIFTS
2088                                    ;POKE CLK TO GET INTO SYNCRONIZATION
2089  007056  052777  020000  172642            BIS     #CLK,@TXCSR     ;POKE CLK UP
2090  007064  042777  020000  172634            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2091  007072  005000                    1$:     CLR     R0
2092  007074  006067  172400                   ROR     $TMP1   ;FORCE CARRY
2093  007100  103002                           BCC     2$
2094  007102  052700  002000                   BIS     #BITW,R0        ;EQUIV OF BIT WINDOW
2095  007106                            2$:
2096  007106  052777  020000  172612            BIS     #CLK,@TXCSR     ;POKE CLK UP
2097  007114  042777  020000  172604            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2098  007122  017701  172600                   MOV     @TXCSR,R1       ;ACTUAL
2099  007126  042701  075777                   BIC     #075777,R1      ;SAVE BITW & DNA
2100  007132  020001                           CMP     R0,R1   ;COMPARE EXP VS ACT
2101  007134  001401                           BEQ     .+4
2102  007136  104003                           ERROR   3               ;BIT WINDOW DID NOT MATCH ACTUAL DATA
2103                                                                    ;BIT....ALSO CHECK DNA
2104  007140  005367  171756                   DEC     SHIFT   ;# OF SHIFTS
2105  007144  001352                           BNE     1$      ;DO IT AGAIN ?
2106                                    ;NOW POKE CLK TO SEE DNA
2107  007146  052777  020000  172552            BIS     #CLK,@TXCSR     ;POKE CLK
2108  007154  012700  100000                   MOV     #100000,R0      ;EXPECTED
2109  007160  017701  172542                   MOV     @TXCSR,R1       ;ACTUAL
2110  007164  042701  077777                   BIC     #77777,R1       ;SAVE DNA ONLY
2111  007170  020001                           CMP     R0,R1   ;COMPARE EXPECTED VS ACTUAL
2112  007172  001401                           BEQ     .+4
2113  007174  104003                           ERROR   3               ;DNA SHOULD BE SET
2114                                                                    ;IF DNA DID NOT SET ,CHECK WORD LENGTH
2115                                                                    ;SELECT LOGIC OF THE TRANSMITTER
2116  007176  005777  172524                   TST     @TXCSR  ;DNA ?
2117  007202  100001                           BPL     .+4
2118  007204  104004                           ERROR   4                       ;DNA SHOULD NOT BE SET
2119                                                                    ;IT SHOULD HAVE BEEN CLEARED FROM
2120                                                                    ;PREVIOUS READ
2121
2122                                            ;;THIS TEST VERIFYS WORD LENGTH SELECT OF
2123                                            ;;THE TRANSMITTER SECTION,IT USES THE DNA FLAG
2124                                            ;;AND BIT WINDOW TO DETERMINE THAT IT WAS SELECTED
2125                                            ;;CORRECTLY
2126                                            ;;NOTE: DNA COMES UP ON THE FIRST RISING BIT
```

```
                                        INITIALIZE THE COMMON TAGS

2127                                            ;;EDGE OF THE NEXT CHARACTER IF NO NEW CHARACTER IS
2128                                            ;;LOADED INTO TXDBUF
2129                                            ;;MODE:SYNEXT
2130                                            ;;PARITY:NO PARITY
2131                                            ;;LENGTH:SEVEN
2132                                            ;;
2133                                            ;;*****************************************************************
2134  007206  000004                           TST14:  SCOPE
2135  007210  052777  000400  172510                    BIS     #MRESET,@TXCSR  ;MASTER RESET
2136  007216  012777  020000  172476                    MOV     #SYNEXT,@PARCSR ;SET THE MODE
2137  007224  052777  000400  172474                    BIS     #MRESET,@TXCSR  ;MASTER RESET
2138
2139                                            ;SET MAINTENANCE MODE & SEND
2140                                                    ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
2141  007232  012777  004020  172466                    MOV     #MINT!SEND,@TXCSR
2142
2143                                            ;SET MODE, # OF BITS,PARITY SENSE,& LOAD SYNC REG
2144  007240  012777  024026  172454                    MOV     #SYNEXT!SEVEN!NOPAR!26,@PARCSR
2145  007246  016703  172454                          MOV     TXCSR,R3        ;SET UP FOR ERROR MSG
2146  007252  112777  000021  172452                    MOVB    #21,@TXDBUF     ;LOAD CHAR
2147  007260  012767  000021  172212                    MOV     #21,$TMP1       ;SHIFTED CHAR
2148  007266  012767  000007  171626                    MOV     #7,SHIFT        ;# OF SHIFTS
2149                                            ;POKE CLK TO GET INTO SYNCRONIZATION
2150  007274  052777  020000  172424                    BIS     #CLK,@TXCSR     ;POKE CLK UP
2151  007302  042777  020000  172416                    BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2152  007310  005000                           1$:      CLR     R0
2153  007312  006067  172162                          ROR     $TMP1   ;FORCE CARRY
2154  007316  103002                                   BCC     2$
2155  007320  052700  002000                          BIS     #BITW,R0        ;EQUIV OF BIT WINDOW
2156  007324                                   2$:
2157  007324  052777  020000  172374                    BIS     #CLK,@TXCSR     ;POKE CLK UP
2158  007332  042777  020000  172366                    BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2159  007340  017701  172362                          MOV     @TXCSR,R1       ;ACTUAL
2160  007344  042701  075777                          BIC     #075777,R1      ;SAVE BITW & DNA
2161  007350  020001                                   CMP     R0,R1   ;COMPARE EXP VS ACT
2162  007352  001401                                   BEQ     .+4
2163  007354  104003                                   ERROR   3               ;BIT WINDOW DID NOT MATCH ACTUAL DATA
2164                                                                            ;BIT.....ALSO CHECK DNA
2165  007356  005367  171540                          DEC     SHIFT   ;# OF SHIFTS
2166  007362  001352                                   BNE     1$      ;DO IT AGAIN ?
2167                                            ;NOW POKE CLK TO SEE DNA
2168  007364  052777  020000  172334                    BIS     #CLK,@TXCSR     ;POKE CLK
2169  007372  012700  100000                          MOV     #100000,R0      ;EXPECTED
2170  007376  017701  172324                          MOV     @TXCSR,R1       ;ACTUAL
2171  007402  042701  077777                          BIC     #77777,R1       ;SAVE DNA ONLY
2172  007406  020001                                   CMP     R0,R1   ;COMPARE EXPECTED VS ACTUAL
2173  007410  001401                                   BEQ     .+4
2174  007412  104003                                   ERROR   3               ;DNA SHOULD BE SET
2175                                                                            ;IF DNA DID NOT SET ,CHECK WORD LENGTH
2176                                                                            ;SELECT LOGIC OF THE TRANSMITTER
2177  007414  005777  172306                          TST     @TXCSR  ;DNA ?
2178  007420  100001                                   BPL     .+4
2179  007422  104004                                   ERROR   4               ;DNA SHOULD NOT BE SET
2180                                                                            ;IT SHOULD HAVE BEEN CLEARED FROM
2181                                                                            ;PREVIOUS READ
2182
```

INITIALIZE THE COMMON TAGS

```
                                        ;;THIS TEST VERIFYS WORD LENGTH SELECT OF
                                        ;;THE TRANSMITTER SECTION,IT USES THE DNA FLAG
                                        ;;AND BIT WINDOW TO DETERMINE THAT IT WAS SELECTED
                                        ;;CORRECTLY
                                        ;;NOTE: DNA COMES UP ON THE FIRST RISING BIT
                                        ;;EDGE OF THE NEXT CHARACTER IF NO NEW CHARACTER IS
                                        ;;LOADED INTO TXDBUF
                                        ;;MODE:SYNEXT
                                        ;;PARITY:NO PARITY
                                        ;;LENGTH:EIGHT
                                        ;;
                                ;;*****************************************************************
007424  000004                TST15:  SCOPE
007426  052777  000400  172272          BIS     #MRESET,@TXCSR  ;MASTER RESET
007434  012777  020000  172260          MOV     #SYNEXT,@PARCSR ;SET THE MODE
007442  052777  000400  172256          BIS     #MRESET,@TXCSR  ;MASTER RESET

                                ;SET MAINTENANCE MODE & SEND
                                        ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
007450  012777  004020  172250          MOV     #MINT!SEND,@TXCSR

                                ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
007456  012777  026026  172236          MOV     #SYNEXT!EIGHT!NOPAR!26,@PARCSR
007464  016703  172236                  MOV     TXCSR,R3        ;SET UP FOR ERROR MSG
007470  112777  000021  172234          MOVB    #21,@TXDBUF     ;LOAD CHAR
007476  012767  000021  171774          MOV     #21,$TMP1       ;SHIFTED CHAR
007504  012767  000010  171410          MOV     #8.,SHIFT       ;# OF SHIFTS
                                ;POKE CLK TO GET INTO SYNCRONIZATION
007512  052777  020000  172206          BIS     #CLK,@TXCSR     ;POKE CLK UP
007520  042777  020000  172200          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
007526  005000                1$:       CLR     R0
007530  006067  171744                  ROR     $TMP1   ;FORCE CARRY
007534  103002                          BCC     2$
007536  052700  002000                  BIS     #BITW,R0        ;EQUIV OF BIT WINDOW
007542                          2$:
007542  052777  020000  172156          BIS     #CLK,@TXCSR     ;POKE CLK UP
007550  042777  020000  172150          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
007556  017701  172144                  MOV     @TXCSR,R1       ;ACTUAL
007562  042701  075777                  BIC     #075777,R1      ;SAVE BITW & DNA
007566  020001                          CMP     R0,R1   ;COMPARE EXP VS ACT
007570  001401                          BEQ     .+4
007572  104003                          ERROR   3       ;BIT WINDOW DID NOT MATCH ACTUAL DATA
                                                        ;BIT.....ALSO CHECK DNA
007574  005367  171322                  DEC     SHIFT   ;# OF SHIFTS
007600  001352                          BNE     1$      ;DO IT AGAIN ?
                                ;NOW POKE CLK TO SEE DNA
007602  052777  020000  172116          BIS     #CLK,@TXCSR     ;POKE CLK
007610  012700  100000                  MOV     #100000,R0      ;EXPECTED
007614  017701  172106                  MOV     @TXCSR,R1       ;ACTUAL
007620  042701  077777                  BIC     #77777,R1       ;SAVE DNA ONLY
007624  020001                          CMP     R0,R1   ;COMPARE EXPECTED VS ACTUAL
007626  001401                          BEQ     .+4
007630  104003                          ERROR   3       ;DNA SHOULD BE SET
                                                        ;IF DNA DID NOT SET ,CHECK WORD LENGTH
                                                        ;SELECT LOGIC OF THE TRANSMITTER
007632  005777  172070                  TST     @TXCSR  ;DNA ?
```

```
                                        INITIALIZE THE COMMON TAGS

 2239  007636  100001                           BPL     .+4
 2240  007640  104004                           ERROR   4               ;DMA SHOULD NOT BE SET
 2241                                                                   ;IT SHOULD HAVE BEEN CLEARED FROM
 2242                                                                   ;PREVIOUS READ
 2243
 2244                                           ;;THIS TEST VERIFYS CHARACTER PLUS PARITY GENERATION
 2245                                           ;;OF THE TRANSMITTER SECTION.
 2246                                           ;;IT ALSO CHECKS DMA TIMING
 2247                                           ;;MODE:SYNINT
 2248                                           ;;LENGTH:FIVE PLUS PARITY
 2249                                           ;;PARITY:EVEPAR
 2250                                           ;;CHARACTER:25
 2251                                           ;;
 2252                                   ;;**************************************************************
 2253  007642  000004                  TST16:  SCOPE
 2254  007644  052777  000400  172054           BIS     #MRESET,@TXCSR  ;MASTER RESET
 2255  007652  012777  030000  172042           MOV     #SYNINT,@PARCSR ;SET THE MODE
 2256  007660  052777  000400  172040           BIS     #MRESET,@TXCSR  ;MASTER RESET
 2257
 2258                                   ;SET MAINTENANCE MODE & SEND
 2259                                           ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
 2260  007666  012777  004020  172032           MOV     #MINT!SEND,@TXCSR
 2261
 2262                                   ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
 2263  007674  012777  031426  172020           MOV     #SYNINT!FIVE!EVEPAR!26,@PARCSR
 2264  007702  016703  172020                  MOV     TXCSR,R3        ;SET UP FOR ERROR MSG
 2265  007706  112777  000025  172016           MOVB    #25,@TXDBUF     ;LOAD DATA CHAR
 2266  007714  012767  000065  171556           MOV     #65,$TMP1       ;TO BE SHIFTED CHAR
 2267  007722  012767  000006  171172           MOV     #6,SHIFT        ;# OF SHIFTS
 2268                                   ;POKE CLK TO GET INTO SYNCRONIZATION
 2269  007730  052777  020000  171770           BIS     #CLK,@TXCSR     ;POKE CLK UP
 2270  007736  042777  020000  171762           BIC     #CLK,@TXCSR     ;POKE CLK DOWN
 2271  007744  005000                  1$:     CLR     R0
 2272  007746  006067  171526                  ROR     $TMP1   ;FORCE CARRY
 2273  007752  103002                          BCC     2$      ;BR IF CARRY CLR
 2274  007754  052700  002000                  BIS     #BITW,R0        ;EQUIV OF BITW
 2275  007760                          2$:
 2276  007760  052777  020000  171740           BIS     #CLK,@TXCSR     ;POKE CLK UP
 2277  007766  042777  020000  171732           BIC     #CLK,@TXCSR     ;POKE CLK DOWN
 2278  007774  017701  171726                  MOV     @TXCSR,R1       ;ACTUAL
 2279  010000  042701  075777                  BIC     #075777,R1      ;SAVE BITW & DMA
 2280  010004  020001                          CMP     R0,R1   ;COMPARE EXP VS ACT
 2281  010006  001401                          BEQ     .+4
 2282  010010  104003                          ERROR   3               ;BIT WINDOW DID NOT MATCH ACTUAL DATA
 2283                                                                   ;BIT....ALSO CHECK DMA
 2284  010012  005367  171104                  DEC     SHIFT   ;# OF SHIFTS
 2285  010016  001352                          BNE     1$      ;DO IT AGAIN ?
 2286                                   ;NOW POKE CLK TO SEE DMA
 2287  010020  052777  020000  171700           BIS     #CLK,@TXCSR     ;POKE CLK
 2288  010026  012700  100000                  MOV     #100000,R0      ;EXPECTED
 2289  010032  017701  171670                  MOV     @TXCSR,R1       ;ACTUAL
 2290  010036  042701  077777                  BIC     #77777,R1       ;SAVE DMA ONLY
 2291  010042  020001                          CMP     R0,R1           ;COMPARE EXP VS ACT
 2292  010044  001401                          BEQ     .+4
 2293  010046  104003                          ERROR   3               ;DMA SHOULD BE SET
 2294                                                                   ;IF DMA DID NOT SET
```

```
                                                        ;CHECK WORD LENGTH SELECT LOGIC

                                                ;;THIS TEST VERIFYS CHARACTER PLUS PARITY GENERATION
                                                ;;OF THE TRANSMITTER SECTION.
                                                ;;IT ALSO CHECKS DNA TIMING
                                                ;;MODE:SYNINT
                                                ;;LENGTH:FIVE PLUS PARITY
                                                ;;PARITY:ODDPAR
                                                ;;CHARACTER:25
                                                ;;
                                        ;;**************************************************************************
010050  000004                          TST17:  SCOPE
010052  052777  000400  171646                  BIS     #MRESET,@TXCSR  ;MASTER RESET
010060  012777  030000  171634                  MOV     #SYNINT,@PARCSR ;SET THE MODE
010066  052777  000400  171632                  BIS     #MRESET,@TXCSR  ;MASTER RESET

                                        ;SET MAINTENANCE MODE & SEND
                                                ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
010074  012777  004020  171624                  MOV     #MINT!SEND,@TXCSR

                                        ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
010102  012777  031026  171612                  MOV     #SYNINT!FIVE!ODDPAR!26,@PARCSR
010110  016703  171612                          MOV     TXCSR,R3        ;SET UP FOR ERROR MSG
010114  112777  000025  171610                  MOVB    #25,@TXDBUF     ;LOAD DATA CHAR
010122  012767  000025  171350                  MOV     #25,$TMP1       ;TO BE SHIFTED CHAR
010130  012767  000006  170764                  MOV     #6,SHIFT        ;# OF SHIFTS
                                        ;POKE CLK TO GET INTO SYNCRONIZATION
010136  052777  020000  171562          1$:     BIS     #CLK,@TXCSR     ;POKE CLK UP
010144  042777  020000  171554                  BIC     #CLK,@TXCSR     ;POKE CLK DOWN
010152  005000                          1$:     CLR     R0
010154  006067  171320                          ROR     $TMP1   ;FORCE CARRY
010160  103002                                  BCC     2$      ;BR IF CARRY CLR
010162  052700  002000                          BIS     #BITW,R0        ;EQUIV OF BITW
010166                                  2$:
010166  052777  020000  171532                  BIS     #CLK,@TXCSR     ;POKE CLK UP
010174  042777  020000  171524                  BIC     #CLK,@TXCSR     ;POKE CLK DOWN
010202  017701  171520                          MOV     @TXCSR,R1       ;ACTUAL
010206  042701  075777                          BIC     #075777,R1      ;SAVE BITW & DNA
010212  020001                                  CMP     R0,R1   ;COMPARE EXP VS ACT
010214  001401                                  BEQ     .+4
010216  104003                                  ERROR   3       ;BIT WINDOW DID NOT MATCH ACTUAL DATA
                                                                ;BIT....ALSO CHECK DNA
010220  005367  170676                          DEC     SHIFT   ;# OF SHIFTS
010224  001352                                  BNE     1$      ;DO IT AGAIN ?
                                        ;NOW POKE CLK TO SEE DNA
010226  052777  020000  171472                  BIS     #CLK,@TXCSR     ;POKE CLK
010234  012700  100000                          MOV     #100000,R0      ;EXPECTED
010240  017701  171462                          MOV     @TXCSR,R1       ;ACTUAL
010244  042701  077777                          BIC     #77777,R1       ;SAVE DNA ONLY
010250  020001                                  CMP     R0,R1           ;COMPARE EXP VS ACT
010252  001401                                  BEQ     .+4
010254  104003                                  ERROR   3       ;DNA SHOULD BE SET
                                                                ;IF DNA DID NOT SET
                                                                ;CHECK WORD LENGTH SELECT LOGIC

                                                ;;THIS TEST VERIFYS CHARACTER PLUS PARITY GENERATION
```

```
                                        ;;OF THE TRANSMITTER SECTION.
                                        ;;IT ALSO CHECKS DNA TIMING
                                        ;;MODE:ISYMOD
                                        ;;LENGTH:FIVE PLUS PARITY
                                        ;;PARITY:EVEPAR
                                        ;;CHARACTER:2S
                                        ;;
                                ;;*************************************************************************
010256  000004                  TST20:  SCOPE
010260  052777  000400  171440          BIS     #MRESET,@TXCSR  ;MASTER RESET
010266  012777  000000  171426          MOV     #ISYMOD,@PARCSR ;SET THE MODE
010274  052777  000400  171424          BIS     #MRESET,@TXCSR  ;MASTER RESET

                                ;SET MAINTENANCE MODE & SEND
                                        ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
010302  012777  004020  171416          MOV     #MINT!SEND,@TXCSR

                                ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
010310  012777  001426  171404          MOV     #ISYMOD!FIVE!EVEPAR!26,@PARCSR
010316  016703  171404                  MOV     TXCSR,R3        ;SET UP FOR ERROR MSG
010322  112777  000025  171402          MOVB    #25,@TXDBUF     ;LOAD DATA CHAR
010330  012767  000352  171142          MOV     #352,$TMP1      ;TO BE SHIFTED CHAR
010336  012767  000010  170556          MOV     #8.,SHIFT       ;# OF SHIFTS
                                ;POKE CLK TO GET INT) SYNCRONIZATION
010344  052777  020000  171354          BIS     #CLK,@TXCSR     ;POKE CLK UP
010352  042777  020000  171346          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
010360  005000                  1$:     CLR     R0
010362  006067  171112                  ROR     $TMP1   ;FORCE CARRY
010366  103002                          BCC     2$      ;BR IF CARRY CLR
010370  052700  002000                  BIS     #BITW,R0        ;EQUIV OF BITW
010374                          2$:
010374  052777  020000  171324          BIS     #CLK,@TXCSR     ;POKE CLK UP
010402  042777  020000  171316          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
010410  017701  171312                  MOV     @TXCSR,R1       ;ACTUAL
010414  042701  075777                  BIC     #075777,R1      ;SAVE BITW & DNA
010420  020001                          CMP     R0,R1   ;COMPARE EXP VS ACT
010422  001401                          BEQ     .+4
010424  104003                          ERROR   3       ;BIT WINDOW DID NOT MATCH ACTUAL DATA
                                                        ;BIT...ALSO CHECK DNA
010426  005367  170470                  DEC     SHIFT   ;# OF SHIFTS
010432  001352                          BNE     1$      ;DO IT AGAIN ?
                                ;NOW POKE CLK TO SEE DNA
010434  052777  020000  171264          BIS     #CLK,@TXCSR     ;POKE CLK
010442  012700  000000                  MOV     #0,R0   ;EXPECTED
010446  017701  171254                  MOV     @TXCSR,R1       ;ACTUAL
010452  042701  077777                  BIC     #77777,R1       ;SAVE DNA ONLY
010456  020001                          CMP     R0,R1           ;COMPARE EXP VS ACT
010460  001401                          BEQ     .+4
010462  104003                          ERROR   3       ;DNA SHOULD BE SET
                                                        ;IF DNA DID NOT SET
                                                        ;CHECK WORD LENGTH SELECT LOGIC


                                        ;;THIS TEST VERIFYS CHARACTER PLUS PARITY GENERATION
                                        ;;OF THE TRANSMITTER SECTION.
                                        ;;IT ALSO CHECKS DNA TIMING
                                        ;;MODE:ISYMOD
```

```
                                        INITIALIZE THE COMMON TAGS

                                                ;;LENGTH:FIVE PLUS PARITY
                                                ;;PARITY:ODDPAR
                                                ;;CHARACTER:25
                                                ;;
                                        ;;*****************************************************************************
010464  000004                        TST21:  SCOPE
010466  052777  000400  171232                BIS     #MRESET,@TXCSR  ;MASTER RESET
010474  012777  000000  171220                MOV     #ISYMOD,@PARCSR ;SET THE MODE
010502  052777  000400  171216                BIS     #MRESET,@TXCSR  ;MASTER RESET

                                        ;SET MAINTENANCE MODE & SEND
                                                ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
010510  012777  004020  171210                MOV     #MINT!SEND,@TXCSR

                                        ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
010516  012777  001026  171176                MOV     #ISYMOD!FIVE!ODDPAR!26,@PARCSR
010524  016703  171176                        MOV     TXCSR,R3        ;SET UP FOR ERROR MSG
010530  112777  000025  171174                MOVB    #25,@TXDBUF     ;LOAD DATA CHAR
010536  012767  000252  170734                MOV     #252,$TMP1      ;TO BE SHIFTED CHAR
010544  012767  000010  170350                MOV     #8.,SHIFT       ;# OF SHIFTS
                                        ;POKE CLK TO GET INTO SYNCRONIZATION
010552  052777  020000  171146                BIS     #CLK,@TXCSR     ;POKE CLK UP
010560  042777  020000  171140                BIC     #CLK,@TXCSR     ;POKE CLK DOWN
010566  005000                        1$:     CLR     R0
010570  006067  170704                        ROR     $TMP1   ;FORCE CARRY
010574  103002                                BCC     2$      ;BR IF CARRY CLR
010576  052700  002000                        BIS     #BITW,R0        ;EQUIV OF BITW
010602                                  2$:
010602  052777  020000  171116                BIS     #CLK,@TXCSR     ;POKE CLK UP
010610  042777  020000  171110                BIC     #CLK,@TXCSR     ;POKE CLK DOWN
010616  017701  171104                        MOV     @TXCSR,R1       ;ACTUAL
010622  042701  075777                        BIC     #075777,R1      ;SAVE BITW & DNA
010626  020001                                CMP     R0,R1   ;COMPARE EXP VS ACT
010630  001401                                BEQ     .+4
010632  104003                                ERROR   3               ;BIT WINDOW DID NOT MATCH ACTUAL DATA
                                                                        ;BIT....ALSO CHECK DNA
010634  005367  170262                        DEC     SHIFT   ;# OF SHIFTS
010640  001352                                BNE     1$      ;DO IT AGAIN ?
                                        ;NOW POKE CLK TO SEE DNA
010642  052777  020000  171056                BIS     #CLK,@TXCSR     ;POKE CLK
010650  012700  000000                        MOV     #0,R0   ;EXPECTED
010654  017701  171046                        MOV     @TXCSR,R1       ;ACTUAL
010660  042701  077777                        BIC     #77777,R1       ;SAVE DNA ONLY
010664  020001                                CMP     R0,R1           ;COMPARE EXP VS ACT
010666  001401                                BEQ     .+4
010670  104003                                ERROR   3               ;DNA SHOULD BE SET
                                                                        ;IF DNA DID NOT SET
                                                                        ;CHECK WORD LENGTH SELECT LOGIC


                                                ;;THIS TEST VERIFYS CHARACTER PLUS PARITY GENERATION
                                                ;;OF THE TRANSMITTER SECTION.
                                                ;;IT ALSO CHECKS DNA TIMING
                                                ;;MODE:SYNINT
                                                ;;LENGTH:SIX PLUS PARITY
                                                ;;PARITY:EVENPAR
```

INITIALIZE THE COMMON TAGS

```
                                                ;;CHARACTER:25
                                                ;;
                                        ;;*****************************************************************
010672  000004                        TST22:  SCOPE
010674  052777  000400  171024                BIS     #MRESET,@TXCSR  ;MASTER RESET
010702  012777  030000  171012                MOV     #SYNINT,@PARCSR ;SET THE MODE
010710  052777  000400  171010                BIS     #MRESET,@TXCSR  ;MASTER RESET

                                        ;SET MAINTENANCE MODE & SEND
                                                ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
010716  012777  004020  171002                MOV     #MINT!SEND,@TXCSR

                                        ;SET MODE, # OF BITS,PARITY SENSE,& LOAD SYNC REG
010724  012777  033426  170770                MOV     #SYNINT!SIX!EVEPAR!26,@PARCSR
010732  016703  170770                        MOV     TXCSR,R3        ;SET UP FOR ERROR MSG
010736  112777  000025  170766                MOVB    #25,@TXDBUF     ;LOAD DATA CHAR
010744  012767  000125  170526                MOV     #125,$TMP1      ;TO BE SHIFTED CHAR
010752  012767  000007  170142                MOV     #7,SHIFT        ;# OF SHIFTS
                                        ;POKE CLK TO GET INTO SYNCRONIZATION
010760  052777  020000  170740                BIS     #CLK,@TXCSR     ;POKE CLK UP
010766  042777  020000  170732                BIC     #CLK,@TXCSR     ;POKE CLK DOWN
010774  005000                        1$:     CLR     R0
010776  006067  170476                        ROR     $TMP1   ;FORCE CARRY
011002  103002                                BCC     2$      ;BR IF CARRY CLR
011004  052700  002000                        BIS     #BITW,R0        ;EQUIV OF BITW
011010                                  2$:
011010  052777  02000C  170710                BIS     #CLK,@TXCSR     ;POKE CLK UP
011016  042777  020000  170702                BIC     #CLK,@TXCSR     ;POKE CLK DOWN
011024  017701  170676                        MOV     @TXCSR,R1       ;ACTUAL
011030  042701  075777                        BIC     #075777,R1      ;SAVE BITW & DNA
011034  020001                                CMP     R0,R1   ;COMPARE EXP VS ACT
011036  001401                                BEQ     .+4
011040  104003                                ERROR   3       ;BIT WINDOW DID NOT MATCH ACTUAL DATA
                                                                ;BIT,...ALSO CHECK DNA
011042  005367  170054                        DEC     SHIFT   ;# OF SHIFTS
011046  001352                                BNE     1$      ;DO IT AGAIN ?
                                        ;NOW POKE CLK TO SEE DNA
011050  052777  020000  170650                BIS     #CLK,@TXCSR     ;POKE CLK
011056  012700  100000                        MOV     #100000,R0      ;EXPECTED
011062  017701  170640                        MOV     @TXCSR,R1       ;ACTUAL
011066  042701  077777                        BIC     #77777,R1       ;SAVE DNA ONLY
011072  020001                                CMP     R0,R1           ;COMPARE EXP VS ACT
011074  001401                                BEQ     .+4
011076  104003                                ERROR   3       ;DNA SHOULD BE SET
                                                                ;IF DNA DID NOT SET
                                                                ;CHECK WORD LENGTH SELECT LOGIC

                                                ;;THIS TEST VERIFYS CHARACTER PLUS PARITY GENERATION
                                                ;;OF THE TRANSMITTER SECTION.
                                                ;;IT ALSO CHECKS DNA TIMING
                                                ;;MODE:SYNINT
                                                ;;LENGTH:SIX PLUS PARITY
                                                ;;PARITY:ODDPAR
                                                ;;CHARACTER:25
                                                ;;
                                        ;;*****************************************************************
```

```
                                        INITIALIZE THE COMMON TAGS

 2519  011100  000004                   TST23:  SCOPE
 2520  011102  052777  000400  170616           BIS     #MRESET,@TXCSR  ;MASTER RESET
 2521  011110  012777  030000  170604           MOV     #SYNINT,@PARCSR ;SET THE MODE
 2522  011116  052777  000400  170602           BIS     #MRESET,@TXCSR  ;MASTER RESET
 2523
 2524                                   ;SET MAINTENANCE MODE & SEND
 2525                                           ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
 2526  011124  012777  004020  170574           MOV     #MINT!SEND,@TXCSR
 2527
 2528                                   ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
 2529  011132  012777  033026  170562           MOV     #SYNINT!SIX!ODDPAR!26,@PARCSR
 2530  011140  016703  170562                   MOV     TXCSR,R3        ;SET UP FOR ERROR MSG
 2531  011144  112777  000025  170560           MOVB    #25,@TXDBUF     ;LOAD DATA CHAR
 2532  011152  012767  000025  170320           MOV     #25,$TMP1       ;TO BE SHIFTED CHAR
 2533  011160  012767  000007  167734           MOV     #7,SHIFT        ;# OF SHIFTS
 2534                                   ;POKE CLK TO GET INTO SYNCRONIZATION
 2535  011166  052777  020000  170532           BIS     #CLK,@TXCSR     ;POKE CLK UP
 2536  011174  042777  020000  170524           BIC     #CLK,@TXCSR     ;POKE CLK DOWN
 2537  011202  005000                   1$:     CLR     R0
 2538  011204  006067  170270                   ROR     $TMP1   ;FORCE CARRY
 2539  011210  103002                           BCC     2$      ;BR IF CARRY CLR
 2540  011212  052700  002000                   BIS     #BITW,R0        ;EQUIV OF BITW
 2541  011216                           2$:
 2542  011216  052777  020000  170502           BIS     #CLK,@TXCSR     ;POKE CLK UP
 2543  011224  042777  020000  170474           BIC     #CLK,@TXCSR     ;POKE CLK DOWN
 2544  011232  017701  170470                   MOV     @TXCSR,R1       ;ACTUAL
 2545  011236  042701  075777                   BIC     #075777,R1      ;SAVE BITW & DNA
 2546  011242  020001                           CMP     R0,R1   ;COMPARE EXP VS ACT
 2547  011244  001401                           BEQ     .+4
 2548  011246  104003                           ERROR   3       ;BIT WINDOW DID NOT MATCH ACTUAL DATA
 2549                                                           ;BIT....ALSO CHECK DNA
 2550  011250  005367  167646                   DEC     SHIFT   ;# OF SHIFTS
 2551  011254  001352                           BNE     1$      ;DO IT AGAIN ?
 2552                                   ;NOW POKE CLK TO SEE DNA
 2553  011256  052777  020000  170442           BIS     #CLK,@TXCSR     ;POKE CLK
 2554  011264  012700  100000                   MOV     #100000,R0      ;EXPECTED
 2555  011270  017701  170432                   MOV     @TXCSR,R1       ;ACTUAL
 2556  011274  042701  077777                   BIC     #77777,R1       ;SAVE DNA ONLY
 2557  011300  020001                           CMP     R0,R1           ;COMPARE EXP VS ACT
 2558  011302  001401                           BEQ     .+4
 2559  011304  104003                           ERROR   3       ;DNA SHOULD BE SET
 2560                                                           ;IF DNA DID NOT SET
 2561                                                           ;CHECK WORD LENGTH SELECT LOGIC
 2562
 2563                                           ;;THIS TEST VERIFYS CHARACTER PLUS PARITY GENERATION
 2564                                           ;;OF THE TRANSMITTER SECTION.
 2565                                           ;;IT ALSO CHECKS DNA TIMING
 2566                                           ;;MODE:ISYMOD
 2567                                           ;;LENGTH:SIX PLUS PARITY
 2568                                           ;;PARITY:EVEPAR
 2569                                           ;;CHARACTER:25
 2570                                           ;;
 2571                                   ;;**************************************************************
 2572  011306  000004                   TST24:  SCOPE
 2573  011310  052777  000400  170410           BIS     #MRESET,@TXCSR  ;MASTER RESET
 2574  011316  012777  000000  170376           MOV     #ISYMOD,@PARCSR ;SET THE MODE
```

```
                                        INITIALIZE THE COMMON TAGS

  2575  011324  052777  000400  170374          BIS     #MRESET,@TXCSR  ;MASTER RESET
  2576
  2577                                  ;SET MAINTENANCE MODE & SEND
  2578                                          ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
  2579  011332  012777  004020  170366          MOV     #MINT!SEND,@TXCSR
  2580
  2581                                  ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
  2582  011340  012777  003426  170354          MOV     #ISYMOD!SIX!EVEPAR!26,@PARCSR
  2583  011346  016703  170354                 MOV     TXCSR,R3        ;SET UP FOR ERROR MSG
  2584  011352  112777  000025  170352          MOVB    #25,@TXDBUF     ;LOAD DATA CHAR
  2585  011360  012767  000652  170112          MOV     #652,$TMP1      ;TO BE SHIFTED CHAR
  2586  011366  012767  000011  167526          MOV     #9.,$SHIFT      ;# OF SHIFTS
  2587                                  ;POKE CLK TO GET INTO SYNCRONIZATION
  2588  011374  052777  020000  170324          BIS     #CLK,@TXCSR     ;POKE CLK UP
  2589  011402  042777  020000  170316          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
  2590  011410  005000                  1$:     CLR     R0
  2591  011412  006067  170062                 ROR     $TMP1   ;FORCE CARRY
  2592  011416  103002                          BCC     2$      ;BR IF CARRY CLR
  2593  011420  052700  002000                 BIS     #BITW,R0        ;EQUIV OF BITW
  2594  011424                          2$:
  2595  011424  052777  020000  170274          BIS     #CLK,@TXCSR     ;POKE CLK UP
  2596  011432  042777  020000  170266          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
  2597  011440  017701  170262                 MOV     @TXCSR,R1       ;ACTUAL
  2598  011444  042701  075777                 BIC     #075777,R1      ;SAVE BITW & DNA
  2599  011450  020001                          CMP     R0,R1   ;COMPARE EXP VS ACT
  2600  011452  001401                          BEQ     .+4
  2601  011454  104003                          ERROR   3       ;BIT WINDOW DID NOT MATCH ACTUAL DATA
  2602                                                          ;BIT...ALSO CHECK DNA
  2603  011456  005367  167440                 DEC     SHIFT   ;# OF SHIFTS
  2604  011462  001352                          BNE     1$      ;DO IT AGAIN ?
  2605                                  ;NOW POKE CLK TO SEE DNA
  2606  011464  052777  020000  170234          BIS     #CLK,@TXCSR     ;POKE CLK
  2607  011472  012700  000000                 MOV     #0,R0   ;EXPECTED
  2608  011476  017701  170224                 MOV     @TXCSR,R1       ;ACTUAL
  2609  011502  042701  077777                 BIC     #77777,R1       ;SAVE DNA ONLY
  2610  011506  020001                          CMP     R0,R1           ;COMPARE EXP VS ACT
  2611  011510  001401                          BEQ     .+4
  2612  011512  104003                          ERROR   3       ;DNA SHOULD BE SET
  2613                                                          ;IF DNA DID NOT SET
  2614                                                          ;CHECK WORD LENGTH SELECT LOGIC
  2615
  2616                                          ;;THIS TEST VERIFYS CHARACTER PLUS PARITY GENERATION
  2617                                          ;;OF THE TRANSMITTER SECTION.
  2618                                          ;;IT ALSO CHECKS DNA TIMING
  2619                                          ;;MODE:ISYMOD
  2620                                          ;;LENGTH:SIX PLUS PARITY
  2621                                          ;;PARITY:ODDPAR
  2622                                          ;;CHARACTER:25
  2623                                          ;;
  2624                                  ;;**************************************************************************
  2625  011514  000004                  TST25:  SCOPE
  2626  011516  052777  000400  170202          BIS     #MRESET,@TXCSR  ;MASTER RESET
  2627  011524  012777  000000  170170          MOV     #ISYMOD,@PARCSR ;SET THE MODE
  2628  011532  052777  000400  170166          BIS     #MRESET,@TXCSR  ;MASTER RESET
  2629
  2630                                  ;SET MAINTENANCE MODE & SEND
```

```
DZDUT-A MACY11 27(1006)  03-FEB-77  07:54  PAGE 55
DZDUTA.M11    13-OCT-76 08:39          INITIALIZE THE COMMON TAGS

                                                ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
011540  012777  004020  170160            MOV     #MINT!SEND,@TXCSR

                                        ;SET MODE, # OF BITS,PARITY SENSE & LOAD SYNC REG
011546  012777  003026  170146            MOV     #ISYMOD!SIX!ODDPAR!26,@PARCSR
011554  016703  170146                    MOV     TXCSR,R3        ;SET UP FOR ERROR MSG
011560  112777  000025  170144            MOVB    #25,@TXDBUF     ;LOAD DATA CHAR
011566  012767  000452  167704            MOV     #452,$TMP1      ;TO BE SHIFTED CHAR
011574  012767  000011  167320            MOV     #9.,SHIFT       ;# OF SHIFTS
                                        ;POKE CLK TO GET INTO SYNCRONIZATION
011602  052777  020000  170116            BIS     #CLK,@TXCSR     ;POKE CLK UP
011610  042777  020000  170110            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
011616  005000                        1$: CLR     R0
011620  006067  167654                    ROR     $TMP1   ;FORCE CARRY
011624  103002                            BCC     2$      ;BR IF CARRY CLR
011626  052700  002000                    BIS     #BITW,R0        ;EQUIV OF BITW
011632                                  2$:
011632  052777  020000  170066            BIS     #CLK,@TXCSR     ;POKE CLK UP
011640  042777  020000  170060            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
011646  017701  170054                    MOV     @TXCSR,R1       ;ACTUAL
011652  042701  075777                    BIC     #075777,R1      ;SAVE BITW & DNA
011656  020001                            CMP     R0,R1   ;COMPARE EXP VS ACT
011660  001401                            BEQ     .+4
011662  104003                            ERROR   3               ;BIT WINDOW DID NOT MATCH ACTUAL DATA
                                                                ;BIT....ALSO CHECK DNA
011664  005367  167232                    DEC     SHIFT   ;# OF SHIFTS
011670  001352                            BNE     1$      ;DO IT AGAIN ?
                                        ;NOW POKE CLK TO SEE DNA
011672  052777  020000  170026            BIS     #CLK,@TXCSR     ;POKE CLK
011700  012700  000000                    MOV     #0,R0   ;EXPECTED
011704  017701  170016                    MOV     @TXCSR,R1       ;ACTUAL
011710  042701  077777                    BIC     #77777,R1       ;SAVE DNA ONLY
011714  020001                            CMP     R0,R1           ;COMPARE EXP VS ACT
011716  001401                            BEQ     .+4
011720  104003                            ERROR   3               ;DNA SHOULD BE SET
                                                                ;IF DNA DID NOT SET
                                                                ;CHECK WORD LENGTH SELECT LOGIC



                                                ;;THIS TEST VERIFYS CHARACTER PLUS PARITY GENERATION
                                                ;;OF THE TRANSMITTER SECTION.
                                                ;;IT ALSO CHECKS DNA TIMING
                                                ;;MODE:SYNINT
                                                ;;LENGTH:SEVEN PLUS PARITY
                                                ;;PARITY:EVEPAR
                                                ;;CHARACTER:125
                                                ;;
                                        ;;**************************************************************
011722  000004                        TST26:  SCOPE
011724  052777  000400  167774                BIS     #MRESET,@TXCSR  ;MASTER RESET
011732  012777  030000  167762                MOV     #SYNINT,@PARCSR ;SET THE MODE
011740  052777  000400  167760                BIS     #MRESET,@TXCSR  ;MASTER RESET

                                        ;SET MAINTENANCE MODE & SEND
                                                ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
```

```
                                        INITIALIZE THE COMMON TAGS

 2687  011746  012777  004020  167752          MOV     #MINT!SEND,@TXCSR
 2688
 2689                                  ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
 2690  011754  012777  035426  167740          MOV     #SYNINT!SEVEN!EVEPAR!P3,@PARCSR
 2691  011762  016703  167740                  MOV     TXCSR,R3        ;SET UP FOR ERROR MSG
 2692  011766  112777  000125  167736          MOVB    #125,@TXDBUF    ;LOAD DATA CHAR
 2693  011774  012767  000125  167476          MOV     #125,$TMP1      ;TO BE SHIFTED CHAR
 2694  012002  012767  000010  167112          MOV     #8.,SHIFT       ;# OF SHIFTS
 2695                                  ;POKE CLK TO GET INTO SYNCRONIZATION
 2696  012010  052777  020000  167710          BIS     #CLK,@TXCSR     ;POKE CLK UP
 2697  012016  042777  020000  167702          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
 2698  012024  005000                  1$:     CLR     R0
 2699  012026  006067  167446                  ROR     $TMP1   ;FORCE CARRY
 2700  012032  103002                          BCC     2$      ;BR IF CARRY CLR
 2701  012034  052700  002000                  BIS     #BITW,R0        ;EQUIV OF BITW
 2702  012040                          2$:
 2703  012040  052777  020000  167660          BIS     #CLK,@TXCSR     ;POKE CLK UP
 2704  012046  042777  020000  167652          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
 2705  012054  017701  167646                  MOV     @TXCSR,R1       ;ACTUAL
 2706  012060  042701  075777                  BIC     #075777,R1      ;SAVE BITW & DNA
 2707  012064  020001                          CMP     R0,R1   ;COMPARE EXP VS ACT
 2708  012066  001401                          BEQ     .+4
 2709  012070  104003                          ERROR   3               ;BIT WINDOW DID NOT MATCH ACTUAL DATA
 2710                                                                  ;BIT...ALSO CHECK DNA
 2711  012072  005367  167024                  DEC     SHIFT   ;# OF SHIFTS
 2712  012076  001352                          BNE     1$      ;DO IT AGAIN ?
 2713                                  ;NOW POKE CLK TO SEE DNA
 2714  012100  052777  020000  167620          BIS     #CLK,@TXCSR     ;POKE CLK
 2715  012106  012700  100000                  MOV     #100000,R0      ;EXPECTED
 2716  012112  017701  167610                  MOV     @TXCSR,R1       ;ACTUAL
 2717  012116  042701  077777                  BIC     #77777,R1       ;SAVE DNA ONLY
 2718  012122  020001                          CMP     R0,R1           ;COMPARE EXP VS ACT
 2719  012124  001401                          BEQ     .+4
 2720  012126  104003                          ERROR   3               ;DNA SHOULD BE SET
 2721                                                                  ;IF DNA DID NOT SET
 2722                                                                  ;CHECK WORD LENGTH SELECT LOGIC
 2723
 2724                                          ;;THIS TEST VERIFYS CHARACTER PLUS PARITY GENERATION
 2725                                          ;;OF THE TRANSMITTER SECTION.
 2726                                          ;;IT ALSO CHECKS DNA TIMING
 2727                                          ;;MODE:SYNINT
 2728                                          ;;LENGTH:SEVEN PLUS PARITY
 2729                                          ;;PARITY:ODDPAR
 2730                                          ;;CHARACTER:125
 2731                                          ;;
 2732                                  ;;**************************************************************
 2733  012130  000004                  TST27:  SCOPE
 2734  012132  052777  000400  167566          BIS     #MRESET,@TXCSR  ;MASTER RESET
 2735  012140  012777  030000  167554          MOV     #SYNINT,@PARCSR ;SET THE MODE
 2736  012146  052777  000400  167552          BIS     #MRESET,@TXCSR  ;MASTER RESET
 2737
 2738                                  ;SET MAINTENANCE MODE & SEND
 2739                                          ;NOTE:BIT WINDOW&CLK ARE CLEARED (MTDATA=0)
 2740  012154  012777  004020  167544          MOV     #MINT!SEND,@TXCSR
 2741
 2742                                  ;SET MODE,# OF BITS,PARITY SENSE,& LOAD SYNC REG
```

```
                                        INITIALIZE THE COMMON TAGS

2743  012162  012777  035026  167532            MOV     #SYNINT!SEVEN!ODDPAR!26,@PARCSR
2744  012170  016703  167532                    MOV     TXCSR,R3        ;SET UP FOR ERROR MSG
2745  012174  112777  000125  167530            MOVB    #125,@TYDBUF    ;LOAD DATA CHAR
2746  012202  012767  000325  167270            MOV     #325,$TMP1      ;TO BE SHIFTED CHAR
2747  012210  012767  000010  166704            MOV     #8.,SHIFT       ;# OF SHIFTS
2748                                    ;POKE CLK TO GET INTO SYNCRONIZATION
2749  012216  052777  020000  167502            BIS     #CLK,@TXCSR     ;POKE CLK UP
2750  012224  042777  020000  167474            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2751  012232  005000                    1$:     CLR     R0
2752  012234  006067  167240                    ROR     $TMP1   ;FORCE CARRY
2753  012240  103002                            BCC     2$      ;BR IF CARRY CLR
2754  012242  052700  002000                    BIS     #BITW,R0        ;EQUIV OF BITW
2755  012246                            2$:
2756  012246  052777  020000  167452            BIS     #CLK,@TXCSR     ;POKE CLK UP
2757  012254  042777  020000  167444            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2758  012262  017701  167440                    MOV     @TXCSR,R1       ;ACTUAL
2759  012266  042701  075777                    BIC     #075777,R1      ;SAVE BITW & DNA
2760  012272  020001                            CMP     R0,R1   ;COMPARE EXP VS ACT
2761  012274  001401                            BEQ     .+4
2762  012276  104003                            ERROR   3               ;BIT WINDOW DID NOT MATCH ACTUAL DATA
2763                                                                    ;BIT,...ALSO CHECK DNA
2764  012300  005367  166616                    DEC     SHIFT   ;# OF SHIFTS
2765  012304  001352                            BNE     1$      ;DO I1 AGAIN ?
2766                                    ;NOW POKE CLK TO SEE DNA
2767  012306  052777  020000  167412            BIS     #CLK,@TXCSR     ;POKE CLK
2768  012314  012700  100000                    MOV     #100000,R0      ;EXPECTED
2769  012320  017701  167402                    MOV     @TXCSR,R1       ;ACTUAL
2770  012324  042701  077777                    BIC     #77777,R1       ;SAVE DNA ONLY
2771  012330  020001                            CMP     R0,R1           ;COMPARE EXP VS ACT
2772  012332  001401                            BEQ     .+4
2773  012334  104003                            ERROR   3       ;DNA SHOULD BE SET
2774                                                                    ;IF DNA DID NOT SET
2775                                                                    ;CHECK WORD LENGTH SELECT LOGIC
2776
2777
2778
2779                                    ;END OF PASS
2780                                    ;TYPE NAME OF TEST
2781                                    ;UPDATE PASS COUNT
2782                                    ;CHECK FOR EXIT TO ACT-11
2783                                    ;RESTART TEST
2784
2785  012336  000004                .EOP:   SCOPE
2786  012340  004767  000344                JSR     PC,CKSWR
2787  012344  104401                        TYPE                            ;TYPE NAME OF TEST
2788  012346  015500                        MEPASS
2789  012350  104413  012602                CONVRT  ,OUTCRY
2790  012354  104401  015317                TYPE    ,DEVICE
2791  012360  105767  166566                TSTB    MULTD   ;ARE YOU RUNNING MULTIPLE DEVICES ?
2792  012364  001511                        BEQ     CCC     ;NO,JUMP AROUND
2793  012366  005767  166574                TST     ACTREG  ;ARE ANY DEVICES ACTIVE ?
2794  012372  001007                        BNE     RUNIT   ;YES
2795  012374  104401  015331                TYPE    ,MCOW   ;NO
2796  012400  016700  166562                MOV     ACTREG,R0       ;DISPLAY ACTREG
2797  012404  000000                        HALT                    ;SELECT SOMETHING TO RUN @ ACTREG:
2798                                    ;SELECT SWITCHES & HIT CONTINUE (PUT SW00 =1)
```

```
                                        INITIALIZE THE COMMON TAGS

2799  012406  000167  167540                    JMP     .START  ;START OVER AGAIN.....YOU DESELECTED EVERYTHING
2800  012412  062767  000010  166534  RUNIT:    ADD     #10,BASEADD     ;NEXT BLOCK (ADDRESSES)
2801  012420  062767  000010  166534  ZERO:     ADD     #10,BASEIV      ;NEXT BLOCK (VECTORS)
2802  012426  000241                            CLC
2803  012430  006167  166534                    ROL     ROTADD  ;UP DATE ROTATING POINTER
2804  012434  103410                            BCS     2$      ;IS IT THE LAST DEVICE
                                                              ;TO BE TESTED IN THIS PASS ?
2805
2806  012436  036767  166526  166522            BIT     ROTADD,ACTREG   ;TEST THIS DEVICE FOR ACTIVE STATUS
2807  012444  001762                            BEQ     RUNIT   ;IF NOT ACTIVE, TRY NEXT ADDRESS
2808  012446  004767  000034                    JSR     PC,REPLAY       ;CALCULATE NEW PARAMETERS
2809  012452  000167  000210                    JMP     RESTRT  ;YES IT WAS ACTIVE,TEST THIS DEVICE
2810  012456  012767  000001  166504  2$:       MOV     #1,ROTADD       ;OK!,NOW SET UP  ROTATING
2811                                                          ;POINTER FOR NEXT MULTIPLE PASS
2812  012464  016767  166466  166462            MOV     KEEPADD,BASEADD ;RESTORE BASE ADDRESS
2813  012472  016767  166466  166462            MOV     KEEPIV,BASEIV   ;RESTORE BASE INTERRUPT VECTORS
2814  012500  004767  000002                    JSR     PC,REPLAY       ;CALC NEW PARAMETERS
2815  012504  000441                            BR      CCC     ;JUMP AROUND REPLAY
2816  012506  016767  166442  004404  REPLAY:   MOV     BASEADD,DUBASE  ;SET UP FOR NEW ADDRESSES
2817  012514  004767  004246                    JSR     PC,DUADDR       ;CREATE NEW ADDRESSES
2818  012520  016767  166436  167210            MOV     BASEIV,DURIV    ;CREATE DURIV
2819  012526  062767  000002  166426            ADD     #2,BASEIV
2820  012534  016767  166422  167176            MOV     BASEIV,DURIS    ;CREATE DURIS
2821  012542  062767  000002  166412            ADD     #2,BASEIV
2822  012550  016767  166406  167164            MOV     BASEIV,DUTIV    ;CREATE DUTIV
2823  012556  062767  000002  166376            ADD     #2,BASEIV
2824  012564  016767  166372  167152            MOV     BASEIV,DUTIS    ;CREATE DUTIS
2825  012572  016767  167140  166362            MOV     DURIV,BASEIV    ;RESTORE
2826  012600  000207                            RTS     PC
2827
2828  012602  000001                  OUTCRY:   1
2829  012604      006       002                 .BYTE   6,2
2830  012606  001712                            RXCSR
2631
2832  012610                          CCC:
2833  012610  005067  166566                    CLR     $TSTNM                  ;CLEAR TEST NUMBER
2834  012614  005067  166576                    CLR     $ERRPC                  ;CLEAR LAST ERROR PC
2835  012620  005067  166557                    CLR     $ERFLG                  ;CLEAR ERROR FLAG
2836  012624  005267  166262                    INC     PASCNT                  ;UPDATE PASS COUNT
2837  012630  016767  166256  166244            MOV     PASCNT,LIGHTS           ;DISPLAY PASS COUNT
2838  012636  016767  166250  166670            MOV     PASCNT,$PASS            ;PASS COUNT TO APT
2839  012644  013701  000042                    MOV     @#42,R1                 ;CHECK FOR ACT-11 OR DDP
2840  012650  001406                            BEQ     RESTRT          ;IF NO CONTINUE TESTING
2841  012652  000005                            RESET
2842  012654  000005                            RESET
2843  012656  004711                  SENDAD:   JSR     PC,(R1)
2844  012660  000240                            NOP
2845  012662  000240                            NOP
2846  012664  000240                            NOP
2847  012666  106427  000340          RESTRT:   MTPS    #340    ;PREVENT INTERRUPTS (PRIO: 7)
2848  012672  004767  000012                    JSR     PC,CKSWR
2849  012676  012767  003364  166502            MOV     #TST1+2,$LPADR          ;SET LAST ADDRESS POINTER
2850  012704  000167  170452                    JMP     TST1
2851
2852                                            ;CHECK SWITCH REGISTER ROUTINE.
2853                                            ;CHECKS TO ALLOW FOR <↑G> TO ALLOW
2854                                            ;THE CHANGING OF LOCATION 176
```

INITIALIZE THE COMMON TAGS

```
2855
2856  012710  005737  000042          CKSWR:  TST     @#42
2857  012714  001040                          BNE     OUT
2858  012716  022767  000176  166514          CMP     #SWREG,SWR      ;SOFTWARE SWR PRESENT?
2859  012724  001034                          BNE     OUT             ;NO--LEAVE
2860  012726  105777  166512                  TSTB    @$TKS           ;CHECK TTY READY
2861  012732  100031                          BPL     OUT             ;NO--LEAVE
2862  012734  017767  166506  000422          MOV     @$TKB,.MSG      ;GET CHARACTER
2863  012742  042767  177600  000414          BIC     #177600,.MSG    ;STRIP JUNK
2864  012750  122767  000007  000406          CMPB    #7,.MSG         ;IS IT (^G) ?
2865  012756  001017                          BNE     OUT             ;NO
2866  012760  104401  016105                  TYPE    ,MCNTG
2867  012764  005137  013024          CNTLU:  COM     @#RDSW
2868  012770  104401  016115                  TYPE    ,MMSWR
2869  012774  104413                          CONVRT
2870  012776  013026                          SWREGL
2871  013000  104406  016126                  INSTR,MMNEW
2872  013004  104410                          PARAM
2873  013006  000000                          0
2874  013010  177777                          177777
2875  013012  000176                          SWREG
2876  013014     000     001          .BYTE   0,1
2877  013016  005037  013024          OUT:    CLR     @#RDSW
2878  013022  000207                          RTS     PC
2879  013024  000000                  RDSW:   .WORD   0
2880  013026  000001                  SWREGL: 1
2881  013030     006     002                  .BYTE   6,2
2882  013032  000176                          SWREG
2883
2884  013034  000005                          5
2885
2886                                          ;CHECK FOR FREEZE ON CURRENT DATA
2887
2888  013036  004767  177646          .SCOP1: JSR     PC,CKSWR
2889  013042  032777  001000  166370          BIT     #SW09,@SWR
2890  013050  001402                          BEQ     1$
2891  013052  016716  166032                  MOV     LOCK,(SP)
2892  013056  000002                  1$:     RTI
2893                                  .SBTTL  TYPE ROUTINE
2894
2895                                  ;;*****************************************************************
2896                                  ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
2897                                  ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
2898                                  ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
2899                                  ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
2900                                  ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
2901                                  ;*
2902                                  ;*CALL:
2903                                  ;*1) USING A TRAP INSTRUCTION
2904                                  ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
2905                                  ;*OR
2906                                  ;*      TYPE
2907                                  ;*      MESADR
2908                                  ;*
2909
2910  013060  105767  166373          $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
```

```
 2911  013064  100002                          BPL     1$              ;;BR IF YES
 2912  013066  000000                          HALT                    ;;HALT HERE IF NO TERMINAL
 2913  013070  000430                          BR      3$              ;;LEAVE
 2914  013072  010046                  1$:     MOV     R0,-(SP)        ;;SAVE R0
 2915  013074  017600  000002                  MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
 2916  013100  122767  000001  166440          CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
 2917  013106  001011                          BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
 2918  013110  132767  000100  166431          BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
 2919  013116  001405                          BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
 2920  013120  010067  000004                  MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
 2921  013124  004767  000006'                 JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
 2922  013130  000000                  61$:    .WORD   0               ;;MESSAGE ADDRESS
 2923  013132  132767  000040  166407  62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
 2924  013140  001003                          BNE     60$             ;;YES,SKIP TYPE OUT
 2925  013142  112046                  2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
 2926  013144  001005                          BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
 2927  013146  005726                          TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
 2928  013150  012600                  60$:    MOV     (SP)+,R0        ;;RESTORE R0
 2929  013152  062716  000002          3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
 2930  013156  000002                          RTI                     ;;RETURN
 2931  013160  122716  000011          4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
 2932  013164  001430                          BEQ     8$
 2933  013166  122716  000200                  CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
 2934  013172  001006                          BNE     5$
 2935  013174  005726                          TST     (SP)+           ;;POP  <CR><LF> EQUIV
 2936  013176  104401                          TYPE                    ;;TYPE A CR AND LF
 2937  013200  001523                          $CRLF
 2938  013202  105067  000130                  CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
 2939  013206  000755                          BR      2$              ;;GET NEXT CHARACTER
 2940  013210  004767  000056          5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
 2941  013214  126726  166236          6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
 2942  013220  001350                          BNE     2$              ;;IF NO GO GET NEXT CHAR.
 2943  013222  016746  166226                  MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
 2944                                                                  ;;AND THE NULL CHAR.
 2945  013226  105366  000001          7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
 2946  013232  002770                          BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
 2947  013234  004767  000032                  JSR     PC,$TYPEC       ;;GO TYPE A NULL
 2948  013240  105367  000072                  DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
 2949  013244  000770                          BR      7$              ;;LOOP
 2950
 2951                                  ;HORIZONTAL TAB PROCESSOR
 2952
 2953  013246  112716  000040          8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
 2954  013252  004767  000014          9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
 2955  013256  132767  000007  000052          BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
 2956  013264  001372                          BNE     9$              ;;TAB STOP
 2957  013266  005726                          TST     (SP)+           ;;POP SPACE OFF STACK
 2958  013270  000724                          BR      2$              ;;GET NEXT CHARACTER
 2959  013272  105777  166152          $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
 2960  013276  100375                          BPL     $TYPEC
 2961  013300  116677  000002  166144          MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
 2962  013306  122766  000015  000002          CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
 2963  013314  001003                          BNE     1$              ;;BRANCH IF NO
 2964  013316  105067  000014                  CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
 2965  013322  000406                          BR      $TYPEX          ;;EXIT
 2966  013324  122766  000012  000002  1$:     CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
```

```
 2967  013332  001402                          BEQ     $TYPEX          ;;BRANCH IF YES
 2968  013334  105227                          INCB    (PC)+           ;;COUNT THE CHARACTER
 2969  013336  000000                  $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
 2970  013340  000207                  $TYPEX: RTS     PC
 2971
 2972
 2973                                          ;ASCII STRING INPUT ROUTINE
 2974
 2975  013342  017667  000000  000014  .INSTR: MOV     @(SP),.MSG      ;PICK UP MESSAGE
 2976  013350  062716  000002                  ADD     #2,(SP)         ;JUMP AROUND MESSAGE FOR RTI
 2977  013354  105767  166166                  TSTB    $ENV            ;APT CONTROL
 2978  013360  001036                          BNE     INSTR2          ;YES NO TYPE
 2979  013362  104401                  .INST1: TYPE
 2980  013364  000000                  .MSG:   0
 2981  013366  012704  016140                  MOV     #INBUF,R4       ;GET STARTING LOC OF INBUF
 2982  013372  012703  000007                  MOV     #7,R3           ;MAX # OF CHARS
 2983  013376  105777  166042          1$:     TSTB    @$TKS   ;TTY FLAG
 2984  013402  100375                          BPL     1$
 2985  013404  117714  166036                  MOVB    @$TKB,(R4)      ;TAKE CHAR
 2986  013410  142714  000200                  BICB    #200,(R4)       ;STRIP
 2987  013414  121427  000025                  CMPB    (R4),#25        ;IS IT <^G>
 2988  013420  001760                          BEQ     .INST1
 2989  013422  122427  000015                  CMPB    (R4)+,#15       ;CHECK FOR CR
 2990  013426  001413                          BEQ     INSTR2
 2991  013430  105777  166014          2$:     TSTB    @$TPS   ;TEST FLAG
 2992  013434  100375                          BPL     2$
 2993  013436  117777  166004  166006          MOVB    @$TKB,@$TPB     ;ECHO CHARACTER
 2994  013444  005303                          DEC     R3      ;DID YOU TYPE TOO MANY CHARS ?
 2995  013446  001353                          BNE     1$
 2996  013450  104401                  .INSTE: TYPE
 2997  013452  015425                          MQM     ;?
 2998  013454  000742                          BR      .INST1  ;RETRY
 2999  013456  000002                  INSTR2: RTI
 3000
 3001                                          ;CONVERT ASCII STRING TO OCTAL
 3002
 3003  013460  011605                  .PARAM: MOV     (SP),R5 ;PUT CONTENTS OF SP INTO R5
 3004  013462  012567  000162                  MOV     (R5)+,LOLIM     ;PUT LOW LIMIT INTO LOLIM
 3005  013466  012567  000160                  MOV     (R5)+,HILIM     ;PUT HIGH LIMIT INTO HILIM
 3006  013472  012567  000156                  MOV     (R5)+,DEVADR    ;PUT STORE LOC INTO DEVADR
 3007  013476  112567  000154                  MOVB    (R5)+,LOBITS    ;PUT MASK INTO LOBITS
 3008  013502  112567  000151                  MOVB    (R5)+,ADRCNT    ;PUT COUNT INTO ADRCNT
 3009  013506  010516                          MOV     R5,(SP) ;RESTORE RETURN ADDR ON STACK FOR RTI
 3010  013510  005005                  PARAM1: CLR     R5
 3011  013512  012704  016140                  MOV     #INBUF,R4
 3012  013516  122714  000015                  CMPB    #15,(R4)        ;CR ?
 3013  013522  001420                          BEQ     PARERR  ;YOU TYPED CR TOO SOON !
 3014  013524  121427  000060          1$:     CMPB    (R4),#60        ;LOW LIMIT ASCII 0
 3015  013530  002415                          BLT     PARERR
 3016  013532  121427  000067                  CMPB    (R4),#67        ;HIGH LIMIT ASCII 7
 3017  013536  003012                          BGT     PARERR
 3018  013540  142714  000060                  BICB    #60,(R4)        ;CONVERT TO OCTAL
 3019  013544  152405                          BISB    (R4)+,R5        ;STORE AWAY ITS AN OK CHAR
 3020  013546  122714  000015                  CMPB    #15,(R4)        ;CR ?
 3021  013552  001414                          BEQ     LIMITS  ;NOW CHECK FOR HIGH &LOW LIMIT CONDS
 3022  013554  006305                          ASL     R5      ;ALLOCATE ROOM FOR NEXT CHAR
```

```
3023  013556  006305                          ASL     R5
3024  013560  006305                          ASL     R5
3025  013562  000760                          BR      1$
3026  013564  122714  000015          PARERR: CMPB    #15,(R4)        ;CR?
3027  013570  001003                          BNE     120$
3028  013572  005737  013024                  TST     @#RDSW          ;CK SWR USED
3029  013576  001023                          BNE     PARTI
3030  013600  104407                  120$:   INSTER  ;RETRY
3031  013602  000742                          BR      PARAM1
3032
3033                                          ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
3034
3035  013604  020567  000042          LIMITS: CMP     R5,HILIM
3036  013610  101365                          BHI     PARERR  ;THE # IS TOO HIGH
3037  013612  020567  000032                  CMP     R5,LOLIM
3038  013616  103762                          BLO     PARERR  ;THE # IS TOO LOW
3039  013620  136705  000032                  BITB    LOBITS,R5       ;TEST BY MASKINGTHE #
3040  013624  001357                          BNE     PARERR
3041
3042                                          ;STORE NUMBER AT SPECIFIED ADDRESS
3043
3044  013626  016704  000022                  MOV     DEVADR,R4       ;GET STARTING ADDR OF
3045  013632  010524                  1$:     MOV     R5,(R4)+        ;STORE AT THIS ADDR
3046  013634  062705  000002                  ADD     #2,R5
3047  013640  105367  000013                  DECB    ADRCNT  ;HOW MANY TIMES + 2 ?
3048  013644  001372                          BNE     1$
3049  013646  000002                  PARTI:  RTI
3050  013650  000000                  LOLIM:  0
3051  013652  000000                  HILIM:  0
3052  013654  000000                  DEVADR: 0
3053  013656  000000                  LOBITS: 0
3054          013657                  ADRCNT=LOBITS+1
3055
3056                                          ;SAVE PC OF TEST THAT FAILED AND R0-R5
3057
3058  013660  016667  000004  165240  .SAVOS: MOV     4(SP),SAVPC
3059
3060                                          ;SAVE R0-R5
3061
3062  013666  010567  165602          SVOS:   MOV     R5,$REG5
3063  013672  010467  165574                  MOV     R4,$REG4
3064  013676  010367  165566                  MOV     R3,$REG3
3065  013702  010267  165560                  MOV     R2,$REG2
3066  013706  010167  165552                  MOV     R1,$REG1
3067  013712  010067  165544                  MOV     R0,$REG0
3068  013716  000002                          RTI
3069
3070                                          ;RESTORE R0-R5
3071
3072  013720  016700  165536          .RESOS: MOV     $REG0,R0
3073  013724  016701  165534                  MOV     $REG1,R1
3074  013730  016702  165532                  MOV     $REG2,R2
3075  013734  016703  165530                  MOV     $REG3,R3
3076  013740  016704  165526                  MOV     $REG4,R4
3077  013744  016705  165524                  MOV     $REG5,R5
3078  013750  000002                          RTI
```

```
3079
3080                                            ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
3081
3082  013752  104401                .CONVR: TYPE
3083  013754  015431                        MCRLF   ;CR  LF
3084  013756  017601  000000                MOV     @(SP),R1        ;PICK UP DATA POINTER
3085  013762  062716  000002                ADD     #2,(SP) ;SET UP SP FOR RTI
3086  013766  012167  000130                MOV     (R1)+,WRDCNT    ;PICK UP # OF WORDS FROM TABLE
3087  013772  112167  000126        1$:     MOVB    (R1)+,CHRCNT    ;PICK UP # OF CHARS FROM TABLE
3088  013776  112167  000123                MOVB    (R1)+,SPACNT    ;PICK UP # OF SPACES FROM TABLE
3089  014002  013167  000120                MOV     @(R1)+,BINWRD   ;PICK UP ADDRESS OF  MSG
3090                                                                  ;FROM TABLE
3091  014006  016704  000114        2$:     MOV     BINWRD,R4       ;SAVE
3092  014012  116705  000106                MOVB    CHRCNT,R5       ;SAVE
3093  014016  012700  016202                MOV     #TEMP,R0        ;STARTING ADDRESS OF TEMP BLOCK
3094  014022  010403                3$:     MOV     R4,R3           ;SAVE
3095  014024  042703  177770                BIC     #177770,R3      ;CLR OUT UPPER BITS .. SAVE CHAR
3096  014030  062703  000260                ADD     #260,R3 ;CONVERT TO ASCII
3097  014034  110320                        MOVB    R3,(R0)+        ;STORE AWAY
3098  014036  006204                        ASR     R4      ;SHIFT FOR NEXT #
3099  014040  006204                        ASR     R4      ;DITTO
3100  014042  006204                        ASR     R4      ;DITTO
3101  014044  005305                        DEC     R5      ;DEC CHAR COUNT
3102  014046  001365                        BNE     3$      ;DO IT AGAIN ?
3103  014050  012703  016244                MOV     #MDATA,R3       ;STARTING ADDRESS OF MDATA BLOCK
3104  014054  114023                4$:     MOVB    -(R0),(R3)+     ;REVERSE THE ORDER OF NUMBERS
3105  014056  105367  000042                DECB    CHRCNT  ;DEC CHAR COUNT
3106  014062  001374                        BNE     4$      ;DO IT AGAIN ?
3107  014064  105767  000035                TSTB    SPACNT  ;HOW MANY SPACES ?
3108  014070  001405                        BEQ     6$      ;TYPE # IF BR =0
3109  014072  112723  000240        5$:     MOVB    #240,(R3)+      ;"SPACE" IN ASCII
3110  014076  105367  000023                DECB    SPACNT  ;DEC # OF SPACE COUNT
3111  014102  001373                        BNE     5$      ;DO IT AGAIN ?
3112  014104  105013                6$:     CLRB    (R3)    ;INSERT "0" FOR TTY OUTPUT ROUTINE
3113  014106  104401                        TYPE
3114  014110  016244                        MDATA   ;THIS MESSAGE
3115  014112  005367  000004                DEC     WRDCNT  ;HOW MANY #'S ?
3116  014116  001325                        BNE     1$      ;DO THIS ROUTINE AGAIN IF NOT EQUAL TO 0
3117  014120  000002                        RTI     ;RETURN TO PROGRAM
3118  014122  000000                WRDCNT: 0
3119  014124  000000                CHRCNT: 0
3120           014125                SPACNT=CHRCNT+1
3121  014126  000000                BINWRD: 0
3122
3123                                            ;COMPARE THE FIRST CHARACTER IN THE TELETYPE INPUT
3124                                            ;BUFFER TO THE CHARACTERS "N" AND "Y".
3125                                            ;IF THE CHARACTER IS "N" CLEAR THE FLAG
3126                                            ;IF THE CHARACTER IS "Y" SET THE FLAG
3127
3128  014130  017605  000000        .SETFLG:MOV     @(SP),R5
3129  014134  122767  000116  001776        CMPB    #'N,INBUF       ;IS IT "N" ?
3130  014142  001002                        BNE     1$
3131  014144  105015                        CLRB    (R5)    ;000
3132  014146  000406                        BR      2$
3133  014150  122767  000131  001762  1$:     CMPB    #'Y,INBUF       ;IS IT "Y" ?
3134  014156  001005                        BNE     3$
```

```
                                TYPE ROUTINE

 3135  014160  112715  177777                MOVB    #-1,(R5)        ;377
 3136  014164  062716  000002        2$:     ADD     #2,(SP)
 3137  014170  000002                        RTI
 3138  014172  104407                3$:     INSTER  ;RETRY
 3139  014174  000755                        BR      .SETFLG
 3140                                .SBTTL  ERROR HANDLER ROUTINE
 3141
 3142                                ;;**********************************************************************
 3143                                ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
 3144                                ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
 3145                                ;*AND GO TO SAVIT ON ERROR
 3146                                ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
 3147                                ;*SW15=1        HALT ON ERROR
 3148                                ;*SW13=1        INHIBIT ERROR TYPEOUTS
 3149                                ;*SW10=1        BELL ON ERROR
 3150                                ;*SW09=1        LOOP ON ERROR
 3151                                ;*CALL
 3152                                ;*      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER
 3153
 3154  014176                        $ERROR:
 3155  014176  105267  165201        7$:     INCB    $ERFLG          ;;SET THE ERROR FLAG
 3156  014202  001775                        BEQ     7$              ;;DON'T LET THE FLAG GO TO ZERO
 3157  014204  016777  165172  165230        MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
 3158  014212  032777  002000  165220        BIT     #BIT10,@SWR     ;;BELL ON ERROR?
 3159  014220  001402                        BEQ     1$              ;;NO - SKIP
 3160  014222  104401  001516                TYPE    ,$BELL          ;;RING BELL
 3161  014226  005267  165160        1$:     INC     $ERTTL          ;;COUNT THE NUMBER OF ERRORS
 3162  014232  011667  165160                MOV     (SP),$ERRPC     ;;GET ADDRESS OF ERROR INSTRUCTION
 3163  014236  162767  000002  165152        SUB     #2,$ERRPC
 3164  014244  117767  165146  165142        MOVB    @$ERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
 3165  014252  032777  020000  165160        BIT     #BIT13,@SWR     ;;SKIP TYPEOUT IF SET
 3166  014260  001004                        BNE     20$             ;;SKIP TYPEOUTS
 3167  014262  004767  000072                JSR     PC,SAVIT        ;;GO TO USER ERROR ROUTINE
 3168  014266  104401  001523                TYPE    ,$CRLF
 3169  014272                        20$:
 3170  014272  122767  000001  165246        CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
 3171  014300  001007                        BNE     2$              ;;NO,SKIP APT ERROR REPORT
 3172  014302  116767  165106  000004        MOVB    $ITEMB,21$      ;;SET ITEM NUMBER AS ERROR NUMBER
 3173  014310  004767  000016'               JSR     PC,$ATY4        ;;REPORT FATAL ERROR TO APT
 3174  014314     000                21$:    .BYTE   0
 3175  014315     000                        .BYTE   0
 3176  014316  000777                22$:    BR      22$             ;;APT ERROR LOOP
 3177  014320  005777  165114        2$:     TST     @SWR            ;;HALT ON ERROR
 3178  014324  100001                        BPL     3$              ;;SKIP IF CONTINUE
 3179  014326  000000                        HALT                    ;;HALT ON ERROR!
 3180  014330  032777  001000  165102  3$:     BIT     #BIT09,@SWR     ;;LOOP ON ERROR SWITCH SET?
 3181  014336  001402                        BEQ     4$              ;;BR IF NO
 3182  014340  016716  165044                MOV     $LPERR,(SP)     ;;FUDGE RETURN FOR LOOPING
 3183  014344  005767  165144        4$:     TST     $ESCAPE         ;;CHECK FOR AN ESCAPE ADDRESS
 3184  014350  001402                        BEQ     5$              ;;BR IF NONE
 3185  014352  016716  165136                MOV     $ESCAPE,(SP)    ;;FUDGE RETURN ADDRESS FOR ESCAPE
 3186  014356                        5$:
 3187  014356  000002                        RTI                     ;;RETURN
 3188  014360  010067  164544        SAVIT:  MOV     R0,HLD0
 3189  014364  010167  164542                MOV     R1,HLD1
 3190  014370  010267  164540                MOV     R2,HLD2
```

```
                                        ERROR HANDLER ROUTINE

 3191  014374  010367  164536                 MOV     R3,HLD3
 3192  014400  010467  164534                 MOV     R4,HLD4
 3193  014404  010567  164532                 MOV     R5,HLD5
 3194  014410  016767  164766  164526         MOV     $TSTNM,HLD6
 3195
 3196                                  .SBTTL  ERROR MESSAGE TYPEOUT ROUTINE
 3197
 3198                                  ;;**********************************************************************
 3199                                  ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
 3200                                  ;*ERROR IS TO BE REPORTED. IT THEN OBTAINS, FROM THE "ERROR TABLE" ($ERRTB),
 3201                                  ;*AND REPORTS THE APPROPRIATE INFORMATION CONCERNING THE ERROR.
 3202
 3203  014416                          $ERRTYP:
 3204  014416  104401  001523                 TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
 3205  014422  010046                         MOV     R0,-(SP)        ;;SAVE R0
 3206  014424  005000                         CLR     R0              ;;PICKUP THE ITEM INDEX
 3207  014426  153700  001414                 BISB    @#$ITEMB,R0
 3208  014432  001004                         BNE     1$              ;;IF ITEM NUMBER IS ZERO, JUST
 3209                                                                  ;;TYPE THE PC OF THE ERROR
 3210  014434  016746  164756                 MOV     $ERRPC,-(SP)    ;;SAVE $ERRPC FOR TYPEOUT
 3211                                                                  ;;ERROR ADDRESS
 3212  014440  104402                         TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
 3213  014442  000426                         BR      6$              ;;GET OUT
 3214  014444  005300                  1$:    DEC     R0              ;;ADJUST THE INDEX SO THAT IT WILL
 3215  014446  006300                         ASL     R0              ;;      WORK FOR THE ERROR TABLE
 3216  014450  006300                         ASL     R0
 3217  014452  006300                         ASL     R0
 3218  014454  062700  001652                 ADD     #$ERRTB,R0      ;;FORM TABLE POINTER
 3219  014460  012067  000004                 MOV     (R0)+,2$        ;;PICKUP "ERROR MESSAGE" POINTER
 3220  014464  001404                         BEQ     3$              ;;SKIP TYPEOUT IF NO POINTER
 3221  014466  104401                         TYPE                    ;;TYPE THE "ERROR MESSAGE"
 3222  014470  000000                  2$:    .WORD   0               ;;"ERROR MESSAGE" POINTER GOES HERE
 3223  014472  104401  001523                 TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
 3224  014476  012067  000004          3$:    MOV     (R0)+,4$        ;;PICKUP "DATA HEADER" POINTER
 3225  014502  001404                         BEQ     5$              ;;SKIP TYPEOUT IF 0
 3226  014504  104401                         TYPE                    ;;TYPE THE "DATA HEADER"
 3227  014506  000000                  4$:    .WORD   0               ;;"DATA HEADER" POINTER GOES HERE
 3228  014510  104401  001523                 TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
 3229  014514  011000                  5$:    MOV     @(R0),R0        ;;PICKUP "DATA TABLE" POINTER
 3230  014516  001004                         BNE     7$              ;;GO TYPE THE DATA
 3231  014520  012600                  6$:    MOV     (SP)+,R0        ;;RESTORE R0
 3232  014522  104401  001523                 TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
 3233  014526  000207                         RTS     PC              ;;RETURN
 3234  014530                          7$:
 3235  014530  013046                         MOV     @(R0)+,-(SP)    ;;SAVE @(R0)+ FOR TYPEOUT
 3236  014532  104402                         TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
 3237  014534  005710                         TST     (R0)            ;;IS THERE ANOTHER NUMBER?
 3238  014536  001770                         BEQ     6$              ;;BR IF NO
 3239  014540  104401  014546                 TYPE    ,8$             ;;TYPE TWO(2) SPACES
 3240  014544  000771                         BR      7$              ;;LOOP
 3241  014546  020040      000         8$:    .ASCIZ  /  /            ;;TWO(2) SPACES
 3242          014552                         .EVEN
 3243                                  .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
 3244
 3245                                  ;;**********************************************************************
 3246                                  ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
```

```
                                        ;*OCTAL (ASCII) NUMBER AND TYPE IT.
                                        ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
                                        ;*CALL:
                                        ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                        ;*      TYPOS                   ;;CALL FOR TYPEOUT
                                        ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
                                        ;*      .BYTE   M               ;;M=1 OR 0
                                        ;*                                      ;;1=TYPE LEADING ZEROS
                                        ;*                                      ;;0=SUPPRESS LEADING ZEROS
                                        ;*
                                        ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
                                        ;*$TYPOS OR $TYPOC
                                        ;*CALL:
                                        ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                        ;*      TYPON                   ;;CALL FOR TYPEOUT
                                        ;*
                                        ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
                                        ;*CALL:
                                        ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                        ;*      TYPOC                   ;;CALL FOR TYPEOUT

014552  017646  000000          $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
014556  116667  000001  000211          MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
014564  112667  000207                  MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
014570  062716  000002                  ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
014574  000406                          BR      $TYPON
014576  112767  000001  000171  $TYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
014604  112767  000006  000165          MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
014612  112767  000005  000154  $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
014620  010346                          MOV     R3,-(SP)        ;;SAVE R3
014622  010446                          MOV     R4,-(SP)        ;;SAVE R4
014624  010546                          MOV     R5,-(SP)        ;;SAVE R5
014626  116704  000145                  MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
014632  005404                          NEG     R4
014634  062704  000006                  ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
014640  110467  000132                  MOVB    R4,$OMODE       ;;SAVE IT FOR USE
014644  116704  000125                  MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
014650  016605  000012                  MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
014654  005003                          CLR     R3              ;;CLEAR THE OUTPUT WORD
014656  006105                  1$:     ROL     R5              ;;ROTATE MSB INTO "C"
014660  000404                          BR      3$              ;;GO DO MSB
014662  006105                  2$:     ROL     R5              ;;FORM THIS DIGIT
014664  006105                          ROL     R5
014666  006105                          ROL     R5
014670  010503                          MOV     R5,R3
014672  006103                  3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
014674  105367  000076                  DECB    $OMODE          ;;TYPE THIS DIGIT?
014700  100016                          BPL     7$              ;;BR IF NO
014702  042703  177770                  BIC     #177770,R3      ;;GET RID OF JUNK
014706  001002                          BNE     4$              ;;TEST FOR 0
014710  005704                          TST     R4              ;;SUPPRESS THIS 0?
014712  001403                          BEQ     5$              ;;BR IF YES
014714  005204                  4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
014716  052703  000060                  BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
014722  052703  000040          5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
014726  110367  000040                  MOVB    R3,8$           ;;SAVE FOR TYPING
```

BINARY TO OCTAL (ASCII) AND TYPE

```
3303  014732  104401  014772                  TYPE    @8$             ;;GO TYPE THIS DIGIT
3304  014736  105367  000032          7$:     DECB    $OCNT           ;;COUNT BY 1
3305  014742  003347                          BGT     2$              ;;BR IF MORE TO DO
3306  014744  002402                          BLT     6$              ;;BR IF DONE
3307  014746  005204                          INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
3308  014750  000744                          BR      2$              ;;GO DO THE LAST DIGIT
3309  014752  012605                  6$:     MOV     (SP)+,R5        ;;RESTORE R5
3310  014754  012604                          MOV     (SP)+,R4        ;;RESTORE R4
3311  014756  012603                          MOV     (SP)+,R3        ;;RESTORE R3
3312  014760  016666  000002  000004         MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
3313  014766  012616                          MOV     (SP)+,(SP)
3314  014770  000002                          RTI                     ;;RETURN
3315  014772     000          8$:     .BYTE   0                       ;;STORAGE FOR ASCII DIGIT
3316  014773     000                  .BYTE   0                       ;;TERMINATOR FOR TYPE ROUTINE
3317  014774     000          $OCNT:  .BYTE   0                       ;;OCTAL DIGIT COUNTER
3318  014775     000          $OFILL: .BYTE   0                       ;;ZERO FILL SWITCH
3319  014776  000000          $OMODE: .WORD   0                       ;;NUMBER OF DIGITS TO TYPE
3320                                  ;ENTER HERE ON POWER FAILURE
3321
3322
3323  015000                  $PWRUN:
3324  015000  010046          .PFAIL: MOV     R0,-(SP)                ;SAVE R0-R5 ON PROCESSOR STACK
3325  015002  010146                  MOV     R1,-(SP)
3326  015004  010246                  MOV     R2,-(SP)
3327  015006  010346                  MOV     R3,-(SP)
3328  015010  010446                  MOV     R4,-(SP)
3329  015012  010546                  MOV     R5,-(SP)
3330  015014  016746  163004          MOV     24,-(SP)
3331  015020  010667  164072          MOV     SP,SAVSP                ;SAVE STACK POINTER
3332  015024  012767  015036  162772  MOV     #RESTART,24             ;SET UP FOR POWER UP TRAP
3333  015032  000000                  HALT                            ;HALT ON POWER DOWN NORMAL
3334  015034  000777                  BR      .
3335
3336                                  ;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED
3337
3338  015036  016706  164054  RESTAR: MOV     SAVSP,SP                ;RESTORE STACK POINTER
3339  015042  012605                  MOV     (SP)+,R5                ;RESTORE R0-R5
3340  015044  012604                  MOV     (SP)+,R4
3341  015046  012603                  MOV     (SP)+,R3
3342  015050  012602                  MOV     (SP)+,R2
3343  015052  012601                  MOV     (SP)+,R1
3344  015054  012600                  MOV     (SP)+,R0
3345  015056  012767  015000  162740  MOV     #.PFAIL,24              ;SET UP FOR POWER FAILURE
3346  015064  106427  000340          MTPS    #340
3347  015070  012706  001100          MOV     #STACK,SP
3348  015074  005067  001102          CLR     TEMP
3349  015100  005267  001076          INC     TEMP
3350  015104  001375                  BNE     .-4
3351  015106  104413                  CONVRT
3352  015110  015132                  PFTAB
3353  015112  104401                  TYPE
3354  015114  015434                  MPFAIL
3355  015116  005067  164261          CLR     $ERFLG
3356  015122  005067  164270          CLR     $ERRPC
3357  015126  000177  163752          JMP     @RETURN
3358  015132  000001          PFTAB:  1
```

```
3359  015134      006      002                        .BYTE   6,2
3360  015136  000207                                 RETURN
3361  015140  005015  042012  053125  MTITLE: .ASCIZ  <15><12><12>/DUV11 DZDUT-A TAPE D /<15><12>
3362  015146  030461  042040  042132
3363  015154  052125  040455  052040
3364  015162  050101  020105  020104
3365  015170  005015      000
3366  015173     015  053012  041505  MVECTO: .ASCIZ  <15><12>/VEC ADD-/
3367  015200  040440  042104  000055
3368  015206  005015  051461  020124  MREGAD: .ASCIZ  <15><12>/1ST DEV: REC CSR ADD-/
3369  015214  042504  035126  051040
3370  015222  041505  041440  051123
3371  015230  040440  042104  000055
3372  015236  005015  052515  052114  MMULT:  .ASCIZ  <15><12>/MULT DEV ? (Y OR N)-/
3373  015244  042040  053105  037440
3374  015252  024040  020131  051117
3375  015260  047040  026451      000
3376  015265     015  046012  051501  MLASTD: .ASCIZ  <15><12>/LAST DEV: REC CSR ADDR-/
3377  015272  020124  042504  035126
3378  015300  051040  041505  041440
3379  015306  051123  040440  042104
3380  015314  026522      000
3381  015317     075  042504  044526  DEVICE: .ASCIZ  /=DEVICE  /
3382  015324  042503  020040      000
3383  015331     015  051412  046105  MCOW:   .ASCIZ  <15><12>/SELECT TO RUN @ACTREG/
3384  015336  041505  020124  047524
3385  015344  051040  047125  040040
3386  015352  041501  051124  043505
3387  015360      000
3388  015361     015  047412  043126  MRANGE: .ASCIZ  <15><12>/OVFLO:RETYPE LAST DEV RXCSR ADDS-/
3389  015366  047514  051072  052105
3390  015374  050131  020105  040514
3391  015402  052123  042040  053105
3392  015410  051040  041530  051123
3393  015416  040440  042104  026523
3394  015424      000
3395  015425     040  037440      000  MQM:    .ASCIZ  /  ?/
3396  015431     015  000012           MCRLF:  .ASCIZ  <15><12>
3397  015434  043120  044501  026114  MPFAIL: .ASCIZ  /PFAIL,  RESTART AT TEST IN PROGRESS/
3398  015442  020040  042522  052123
3399  015450  051101  020124  052101
3400  015456  052040  051505  020124
3401  015464  047111  050040  047522
3402  015472  051107  051505  000123
3403  015500  005015  047105  020104  MEPASS: .ASCIZ  <15><12>/END OF PASS TAPE D/
3404  015506  043117  050040  051501
3405  015514  020123  040524  042520
3406  015522  042040      000
3407  015526     015  051012      000  MR:     .ASCIZ  <15><12>/R/
3408  015531     015  052012  051505  MTSTPC: .ASCIZ  <15><12>/TEST PC-/
3409  015536  020124  041520  000055
3410  015544  005015  047514  045503  MLOCK:  .ASCIZ  <15><12>/LOCK ON  TEST? (Y OR N)-/
3411  015552  047440  020116  052040
3412  015560  051505  037524  024040
3413  015566  020131  051117  047040
3414  015574  026451      000
```

```
3415  015577     015  021412  047440  MSYNC:  .ASCIZ  <15><12>/# OF SYNC CHARS SELECTED ( 1 OR 2)-/
3416  015604  020106  054523  041516
3417  015612  041440  040510  051522
3418  015620  051440  046105  041505
3419  015626  042524  020104  020050
3420  015634  020061  051117  031040
3421  015642  026451     000
3422  015645     015  044412  020123  MWIRE6: .ASCIZ  <15><12>/IS SEC XMIT SWITCH E55-2 IN? (Y OR N)-/
3423  015652  042523  020103  046530
3424  015660  052111  051440  044527
3425  015666  041524  020110  032505
3426  015674  026465  020062  047111
3427  015702  020077  054450  047440
3428  015710  020122  024516  000055
3429  015716  005015  051511  051440  MWIRE5: .ASCIZ  <15><12>/IS SEC REC SWITCH E55-3 IN? (Y OR N)-/
3430  015724  041505  051040  041505
3431  015732  051440  044527  041524
3432  015740  020110  032505  026465
3433  015746  020063  047111  020077
3434  015754  054450  047440  020122
3435  015762  024516  000055
3436  015766  005015  051511  047440  MWIRE4: .ASCIZ  <15><12>/IS OPT CLR ENABLE SWITCH E55-1 IN? (Y OR N)-/
3437  015774  052120  041440  051114
3438  016002  042440  040516  046102
3439  016010  020105  053523  052111
3440  016016  044103  042440  032465
3441  016024  030455  044440  037516
3442  016032  024040  020131  051117
3443  016040  047040  026451     000
3444  016045     015  005012  031510  MEXTJ:  .ASCIZ  <15><12><12>/H315 CONNECTOR ON ?(Y OR N)-/
3445  016052  032461  041440  047117
3446  016060  042516  052103  051117
3447  016066  047440  020116  024077
3448  016074  020131  051117  047040
3449  016102  026451     000
3450  016105     015  020012  043536  MCNTG:  .ASCIZ  <15><12>/ ↑G  /
3451  016112  020040     000
3452  016115     040  053523  036522  MMSWR:  .ASCIZ  / SWR=   /
3453  016122  020040  000040
3454  016126  020040  047040  053505  MMNEW:  .ASCIZ  /   NEW=  /
3455  016134  020075  000040
3456                                  .EVEN
3457
3458                                  ;BUFFERS FOR INPUT-OUTPUT
3459
3460  016140  000000                  INBUF:  0
3461          016202                  .=.+40
3462  016202  000000                  TEMP:   0
3463          016244                  .=.+40
3464  016244  000000                  MDATA:  0
3465          016306                  .=.+40
3466                                  .SBTTL  SCOPE HANDLER ROUTINE
3467
3468                                  ;;**************************************************************
3469                                  ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
3470                                  ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
```

SCOPE HANDLER ROUTINE

```
3471                                    ;*AND LOAD THE ERROR FLAG (SERFLG) INTO DISPLAY<15:08>
3472                                    ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
3473                                    ;*SW14=1        LOOP ON TEST
3474                                    ;*SW11=1        INHIBIT ITERATIONS
3475                                    ;*SW09=1        LOOP ON ERROR
3476                                    ;*SW08=1        LOOP ON TEST IN SWR<7:0>
3477                                    ;*CALL
3478                                    ;*      SCOPE           ;;SCOPE=IOT
3479
3480  016306                            $SCOPE:
3481
3482                                            ;SCOPE LOOP AND INTERATION HANDLER
3483
3484  016306                            .SCOPE:
3485  016306  004767  174376                    JSR     PC,CKSWR
3486  016312  005067  163100                    CLR     $ERRPC          ;CLEAR LAST ERROR PC
3487  016316  022716  003364                    CMP     #TST1+2,(SP)    ;IS SCOPE AT BEGINING OF TEST 1?
3488  016322  001413                            BEQ     $XTSTR          ;YES NO LOOP.
3489
3490  016324  000406                    TTST:   BR      1$              ;GO TO 1$ (IF LOCK SW02=1)
3491  016326  105777  163112                    TSTB    @$TKS           ;KEYBOARD DONE?
3492  016332  100123                            BPL     $OVER           ;BR IF NO
3493  016334  017766  163106  177776            MOV     @$TKB,-2(SP)    ;CLEAR DONE BIT
3494  016342  032777  040000  163070  1$:       BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
3495  016350  001114                            BNE     $OVER           ;;YES IF SW14=1
3496                                    ;#####START OF CODE FOR THE XOR TESTER#####
3497  016352  000416                    $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
3498                                                                    ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
3499  016354  013746  000004                    MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
3500  016360  012737  016400  000004            MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
3501  016366  005737  177060                    TST     @#177060        ;;TIME OUT ON XOR?
3502  016372  012637  000004                    MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
3503  016376  000463                            BR      $SVLAD          ;;GO TO THE NEXT TEST
3504  016400  022626                    5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
3505  016402  012637  000004                    MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
3506  016406  000423                            BR      7$              ;;LOOP ON THE PRESENT TEST
3507  016410                            6$:;#####END OF CODE FOR THE XOR TESTER#####
3508  016410  032777  000400  163022            BIT     #BIT08,@SWR     ;;LOOP ON SPEC. TEST?
3509  016416  001404                            BEQ     2$              ;;BR IF NO
3510  016420  127767  163014  162754            CMPB    @SWR,$TSTNM     ;;ON THE RIGHT TEST?    SWR<7:0>
3511  016426  001465                            BEQ     $OVER           ;;BR IF YES
3512  016430  105767  162747            2$:     TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
3513  016434  001421                            BEQ     3$              ;;BR IF NO
3514  016436  126767  162753  162737            CMPB    $ERMAX,$ERFLG   ;;MAX. ERRORS FOR THIS TEST OCCURRED?
3515  016444  101015                            BHI     3$              ;;BR IF NO
3516  016446  032777  001000  162764            BIT     #BIT09,@SWR     ;;LOOP ON ERROR?
3517  016454  001404                            BEQ     4$              ;;BR IF NO
3518  016456  016767  162726  162722  7$:       MOV     $LPERR,$LPADR   ;;SET LOOP ADDRESS TO LAST SCOPE
3519  016464  000446                            BR      $OVER
3520  016466  105067  162711            4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
3521  016472  005067  163014                    CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
3522  016476  000415                            BR      1$              ;;ESCAPE TO THE NEXT TEST
3523  016500  032777  004000  162732  3$:       BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
3524  016506  001011                            BNE     1$              ;;BR IF YES
3525  016510  005767  163020                    TST     $PASS           ;;IF FIRST PASS OF PROGRAM
3526  016514  001406                            BEQ     1$              ;;      INHIBIT ITERATIONS
```

```
3527  016516  005267  162662                  INC     $ICNT                   ;;INCREMENT ITERATION COUNT
3528  016522  026767  162764  162654          CMP     $TIMES,$ICNT            ;;CHECK THE NUMBER OF ITERATIONS MADE
3529  016530  002024                          BGE     $OVER                   ;;BR IF MORE ITERATION REQUIRED
3530  016532  012767  000001  162644  1$:     MOV     #1,$ICNT                ;;REINITIALIZE THE ITERATION COUNTER
3531  016540  016767  000056  162744          MOV     $MXCNT,$TIMES           ;;SET NUMBER OF ITERATIONS TO DO
3532  016546  105267  162630          $SVLAD: INCB    $TSTNM                  ;;COUNT TEST NUMBERS
3533  016552  116767  162624  162752          MOVB    $TSTNM,$TESTN           ;;SET TEST NUMBER IN APT MAILBOX
3534  016560  011667  162622                  MOV     (SP),$LPADR             ;;SAVE SCOPE LOOP ADDRESS
3535  016564  011667  162620                  MOV     (SP),$LPERR             ;;SAVE ERROR LOOP ADDRESS
3536  016570  005067  162720                  CLR     $ESCAPE                 ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
3537  016574  112767  000001  162613          MOVB    #1,$ERMAX               ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
3538  016602  016777  162574  162632  $OVER:  MOV     $TSTNM,@DISPLAY         ;;DISPLAY TEST NUMBER
3539  016610  016716  162572                  MOV     $LPADR,(SP)             ;;FUDGE RETURN ADDRESS
3540  016614  000002                  4$:     RTI
3541  016616  001407                  BRW:    1407
3542  016620  000432                  BRX:    432
3543  016622  000005                  $MXCNT: 5                               ;;MAX. NUMBER OF ITERATIONS
3544                                  .SBTTL  TRAP DECODER
3545
3546                                  ;;**************************************************************
3547                                  ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
3548                                  ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
3549                                  ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
3550                                  ;*GO TO THAT ROUTINE.
3551
3552  016624  010046                  $TRAP:  MOV     R0,-(SP)                ;;SAVE R0
3553  016626  016600  000002                  MOV     2(SP),R0                ;;GET TRAP ADDRESS
3554  016632  005740                          TST     -(R0)                   ;;BACKUP BY 2
3555  016634  111000                          MOVB    (R0),R0                 ;;GET RIGHT BYTE = TRAP
3556  016636  006300                          ASL     R0                      ;;POSITION FOR INDEXING
3557  016640  016000  016660                  MOV     $TRPAD(R0),R0           ;;INDEX TO TABLE
3558  016644  000200                          RTS     R0                      ;;GO TO ROUTINE
3559
3560
3561                                  ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
3562
3563  016646  011646                  $TRAP2: MOV     (SP),-(SP)              ;;MOVE THE PC DOWN
3564  016650  016666  000004  000002          MOV     4(SP),2(SP)             ;;MOVE THE PSW DOWN
3565  016656  000002                          RTI                             ;;RESTORE THE PSW
3566
3567                                  .SBTTL  TRAP TABLE
3568
3569                                  ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
3570                                  ;*BY THE "TRAP" INSTRUCTION.
3571
3572                                  ;       ROUTINE
3573                                  ;       -------
3574  016660  016646                  $TRPAD: .WORD   $TRAP2
3575  016662  013060                          $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
3576  016664  014576                          $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
3577  016666  014552                          $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
3578  016670  014612                          $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
3579
3580
3581  016672  013036                          .SCOPI  ;;CALL=SCOPI    TRAP+5(104405)
3582  016674  013342                          .INSTR  ;;CALL=INSTR    TRAP+6(104406)
```

```
3583  016676  013450                          .INSTER ;;CALL=INSTER   TRAP+7(104407)
3584  016700  013460                          .PARAM  ;;CALL=PARAM    TRAP+10(104410)
3585  016702  013660                          .SAVOS  ;;CALL=SAVOS    TRAP+11(104411)
3586  016704  013720                          .RESOS  ;;CALL=RESUS    TRAP+12(104412)
3587  016706  013752                          .CONVRT ;;CALL=CONVRT   TRAP+13(104413)
3588  016710  014130                          .SETFLG ;;CALL=SETFLG   TRAP+14(104414)
3589                                  ;*****************************************************************
3590                                  ;UTILITIES
3591                                  ;*****************************************************************
3592
3593                                  ;THIS UTILITY CALCULATES PRIORITY LEVEL
3594  016712  006367  000044          DULEV:  ASL     DUPRT   ;SHIFT LEFT
3595  016716  006367  000040                  ASL     DUPRT   ;
3596  016722  006367  000034                  ASL     DUPRT   ;
3597  016726  006367  000030                  ASL     DUPRT   ;
3598  016732  006367  000024                  ASL     DUPRT   ;
3599  016736  016767  000020  000020         MOV     DUPRT,LESS1     ;MOVE THIS TO LESS1
3600  016744  162767  000001  000012         SUB     #1,LESS1        ;CREATE LESS1
3601  016752  042767  000037  000004         BIC     #37,LESS1       ;CLEAR TNZVC
3602  016760  000207                  DUPRT:  RTS     PC
3603  016762  000240                  LESS1:  PR4     ;LEVEL TO ALLOW INTERRUPTS
3604  016764  000200
3605
3606                                  ;NEW DU ADDRESSES
3607  016766  016767  000126  162716 DUADDR: MOV     DUBASE,RXCSR    ;XXX0
3608  016774  005267  000120                  INC     DUBASE
3609  017000  016767  000114  162706         MOV     DUBASE,HRXCSR   ;XXX1
3610  017006  005267  000106                  INC     DUBASE
3611  017012  016767  000102  162676         MOV     DUBASE,RXDBUF   ;XXX2
3612  017020  016767  000074  162674         MOV     DUBASE,PARCSR   ;XXX2
3613  017026  005267  000066                  INC     DUBASE
3614  017032  016767  000062  162660         MOV     DUBASE,HRXDBUF  ;XXX3
3615  017040  016767  000054  162656         MOV     DUBASE,HPARCSR  ;XXX3
3616  017046  005267  000046                  INC     DUBASE
3617  017052  016767  000042  162646         MOV     DUBASE,TXCSR    ;XXX4
3618  017060  005267  000034                  INC     DUBASE
3619  017064  016767  000030  162636         MOV     DUBASE,HTXCSR   ;XXX5
3620  017072  005267  000022                  INC     DUBASE
3621  017076  016767  000016  162626         MOV     DUBASE,TXDBUF   ;XXX6
3622  017104  005267  000010                  INC     DUBASE
3623  017110  016767  000004  162616         MOV     DUBASE,HTXDBUF  ;XXX7
3624  017116  000207                  DUBASE: RTS     PC
3625  017120  000000                          0
3626
3627                                  ;THIS UTILITY POKES THE MAINT DATA BASED UPON THE
3628                                  ;INFORMATION CONTAINED IN $TMP1 AND IT IS
3629                                  ;SHIFTED IN BY THE CONTENTS OF SHIFT
3630  017122  042777  040000  162576 RPOKE:  BIC     #MTDATA,@TXCSR
3631  017130  005067  162346                  CLR     $TMP2
3632  017134  006067  162340                  ROR     $TMP1   ;FORCE CARRY
3633  017140  006067  162336                  ROR     $TMP2   ;PICK UP CARRY IN BIT 15
3634  017144  006267  162332                  ASR     $TMP2   ;SHIFT INTO BIT 14
3635  017150  042767  100000  162324         BIC     #BIT15,$TMP2    ;CLR BIT 15
3636  017156  056777  162320  162542         BIS     $TMP2,@TXCSR    ;POKE MAINT DATA
3637  017164  042777  020000  162534         BIC     #CLK,@TXCSR     ;POKE CLK
3638  017172  052777  020000  162526         BIS     #CLK,@TXCSR     ;
```

```
3639  017200  005367  161716                    DEC     SHIFT
3640  017204  001346                            BNE     RPOKE
3641  017206  000207                            RTS     PC
3642
3643                                            ;THIS ROUTINE CALCULATES ODD PARITY FOR AN 8 BIT CHAR
3644  017210  016767  162264  162264  ODD8:     MOV     $TMP1,$TMP2     ;SAVE TEMP1
3645  017216  005067  162262                    CLR     $TMP3
3646  017222  012727  000010                    MOV     #8.,(PC)+
3647  017226  000000                    4$:     0
3648  017230  006067  162246            1$:     ROR     $TMP2
3649  017234  005567  162244                    ADC     $TMP3
3650  017240  005367  177762                    DEC     4$
3651  017244  001371                            BNE     1$
3652  017246  006067  162232                    ROR     $TMP3
3653  017252  103404                            BCS     2$
3654  017254  052767  000400  162216            BIS     #BIT8,$TMP1     ;SET ODD PARITY
3655  017262  000403                            BR      3$
3656  017264  042767  000400  162206  2$:       BIC     #BIT8,$TMP1     ;CLR EVEN PARITY
3657                                            ;$TMP1 NOW HAS ODD PARITY CHARACTER
3658  017272  000207                    3$:     RTS     PC
3659
3660                                            ;THIS ROUTINE CALCULATES EVEN PARITY FOR AN 8 BIT CHARACTER
3661  017274  016767  162200  162200  EVEN8:    MOV     $TMP1,$TMP2     ;SAVE TEMP1
3662  017302  005067  162176                    CLR     $TMP3
3663  017306  012727  000010                    MOV     #8.,(PC)+
3664  017312  000000                    4$:     0
3665  017314  006067  162162            1$:     ROR     $TMP2
3666  017320  005567  162160                    ADC     $TMP3
3667  017324  005367  177762                    DEC     4$
3668  017330  001371                            BNE     1$
3669  017332  006067  162146                    ROR     $TMP3
3670  017336  103004                            BCC     2$
3671  017340  052767  000400  162132            BIS     #BIT8,$TMP1     ;SET EVEN PARITY
3672  017346  000403                            BR      3$
3673  017350  042767  000400  162122  2$:       BIC     #BIT8,$TMP1     ;CLR ODD PARITY
3674                                            ;$TMP1 NOW HAS EVEN PARITY CHARACTER
3675  017356  000207                    3$:     RTS     PC
3676  017360  062716  000002            TRPREG: ADD     #2,(SP) ;ALLOW IT TO "CRUNCH" INTO HLT BACK
3677                                                            ;IN MAIN PART OF THE PROGRAM
3678  017364  000002                            RTI
3679          000001                    .END
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
AAA     003200           1292#
ABASE = 000000            875     916
ACDW1 = 000000            875     918
ACDW2 = 000000            875     919
ACPUOP= 000000            875     890
ACTREG  001166            734#   1248#   1262*   1263*   1270*   2793    2796    2806
ADDW0 = 000000            875     920
ADDW1 = 000000            875     921
ADDW10= 000000            875     930
ADDW11= 000000            875     931
ADDW12= 000000            875     932
ADDW13= 000000            875     933
ADDW14= 000000            875     934
ADDW15= 000000            875     935
ADDW2 = 000000            875     922
ADDW3 = 000000            875     923
ADDW4 = 000000            875     924
ADDW5 = 000000            875     925
ADDW6 = 000000            875     926
ADDW7 = 000000            875     927
ADDW8 = 000000            875     928
ADDW9 = 000000            875     929
ADEVCT= 000000            875     881
ADEVM = 000000            875     917
ADRCNT= 013657           3008*   3047*   3054#
AENV  = 000000            875     886
AENVM = 000000            875     887
AFATAL= 000000            875     878
AMADR1= 000000            875     903
AMADR2= 000000            875     907
AMADR3= 000000            875     910
AMADR4= 000000            875     913
AMAMS1= 000000            875     897
AMAMS2= 000000            875     905
AMAMS3= 000000            875     908
AMAMS4= 000000            875     911
AMSGAD= 000000            875     883
AMSGLG= 000000            875     884
AMSGTY= 000000            875     877
AMTYP1= 000000            875     898
AMTYP2= 000000            875     906
AMTYP3= 000000            875     909
AMTYP4= 000000            875     912
APASS = 000000            875     880
APRIOR= 000000            875
APTCSU= 000040            535#   2923
APTENV= 000001            535#   2916    3170
APTSIZ= 000200            535#   1167
APTSP0= 000100            535#   2918
ASWREG= 000000            875     888
ATESTN= 000000            875     879
AUNIT = 000000            875     882
AUSWR = 000000            875     889
AVECT1= 000000            875     914
AVECT2= 000000            875     915
BASEAD  001154            729#   1230*   1267*   1268    1274*   1276*   2800*   2812*   2816
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
BASEIV  001162          732#  1240*  2801*  2813*  2818   2819*  2820   2821*  2822   2823*  2824   2825*
BBB     003026         1247   1251#
BINWRD  014126         3089*  3091   3121#
BITW  = 002000          801#   994#  1789   1850   1911   1972   2033   2094   2155   2216   2274   2327   2380
                       2433   2487  2540   2593   2646   2701   2754
BIT0  = 000001          664#   777   808    970   1001
BIT00 = 000001          654#   664
BIT01 = 000002          653#   663
BIT02 = 000004          652#   662
BIT03 = 000010          651#   661
BIT04 = 000020          650#   660
BIT05 = 000040          649#   659
BIT06 = 000100          648#   658
BIT07 = 000200          647#   657
BIT08 = 000400          646#   656   3508
BIT09 = 001000          645#   655   3180   3516
BIT1  = 000002          663#   776   969
BIT10 = 002000          644#   767   801    960    994   3158
BIT11 = 004000          643#   766   959    3523
BIT12 = 010000          642#   765   782    958    975
BIT13 = 020000          641#   764   781    800    957   974    993   3165
BIT14 = 040000          640#   763   780    799    956   973    992   3494
BIT15 = 100000          639#   762   779    798    955   972    991   3635
BIT2  = 000004          662#   775   968
BIT3  = 000010          661#   774   807    967   1000
BIT4  = 000020          660#   773   806    966    999
BIT5  = 000040          659#   772   805    965    998
BIT6  = 000100          658#   771   804    964    997
BIT7  = 000200          657#   770   803    963    996
BIT8  = 000400          656#   769   785    802    962   978    995   3654   3656   3671   3673
BIT9  = 001000          655#   768   784    961    977
BPTVEC= 000014          671#
BREAK = 000001          808#  1001#  1356   1402   1495   1591   1687
BRW     016616         3541#
BRX     016620         3542#
CARDET= 010000          765#   958#
CCC     012610         2792   2815  2832#
CHPCNT  014124         3087*  3092  3105*  3119#  3120
CKSWR   012710         2786   2848  2856#  2888   3485
CLK   = 020000          800#   993#  1356   1362   1363   1365   1366   1402   1410   1411   1413   1414   1495
                       1503   1504  1506   1507   1591   1599   1600   1602   1603   1687   1695   1696   1698
                       1699   1784  1785   1791   1792   1802   1845   1846   1852   1853   1863   1906   1907
                       1913   1914  1924   1967   1968   1974   1975   1985   2028   2029   2035   2036   2046
                       2089   2090  2096   2097   2107   2150   2151   2157   2158   2168   2211   2212   2218
                       2219   2229  2269   2270   2276   2277   2287   2322   2323   2329   2330   2340   2375
                       2376   2382  2383   2393   2428   2429   2435   2436   2446   2482   2483   2489   2490
                       2500   2535  2536   2542   2543   2553   2588   2589   2595   2596   2606   2641   2642
                       2648   2649  2659   2696   2697   2703   2704   2714   2749   2750   2756   2757   2767
                       3637   3638
CNTLU   012764         1197   2867#
CONVRT= 104413         2789   2869   3351   3587#
COUNT   001124          709#  1368*  1375*  1407*  1422*  1433*  1447*  1449   1451   1500*  1515*  1526*  1543*
                       1545   1547  1596*  1611*  1622*  1639*  1641   1643   1692*  1707*  1718*  1735*  1737
                       1739
CR    = 000015          579#  2962   2972
CRLF  = 000200          580#  2933   2972
```

```
CTS    = 020000            764#   957#
DDISP  = 177570            586#   842   1155
DEVADR  013654            3006*  3044   3052#
DEVICE  015317            2790   3381#
DF1     002132            1026   1030   1034   1038   1084#
DH1     002067            1024   1028   1032   1073#
DISPLA  001442             842#  1155*  1163*  1188*  3157*  3538*
DISPRE  000174             683#  1163   1188
DMA    = 100000            798#   991#
DMAINT= 000040             805#   998#
DSC    = 100000            762#   955#
DSINTE= 000040             772#   965#
DSR    = 001000            768#   961#
DSWR   = 177570            585#   841   1154
DTR    = 000002            776#   969#
DT1     002116            1025   1029   1033   1079#
DT4     002126            1037   1082#
DUADDR  016766            1229   2817   3607#
DUBASE  017120            1225   1228   2816*  3607   3608*  3609   3610*  3611   3612   3613*  3614   3615   3616*
                          3617   3618*  3619   3620*  3621   3622*  3623   3625#
DULEV   016712            1287   3594#
DUPRT   016762            1286*  3594*  3595*  3596*  3597*  3598*  3599   3603#
DURIS   001740            1053#  2820*
DURIV   001736            1052#  1236   1239   1240   2818*  2825
DUTIS   001744            1055#  2824*
DUTIV   001742            1054#  2822*
EIGHT  = 006000             793#   986#  1359   1405   1961   2205
EMTVEC= 000030              674#  1139*  1140*
EM1     001762            1023   1059#
EM2     002022            1027   1065#
EM3     002043            1031   1068#
EMT     001746            1035   1057#
EPSCNT  001114             702#
ERRVEC= 000004             667#  1152   1153*  1164*  3499   3500*  3502*  3505*
EVENB   017274            3661#
EVEPAR= 001400             796#   989#  1405   1498   1594   1690   2263   2369   2476   2582   2690
EVPAR  = 000400             785#   978#
FIVE   = 000000             790#   983#  1690   1778   2022   2263   2316   2369   2422
FRMERR= 020000              781#   974#  1459   1462   1465   1555   1558   1561   1651   1654   1657   1747   1750
                           1753
GNS    = ****** U          3575   3576   3577   3578   3581   3582   3583   3584   3585   3586   3587   3588
HDXEN  = 000010             807#  1000#
HILIM   013652            3005*  3035   3051#
HLD0    001130             711#  1079   3188*
HLD1    001132             712#  1079   3189*
HLD2    001134             713#  3190*
HLD3    001136             714#  3191*
HLD4    001140             715#  3192*
HLD5    001142             716#  3193*
HLD6    001144             717#  3194*
HOLD    001120             707#
HPARCS  001724            1046#  3615*
HRXCSR  001714            1042#  3609*
HRXDBU  001720            1044#  3614*
HT     = 000011             577#  2931   2972
HTXCSR  001730            1048#  3619*
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
HTXDBU  001734           1050#  3623#
INBUF   016140           1295   1299   2981   3011   3129   3133   3460#
INIFLG  001172            742#  1198   1201#
INSTER= 104407           1303   3030   3138   3583#
INSTR = 104406           1220   1231   1241   1252   1277   1293   1306   1310   1314   1318   1329   2871   3582#
INSTR2  013456           2978   2990   2999#
IOTVEC= 000020            672#  1137#  1138#
ISYMOD= 000000            789#   982#  1398   1405   1491   1498   1587   1594   1683   1690   2361   2369   2414
                         2422   2574   2582   2627   2635
JMRBY   001153            725#  1206#  1321
KEEPAD  001156            730#  1228#  1230   1274   1276   2812
KEEPIV  001164            733#  1239#  2813
LASTAD  001160            731#  1257   1268   1282
LESS1   016764           3593#  3600#  3601#  3604#
LF    = 000012            578#  2966   2972
LIGHTS  001102            692#  2837#
LIMITS  013604           3021   3035#
LOBITS  013656           3007#  3039   3053#  3054
LOCK    001110            700#  2891
LOKFLG  001174            744#
LOLIM   013650           3004#  3037   3050#
MCNTG   016105           2866   3450#
MCOW    015331           2795   3383#
MCRLF   015431           3083   3396#
MDATA   016244           3103   3114   3464#
MEPASS  015500           2788   3403#
MEXT  = 010000            812#  1005#
MEXTJ   016045           1319   3444#
MINT  = 004000            811#  1004#  1356   1402   1495   1591   1687   1775   1836   1897   1958   2019   2080
                         2141   2202   2260   2313   2366   2419   2473   2526   2579   2632   2687   2740
MLASTD  015265           1253   3376#
MLOCK   015544           3410#
MMNEW   016126           2871   3454#
MMSHR   016115           2868   3452#
MMULT   015236           1242   3372#
MPFAIL  015434           3354   3397#
MQM     015425           2997   3395#
MR      015525           1339   3407#
MRANGE  015361           1278   3388#
MREGAD  015206           1221   3368#
MRESET= 000400            802#   995#  1351   1353   1397   1399   1490   1492   1586   1588   1682   1684   1769
                         1771   1830   1832   1891   1893   1952   1954   2013   2015   2074   2076   2135   2137
                         2196   2198   2254   2256   2307   2309   2360   2362   2413   2415   2467   2469   2520
                         2522   2573   2575   2626   2628   2681   2683   2734   2736
MSYNC   015577           1294   3415#
MTDATA= 040000            799#   992#  1356   1402   1495   1591   1687   3630
MTITLE  015140           1200   3361#
MTSTPC  015531           1330   3408#
MULTD   001152            724#  1244   1245   2791
MVECTO  015173           1232   3366#
MWIRE4  015766           1315   3436#
MWIRE5  015716           1311   3429#
MWIRE6  015645           1307   3422#
NEXT    001106            699#
NOPAR = 000000            794#   987#  1359   1778   1839   1900   1961   2022   2083   2144   2205
ODDPAR= 001000            795#   988#  2316   2422   2529   2635   2743
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
0008    017210            3644#
ONCE    002610            1199    1202#
OPTCLR  001151             723#   1317
OUT     013016            2857    2859    2861    2865    2877#
OUTCRY  012602            2789    2828#
OUTMUL  003166            1250    1275    1286#
OVRRUN= 040000             780#    973#   1459    1555    1651    1747
PARAM = 104410            1222    1233    1254    1279    1331    2872    3584#
PARAM1  013510            3010#   3031
PARCSR  001722            1045#   1352#   1359#   1398#   1405#   1491#   1498#   1587#   1594#   1683#   1690#   1770#   1778#
                          1831#   1839#   1892#   1900#   1953#   1961#   2014#   2022#   2075#   2083#   2136#   2144#   2197#
                          2205#   2255#   2263#   2308#   2316#   2361#   2369#   2414#   2422#   2468#   2476#   2521#   2529#
                          2574#   2582#   2627#   2635#   2682#   2690#   2735#   2743#   3612#
PAREN = 001000             784#    977#
PARER = 010060             782#    975#   1434    1459    1465    1527    1555    1561    1623    1651    1657    1719    1747
                          1753
PARERR  013564            3013    3015    3017    3026#   3036    3038    3040
PARTI   013646            3029    3049#
PASCNT  001112             701#   1175#   2836#   2837    2838
PFTAB   015132            3352    3358#
PIRQ  = 177772             584#
PIRQVE= 000240             678#
POPRO = 012600             757#    950#
POP1SP= 005726             755#    948#
POP2SP= 022626             759#    952#
PRO   = 000000             601#
PR1   = 000040             602#
PR2   = 000100             603#
PR3   = 000140             604#
PR4   = 000200             605#   3604
PR5   = 000240             606#   3603
PR6   = 000300             607#
PR7   = 000340             608#
PS    = 177776             581#    582
PSW   = 177776             582#
PUSHRO= 010046             756#    949#
PUSH1S= 005746             754#    947#
PUSH2S= 024646             758#    951#
PWRVEC= 000024             673#   1143#   1144#
RDSW    013024            2867#   2877#   2879#   3028
RECACT= 004000             766#    959#
REPLAY  012506            2808    2814    2816#
RESTAR  015036            3332    3338#
RESTRT  012666            2809    2840    2847#
RESVEC= 000010             668#
RESOS = 104412            3586#
RETURN  001104             698#   1180#   1338#   1340    3357
RING  = 040000             763#    956#
RINTEN= 000100             771#    964#
ROTADD  001170             737#   1249#   1261#   1263    1265#   1270    1273#   2803#   2806    2810#
RPOKE   017122            1371    1418    1437    1456    1511    1530    1552    1607    1626    1648    1703    1722    1744
                          3630#   3640
RTS   = 000004             775#    968#
RUNA  = ****** U              1      51     138     512
RUNB  = ****** U              1      51     138     512
RUNC  = ****** U              1      51     138     512
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
RUN0  = 000000            1     51    138    512
RUNE  = ****** U         21     57    141    517
RUNF  = ****** U         21     57    141    517
RUNIT   012412         2794   2800#  2807
RXCSR   001712         1041#  1360*  1367*  1372   1408*  1415*  1419   1438   1501*  1508*  1512   1531   1597*
                       1604*  1608   1627   1693*  1700*  1704   1723   2830   3607*
RXDBUF  001716         1043#  1406   1425   1441   1499   1518   1534   1595   1614   1630   1691   1710   1726
                       3611*
RXDONE= 000200          770#   963#
RXERR = 100000          779#   972#  1434   1459   1462   1465   1527   1555   1558   1561   1623   1651   1654
                       1657   1719   1747   1750   1753
SAVIT   014360         3167   3188#
SAVPC   001126          710#  3058*
SAVSP   001116          703#  3331*  3338
SAVOS = 104411         3585#
SCOP1 = 104405         3581#
SEND  = 000020          806#   999#  1775   1836   1897   1958   2019   2080   2141   2202   2260   2313   2366
                       2419   2473   2526   2579   2632   2687   2740
SEREC   001150          722#  1313
SETFLG= 104414         1243   1308  1312   1316   1320   3588#
SEVEN = 004000          792#   985#  1498   1900   2144   2690   2743
SEXMIT  001147          721#  1309
SHIFT   001122          708#  1370*  1416*  1436*  1454*  1509*  1529*  1550*  1605*  1625*  1646*  1701*  1721*
                       1742*  1782*  1799*  1843*  1860*  1904*  1921*  1965*  1982*  2026*  2043*  2087*  2104*
                       2148*  2165*  2209*  2226*  2267*  2284*  2320*  2337*  2373*  2390*  2426*  2443*  2480*
                       2497*  2533*  2550*  2586*  2603*  2639*  2656*  2694*  2711*  2747*  2764*  3639*
SIX   = 002000          791#   984#  1594   1839   2083   2476   2529   2582   2635
SPACNT= 014125         3088*  3107   3110*  3120#
SRD   = 002000          767#   960#
STACK = 001100          572#  1135   1171   1325   3347
STD   = 000010          774#   967#
STFLG   001173          743#  1174*
STKLMT= 177774          583#
STPSYN= 000400          769#   962#  1367   1415   1508   1604   1700
SVOS    013666         3062#
SWR     001440          841#  1133   1154*  1156   1162*  1169*  1185   1187*  1192   1208   1327   2858   2889
                       3158   3165   3177   3180   3494   3508   3510   3516   3523
SWREG   000176          684#  1162   1187   1192   2858   2875   2882
SWREGL  013026         2870   2880#
SW0   = 000001          636#
SW00  = 000001          626#   636   1208
SW01  = 000002          625#   635   1327
SW02  = 000004          624#   634
SW03  = 000010          623#   633
SW04  = 000020          622#   632
SW05  = 000040          621#   631
SW06  = 000100          620#   630
SW07  = 000200          619#   629
SW08  = 000400          618#   628
SW09  = 001000          617#   627   2889
SW1   = 000002          635#
SW10  = 002000          616#
SW11  = 004000          615#
SW12  = 010000          614#
SW13  = 020000          613#
SW14  = 040000          612#
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
SW15  = 100000            611#
SW2   = 000004            634#
SW3   = 000010            633#
SW4   = 000020            632#
SW5   = 000040            631#
SW6   = 000100            630#
SW7   = 000200            629#
SW8   = 000400            628#
SW9   = 001000            627#
SYNCNO  001146            720#   1297*  1301*
SYNEXT= 020000            788#    981#  2014   2022   2075   2083   2136   2144   2197   2205
SYNINT= 030000            787#    980#  1352   1359   1770   1778   1831   1839   1892   1900   1953   1961   2255
                         2263   2308   2316   2468   2476   2521   2529   2682   2690   2735   2743
SYNSCH= 000020            773#    966#  1360   1408   1501   1597   1693
SYSTST= 014000            813#   1006#
TBITVE= 000014            669#
TEMP    016202           3093   3348*  3349*  3462#
TKVEC = 000060            676#
TPVEC = 000064            677#
TRAPVE= 000034            675#   1141*  1142*
TRPREG  017360           3676#
TRTVEC= 000014            670#
TST1    003362           1332   1338   1350#  2849   2850   3487
TST10   006116           1890#
TST11   006334           1951#
TST12   006552           2012#
TST13   006770           2073#
TST14   007206           2134#
TST15   007424           2195#
TST16   007642           2253#
TST17   010050           2306#
TST2    003532           1396#
TST20   010256           2359#
TST21   010464           2412#
TST22   010672           2466#
TST23   011100           2519#
TST24   011306           2572#
TST25   011514           2625#
TST26   011722           2680#
TST27   012130           2733#
TST3    004120           1489#
TST4    004506           1585#
TST5    005074           1681#
TST6    005462           1768#
TST7    005700           1829#
TTST    016324           3490#
TXCSR   001726           1047#  1351*  1353*  1356*  1362*  1363*  1365*  1366*  1397*  1399*  1402*  1410*  1411*
                         1413*  1414*  1490*  1492*  1495*  1503*  1504*  1506*  1507*  1586*  1588*  1591*  1599*
                         1600*  1602*  1603*  1682*  1684*  1687*  1695*  1696*  1698*  1699*  1769*  1771*  1775*
                         1779   1784*  1785*  1791*  1792*  1793   1802*  1804   1811   1830*  1832*  1836*  1840
                         1845*  1846*  1852*  1853*  1854   1863*  1865   1872   1891*  1893*  1897*  1901   1906*
                         1907*  1913*  1914*  1915   1924*  1926   1933   1952*  1954*  1958*  1962   1967*  1968*
                         1974*  1975*  1976   1985*  1987   1994   2013*  2015*  2019*  2023   2028*  2029*  2035*
                         2036*  2037   2046*  2048   2055   2074*  2076*  2080*  2084   2089*  2090*  2096*  2097*
                         2098   2107*  2109   2116   2135*  2137*  2141*  2145   2150*  2151*  2157*  2158*  2159
                         2168*  2170   2177   2196*  2198*  2202*  2206   2211*  2212*  2218*  2219*  2220   2229*
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
                        2231    2238    2254*   2256*   2260*   2264    2269*   2270*   2276*   2277*   2278    2287*   2289
                        2307*   2309*   2313*   2317    2322*   2323*   2329*   2330*   2331    2340*   2342    2360*   2362*
                        2366*   2370    2375*   2376*   2382*   2383*   2384    2393*   2395    2413*   2415*   2419*   2423
                        2428*   2429*   2435*   2436*   2437    2446*   2448    2467*   2469*   2473*   2477    2482*   2483*
                        2489*   2490*   2491    2500*   2502    2520*   2522*   2526*   2530    2535*   2536*   2542*   2543*
                        2544    2553*   2555    2573*   2575*   2579*   2583    2588*   2589*   2595*   2596*   2597    2606*
                        2608    2626*   2628*   2632*   2636    2641*   2642*   2648*   2649*   2650    2659*   2661    2681*
                        2683*   2687*   2691    2696*   2697*   2703*   2704*   2705    2714*   2716    2734*   2736*   2740*
                        2744    2749*   2750*   2756*   2757*   2758    2767*   2769    3617*   3630*   3636*   3637*   3638*
TXDBUF  001732          1049*   1780*   1841*   1902*   1963*   2024*   2085*   2146*   2207*   2265*   2318*   2371*   2424*
                        2478*   2531*   2584*   2637*   2692*   2745*   3621*
TXDONE= 000200           803*    996*
TXINTE= 000100           804*    997*
TYPE  = 104401          1200    1339    2787    2790    2795    2866    2868    2936    2979    2996    3082    3113    3160
                        3168    3204    3221    3223    3226    3228    3232    3239    3303    3353    3575*
TYPOC = 104402          3212    3236    3576*
TYPON = 104404          3578*
TYPOS = 104403          3577*
USER  = 000000           810*    1003*
VOID  = 000001           777*    970*
WRDCNT  014122          3086*   3115*   3118*
ZERO    012420          2801*
$APTHD  002136          1106    1112*
$ASTAT= ****** U         535
$ATYC   000024R          535*
$ATY1   000000R          535*
$ATY3   000006R          535*    2921
$ATY4   000016R          535*    3173
$AUTOB  001434           838*
$BASE   001602           916*
$ERROR  001422           833*
$HDOAT  001426           835*
$BELL   001516           867*    3160    3188
$CDW1   001606           918*
$CDW2   001610           919*
$CHARC  013336          2938*   2948*   2955    2964*   2969*
$CKSWR= ****** U        3581
$CMTAG  001400           821*    1130    1131    1139    1145    1146
$CM1  = 000006           853*    854*    855*    856*    857*    858*    859*
$CM2  = 000014           853*    854*    855*    856*    857*    858*    859*
$CM3  = 000006           851*    853
$CM4  = 000006           859*    860*    861*    862*    863*    864*    865*
$CPUOP  001554           890*
$CRLF   001523           869*    2937    2972    3168    3188    3204    3223    3228    3232
$DDW0   001612           920*
$DDW1   001614           921*
$DDW10  001636           930*
$DDW11  001640           931*
$DDW12  001642           932*
$DDW13  001644           933*
$DDW14  001646           934*
$DDW15  001650           935*
$DDW2   001616           922*
$DDW3   001620           923*
$DDW4   001622           924*
$DDW5   001624           925*
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
$DOW6   001626            926#
$DOW7   001630            927#
$DOW8   001632            928#
$DOW9   001634            929#
$DEVCT  001536            881#
$DEVM   001604            917#
$E    = 000002            533#
$ENDAD  017656           1093    2843#
$ENV    001546            535     886#  1202    2916    2977    3170
$ENVM   001547            535     887#  1167    2918    2923
$ERFLG  001403            824#   1176*  2835*   3155*   3188    3355*   3471    3512    3514    3520*   3544
$ERMAX  001415            830#   1147*  3514    3537*   3544
$ERROR  014176           1139    3154#
$ERPC   001416            831#   1079    1082    1178*   2834*   3162*   3163*   3164    3188    3210    3356*   3486*
$ERTB   001652           1021#   3218
$ERTY   014416           3203#
$ERTTL  001412            828#   1177*  3161*   3188
$ESCAP  001514            866#   1146*  3183    3185    3188    3536*
$ETABL  001546            885#
$ETEND  001652            938#   1118
$FATAL  001530            535*    878#
$FFLG   000244R           535#*
$FILLC  001456            849#   2941    2972
$FILLS  001455            848#   2972
$GDADR  001420            832#
$GDDAT  001424            834#
$GTSWR= ****** U         3580
$HIBTS  002136           1113#
$ICNT   001404            825#   3527*   3528    3530*   3543
$INTAG  001435            839#
$ITEMB  001414            829#   3164*   3172    3188    3207
$LF     001524            870#   2972    3188
$LFLG   000243R           535#*
$LPADR  001406            826#   1148*   2849*   3518*   3534*   3539    3543
$LPERR  001410            827#   1149*   3182    3518    3535*   3543
$MADR1  001560            903#
$MADR2  001564            907#
$MADR3  001570            910#
$MADR4  001574            913#
$MAIL   001526            876#   1114    1118    1166    2916    3170    3533
$MTS1   001556            897#
$MTS2   001562            905#
$MTS3   001566            908#
$MTS4   001572            911#
$MVADR  002140           1114#
$MWFLG  000242R           535#*
$MSGAD  001542            535*    883#
$MSGLG  001544            535*    884#
$MSGTY  001526            535*    877#
$MTYP1  001557            898#
$MTYP2  001563            906#
$MTYP3  001567            909#
$MTYP4  001573            912#
$MXCNT  016622           3531    3543#
$N    = 000000            533#   2779#
$NULL   001454            847#   2943    2972
```

DZDUTA.M11 13-OCT-76 08:39 CROSS REFERENCE TABLE -- USER SYMBOLS

```
$NWTST= 000000          1349#  1395#  1488#  1584#  1680#  1767#  1828#  1889#  1950#  2011#  2072#  2133#  2194#
                        2252#  2305#  2358#  2411#  2465#  2518#  2571#  2624#  2679#  2732#
$OCNT   014774          3275*  3304*  3317#
$OMODE  014776          3270*  3274*  3279    3282*  3293*  3319#
$OVER   016602          3492   3495   3511    3519   3529   3538#
$PASS   001534           880#  1166*  2838*  3525   3544
$PASTM  002144          1116#
$PWRON  015000          1143   3323#
$QUES   001522           868#  2972   3188
$RDCHR= ****** U        3581
$RDDEC= ****** U        3581
$RDLIN= ****** U        3581
$RDOCT= ****** U        3581
$REGAD  001460           851#
$REG0   001462           853#  3067*  3072
$REG1   001464           854#  3066*  3073
$REG2   001466           855#  3065*  3074
$REG3   001470           856#  3064*  3075
$REG4   001472           857#  3063*  3076
$REG5   001474           858#  3062*  3077
$R2A  = ****** U        3581
$SAVRE= ****** U        3581
$SCOPE  016306          1137   3480#
$SETUP= 000017          1119#  1136   1137   1139   1141   1143   1145   1146   1148   3155   3180   3187   3481
$STUP = 177777          1119#
$SVLAD  016546          3503   3532#
$SVPC = 002136          1091#  1096
$SWR  = 177400           524#   865    866    867   1145   1146   1148   1149   1351   1397   1490   1586   1682
                        1769   1830   1891   1952   2013   2074   2135   2196   2254   2307   2360   2413   2467
                        2520   2573   2626   2681   2734   3146   3147   3148   3149   3150   3158   3165   3177
                        3180   3188   3472   3473   3474   3475   3476   3494   3506   3508   3509   3512   3513
                        3514   3521   3522   3523   3535   3538   3543
$SWREG  001550           888#  1169
$SWRMK= 000000          3476   3477   3510
$TESTN  001532           879#  3533*
$TIMES  001512           865#  1145*  3521*  3528   3531*  3543
$TKB    001446           844#  2862   2985   2993   3493
$TKS    001444           843#  2860   2983   3491
$TMP0   001476           859#
$TMP1   001500           860#  1369*  1417*  1435*  1455*  1458*  1461*  1464*  1510*  1528*  1551*  1554*  1557*
                        1560*  1606*  1624*  1647*  1650*  1653*  1656*  1702*  1720*  1743*  1746*  1749*  1752*
                        1781*  1787*  1842*  1848*  1903*  1909*  1964*  1970*  2025*  2031*  2086*  2092*  2147*
                        2153*  2208*  2214*  2266*  2272*  2319*  2325*  2372*  2378*  2425*  2431*  2479*  2485*
                        2532*  2538*  2585*  2591*  2638*  2644*  2693*  2699*  2746*  2752*  3632*  3644   3654*
                        3656*  3661   3671*  3673*
$TMP2   001502           861#  3631*  3633*  3634*  3635*  3636   3644*  3648*  3661*  3665*
$TMP3   001504           862#  3645*  3649*  3652*  3662*  3666*  3669*
$TMP4   001506           863#
$TMP5   001510           864#
$TN   = 000030           535#  1349   1351#  1395   1397#  1488   1490#  1584   1586#  1680   1682#  1767   1769#
                        1828   1830#  1889   1891#  1950   1952#  2011   2013#  2072   2074#  2133   2135#  2194
                        2196#  2252   2254#  2305   2307#  2358   2360#  2411   2413#  2465   2467#  2518   2520#
                        2571   2573#  2624   2626#  2679   2681#  2732   2734#
$TPB    001452           846#  2961*  2972   2993*
$TPFLG  001457           850#  2910   2972
$TPS    001450           845#  2959   2972   2991
```

```
$TRAP   016624            1141    3552#
$TRAP2  016646            3563#   3574
$TRP  = 000015            3567#   3576#   3577#   3578#   3579#   3581    3582#   3583#   3584#   3585#   3586#   3587#   3588#
                          3589#
$TRPAD  016660            3557    3574#
$TSTM   002142            1115#
$TSTMM  001402             823#   1179#   2833#   3157    3188    3194    3471    3510    3532#   3533    3538    3544
$TYPBN= ****** U          3579
$TYPDS= ****** U          3579
$TYPE   013060             535    2910#   3567    3575
$TYPEC  013272            2940    2947    2954    2959#   2960
$TYPEX  013340            2965    2967    2970#
$TYPOC  014576            3273#   3576
$TYPON  014612            3272    3275#   3578
$TYPOS  014552            3268#   3577
$UNIT   001540             882#
$UNITM  002146            1117#
$USWR   001552             889#   1204
$VECT1  001576             914#
$VECT2  001600             915#
$XTSTR  016352            3488    3497#
$OFILL  014775            3269#   3273#   3283    3318#
$40CAT= ****** U          3167    3494
.     = 017366             535#    569#    682#    685#    690#    745#    746#    820#    871    1077#   1091    1092#   1094#
                          1096#   1102    1103#   1105#   1107#   1134    1148    1149    1373    1420    1430    1439    1443
                          1513    1523    1532    1536    1609    1619    1628    1632    1705    1715    1724    1728    1796
                          1807    1812    1857    1868    1873    1918    1929    1934    1979    1990    1995    2040    2051
                          2056    2101    2112    2117    2162    2173    2178    2223    2234    2239    2281    2292    2334
                          2345    2387    2398    2440    2451    2494    2505    2547    2558    2600    2611    2653    2664
                          2708    2719    2761    2772    2972    3188    3242#   3334    3350    3461#   3463#   3465#   3543
                          3544
.BEGIN  003310            1196    1207    1210    1325#
.CONVR  013752            3082#   3587
.EOP    012336            2785#
.INSTE  013450            2996#   3583
.INSTR  013342            2975#   3582
.INST1  013362            2979#   2988    2998
.MSG    013364            2862#   2863#   2864    2975#   2980#
.PARAM  013460            3003#   3584
.PFAIL  015000            1173    3324#   3345
.RESOS  013720            3072#   3586
.SAVOS  013660            3058#   3585
.SCOPE  016306            3484#
.SCOP1  013036            2888#   3581
.SETFL  014130            3128#   3139    3588
.START  002152             686    1128#   1180    2799
.$ASTA= ****** U           535
.$X   = 002136            1102#   1107
```

CROSS REFERENCE TABLE -- MACRO NAMES

```
COMMEN    679#
ENDCOM    679#
ERROR     573#  1374  1421  1431  1440  1444  1514  1524  1533  1537  1610  1620  1629  1633  1706
         1716  1725  1729  1797  1808  1813  1858  1869  1874  1919  1930  1935  1980  1991  1996
         2041  2052  2057  2102  2113  2118  2163  2174  2179  2224  2235  2240  2282  2293  2335
         2346  2388  2399  2441  2452  2495  2506  2548  2559  2601  2612  2654  2665  2709  2720
         2762  2773
ESCAPE    679#
GETPRI    679#
GETSWR    679#
MULT      679#
NEWTST    679#  1349  1395  1488  1584  1680  1767  1828  1889  1950  2011  2072  2133  2194  2252
         2305  2358  2411  2465  2518  2571  2624  2679  2732
POP       535   679#
PRGEND    557#  2778
PRGFRT    536#   558
PUSH      535   679#
PUSSYF    554#
REPORT    524#  679#
RSETUP    541#  1351  1397  1490  1586  1682
SC        533#  3481
SCOPE     574#  1350  1396  1489  1585  1681  1768  1829  1890  1951  2012  2073  2134  2195  2253
         2306  2359  2412  2466  2519  2572  2625  2680  2733  2785
SC1       533#  3540
SETPRI    679#
SETTRA    524#  3567#  3576  3577  3578  3581  3582  3583  3584  3585  3586  3587  3588
SETUP     679#  1128
SKIP      679#
SLASH     679#
SPACE     679#
STARS     535   679#   816   871   874  1089  1099  1101  1108  1349  1395  1488  1584  1680  1767
         1828  1889  1950  2011  2072  2133  2194  2252  2305  2358  2411  2465  2518  2571  2624
         2679  2732  2895  3142  3198  3245  3468  3546
SWRSU     679#  1150#
TRMTRP   3567#
TSETUP    542#  1769  1830  1891  1952  2013  2074  2135  2196  2254  2307  2360  2413  2467  2520
         2573  2626  2681  2734
TYPBIN    679#
TYPDEC    679#
TYPNAM    679#
TYPNUM    679#
TYPOCS    679#
TYPOCT    679#  3210  3234
TYPTXT    679#
$BEGIN    533#  1322
$BINAR    553#
$BUFFE    535#  3457
$CABLE    555#
$CATCH    527#   569
$CK       534#  2851
$CLRVE    533#  1202
$CONVR    535#  3079
$DNA      551#  1756  1817  1878  1939  2000  2061  2122  2183
$EOP      534#  2778
$GETFL    533#  1241  1306  1310  1314  1318
$GETPA    533#  1220  1231  1251  1277  1329
```

CROSS REFERENCE TABLE -- MACRO NAMES

```
$GETSY    533#  1288
$HEADE    524#   558
$INSTR    535#  2972
$ISOB     549#
$MATCH    546#
$MRR      540#
$MRRW     538#
$MRW      539#
$MSG      535#  3361
$NEED     556#  3188
$PARAM    535#  3000
$PFAIL    535#  3320
$POKE     544#  1784  1790  1845  1851  1906  1912  1967  1973  2028  2034  2089  2095  2150  2156
           2211  2217  2269  2275  2322  2328  2375  2381  2428  2434  2482  2488  2535  2541  2588
           2594  2641  2647  2696  2702  2749  2755
$POKER    545#  1364  1412  1505  1601  1697
$RCNET    556#  1378  1468  1564  1660
$RECAC    544#
$REG      535#  3055
$RESET    537#  1351  1353  1397  1399  1490  1492  1586  1588  1682  1684  1769  1771  1830  1832
           1891  1893  1952  1954  2013  2015  2074  2076  2135  2137  2196  2198  2254  2256  2307
           2309  2360  2362  2413  2415  2467  2469  2520  2522  2573  2575  2626  2628  2681  2683
           2734  2736
$RXACT    543#
$SCOPE    533#  3466
$SCOP1    534#  2885
$SETFL    533#  3122
$SETVE    528#   679
$START    533#  1120
$STRIP    550#  1342
$SYMBO    524#   747   940
$SYNCR    546#  1360  1408  1501  1597  1693
$TRPAR    552#  2244  2297  2350  2403  2457  2510  2563  2616  2671  2724
$TSTNO    533#  1349  1395  1488  1584  1680  1767  1828  1889  1950  2011  2072  2133  2194  2252
           2305  2358  2411  2465  2518  2571  2624  2679  2732
$UNIBU    536#
$VARIA    531#   689
$WORDF    547#
$WORDO    546#
$WORDP    548#
$$CMRE    814#   853   854   855   856   857   858
$$CMTM    814#   859   860   861   862   863   864
$$ESCA    679#
$$NEWT    679#  1349  1395  1488  1584  1680  1767  1828  1889  1950  2011  2072  2133  2194  2252
           2305  2358  2411  2465  2518  2571  2624  2679  2732
$$SET     3567#  3576  3577  3578  3581  3582  3583  3584  3585  3586  3587  3588
$$SETM    1166#
$$SKIP    679#
.EQUAT    524#   569
.HEADE    524#
.SETUP    524#  1119
.$ACT1    524#  1087
.$APTB    524#   872#
.$APTH    524#  1097
.$APTY    524#   535
.$CATC    524#
```

```
DZDUT-A MACY11 27(1006)  03-FEB-77  07:54  PAGE 89
DZDUTA.M11    13-OCT-76 08:39          CROSS REFERENCE TABLE -- MACRO NAMES

.$CMTA     524#    814
.$EOP      524#
.$ERRO     524#   3140
.$ERRT     524#   3196
.$POWE     524#
.$SCOP     524#   3466
.$TRAP     524#   3544
.$TYPE     524#   2893
.$TYPO     524#   3243


. ABS.   017366     000


 ERRORS DETECTED:  0
 DEFAULT GLOBALS GENERATED:  0

 DZDUTA,DZDUTA.SEQ/SOL/CRF=DZDUT1/EQ:RUND,DZDUT2,DZDUTA
 RUN-TIME:  18 12 1 SECONDS
 RUN-TIME RATIO: 141/31=4.4
 CORE USED:  31K  (62 PAGES)
```