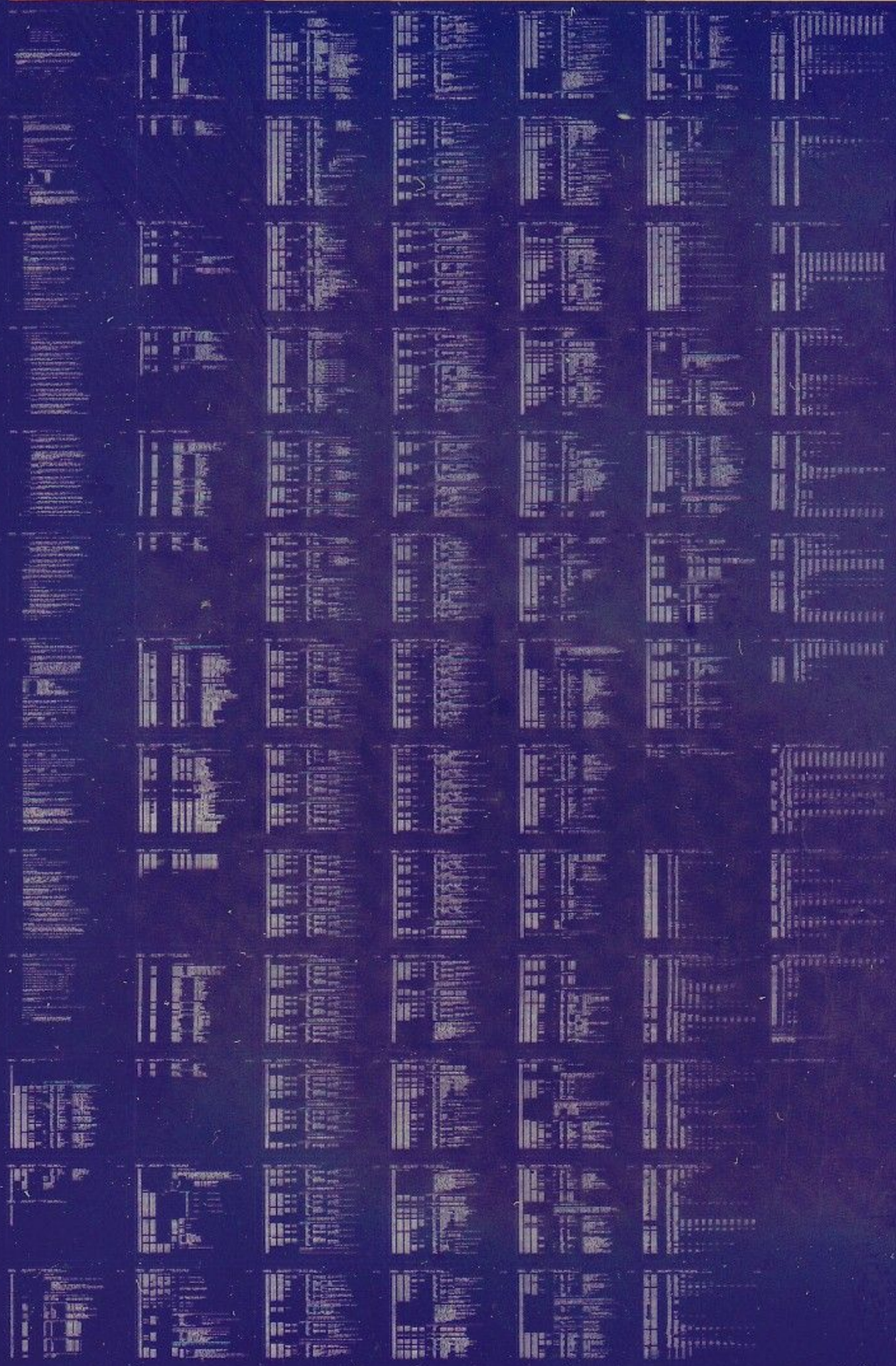
DUV11

DUV11 OFLNE LGC TSTS
CZDUQC0

AH-8706C-MC
FICHE 1 OF 1

FEB 1981

MADE IN USA



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.REM    *
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I D E N T I F I C A T I O N

PRODUCT CODE: AC-8704C-MC

PRODUCT NAME: CZDUQC0 DUV11 OFLNE LGC TSTS

PRODUCT DATE: AUGUST , 1980

MAINTAINER: DIAGNOSTIC ENGINEERING

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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.

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.REM *

1. THE DUV11 OFFLINE LOGIC TESTS VERIFY THAT ALL REGISTERS EXIST
,AND ALL RESPECTIVE BITS CAN BE MASTER CLEARED, READ,
WRITTEN AND/OR READ/WRITTEN

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.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.

THE USER CHANGES THE CONTENTS OF THIS LOCATION
WHEN BUILDING THE E TABLE, BY ANSWERING THE
PROMPT "SWITCH 2".

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)

SW14=1
NOTE1: IN GENERAL SW01 WILL BE USED WHEN SW14=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.

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.REM *

4.3.1.5 THE PROGRAM WILL TYPE "DUV11 CZDUQ-C TAPE A" (ONCE ONLY)

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.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 XMI1 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 SW14 =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 SW14=1 IN SWITCH REG. (LOC. 176)

4.3.5.2 TYPE 200G.

4.3.5.3 PROGRAM WILL START.

4.3.5.4 THE PROGRAM WILL TYPE "LOCK ON SELECTED TEST ? (Y OR N)-"
AND WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD

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

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

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

5. OPERATING PROCEDURE

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

SW15 =1	HALT ON ERROR
SW14 =1	LOOP ON CURRENT TEST
SW13 =1	INHIBIT ERROR TYPEOUT
SW11 =1	INHIBIT ITERATIONS
SW10 =1	ESCAPE TO NEXT TEST ON ERROR
SW09 =1	LOOP ON ERROR
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
1XXXXX	YYYYYY	ZZZZZZ

WHERE 1XXXXX 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
1XXXXX	YYYYYY	ZZZZZZ

WHERE 1XXXXX 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
1XXXXX	YYYYYY	ZZZZZZ

WHERE 1XXXXX IS THE ADDRESS OF THE FAILING TRANSMITTER (TXCST) 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 ESTING

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:

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            END OF PASS TAPE Y
            1XXXXX = DEVICE

            WHERE Y IS THE TAPE LOADED

            WHERE 1XXXXX 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"
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            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 LOGIC BIT BANGING
            OF THE DEVICE
            SEE LISTING FOR DETAILS
                                                                    *
                                                                    *
                                                          .REM      *
      10.   FLOW CHARTS: RECEIVER FLOW,TRANSMITTER FLOW,TRANSMITTER & RECEIVER FLOW

      11.   CHANGE HISTORY
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            NOTE: HISTORY BEGINS WITH REV. C0

            REV. C0:  1) ALLOW OPERATOR TO SPECIFY ADDRESS > 170000
                      2) INCREASE DELAY VALUE "HOLD" TO COMPENSATE
                         FOR 11/23 EXECUTION TIME (FROM 3777 TO 6200)

      12.   LISTINGS

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                                .SBTTL  APT COMMUNICATIONS ROUTINE
                                ;;*****************************************************************
000000  112767  000001  000236  $ATY1:  MOVB    #1,$FFLG        ;;TO REPORT FATAL ERROR
000006  112767  000001  000226  $ATY3:  MOVB    #1,$MFLG        ;;TO TYPE A MESSAGE
000014  000403                         BR      $ATYC
000016  112767  000001  000220  $ATY4:  MOVB    #1,$FFLG        ;;TO ONLY REPORT FATAL ERROR
000024                          $ATYC:
000024  010046                         MOV     R0,-(SP)        ;;PUSH R0 ON STACK
000026  010146                         MOV     R1,-(SP)        ;;PUSH R1 ON STACK
000030  105767  000206                 TSTB    $MFLG           ;;SHOULD TYPE A MESSAGE?
000034  001450                         BEQ     5$              ;;IF NOT:  BR
000036  122767  000001  001502         CMPB    #APTENV,$ENV    ;;OPERATING UNDER APT?
000044  001031                         BNE     3$              ;;IF NOT:  BR
000046  132767  000100  001473         BITB    #APTSPOOL,$ENVM ;;SHOULD SPOOL MESSAGES?
000054  001425                         BEQ     3$              ;;IF NOT:  BR
000056  017600  000004                 MOV     @4(SP),R0       ;;GET MESSAGE ADDR.
000062  062766  000002  000004         ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
000070  005767  001432          1$:    TST     $MSGTYPE        ;;SEE IF DONE W/ LAST XMISSION?
000074  001375                         BNE     1$              ;;IF NOT:  WAIT
000076  010067  001440                 MOV     R0,$MSGAD       ;;PUT ADDR IN MAILBOX
000102  105720                  2$:    TSTB    (R0)+           ;;FIND END OF MESSAGE
000104  001376                         BNE     2$
000106  166700  001430                 SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
000112  006200                         ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
000114  010067  001424                 MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
000120  012767  000004  001400         MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
000126  000413                         BR      5$
000130  017667  000004  000016  3$:    MOV     @4(SP),4$       ;;PUT MSG ADDR IN JSR LINKAGE
000136  062766  000002  000004         ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
000144  016746  177626                 MOV     177776,-(SP)    ;;PUSH 177776 ON STACK
000150  004767  012666                 JSR     PC,$TYPE        ;;CALL TYPE MACRO
000154  000000                  4$:    .WORD   0
000156                          5$:
000156  105767  000062          10$:   TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
000162  001416                         BEQ     12$             ;;IF NOT:  BR
000164  005767  001356                 TST     $ENV            ;;RUNNING UNDER APT?
000170  001413                         BEQ     12$             ;;IF NOT:  BR
000172  005767  001330          11$:   TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
000176  001375                         BNE     11$             ;;IF NOT:  WAIT
000200  017667  000004  001322         MOV     @4(SP),$FATAL   ;;GET ERROR #
000206  062766  000002  000004         ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
000214  005267  001306                 INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
000220  105067  000020          12$:   CLRB    $FFLG           ;;CLEAR FATAL FLAG
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   594  000224  105067  000013                  CLRB    $LFLG           ;;CLEAR LOG FLAG
   595  000230  105067  000006                  CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
   596  000234  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
   597  000236  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
   598  000240  000207                          RTS     PC              ;;RETURN
   599  000242     000                $MFLG:   .BYTE   0               ;;MESSG. FLAG
   600  000243     000                $LFLG:   .BYTE   0               ;;LOG FLAG
   601  000244     000                $FFLG:   .BYTE   0               ;;FATAL FLAG
   602          000246                          .EVEN
   603          000200                APTSIZE=200
   604          000001                APTENV=001
   605          000100                APTSPOOL=100
   606          000040                APTCSUP=040
   607          000001                $TN=1
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                        .ENABLE ABS

                        ;CZDUQ-C0 DUV11 TAPE A
                        ;COPYRIGHT 1977,1980, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754

                                ;STARTING PROCEDURE
                                ;TYPE 200G
                                ;PROGRAM WILL TYPE "CZDUQ-C0 DUV11 TAPE A "
                                ;PROGRAM WILL TYPE "R" TO INDICATE THAT TESTING HAS STARTED
                                ;AT THE END OF A PASS, PROGRAM WILL TYPE "END OF PASS TAPE A"
                                ;AND THEN RESUME TESTING

                        .SBTTL  BASIC DEFINITIONS

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

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

                        ;*GENERAL PURPOSE REGISTER DEFINITIONS
000000                  R0=     %0              ;;GENERAL REGISTER
000001                  R1=     %1              ;;GENERAL REGISTER
000002                  R2=     %2              ;;GENERAL REGISTER
000003                  R3=     %3              ;;GENERAL REGISTER
000004                  R4=     %4              ;;GENERAL REGISTER
000005                  R5=     %5              ;;GENERAL REGISTER
000006                  R6=     %6              ;;GENERAL REGISTER
C00007                  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
```

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

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

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

```
   741          000014                  TBITVEC=14              ;;"T" BIT
   742          000014                  TRTVEC= 14              ;;TRACE TRAP
   743          000014                  BPTVEC= 14              ;;BREAKPOINT TRAP (BPT)
   744          000020                  IOTVEC= 20              ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
   745          000024                  PWRVEC= 24              ;;POWER FAIL
   746          000030                  EMTVEC= 30              ;;EMULATOR TRAP (EMT) **ERROR**
   747          000034                  TRAPVEC=34              ;;"TRAP" TRAP
   748          000060                  TKVEC=  60              ;;TTY KEYBOARD VECTOR
   749          000064                  TPVEC=  64              ;;TTY PRINTER VECTOR
   750          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
```

```
                        DNAINTE=BIT5            ;DNA INTR ENAB
                        SEND=BIT4               ;SEND
                        HDXEN=BIT3              ;HDX/FDX
                        BREAK=BIT0              ;BREAK
                                ;TXCSR WRD DEFINITIONS
                        USER=0                  ;USER MODE
                        MINT=4000               ;MAINT INT MODE
                        MEXT=10000              ;MAINT EXT MODE
                        SYSTST=14000            ;SYSTEM TEST MODE
```

```
                                .SBTTL  COMMON TAGS

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

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

```
                                        $LF:    .ASCIZ  <12>            ;;LINE FEED
                                        ;;*****************************************************************
                                        .SBTTL  APT MAILBOX-ETABLE

                                        ;;*****************************************************************
                                        .EVEN
001526                                  $MAIL:                          ;;APT MAILBOX
001526  000000                          $MSGTY: .WORD   AMSGTY   ;;MESSAGE TYPE CODE
001530  000000                          $FATAL: .WORD   AFATAL   ;;FATAL ERROR NUMBER
001532  000000                          $TESTN: .WORD   ATESTN   ;;TEST NUMBER
001534  000000                          $PASS:  .WORD   APASS    ;;PASS COUNT
001536  000000                          $DEVCT: .WORD   ADEVCT   ;;DEVICE COUNT
001540  000000                          $UNIT:  .WORD   AUNIT    ;;I/O UNIT NUMBER
001542  000000                          $MSGAD: .WORD   AMSGAD   ;;MESSAGE ADDRESS
001544  000000                          $MSGLG: .WORD   AMSGLG   ;;MESSAGE LENGTH
001546                                  $ETABLE:                        ;;APT ENVIRONMENT TABLE
001546     000                          $ENV:   .BYTE   AENV     ;;ENVIRONMENT BYTE
001547     000                          $ENVM:  .BYTE   AENVM    ;;ENVIRONMENT MODE BITS
001550  000000                          $SWREG: .WORD   ASWREG   ;;APT SWITCH REGISTER
001552  000000                          $USWR:  .WORD   AUSWR    ;;USER SWITCHES
001554  000000                          $CPUOP: .WORD   ACPUOP   ;;CPU TYPE,OPTIONS
                                        ;*                              BITS 15-11=CPU TYPE
                                        ;*                                      11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
                                        ;*                                      11/70=06,PDQ=07,Q=10
                                        ;*                              BIT 10=REAL TIME CLOCK
                                        ;*                              BIT  9=FLOATING POINT PROCESSOR
                                        ;*                              BIT  8=MEMORY MANAGEMENT
001556     000                          $MAMS1: .BYTE   AMAMS1   ;;HIGH ADDRESS,M.S. BYTE
001557     000                          $MTYP1: .BYTE   AMTYP1   ;;MEM. TYPE,BLK#1
                                        ;*                              MEM.TYPE BYTE   --  (HIGH BYTE)
                                        ;*                                      900 NSEC CORE=001
                                        ;*                                      300 NSEC BIPOLAR=002
                                        ;*                                      500 NSEC MOS=003
001560  000000                          $MADR1: .WORD   AMADR1   ;;HIGH ADDRESS,BLK#1
                                        ;*                                MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF ''TYPE'' ABOVE
001562     000                          $MAMS2: .BYTE   AMAMS2   ;;HIGH ADDRESS,M.S. BYTE
001563     000                          $MTYP2: .BYTE   AMTYP2   ;;MEM.TYPE,BLK#2
001564  000000                          $MADR2: .WORD   AMADR2   ;;MEM.LAST ADDRESS,BLK#2
001566     000                          $MAMS3: .BYTE   AMAMS3   ;;HIGH ADDRESS,M.S.BYTE
001567     000                          $MTYP3: .BYTE   AMTYP3   ;;MEM.TYPE,BLK#3
001570  000000                          $MADR3: .WORD   AMADR3   ;;MEM.LAST ADDRESS,BLK#3
001572     000                          $MAMS4: .BYTE   AMAMS4   ;;HIGH ADDRESS,M.S.BYTE
001573     000                          $MTYP4: .BYTE   AMTYP4   ;;MEM.TYPE,BLK#4
001574  000000                          $MADR4: .WORD   AMADR4   ;;MEM.LAST ADDRESS,BLK#4
001576  000000                          $VECT1: .WORD   AVECT1   ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
001600  000000                          $VECT2: .WORD   AVECT2   ;;INTERRUPT VECTOR#2BUS PRIORITY#2
001602  000000                          $BASE:  .WORD   ABASE    ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
001604  000000                          $DEVM:  .WORD   ADEVM    ;;DEVICE MAP
001606  000000                          $CDW1:  .WORD   ACDW1    ;;CONTROLLER DESCRIPTION WORD#1
001610  000000                          $CDW2:  .WORD   ACDW2    ;;CONTROLLER DESCRIPTION WORD#2
001612  000000                          $DDW0:  .WORD   ADDW0    ;;DEVICE DESCRIPTOR WORD#0
001614  000000                          $DDW1:  .WORD   ADDW1    ;;DEVICE DESCRIPTOR WORD#1
001616  000000                          $DDW2:  .WORD   ADDW2    ;;DEVICE DESCRIPTOR WORD#2
001620  000000                          $DDW3:  .WORD   ADDW3    ;;DEVICE DESCRIPTOR WORD#3
001622  000000                          $DDW4:  .WORD   ADDW4    ;;DEVICE DESCRIPTOR WORD#4
001624  000000                          $DDW5:  .WORD   ADDW5    ;;DEVICE DESCRIPTOR WORD#5
```

```
  998  001626  000000                    $DDW6:  .WORD   ADDW6   ;;DEVICE DESCRIPTOR WORD#6
  999  001630  000000                    $DDW7:  .WORD   ADDW7   ;;DEVICE DESCRIPTOR WORD#7
 1000  001632  000000                    $DDW8:  .WORD   ADDW8   ;;DEVICE DESCRIPTOR WORD#8
 1001  001634  000000                    $DDW9:  .WORD   ADDW9   ;;DEVICE DESCRIPTOR WORD#9
 1002  001636  000000                    $DDW10: .WORD   ADDW10  ;;DEVICE DESCRIPTOR WORD#10
 1003  001640  000000                    $DDW11: .WORD   ADDW11  ;;DEVICE DESCRIPTOR WORD#11
 1004  001642  000000                    $DDW12: .WORD   ADDW12  ;;DEVICE DESCRIPTOR WORD#12
 1005  001644  000000                    $DDW13: .WORD   ADDW13  ;;DEVICE DESCRIPTOR WORD#13
 1006  001646  000000                    $DDW14: .WORD   ADDW14  ;;DEVICE DESCRIPTOR WORD#14
 1007  001650  000000                    $DDW15: .WORD   ADDW15  ;;DEVICE DESCRIPTOR WORD#15
 1008
 1009
 1010  001652                            $ETEND:
 1011
 1012
 1013
```

```
                                ;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
```

```
1070    000040          DNAINTE=BIT5            ;DNA INTR ENAB
1071    000020          SEND=BIT4               ;SEND
1072    000010          HDXEN=BIT3              ;HDX/FDX
1073    000001          BREAK=BIT0              ;BREAK
1074                            ;TXCSR WRD DEFINITIONS
1075    000000          USER=0                  ;USER MODE
1076    004000          MINT=4000               ;MAINT INT MODE
1077    010000          MEXT=10000              ;MAINT EXT MODE
1078    014000          SYSTST=14000            ;SYSTEM TEST MODE
```

```
                                .SBTTL  ERROR POINTER TABLE

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

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


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

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

```
1135  002012  044507  052123  051105
1136  002020  000123
1137  002022  020040  042522  042503  EM2:    .ASCIZ  /  RECEIVER ERROR/
1138  002030  053111  051105  042440
1139  002036  051122  051117     000
1140  002043     040  052040  040522  EM3:    .ASCIZ  /  TRANSMITTER ERROR/
1141  002050  051516  044515  052124
1142  002056  051105  042440  051122
1143  002064  051117     000
1144                                          ;DATA HEADERS FOR ERROR MESSAGES
1145  002067     105  051122  041520  DH1:    .ASCIZ  /ERRPC  WANTED  ACTUAL/
1146  002074  020040  040527  052116
1147  002102  042105  020040  041501
1148  002110  052524  046101     000
1149          002116                  .EVEN
1150                                          ;DATA TABLES FOR ERROR MESSAGES
1151  002116  001416  001130  001132  DT1:    .WORD   $ERRPC,HLD0,HLD1,0
1152  002124  000000
1153
1154  002126  001416  000000          DT4:    .WORD   $ERRPC,0
1155
1156  002132     000     000     000  DF1:    .BYTE   0,0,0,0
1157  002135     000
1158                                  .EVEN
1159                                  .SBTTL  ACT11 HOOKS
1160
1161                                  ;;*****************************************************************
1162                                  ;HOOKS REQUIRED BY ACT11
1163          002136                          $SVPC=.                 ;SAVE PC
1164          000046                          .=46
1165  000046  012644                          $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
1166          000052                          .=52
1167  000052  000000                          .WORD   0               ;;2)SET LOC.52 TO ZERO
1168          002136                          .=$SVPC                 ;; RESTORE PC
1169                                  .SBTTL  APT PARAMETER BLOCK
1170
1171                                  ;;*****************************************************************
1172                                  ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
1173                                  ;;*****************************************************************
1174          002136                          .$X=.   ;;SAVE CURRENT LOCATION
1175          000024                          .=24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
1176  000024  000200                          200     ;;FOR APT START UP
1177          000044                          .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
1178  000044  002136                          $APTHDR ;;POINT TO APT HEADER BLOCK
1179          002136                          .=.$X   ;;RESET LOCATION COUNTER
1180                                  ;;*****************************************************************
1181                                  ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
1182                                  ;INTERFACE SPEC.
1183
1184  002136                          $APTHD:
1185  002136  000000                  $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
1186  002140  001526                  $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
1187  002142  000010                  $TSTM:  .WORD   10      ;;RUN TIM OF LONGEST TEST
1188  002144  000010                  $PASTM: .WORD   10      ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
1189  002146  000000                  $UNITM: .WORD           ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
1190  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  016272  000020          MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
002200  012737  000340  000022          MOV     #340,@#IOTVEC+2 ;;LEVEL 7
002206  012737  014160  000030          MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
002214  012737  000340  000032          MOV     #340,@#EMTVEC+2 ;;LEVEL 7
002222  012737  016626  000034          MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
002230  012737  000340  000036          MOV     #340,@#TRAPVEC+2;LEVEL 7
002236  012737  014762  000024          MOV     #$PWRDN,@#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  014762  000024          MOV     #.PFAIL,@#24            ;SET UP POWER FAIL VECTOR
002432  105067  176535                  CLRB    STFLG                   ;CLEAR START FLAG
```

```
002436 005067 176450                 CLR     PASCNT                  ;CLEAR PASS COUNT
002442 105067 176735                 CLRB    $ERFLG                  ;CLEAR ERROR FLAG
002446 005067 176740                 CLR     $ERTTL                  ;CLEAR ERROR COUNT
002452 005067 176740                 CLR     $ERRPC                  ;CLEAR LAST ERROR POINTER
002456 012767 000001 176716          MOV     #1,$TSTNM               ;SET UP FOR TEST 1
002464 012767 002152 176412          MOV     #.START,RETURN          ;SET UP FOR POWER FAIL BEFORE
                                                                     ;TESTING STARTS
002472 013746 000006                 MOV     @#6,-(SP)
002476 013746 000004                 MOV     @#4,-(SP)
002502 012737 002516 000004          MOV     #1$,@#4
002510 005777 176724                 TST     @SWR
002514 000407                        BR      2$
002516 012767 000176 176714  1$:     MOV     #SWREG,SWR
002524 012767 000174 176710          MOV     #DISPREG,DISPLAY
002532 022626                        CMP     (SP)+,(SP)+
002534 012637 000004         2$:     MOV     (SP)+,@#4
002540 012637 000006                 MOV     (SP)+,@#6
002544 022767 000176 176666          CMP     #SWREG,SWR
002552 001007                        BNE     3$
002554 005737 000042                 TST     @#42                    ;CHECK FOR CHAIN
002560 001402                        BEQ     33$
002562 000167 000522                 JMP     .BEGIN
002566 004767 010154         33$:    JSR     PC,CNTLU
002572 105767 176374         3$:     TSTB    INIFLG                  ;HAS INITIALIZATION BEEN PERFORMED
002576 001004                        BNE     ONCE
002600 104401 015122                 TYPE    ,MTITLE                 ;TYPE TITLE MESSAGE
002604 105167 176362                 COMB    INIFLG                  ;IF NOT SET FLAG AND DO
002610 105767 176732         ONCE:   TSTB    $ENV            ;APT CONTROL?
002614 001410                        BEQ     11$             ;BR IF NO
002616 032767 000001 176726          BIT     #1,$USWR        ;EXTENAL JUMPER ON?
002624 001002                        BNE     12$             ;NO
002626 105067 176321                 CLRB    JMRBY           ;CLEAR FLAG
002632 000167 000452         12$:    JMP     .BEGIN          ;GO DO IT
002636 032777 000001 176574  11$:    BIT     #SW00,@SWR      ;RESELECT VECTOR & CONTROL REG?
002644 001002                        BNE     1$
002646 000167 000436                 JMP     .BEGIN
002652 012700 000300         1$:     MOV     #300,R0 ;RESTORE VECTOR AREA TO TRAPCATCHER
002656 012701 000302                 MOV     #302,R1 ;START AT LOCATION 300
002662 012702 000004                 MOV     #4,R2
002666 010110                2$:     MOV     R1,(R0)
002670 005011                        CLR     (R1)
002672 060200                        ADD     R2,R0
002674 060201                        ADD     R2,R1
002676 022701 001000                 CMP     #1000,R1        ;END AT LOCATION 776
002702 002771                        BLT     2$
002704 104406                        INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
002706 015171                        MREGAD  ;MESSAGE
002710 104410                        PARAM   ;CONVERT STRING
002712 160000                        160000  ;LOW LIMIT
002714 177776                        177776  ;HIGH LIMIT
002716 017122                        DUBASE  ;STORE AT THIS LOCATION
002720    001                .BYTE   1       ;MASK
002721    001                .BYTE   1       ;HOW MANY TIMES + 2
002722 016767 014174 176226          MOV     DUBASE,KEEPADD  ;SAVE
002730 004767 014034                 JSR     PC,DUADDR
002734 016767 176216 176212          MOV     KEEPADD,BASEADD ;RESTORE FOR ROTATION
```

```
1303  002742  104406                          INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1304  002744  015156                          MVECTO  ;MESSAGE
1305  002746  104410                          PARAM   ;CONVERT STRING
1306  002750  000300                          300     ;LOW LIMIT
1307  002752  000776                          776     ;HIGH LIMIT
1308  002754  001736                          DURIV   ;STORE AT THIS LOCATION
1309  002756     001                  .BYTE   1       ;MASK
1310  002757     004                  .BYTE   4       ;HOW MANY TIMES + 2
1311  002760  016767  176752  176176          MOV     DURIV,KEEPIV    ;SAVE
1312  002766  016767  176744  176166          MOV     DURIV,BASEIV    ;SET UP FOR ROTATION
1313  002774  104406                          INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1314  002776  015221                          MMULT   ;MESSAGE
1315  003000  104414                          SETFLG  ;SET FLAG BASED UPON INPUT STRING
1316  003002  001152                          MULTD   ;THIS FLAG
1317  003004  105767  176142                  TSTB    MULTD   ;ARE THERE MULTIPLE DEVICES
1318                                                          ;ON THE SYSTEM ?
1319  003010  100406                          BMI     BBB     ;YES,ASK NEXT QUESTION
1320  003012  005067  176150                  CLR     ACTREG
1321  003016  005067  176146                  CLR     ROTADD
1322  003022  000167  000140                  JMP     OUTMUL  ;JUMP AROUND NEXT QUESTION
1323  003026                          BBB:
1324  003026  104406                          INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1325  003030  015250                          MLASTD  ;MESSAGE
1326  003032  104410                          PARAM   ;CONVERT STRING
1327  003034  160000                          160000  ;LOW LIMIT
1328  003036  177776                          177776  ;HIGH LIMIT
1329  003040  001160                          LASTADD ;STORE AT THIS LOCATION
1330  003042     001                  .BYTE   1       ;MASK
1331  003043     001                  .BYTE   1       ;HOW MANY TIMES + 2
1332                                  ;THE FOLLOWING ROUTINE SETS UP ACTREG FOR THE FIRST TIME
1333  003044  012767  000001  176116  1$:     MOV     #1,ROTADD       ;SET UP POINTER
1334  003052  005067  176110                  CLR     ACTREG  ;CLR ACTIVE REGISTER
1335  003056  056767  176106  176102  2$:     BIS     ROTADD,ACTREG   ;MAKE THIS DEVICE ACTIVE
1336  003064  000241                          CLC
1337  003066  006167  176076                  ROL     ROTADD  ;SET UP POINTER
1338  003072  103421                          BCS     3$      ;ARE YOU OUT OF RANGE ?
1339  003074  062767  000010  176052          ADD     #10,BASEADD     ;SET UP BASE ADDRESS
1340  003102  026767  176052  176044          CMP     LASTADD,BASEADD ;IS THIS THE LAST DEVICE ?
1341  003110  101362                          BHI     2$      ;NO DO IT AGAIN
1342  003112  056767  176052  176046          BIS     ROTADD,ACTREG   ;THIS ASSUMES THAT THERE ARE AT
1343                                                          ;LEAST TWO DEVICES WHEN YOU ANSWER YES TO
1344                                                          ;MULTIPLE DEVICE QUESTION
1345  003120  012767  000001  176042  4$:     MOV     #1,ROTADD       ;SET UP FOR LATER USE IN END OF PASS ROUTINE
1346  003126  016767  176024  176020          MOV     KEEPADD,BASEADD ;DITTO
1347  003134  000414                          BR      OUTMUL  ;CONTINUE QUESTIONS
1348  003136  016767  176014  176010  3$:     MOV     KEEPADD,BASEADD ;RESTORE
1349  003144  104406                          INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1350  003146  015344                          MRANGE  ;MESSAGE
1351  003150  104410                          PARAM   ;CONVERT STRING
1352  003152  160000                          160000  ;LOW LIMIT
1353  003154  177776                          177776  ;HIGH LIMIT
1354  003156  001160                          LASTADD ;STORE AT THIS LOCATION
1355  003160     001                  .BYTE   1       ;MASK
1356  003161     001                  .BYTE   1       ;HOW MANY TIMES + 2
1357  003162  000167  177656                  JMP     1$      ;DO IT AGAIN
1358  003166  012767  000340  013570  OUTMUL: MOV     #340,DUPRT
```

```
1359  003174  004767  013514                    JSR     PC,DULEV
1360                                            ;COMPARE THE FIRST CHARACTER IN THE TELETYPE INPUT
1361                                            ;BUFFER TO THE CHARACTERS "1" AND "2".
1362                                            ;IF THE CHARACTER IS "1" CLEAR THE FLAG
1363                                            ;IF THE CHARACTER IS "2" SET THE FLAG
1364  003200                            AAA:
1365  003200  104406                           INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1366  003202  015562                           MSYNC   ;MESSAGE
1367  003204  122767  000061  012712  3$:     CMPB    #'1,INBUF       ;IS IT "1" ?
1368  003212  001003                           BNE     1$
1369  003214  105067  175726                  CLRB    SYNCNO  ;000
1370  003220  000412                           BR      4$
1371  003222  122767  000062  012674  1$:     CMPB    #'2,INBUF       ;IS IT "2" ?
1372  003230  001004                           BNE     2$
1373  003232  112767  177777  175706          MOVB    #-1,SYNCNO      ;377
1374  003240  000402                           BR      4$
1375  003242  104407                    2$:    INSTER  ;RETRY
1376  003244  000757                           BR      3$
1377  003246  000240                    4$:    NOP
1378  003250  104406                           INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1379  003252  015630                           MWIRE6  ;MESSAGE
1380  003254  104414                           SETFLG  ;SET FLAG BASED UPON INPUT STRING
1381  003256  001147                           SEXMIT  ;THIS FLAG
1382  003260  104406                           INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1383  003262  015701                           MWIRE5  ;MESSAGE
1384  003264  104414                           SETFLG  ;SET FLAG BASED UPON INPUT STRING
1385  003266  001150                           SEREC   ;THIS FLAG
1386  003270  104406                           INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1387  003272  015751                           MWIRE4  ;MESSAGE
1388  003274  104414                           SETFLG  ;SET FLAG BASED UPON INPUT STRING
1389  003276  001151                           OPTCLR  ;THIS FLAG
1390  003300  104406                           INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1391  003302  016030                           MEXTJ   ;MESSAGE
1392  003304  104414                           SETFLG  ;SET FLAG BASED UPON INPUT STRING
1393  003306  001153                           JMRBY   ;THIS FLAG
1394
1395                                            ;TEST START AND RESTART
1396
1397  003310  012706  001100          .BEGIN:  MOV     #STACK,SP               ;SET UP STACK
1398  003314  106427  000340                   MTPS    #340                    ;LOCK OUT INTERRUPTS
1399  003320  032777  000002  176112           BIT     #SW01,@SWR              ;IF SW01=1, GET STARTING PC
1400  003326  001413                           BEQ     3$
1401  003330  104406                           INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1402  003332  015514                           MTSTPC  ;MESSAGE
1403  003334  104410                           PARAM   ;CONVERT STRING
1404  003336  003374                           TST1    ;LOW LIMIT
1405  003340  017500                           17500   ;HIGH LIMIT
1406  003342  001402                           $TSTNM  ;STORE AT THIS LOCATION
1407  003344     001                   .BYTE   1       ;MASK
1408  003345     001                   .BYTE   1       ;HOW MANY TIMES + 2
1409  003346  016767  176030  175530           MOV     $TSTNM,RETURN
1410  003354  000403                           BR      4$
1411  003356  012767  003374  175520  3$:     MOV     #TST1,RETURN            ;START AT TEST 1
1412  003364  104401  015510          4$:     TYPE    ,MR                     ;TYPE R
1413  003370  000177  175510                   JMP     @RETURN                 ;START TESTING
1414
```

```
1415
1416                                        ;;THIS TEST PROVES EXISTANCE OF DEVICE REGISTERS
1417                                        ;;
1418                                    ;;**************************************************************
1419  003374  000004                    TST1:   SCOPE
1420  003376  012737  017362  000004            MOV     #TRPREG,@#4     ;SETUP TRAPCATCHER
1421  003404  016737  174730  000006            MOV     PR7,@#6 ;
1422  003412  105277  176274                    INCB    @RXCSR          ;TEST THIS REG
1423  003416  000401                            BR      .+4             ;IF OK JMP AROUND ERROR
1424  003420  104004                            ERROR   4                       ;CHECK DEVICE REG ADDRESSES
1425  003422  105277  176266                    INCB    @HRXCSR ;TEST UPPER BYTE THIS REGISTER
1426  003426  000401                            BR      .+4             ;IF OK JMP AROUND ERROR
1427  003430  104004                            ERROR   4                       ;CHECK DEVICE REG ADDRESSES
1428  003432  012737  000006  000004            MOV     #6,@#4          ;RESTORE TRAPCATCHER
1429  003440  012737  000000  000006            MOV     #0,@#6          ;
1430
1431  003446  012767  006200  175444            MOV     #6200,HOLD      ;SET LONGER DELAY FOR TEST.     ;;REV. CO
1432                                        ;;THIS TEST PROVES EXISTANCE OF DEVICE REGISTERS
1433                                        ;;
1434                                    ;;**************************************************************
1435  003454  000004                    TST2:   SCOPE
1436  003456  012737  017362  000004            MOV     #TRPREG,@#4     ;SETUP TRAPCATCHER
1437  003464  016737  174650  000006            MOV     PR7,@#6 ;
1438  003472  105277  176220                    INCB    @RXDBUF         ;TEST THIS REG
1439  003476  000401                            BR      .+4             ;IF OK JMP AROUND ERROR
1440  003500  104004                            ERROR   4                       ;CHECK DEVICE REG ADDRESSES
1441  003502  105277  176212                    INCB    @HRXDBUF        ;TEST UPPER BYTE THIS REGISTER
1442  003506  000401                            BR      .+4             ;IF OK JMP AROUND ERROR
1443  003510  104004                            ERROR   4                       ;CHECK DEVICE REG ADDRESSES
1444  003512  012737  000006  000004            MOV     #6,@#4          ;RESTORE TRAPCATCHER
1445  003520  012737  000000  000006            MOV     #0,@#6          ;
1446
1447                                        ;;THIS TEST PROVES EXISTANCE OF DEVICE REGISTERS
1448                                        ;;
1449                                    ;;**************************************************************
1450  003526  000004                    TST3:   SCOPE
1451  003530  012737  017362  000004            MOV     #TRPREG,@#4     ;SETUP TRAPCATCHER
1452  003536  016737  174576  000006            MOV     PR7,@#6 ;
1453  003544  105277  176152                    INCB    @PARCSR         ;TEST THIS REG
1454  003550  000401                            BR      .+4             ;IF OK JMP AROUND ERROR
1455  003552  104004                            ERROR   4                       ;CHECK DEVICE REG ADDRESSES
1456  003554  105277  176144                    INCB    @HPARCSR        ;TEST UPPER BYTE THIS REGISTER
1457  003560  000401                            BR      .+4             ;IF OK JMP AROUND ERROR
1458  003562  104004                            ERROR   4                       ;CHECK DEVICE REG ADDRESSES
1459  003564  012737  000006  000004            MOV     #6,@#4          ;RESTORE TRAPCATCHER
1460  003572  012737  000000  000006            MOV     #0,@#6          ;
1461
1462                                        ;;THIS TEST PROVES EXISTANCE OF DEVICE REGISTERS
1463                                        ;;
1464                                    ;;**************************************************************
1465  003600  000004                    TST4:   SCOPE
1466  003602  012737  017362  000004            MOV     #TRPREG,@#4     ;SETUP TRAPCATCHER
1467  003610  016737  174524  000006            MOV     PR7,@#6 ;
1468  003616  105277  176104                    INCB    @TXCSR          ;TEST THIS REG
1469  003622  000401                            BR      .+4             ;IF OK JMP AROUND ERROR
1470  003624  104004                            ERROR   4                       ;CHECK DEVICE REG ADDRESSES
```

```
1471  003626  105277  176076                    INCB    @HTXCSR ;TEST UPPER BYTE THIS REGISTER
1472  003632  000401                            BR      .+4             ;IF OK JMP AROUND ERROR
1473  003634  104004                            ERROR   4                       ;CHECK DEVICE REG ADDRESSES
1474  003636  012737  000006  000004            MOV     #6,@#4          ;RESTORE TRAPCATCHER
1475  003644  012737  000000  000006            MOV     #0,@#6          ;
1476
1477                                            ;;THIS TEST PROVES EXISTANCE OF DEVICE REGISTERS
1478                                            ;;
1479                                    ;;**************************************************************************
1480  003652  000004                    TST5:   SCOPE
1481  003654  012737  017362  000004            MOV     #TRPREG,@#4     ;SETUP TRAPCATCHER
1482  003662  016737  174452  000006            MOV     PR7,@#6 ;
1483  003670  105277  176036                    INCB    @TXDBUF         ;TEST THIS REG
1484  003674  000401                            BR      .+4             ;IF OK JMP AROUND ERROR
1485  003676  104004                            ERROR   4                       ;CHECK DEVICE REG ADDRESSES
1486  003700  105277  176030                    INCB    @HTXDBUF        ;TEST UPPER BYTE THIS REGISTER
1487  003704  000401                            BR      .+4             ;IF OK JMP AROUND ERROR
1488  003706  104004                            ERROR   4                       ;CHECK DEVICE REG ADDRESSES
1489  003710  012737  000006  000004            MOV     #6,@#4          ;RESTORE TRAPCATCHER
1490  003716  012737  000000  000006            MOV     #0,@#6          ;
1491
1492                                            ;;BUS DRIVER TEST
1493                                            ;;
1494                                    ;;**************************************************************************
1495  003724  000004                    TST6:   SCOPE
1496  003726  022777  000000  175776            CMP     #0,@TXDBUF
1497  003734  001401                            BEQ     .+4
1498  003736  104004                            ERROR   4       ;READING TXDBUF SHOULD BE ALL ZERO'S
1499                                            ;;THIS TEST PERFORMS MASTER RESET TESTING &
1500                                            ;;TESTING OF READ/WRITE BIT DTR
1501                                            ;;
1502                                    ;;**************************************************************************
1503  003740  000004                    TST7:   SCOPE
1504  003742  052777  000002  175742            BIS     #DTR,@RXCSR     ;SET THIS BIT
1505  003750  032777  000002  175734            BIT     #DTR,@RXCSR     ;TEST THIS BIT
1506  003756  001001                            BNE     .+4     ;BR IF "1"
1507  003760  104004                            ERROR   4                       ;THIS BIT SHOULD BE SET
1508  003762  042777  000002  175722            BIC     #DTR,@RXCSR     ;CLR THIS BIT
1509  003770  032777  000002  175714            BIT     #DTR,@RXCSR     ;TEST THIS BIT
1510  003776  001401                            BEQ     .+4             ;BR IF "0"
1511  004000  104004                            ERROR   4                       ;THIS BIT SHOULD BE CLR
1512                                            ;NOW SET THIS BIT
1513  004002  052777  000002  175702            BIS     #DTR,@RXCSR
1514  004010  052777  000400  175710            BIS     #MRESET,@TXCSR  ;MASTER RESET
1515                                            ;;CHECK EXISTANCE OF OPTIONAL CLEAR JUMPER
1516                                            ;;
1517  004016  105767  175127                    TSTB    OPTCLR          ;TEST FLAG
1518  004022  100006                            BPL     1$              ;OPTIONAL CLR JUMPER IS NOT IN
1519  004024  032777  000002  175660            BIT     #DTR,@RXCSR     ;TEST THIS BIT
1520  004032  001401                            BEQ     .+4             ;BR IF "0"
1521  004034  104004                            ERROR   4                       ;CHECK OUT MASTER RESET LOGIC
1522  004036  000405                            BR      2$              ;JMP AROUND
1523  004040  032777  000002  175644  1$:       BIT     #DTR,@RXCSR     ;TEST THIS BIT
1524  004046  001001                            BNE     .+4     ;BR IF "1"
1525  004050  104004                            ERROR   4                       ;CHECK OUT OPTIONAL CLR JUMPER
1526  004052  000240                    2$:     NOP
```

```
1527
1528                                            ;;THIS TEST PERFORMS MASTER RESET TESTING &
1529                                            ;;TESTING OF READ/WRITE BIT RTS
1530                                            ;;
1531                                    ;;**************************************************************************
1532  004054  000004                    TST10:  SCOPE
1533  004056  052777  000004  175626            BIS     #RTS,@RXCSR     ;SET THIS BIT
1534  004064  032777  000004  175620            BIT     #RTS,@RXCSR     ;TEST THIS BIT
1535  004072  001001                            BNE     .+4     ;BR IF "1"
1536  004074  104004                            ERROR   4                       ;THIS BIT SHOULD BE SET
1537  004076  042777  000004  175606            BIC     #RTS,@RXCSR     ;CLR THIS BIT
1538  004104  032777  000004  175600            BIT     #RTS,@RXCSR     ;TEST THIS BIT
1539  004112  001401                            BEQ     .+4             ;BR IF "0"
1540  004114  104004                            ERROR   4                       ;THIS BIT SHOULD BE CLR
1541                                            ;NOW SET THIS BIT
1542  004116  052777  000004  175566            BIS     #RTS,@RXCSR
1543  004124  052777  000400  175574            BIS     #MRESET,@TXCSR  ;MASTER RESET
1544                                            ;;CHECK EXISTANCE OF OPTIONAL CLEAR JUMPER
1545                                            ;;
1546  004132  105767  175013                    TSTB    OPTCLR          ;TEST FLAG
1547  004136  100006                            BPL     1$              ;OPTIONAL CLR JUMPER IS NOT IN
1548  004140  032777  000004  175544            BIT     #RTS,@RXCSR     ;TEST THIS BIT
1549  004146  001401                            BEQ     .+4             ;BR IF "0"
1550  004150  104004                            ERROR   4                       ;CHECK OUT MASTER RESET LOGIC
1551  004152  000405                            BR      2$              ;JMP AROUND
1552  004154  032777  000004  175530  1$:       BIT     #RTS,@RXCSR     ;TEST THIS BIT
1553  004162  001001                            BNE     .+4     ;BR IF "1"
1554  004164  104004                            ERROR   4                       ;CHECK OUT OPTIONAL CLR JUMPER
1555  004166  000240                    2$:     NOP
1556
1557                                            ;WAIT FOR CABLE DELAYS
1558                                            ;*****************************************
1559                                            ;MODIFY "HOLD:"  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
1560                                            ;*****************************************
1561  004170  016702  174724                    MOV     HOLD,R2 ;SET DELAY TIME
1562  004174  005302                            DEC     R2
1563  004176  001376                            BNE     .-2     ;WAIT THIS TIME
1564                                            ;OK NOW FALL THRU AND CONTINUE TESTING.....
1565                                            ;EXIT STAGE LEFT....CHINNNG!
1566                                            ;;THIS TEST PERFORMS MASTER RESET TESTING &
1567                                            ;;TESTING OF READ/WRITE BIT STD
1568                                            ;;
1569                                    ;;**************************************************************************
1570  004200  000004                    TST11:  SCOPE
1571  004202  052777  000010  175502            BIS     #STD,@RXCSR     ;SET THIS BIT
1572  004210  032777  000010  175474            BIT     #STD,@RXCSR     ;TEST THIS BIT
1573  004216  001001                            BNE     .+4     ;BR IF "1"
1574  004220  104004                            ERROR   4                       ;THIS BIT SHOULD BE SET
1575  004222  042777  000010  175462            BIC     #STD,@RXCSR     ;CLR THIS BIT
1576  004230  032777  000010  175454            BIT     #STD,@RXCSR     ;TEST THIS BIT
1577  004236  001401                            BEQ     .+4             ;BR IF "0"
1578  004240  104004                            ERROR   4                       ;THIS BIT SHOULD BE CLR
1579                                            ;NOW SET THIS BIT
1580  004242  052777  000010  175442            BIS     #STD,@RXCSR
1581  004250  052777  000400  175450            BIS     #MRESET,@TXCSR  ;MASTER RESET
1582                                            ;;CHECK EXISTANCE OF OPTIONAL CLEAR JUMPER
```

```
1583                                            ;;
1584  004256  105767  174667                     TSTB    OPTCLR          ;TEST FLAG
1585  004262  100006                             BPL     1$              ;OPTIONAL CLR JUMPER IS NOT IN
1586  004264  032777  000010  175420             BIT     #STD,@RXCSR     ;TEST THIS BIT
1587  004272  001401                             BEQ     .+4             ;BR IF "0"
1588  004274  104004                             ERROR   4                       ;CHECK OUT MASTER RESET LOGIC
1589  004276  000405                             BR      2$              ;JMP AROUND
1590  004300  032777  000010  175404  1$:        BIT     #STD,@RXCSR     ;TEST THIS BIT
1591  004306  001001                             BNE     .+4     ;BR IF "1"
1592  004310  104004                             ERROR   4                       ;CHECK OUT OPTIONAL CLR JUMPER
1593  004312  000240                   2$:       NOP
1594
1595                                            ;;THIS TEST PERFORMS MASTER RESET TESTING &
1596                                            ;;TESTING OF READ/WRITE BIT SYNSCH
1597                                            ;;
1598                                    ;;**************************************************************
1599  004314  000004                    TST12:  SCOPE
1600  004316  052777  000020  175366            BIS     #SYNSCH,@RXCSR  ;SET THIS BIT
1601  004324  032777  000020  175360            BIT     #SYNSCH,@RXCSR  ;TEST THIS BIT
1602  004332  001001                            BNE     .+4     ;BR IF "1"
1603  004334  104004                            ERROR   4                       ;THIS BIT SHOULD BE SET
1604  004336  042777  000020  175346            BIC     #SYNSCH,@RXCSR  ;CLR THIS BIT
1605  004344  032777  000020  175340            BIT     #SYNSCH,@RXCSR  ;TEST THIS BIT
1606  004352  001401                            BEQ     .+4             ;BR IF "0"
1607  004354  104004                            ERROR   4                       ;THIS BIT SHOULD BE CLR
1608                                            ;NOW SET THIS BIT
1609  004356  052777  000020  175326            BIS     #SYNSCH,@RXCSR
1610  004364  052777  000400  175334            BIS     #MRESET,@TXCSR  ;MASTER RESET
1611  004372  032777  000020  175312            BIT     #SYNSCH,@RXCSR  ;TEST THIS BIT
1612  004400  001401                            BEQ     .+4             ;BR IF "0"
1613  004402  104004                            ERROR   4                       ;CHECK OUT MASTER RESET LOGIC
1614
1615                                            ;;THIS TEST PERFORMS MASTER RESET TESTING &
1616                                            ;;TESTING OF READ/WRITE BIT DSINTE
1617                                            ;;
1618                                    ;;**************************************************************
1619  004404  000004                    TST13:  SCOPE
1620  004406  052777  000040  175276            BIS     #DSINTE,@RXCSR  ;SET THIS BIT
1621  004414  032777  000040  175270            BIT     #DSINTE,@RXCSR  ;TEST THIS BIT
1622  004422  001001                            BNE     .+4     ;BR IF "1"
1623  004424  104004                            ERROR   4                       ;THIS BIT SHOULD BE SET
1624  004426  042777  000040  175256            BIC     #DSINTE,@RXCSR  ;CLR THIS BIT
1625  004434  032777  000040  175250            BIT     #DSINTE,@RXCSR  ;TEST THIS BIT
1626  004442  001401                            BEQ     .+4             ;BR IF "0"
1627  004444  104004                            ERROR   4                       ;THIS BIT SHOULD BE CLR
1628                                            ;NOW SET THIS BIT
1629  004446  052777  000040  175236            BIS     #DSINTE,@RXCSR
1630  004454  052777  000400  175244            BIS     #MRESET,@TXCSR  ;MASTER RESET
1631  004462  032777  000040  175222            BIT     #DSINTE,@RXCSR  ;TEST THIS BIT
1632  004470  001401                            BEQ     .+4             ;BR IF "0"
1633  004472  104004                            ERROR   4                       ;CHECK OUT MASTER RESET LOGIC
1634
1635                                            ;;THIS TEST PERFORMS MASTER RESET TESTING &
1636                                            ;;TESTING OF READ/WRITE BIT RINTEN
1637                                            ;;
1638                                    ;;**************************************************************
```

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1639  004474  000004                        TST14:  SCOPE
1640  004476  052777  000100  175206                BIS     #RINTEN,@RXCSR  ;SET THIS BIT
1641  004504  032777  000100  175200                BIT     #RINTEN,@RXCSR  ;TEST THIS BIT
1642  004512  001001                              BNE     .+4     ;BR IF "1"
1643  004514  104004                              ERROR   4                       ;THIS BIT SHOULD BE SET
1644  004516  042777  000100  175166              BIC     #RINTEN,@RXCSR  ;CLR THIS BIT
1645  004524  032777  000100  175160              BIT     #RINTEN,@RXCSR  ;TEST THIS BIT
1646  004532  001401                              BEQ     .+4             ;BR IF "0"
1647  004534  104004                              ERROR   4                       ;THIS BIT SHOULD BE CLR
1648                                               ;NOW SET THIS BIT
1649  004536  052777  000100  175146              BIS     #RINTEN,@RXCSR
1650  004544  052777  000400  175154              BIS     #MRESET,@TXCSR  ;MASTER RESET
1651  004552  032777  000100  175132              BIT     #RINTEN,@RXCSR  ;TEST THIS BIT
1652  004560  001401                              BEQ     .+4             ;BR IF "0"
1653  004562  104004                              ERROR   4                       ;CHECK OUT MASTER RESET LOGIC
1654
1655                                               ;;THIS TEST PERFORMS MASTER RESET TESTING &
1656                                               ;;TESTING OF READ/WRITE BIT STPSYN
1657                                               ;;
1658                                            ;;*****************************************************************
1659  004564  000004                        TST15:  SCOPE
1660  004566  052777  000400  175116              BIS     #STPSYN,@RXCSR  ;SET THIS BIT
1661  004574  032777  000400  175110              BIT     #STPSYN,@RXCSR  ;TEST THIS BIT
1662  004602  001001                              BNE     .+4     ;BR IF "1"
1663  004604  104004                              ERROR   4                       ;THIS BIT SHOULD BE SET
1664  004606  042777  000400  175076              BIC     #STPSYN,@RXCSR  ;CLR THIS BIT
1665  004614  032777  000400  175070              BIT     #STPSYN,@RXCSR  ;TEST THIS BIT
1666  004622  001401                              BEQ     .+4             ;BR IF "0"
1667  004624  104004                              ERROR   4                       ;THIS BIT SHOULD BE CLR
1668                                               ;NOW SET THIS BIT
1669  004626  052777  000400  175056              BIS     #STPSYN,@RXCSR
1670  004634  052777  000400  175064              BIS     #MRESET,@TXCSR  ;MASTER RESET
1671  004642  032777  000400  175042              BIT     #STPSYN,@RXCSR  ;TEST THIS BIT
1672  004650  001401                              BEQ     .+4             ;BR IF "0"
1673  004652  104004                              ERROR   4                       ;CHECK OUT MASTER RESET LOGIC
1674
1675                                               ;;THIS TEST PERFORMS MASTER RESET TESTING &
1676                                               ;;TESTING OF READ/WRITE BIT BREAK
1677                                               ;;
1678                                            ;;*****************************************************************
1679  004654  000004                        TST16:  SCOPE
1680  004656  052777  000001  175042              BIS     #BREAK,@TXCSR   ;SET THIS BIT
1681  004664  032777  000001  175034              BIT     #BREAK,@TXCSR   ;TEST THIS BIT
1682  004672  001001                              BNE     .+4     ;BR IF "1"
1683  004674  104004                              ERROR   4                       ;THIS BIT SHOULD BE SET
1684  004676  042777  000001  175022              BIC     #BREAK,@TXCSR   ;CLR THIS BIT
1685  004704  032777  000001  175014              BIT     #BREAK,@TXCSR   ;TEST THIS BIT
1686  004712  001401                              BEQ     .+4             ;BR IF "0"
1687  004714  104004                              ERROR   4                       ;THIS BIT SHOULD BE CLR
1688                                               ;NOW SET THIS BIT
1689  004716  052777  000001  175002              BIS     #BREAK,@TXCSR
1690  004724  052777  000400  174774              BIS     #MRESET,@TXCSR  ;MASTER RESET
1691  004732  032777  000001  174766              BIT     #BREAK,@TXCSR   ;TEST THIS BIT
1692  004740  001401                              BEQ     .+4             ;BR IF "0"
1693  004742  104004                              ERROR   4                       ;CHECK OUT MASTER RESET LOGIC
1694
```

```
                                        ;;THIS TEST PERFORMS MASTER RESET TESTING &
                                        ;;TESTING OF READ/WRITE BIT HDXEN
                                        ;;
                                ;;*****************************************************************
004744  000004                  TST17:  SCOPE
004746  052777  000010  174752          BIS     #HDXEN,@TXCSR   ;SET THIS BIT
004754  032777  000010  174744          BIT     #HDXEN,@TXCSR   ;TEST THIS BIT
004762  001001                          BNE     .+4     ;BR IF "1"
004764  104004                          ERROR   4                       ;THIS BIT SHOULD BE SET
004766  042777  000010  174732          BIC     #HDXEN,@TXCSR   ;CLR THIS BIT
004774  032777  000010  174724          BIT     #HDXEN,@TXCSR   ;TEST THIS BIT
005002  001401                          BEQ     .+4             ;BR IF "0"
005004  104004                          ERROR   4                       ;THIS BIT SHOULD BE CLR
                                        ;NOW SET THIS BIT
005006  052777  000010  174712          BIS     #HDXEN,@TXCSR
005014  052777  000400  174704          BIS     #MRESET,@TXCSR  ;MASTER RESET
005022  032777  000010  174676          BIT     #HDXEN,@TXCSR   ;TEST THIS BIT
005030  001401                          BEQ     .+4             ;BR IF "0"
005032  104004                          ERROR   4                       ;CHECK OUT MASTER RESET LOGIC

                                        ;;THIS TEST PERFORMS MASTER RESET TESTING &
                                        ;;TESTING OF READ/WRITE BIT SEND
                                        ;;
                                ;;*****************************************************************
005034  000004                  TST20:  SCOPE
005036  052777  000020  174662          BIS     #SEND,@TXCSR    ;SET THIS BIT
005044  032777  000020  174654          BIT     #SEND,@TXCSR    ;TEST THIS BIT
005052  001001                          BNE     .+4     ;BR IF "1"
005054  104004                          ERROR   4                       ;THIS BIT SHOULD BE SET
005056  042777  000020  174642          BIC     #SEND,@TXCSR    ;CLR THIS BIT
005064  032777  000020  174634          BIT     #SEND,@TXCSR    ;TEST THIS BIT
005072  001401                          BEQ     .+4             ;BR IF "0"
005074  104004                          ERROR   4                       ;THIS BIT SHOULD BE CLR
                                        ;NOW SET THIS BIT
005076  052777  000020  174622          BIS     #SEND,@TXCSR
005104  052777  000400  174614          BIS     #MRESET,@TXCSR  ;MASTER RESET
005112  032777  000020  174606          BIT     #SEND,@TXCSR    ;TEST THIS BIT
005120  001401                          BEQ     .+4             ;BR IF "0"
005122  104004                          ERROR   4                       ;CHECK OUT MASTER RESET LOGIC

                                        ;;THIS TEST PERFORMS MASTER RESET TESTING &
                                        ;;TESTING OF READ/WRITE BIT DNAINTE
                                        ;;
                                ;;*****************************************************************
005124  000004                  TST21:  SCOPE
005126  052777  000040  174572          BIS     #DNAINTE,@TXCSR ;SET THIS BIT
005134  032777  000040  174564          BIT     #DNAINTE,@TXCSR ;TEST THIS BIT
005142  001001                          BNE     .+4     ;BR IF "1"
005144  104004                          ERROR   4                       ;THIS BIT SHOULD BE SET
005146  042777  000040  174552          BIC     #DNAINTE,@TXCSR ;CLR THIS BIT
005154  032777  000040  174544          BIT     #DNAINTE,@TXCSR ;TEST THIS BIT
005162  001401                          BEQ     .+4             ;BR IF "0"
005164  104004                          ERROR   4                       ;THIS BIT SHOULD BE CLR
                                        ;NOW SET THIS BIT
005166  052777  000040  174532          BIS     #DNAINTE,@TXCSR
005174  052777  000400  174524          BIS     #MRESET,@TXCSR  ;MASTER RESET
```

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1751  005202  032777  000040  174516          BIT     #DNAINTE,@TXCSR ;TEST THIS BIT
1752  005210  001401                          BEQ     .+4             ;BR IF "0"
1753  005212  104004                          ERROR   4                       ;CHECK OUT MASTER RESET LOGIC
1754
1755                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1756                                          ;;TESTING OF READ/WRITE BIT TXINTE
1757                                          ;;
1758                                  ;;**************************************************************************
1759  005214  000004                  TST22:  SCOPE
1760  005216  052777  000100  174502          BIS     #TXINTE,@TXCSR  ;SET THIS BIT
1761  005224  032777  000100  174474          BIT     #TXINTE,@TXCSR  ;TEST THIS BIT
1762  005232  001001                          BNE     .+4     ;BR IF "1"
1763  005234  104004                          ERROR   4                       ;THIS BIT SHOULD BE SET
1764  005236  042777  000100  174462          BIC     #TXINTE,@TXCSR  ;CLR THIS BIT
1765  005244  032777  000100  174454          BIT     #TXINTE,@TXCSR  ;TEST THIS BIT
1766  005252  001401                          BEQ     .+4             ;BR IF "0"
1767  005254  104004                          ERROR   4                       ;THIS BIT SHOULD BE CLR
1768                                          ;NOW SET THIS BIT
1769  005256  052777  000100  174442          BIS     #TXINTE,@TXCSR
1770  005264  052777  000400  174434          BIS     #MRESET,@TXCSR  ;MASTER RESET
1771  005272  032777  000100  174426          BIT     #TXINTE,@TXCSR  ;TEST THIS BIT
1772  005300  001401                          BEQ     .+4             ;BR IF "0"
1773  005302  104004                          ERROR   4                       ;CHECK OUT MASTER RESET LOGIC
1774
1775                                          ;;TEST MAINT MODE BIT 0
1776                                          ;;
1777                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1778                                          ;;TESTING OF READ/WRITE BIT BIT11
1779                                          ;;
1780                                  ;;**************************************************************************
1781  005304  000004                  TST23:  SCOPE
1782  005306  052777  004000  174412          BIS     #BIT11,@TXCSR   ;SET THIS BIT
1783  005314  032777  004000  174404          BIT     #BIT11,@TXCSR   ;TEST THIS BIT
1784  005322  001001                          BNE     .+4     ;BR IF "1"
1785  005324  104004                          ERROR   4                       ;THIS BIT SHOULD BE SET
1786  005326  042777  004000  174372          BIC     #BIT11,@TXCSR   ;CLR THIS BIT
1787  005334  032777  004000  174364          BIT     #BIT11,@TXCSR   ;TEST THIS BIT
1788  005342  001401                          BEQ     .+4             ;BR IF "0"
1789  005344  104004                          ERROR   4                       ;THIS BIT SHOULD BE CLR
1790                                          ;NOW SET THIS BIT
1791  005346  052777  004000  174352          BIS     #BIT11,@TXCSR
1792  005354  052777  000400  174344          BIS     #MRESET,@TXCSR  ;MASTER RESET
1793  005362  032777  004000  174336          BIT     #BIT11,@TXCSR   ;TEST THIS BIT
1794  005370  001401                          BEQ     .+4             ;BR IF "0"
1795  005372  104004                          ERROR   4                       ;CHECK OUT MASTER RESET LOGIC
1796
1797                                          ;;TEST MAINT MODE BIT 1
1798                                          ;;
1799                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1800                                          ;;TESTING OF READ/WRITE BIT BIT12
1801                                          ;;
1802                                  ;;**************************************************************************
1803  005374  000004                  TST24:  SCOPE
1804  005376  052777  010000  174322          BIS     #BIT12,@TXCSR   ;SET THIS BIT
1805  005404  032777  010000  174314          BIT     #BIT12,@TXCSR   ;TEST THIS BIT
1806  005412  001001                          BNE     .+4     ;BR IF "1"
```

```
1807  005414  104004                          ERROR   4                       ;THIS BIT SHOULD BE SET
1808  005416  042777  010000  174302          BIC     #BIT12,@TXCSR   ;CLR THIS BIT
1809  005424  032777  010000  174274          BIT     #BIT12,@TXCSR   ;TEST THIS BIT
1810  005432  001401                          BEQ     .+4             ;BR IF "0"
1811  005434  104004                          ERROR   4                       ;THIS BIT SHOULD BE CLR
1812                                          ;NOW SET THIS BIT
1813  005436  052777  010000  174262          BIS     #BIT12,@TXCSR
1814  005444  052777  000400  174254          BIS     #MRESET,@TXCSR  ;MASTER RESET
1815  005452  032777  010000  174246          BIT     #BIT12,@TXCSR   ;TEST THIS BIT
1816  005460  001401                          BEQ     .+4             ;BR IF "0"
1817  005462  104004                          ERROR   4                       ;CHECK OUT MASTER RESET LOGIC
1818
1819                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1820                                          ;;TESTING OF READ/WRITE BIT CLK
1821                                          ;;
1822                                  ;;**************************************************************************
1823  005464  000004                  TST25:  SCOPE
1824  005466  052777  020000  174232          BIS     #CLK,@TXCSR     ;SET THIS BIT
1825  005474  032777  020000  174224          BIT     #CLK,@TXCSR     ;TEST THIS BIT
1826  005502  001001                          BNE     .+4     ;BR IF "1"
1827  005504  104004                          ERROR   4                       ;THIS BIT SHOULD BE SET
1828  005506  042777  020000  174212          BIC     #CLK,@TXCSR     ;CLR THIS BIT
1829  005514  032777  020000  174204          BIT     #CLK,@TXCSR     ;TEST THIS BIT
1830  005522  001401                          BEQ     .+4             ;BR IF "0"
1831  005524  104004                          ERROR   4                       ;THIS BIT SHOULD BE CLR
1832                                          ;NOW SET THIS BIT
1833  005526  052777  020000  174172          BIS     #CLK,@TXCSR
1834  005534  052777  000400  174164          BIS     #MRESET,@TXCSR  ;MASTER RESET
1835  005542  032777  020000  174156          BIT     #CLK,@TXCSR     ;TEST THIS BIT
1836  005550  001401                          BEQ     .+4             ;BR IF "0"
1837  005552  104004                          ERROR   4                       ;CHECK OUT MASTER RESET LOGIC
1838
1839                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1840                                          ;;TESTING OF READ/WRITE BIT MTDATA
1841                                          ;;
1842                                  ;;**************************************************************************
1843  005554  000004                  TST26:  SCOPE
1844  005556  052777  040000  174142          BIS     #MTDATA,@TXCSR  ;SET THIS BIT
1845  005564  032777  040000  174134          BIT     #MTDATA,@TXCSR  ;TEST THIS BIT
1846  005572  001001                          BNE     .+4     ;BR IF "1"
1847  005574  104004                          ERROR   4                       ;THIS BIT SHOULD BE SET
1848  005576  042777  040000  174122          BIC     #MTDATA,@TXCSR  ;CLR THIS BIT
1849  005604  032777  040000  174114          BIT     #MTDATA,@TXCSR  ;TEST THIS BIT
1850  005612  001401                          BEQ     .+4             ;BR IF "0"
1851  005614  104004                          ERROR   4                       ;THIS BIT SHOULD BE CLR
1852                                          ;NOW SET THIS BIT
1853  005616  052777  040000  174102          BIS     #MTDATA,@TXCSR
1854  005624  052777  000400  174074          BIS     #MRESET,@TXCSR  ;MASTER RESET
1855  005632  032777  040000  174066          BIT     #MTDATA,@TXCSR  ;TEST THIS BIT
1856  005640  001401                          BEQ     .+4             ;BR IF "0"
1857  005642  104004                          ERROR   4                       ;CHECK OUT MASTER RESET LOGIC
1858
1859                                  ;;THIS TEST VERIFYS THAT INIT (RESET) CLEARS BITS IN THE
1860                                  ;;RXCSR & TXCSR
1861                                  ;;
1862                                  ;;**************************************************************************
```

```
 1863  005644  000004                    TST27:  SCOPE
 1864  005646  012777  177777  174036            MOV     #177777,@RXCSR  ;SET ALL POSSIBLE BITS
 1865  005654  012777  177777  174044            MOV     #177777,@TXCSR  ;DITTO
 1866  005662  000005                            RESET
 1867  005664  106427  000340                    MTPS    #340    ;RESTORE NON INTERRUPT STATUS
 1868  005670  017701  174016                    MOV     @RXCSR,R1       ;SAVE
 1869  005674  017702  174026                    MOV     @TXCSR,R2       ;SAVE
 1870  005700  105767  173245                    TSTB    OPTCLR  ;IS THE OPTIONAL CLR JUMPER ON ?
 1871  005704  100402                            BMI     1$      ;YES
 1872  005706  042701  000016                    BIC     #16,R1  ;CLR THE NON RESETABLE BITS
 1873  005712  042701  073000            1$:     BIC     #073000,R1      ;CLR ALL NON-CLEARABLE BITS
 1874  005716  005701                            TST     R1      ;ARE THEY ALL 0 ?
 1875  005720  001401                            BEQ     .+4
 1876  005722  104004                            ERROR   4       ;ALL SPECIFIED BITS SHOULD BE CLEAR
 1877  005724  042702  002200                    BIC     #002200,R2      ;CLEAR ALL NON-CLEARABLE BITS
 1878  005730  005702                            TST     R2      ;ARE THEY ALL 0 ?
 1879  005732  001401                            BEQ     .+4
 1880  005734  104004                            ERROR   4       ;ALL SPECIFIED BITS SHOULD BE CLEAR
 1881                                            ;WAIT FOR CABLE DELAYS
 1882                                            ;*************************************
 1883                                            ;MODIFY "HOLD:"  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
 1884                                            ;*************************************
 1885  005736  016702  173156                    MOV     HOLD,R2 ;SET DELAY TIME
 1886  005742  005302                            DEC     R2
 1887  005744  001376                            BNE     .-2     ;WAIT THIS TIME
 1888                                            ;OK NOW FALL THRU AND CONTINUE TESTING.....
 1889                                            ;EXIT STAGE LEFT....CHINNNG!
 1890
 1891                                            ;;THIS TEST PERFORMS MASTER RESET TESTING &
 1892                                            ;;TESTING OF WRITE ONLY BIT MRESET
 1893                                            ;;
 1894                                    ;;**************************************************************************
 1895  005746  000004                    TST30:  SCOPE
 1896  005750  052777  000400  173750            BIS     #MRESET,@TXCSR  ;TRY TO SET THIS BIT
 1897  005756  032777  000400  173742            BIT     #MRESET,@TXCSR  ;TEST THIS BIT
 1898  005764  001401                            BEQ     .+4             ;BR IF "0"
 1899  005766  104004                            ERROR   4                       ;THIS BIT SHOULD NOT BE SET
 1900  005770  052777  000400  173730            BIS     #MRESET,@TXCSR  ;MASTER RESET
 1901  005776  032777  000400  173722            BIT     #MRESET,@TXCSR  ;TEST THIS BIT
 1902  006004  001401                            BEQ     .+4             ;BR IF "0"
 1903  006006  104004                            ERROR   4                       ;THIS BIT SHOULD NOT BE SET
 1904                                                                    ;CHECK MASTER RESET LOGIC
 1905
 1906                                    ;;THIS TEST VERIFYS THAT THE RXCSR & TXCSR CAN BE BYTE ADDRESSED (DATOB)
 1907                                    ;;
 1908                                    ;;**************************************************************************
 1909  006010  000004                    TST31:  SCOPE
 1910  006012  052777  000400  173706            BIS     #MRESET,@TXCSR  ;MASTER RESET
 1911  006020  105767  173125                    TSTB    OPTCLR  ;IS THE OPTIONAL CLR JUMPER ON ?
 1912  006024  100405                            BMI     1$      ;YES
 1913  006026  012777  000000  173656            MOV     #0,@RXCSR       ;CLR OUT NON RESETABLE BITS
 1914  006034  005777  173652                    TST     @RXCSR  ;CLR OUT DSC BY READING RXCSR
 1915  006040  152777  000001  173646  1$:       BISB    #BIT0,@HRXCSR   ;SET STRIP SYNC  UPPER BYTE
 1916  006046  017701  173640                    MOV     @RXCSR,R1       ;SAVE RXCSR
 1917  006052  022701  000400                    CMP     #400,R1 ;TEST RXCSR
 1918  006056  001401                            BEQ     .+4
```

```
1919  006060  104004                          ERROR   4       ;ONLY STRIP SYNC SHOULD BE SET
1920  006062  105077  173624                  CLRB    @RXCSR  ;CLR LOWER BYTE
1921  006066  017701  173620                  MOV     @RXCSR,R1       ;SAVE RXCSR
1922  006072  022701  000400                  CMP     #400,R1 ;TEST RXCSR
1923  006076  001401                          BEQ     .+4
1924  006100  104004                          ERROR   4       ;ONLY STRIP SYNC SHOULD BE SET
1925  006102  052777  000400  173616          BIS     #MRESET,@TXCSR  ;MASTER RESET
1926  006110  152777  000040  173612          BISB    #BIT5,@HTXCSR   ;SET MAINT CLK  UPPER BYTE
1927  006116  017701  173604                  MOV     @TXCSR,R1       ;SAVE TXCSR
1928  006122  042701  002000                  BIC     #BITW,R1        ;CLR BIT WINDOW (DEPENDENT
1929                                                  ;ON H315 CONNECTOR EXISTANCE)
1930  006126  022701  020200                  CMP     #20200,R1       ;TEST TXCSR
1931  006132  001401                          BEQ     .+4
1932  006134  104004                          ERROR   4       ;ONLY MAINT CLK BIT & TXDONE SHOULD BE SET
1933  006136  105077  173564                  CLRB    @TXCSR  ;CLR LOWER BYTE
1934  006142  017701  173560                  MOV     @TXCSR,R1       ;SAVE TXCSR
1935  006146  042701  002000                  BIC     #BITW,R1        ;CLR BIT WINDOW (DITTO)
1936  006152  022701  020200                  CMP     #20200,R1       ;TEST TXCSR
1937  006156  001401                          BEQ     .+4
1938  006160  104004                          ERROR   4       ;ONLY MAINT CLK BIT & TXDONE SHOULD BE SET
1939                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1940                                          ;;TESTING OF READ ONLY BIT BITW
1941                                          ;;MAINT INTERNAL
1942                                          ;;
1943                                  ;;**************************************************************************
1944  006162  000004                  TST32:  SCOPE
1945  006164  012777  044001  173534          MOV     #MINT!MTDATA!BREAK,@TXCSR       ;SET MAINT INT.,BREAK,
1946                                                                  ;&MTDATA
1947  006172  032777  002000  173526          BIT     #BITW,@TXCSR    ;TEST BITW
1948  006200  001001                          BNE     .+4
1949  006202  104004                          ERROR   4               ;BIT WINDOW SHOULD BE SET
1950  006204  042777  040000  173514          BIC     #MTDATA,@TXCSR
1951  006212  013702  001132                  MOV     @#1132,R2
1952  006216  005302                  1$:     DEC     R2
1953  006220  001376                          BNE     1$
1954  006222  032777  002000  173476          BIT     #BITW,@TXCSR
1955  006230  001401                          BEQ     .+4
1956  006232  104004                          ERROR   4               ;BIT SHOULD BE CLR
1957                                          ;NOW SET THE MTDATA
1958  006234  052777  040000  173464          BIS     #MTDATA,@TXCSR
1959  006242  052777  000400  173456          BIS     #MRESET,@TXCSR  ;MASTER RESET
1960  006250  052777  004001  173450          BIS     #MINT!BREAK,@TXCSR
1961  006256  013702  001132                  MOV     @#1132,R2
1962  006262  005302                  2$:     DEC     R2
1963  006264  001376                          BNE     2$
1964  006266  032777  002000  173432          BIT     #BITW,@TXCSR
1965  006274  001401                          BEQ     .+4
1966  006276  104004                          ERROR   4       ;BITW SHOULD BE CLR BY MASTER RESET
1967                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1968                                          ;;TESTING OF READ ONLY BIT BITW
1969                                          ;;MAINT EXTERNAL
1970                                          ;;
1971                                  ;;**************************************************************************
1972  006300  000004                  TST33:  SCOPE
1973                                          ;TEST TO SEE IF EXTERNAL MODEM BYPASS CONNECTOR
1974                                          ;IS ON (H315)....IF "NO" JUMP AROUND TEST
```

```
1975  006302  105767  172645              TSTB    JMRBY
1976  006306  100036                      BPL     1$      ;IT IS NOT ON
1977  006310  012777  050001  173410      MOV     #MEXT!MTDATA!BREAK,@TXCSR       ;SET MAINT EXT.,BREAK,
1978                                                      ;&MTDATA
1979  006316  032777  002000  173402      BIT     #BITW,@TXCSR    ;TEST BITW
1980  006324  001001                      BNE     .+4
1981  006326  104004                      ERROR   4               ;BIT WINDOW SHOULD BE SET
1982  006330  042777  040000  173370      BIC     #MTDATA,@TXCSR
1983  006336  032777  002000  173362      BIT     #BITW,@TXCSR
1984  006344  001401                      BEQ     .+4
1985  006346  104004                      ERROR   4               ;BIT SHOULD BE CLR
1986                                      ;NOW SET THE MTDATA
1987  006350  052777  040000  173350      BIS     #MTDATA,@TXCSR
1988  006356  052777  000400  173342      BIS     #MRESET,@TXCSR  ;MASTER RESET
1989  006364  052777  010001  173334      BIS     #MEXT!BREAK,@TXCSR
1990  006372  032777  002000  173326      BIT     #BITW,@TXCSR
1991  006400  001401                      BEQ     .+4
1992  006402  104004                      ERROR   4       ;BITW SHOULD BE CLR BY MASTER RESET
1993  006404                          1$:
1994
1995
1996                                      ;;THIS TEST PERFORMS MASTER RESET TESTING &
1997                                      ;;TESTING OF READ ONLY BIT RXDONE
1998                                      ;;
1999                                  ;;**************************************************************************
2000  006404  000004                  TST34:  SCOPE
2001  006406  052777  000400  173312      BIS     #MRESET,@TXCSR  ;MASTER RESET
2002  006414  032777  000200  173270      BIT     #RXDONE,@RXCSR  ;TEST THIS BIT
2003  006422  001401                      BEQ     .+4             ;BR IF "0"
2004  006424  104004                      ERROR   4                       ;CHECK MASTER RESET LOGIC
2005                                                  ;OR SHORT ON THIS BIT
2006
2007                                      ;;THIS TEST PERFORMS MASTER RESET TESTING &
2008                                      ;;TESTING OF READ ONLY BIT RECACT
2009                                      ;;
2010                                  ;;**************************************************************************
2011  006426  000004                  TST35:  SCOPE
2012  006430  052777  000400  173270      BIS     #MRESET,@TXCSR  ;MASTER RESET
2013  006436  032777  004000  173246      BIT     #RECACT,@RXCSR  ;TEST THIS BIT
2014  006444  001401                      BEQ     .+4             ;BR IF "0"
2015  006446  104004                      ERROR   4                       ;CHECK MASTER RESET LOGIC
2016                                                  ;OR SHORT ON THIS BIT
2017
2018                                      ;;THIS TEST PERFORMS MASTER RESET TESTING &
2019                                      ;;TESTING OF READ ONLY BIT DSC
2020                                      ;;
2021                                  ;;**************************************************************************
2022  006450  000004                  TST36:  SCOPE
2023  006452  052777  000400  173246      BIS     #MRESET,@TXCSR  ;MASTER RESET
2024  006460  032777  100000  173224      BIT     #DSC,@RXCSR     ;TEST THIS BIT
2025  006466  001401                      BEQ     .+4             ;BR IF "0"
2026  006470  104004                      ERROR   4                       ;CHECK MASTER RESET LOGIC
2027                                                  ;OR SHORT ON THIS BIT
2028
2029                                      ;;THIS TEST PERFORMS MASTER RESET TESTING &
2030                                      ;;TESTING OF READ ONLY BIT TXDONE
```

```
                                        ;;
                                ;;**************************************************************
006472  000004                TST37:  SCOPE
006474  052777  000400  173224        BIS     #MRESET,@TXCSR  ;MASTER RESET
006502  032777  000200  173216        BIT     #TXDONE,@TXCSR  ;TEST THIS BIT
006510  001001                        BNE     .+4                     ;BR IF "1"
006512  104004                        ERROR   4               ;CHECK MASTER RESET LOGIC
                                                        ;OR SHORT ON THIS BIT
                                        ;;THIS TEST PERFORMS MASTER RESET TESTING &
                                        ;;TESTING OF READ ONLY BIT DNA
                                        ;;
                                ;;**************************************************************
006514  000004                TST40:  SCOPE
006516  052777  000400  173202        BIS     #MRESET,@TXCSR  ;MASTER RESET
006524  032777  100000  173174        BIT     #DNA,@TXCSR     ;TEST THIS BIT
006532  001401                        BEQ     .+4             ;BR IF "0"
006534  104004                        ERROR   4                       ;CHECK MASTER RESET LOGIC
                                                        ;OR SHORT ON THIS BIT

                                        ;;THIS TEST PERFORMS MASTER RESET TESTING &
                                        ;;TESTING OF READ  ONLY WORD RECEIVE DATA
                                        ;;
                                ;;**************************************************************
006536  000004                TST41:  SCOPE
006540  052777  000400  173160        BIS     #MRESET,@TXCSR  ;MASTER RESET
006546  016703  173144                MOV     RXDBUF,R3       ;FOR ERROR MESSAGE
006552  012700  000377                MOV     #377,R0         ;EXPECTED
006556  017701  173134                MOV     @RXDBUF,R1      ;ACTUAL
006562  120C01                        CMPB    R0,R1
006564  001401                        BEQ     .+4             ;BR IF "0"
006566  104002                        ERROR   2               ;REC DATA SHOULD BE ALL 1'S
                                        ;;THIS TEST PERFORMS MASTER RESET TESTING &
                                        ;;TESTING OF READ ONLY BIT PARER
                                        ;;
                                ;;**************************************************************
006570  000004                TST42:  SCOPE
006572  052777  000400  173126        BIS     #MRESET,@TXCSR  ;MASTER RESET
006600  032777  010000  173110        BIT     #PARER,@RXDBUF  ;TEST THIS BIT
006606  001401                        BEQ     .+4             ;BR IF "0"
006610  104004                        ERROR   4                       ;CHECK MASTER RESET LOGIC
                                                        ;OR SHORT ON THIS BIT

                                        ;;THIS TEST PERFORMS MASTER RESET TESTING &
                                        ;;TESTING OF READ ONLY BIT FRMERR
                                        ;;
                                ;;**************************************************************
006612  000004                TST43:  SCOPE
006614  052777  000400  173104        BIS     #MRESET,@TXCSR  ;MASTER RESET
006622  032777  020000  173066        BIT     #FRMERR,@RXDBUF ;TEST THIS BIT
006630  001401                        BEQ     .+4             ;BR IF "0"
006632  104004                        ERROR   4                       ;CHECK MASTER RESET LOGIC
                                                        ;OR SHORT ON THIS BIT

                                        ;;THIS TEST PERFORMS MASTER RESET TESTING &
                                        ;;TESTING OF READ ONLY BIT OVRRUN
                                        ;;
```

```
                                ;;*****************************************************************
006634  000004                  TST44:  SCOPE
006636  052777  000400  173062          BIS     #MRESET,@TXCSR  ;MASTER RESET
006644  032777  040000  173044          BIT     #OVRRUN,@RXDBUF ;TEST THIS BIT
006652  001401                        BEQ     .+4             ;BR IF "0"
006654  104004                        ERROR   4                       ;CHECK MASTER RESET LOGIC
                                                        ;OR SHORT ON THIS BIT

                                        ;;THIS TEST PERFORMS MASTER RESET TESTING &
                                        ;;TESTING OF READ ONLY BIT RXERR
                                        ;;
                                ;;*****************************************************************
006656  000004                  TST45:  SCOPE
006660  052777  000400  173040          BIS     #MRESET,@TXCSR  ;MASTER RESET
006666  032777  100000  173022          BIT     #RXERR,@RXDBUF  ;TEST THIS BIT
006674  001401                        BEQ     .+4             ;BR IF "0"
006676  104004                        ERROR   4                       ;CHECK MASTER RESET LOGIC
                                                        ;OR SHORT ON THIS BIT

                                        ;;THIS TEST VERIFYS THAT THE DEVICE REGISTER RXCSR
                                        ;;IS CLEARED BY MASTER RESET
                                ;;*****************************************************************
006700  000004                  TST46:  SCOPE
006702  012777  177777  173002          MOV     #177777,@RXCSR  ;SET ALL POSSIBLE BITS
006710  052777  000400  173010          BIS     #MRESET,@TXCSR  ;MASTER RESET
006716  016703  172770                MOV     RXCSR,R3        ;FOR ERROR MESSAGE
006722  017701  172764                MOV     @RXCSR,R1       ;SAVE ACTUAL
006726  105767  172217                TSTB    OPTCLR          ;TEST THE OPT CLR JUMPER FLAG
006732  100010                        BPL     1$              ;NO ,ITS NOT IN
006734  042701  173000                BIC     #173000,R1      ;CLR NON-MASTER RESETTABLE
                                        ;BITS(SINCE THESE ARE DEPENDENT ON H315 CONNECTORS EXISTANCE)
006740  012700  000000                MOV     #0,R0   ;EXPECTED
006744  020001                        CMP     R0,R1   ;EXPECTED VS ACTUAL
006746  001401                        BEQ     .+4
006750  104001                        ERROR   1       ;ALL MASTER RESETABLE BITS SHOULD BE CLR
006752  000407                        BR      2$              ;JUMP AROUND
006754  042701  173000          1$:   BIC     #173000,R1      ;CLR NON-MASTER RESETABLE
                                        ;BITS(SINCE THESE ARE DEPENDENT ON H315 CONNECTORS EXISTANCE)
006760  012700  000016                MOV     #16,R0          ;EXPECTED
006764  020001                        CMP     R0,R1   ;EXPECTED VS ACTUAL
006766  001401                        BEQ     .+4
006770  104001                        ERROR   1       ;ONLY STD,RTS,DTR BITS SHOULD BE SET
                                        ;NOTE THAT STD IS READ =1 INDEPENDENT OF
                                        ;SEC XMIT #6 STRAP
006772                          2$:
                                ;WAIT FOR CABLE DELAYS
                                ;*****************************************
                                ;MODIFY "HOLD:"  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
                                ;*****************************************
006772  016702  172122                MOV     HOLD,R2 ;SET DELAY TIME
006776  005302                        DEC     R2
007000  001376                        BNE     .-2     ;WAIT THIS TIME
                                ;OK NOW FALL THRU AND CONTINUE TESTING.....
                                ;EXIT STAGE LEFT....CHINNNG!
```

```
                                        ;;THIS TEST VERIFYS THAT THE DEVICE REGISTER TXCSR
                                        ;;IS CLEARED BY MASTER RESET
                                        ;;
                                ;;**************************************************************************
007002  000004                  TST47:  SCOPE
007004  012777  177777  172714          MOV     #177777,@TXCSR  ;SET ALL POSSIBLE BITS
007012  052777  000400  172706          BIS     #MRESET,@TXCSR  ;MASTER RESET
007020  016703  172702                  MOV     TXCSR,R3        ;FOR ERROR MESSAGE
007024  017701  172676                  MOV     @TXCSR,R1       ;SAVE ACTUAL
007030  012700  000200                  MOV     #200,R0 ;EXPECTED
007034  020001                          CMP     R0,R1   ;EXPECTED VS ACTUAL
007036  001401                          BEQ     .+4
007040  104001                          ERROR   1       ;ONLY TXDONE SHOULD BE SET

                                        ;;THIS TEST VERIFYS THAT THE DEVICE REGISTER RXDBUF
                                        ;;IS CLEARED BY MASTER RESET
                                        ;;
                                ;;**************************************************************************
007042  000004                  TST50:  SCOPE
007044  052777  000400  172654          BIS     #MRESET,@TXCSR  ;MASTER RESET
007052  016703  172640                  MOV     RXDBUF,R3       ;FOR ERROR MESSAGE
007056  017701  172634                  MOV     @RXDBUF,R1      ;SAVE
007062  012700  000377                  MOV     #377,R0 ;EXPECTED
007066  020001                          CMP     R0,R1   ;EXPECTED VS ACTUAL
007070  001401                          BEQ     .+4
007072  104002                          ERROR   2       ;ONLY REC DATA BITS SHOULD BE SET
                                        ;;THIS TEST VERIFYS BITS RING,CTS,CARDET,SRD,DSR
                                        ;;ALSO DSC IS GENERATED WHEN ANY OF THESE BITS ARE SET
                                        ;;OR CLEARED.....IT ALSO CHECKS THE MODEM BYPASS
                                        ;;JUMPER AND THAT THESE BITS CAN BE READ
                                        ;;NOTE: THE MODEM BYPASS JUMPER MUST BE ON (H315)
                                        ;;
                                ;;**************************************************************************
007074  000004                  TST51:  SCOPE
007076  005077  172610                  CLR     @RXCSR  ;TO GET RID OF STD ,RTS,DTR IF OPTCLR JUMPER #4 IS NOT ON
007102  052777  000400  172616          BIS     #MRESET,@TXCSR  ;MASTER RESET
                                        ;TEST THAT A "YES" ANSWER WAS GIVEN TO QUESTION IN
                                        ;THE MONITOR OR BY DEFAULT
                                        ;THIS TEST WILL BE BYPASSED  IF THE EXTERNAL BYPASS
                                        ;JUMPER IS NOT INSTALLED
007110  105767  172037                  TSTB    JMRBY
007114  100402                          BMI     .+6     ;THE ANSWER WAS YES.....
                                                        ; PERFORM THIS TEST
007116  000167  000652                  JMP     OUT1    ;JUMP AROUND THIS TEST IF THE ANSWER
                                                        ;WAS NO
007122  016703  172564                  MOV     RXCSR,R3        ;SET UP FOR ERROR MESSAGE
007126  017701  172560                  MOV     @RXCSR,R1       ;ACTUAL
007132  005000                          CLR     R0      ;EXPECTED
007134  005701                          TST     R1      ;IS IT = 0 ?
007136  001401                          BEQ     .+4
007140  104001                          ERROR   1       ;RXCSR SHOULD BE CLR
007142  052777  000002  172542          BIS     #DTR,@RXCSR     ;SET DTR
                                        ;WAIT FOR CABLE DELAYS
                                        ;***************************************
                                        ;MODIFY "HOLD:"  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
                                        ;***************************************
```

```
2199  007150  016702  171744                MOV     HOLD,R2 ;SET DELAY TIME
2200  007154  005302                       DEC     R2
2201  007156  001376                       BNE     .-2     ;WAIT THIS TIME
2202                                        ;OK NOW FALL THRU AND CONTINUE TESTING.....
2203                                        ;EXIT STAGE LEFT....CHINNNG!
2204  007160  017701  172526                MOV     @RXCSR,R1       ;ACTUAL
2205  007164  012700  130002                MOV     #130002,R0      ;DSC,CTS,CARDET,DTR
2206  007170  020001                       CMP     R0,R1   ;EXPECTED VS ACTUAL
2207  007172  001401                       BEQ     .+4
2208  007174  104001                       ERROR   1       ;CHECK BYPASS CONNECTOR
2209  007176  017701  172510                MOV     @RXCSR,R1       ;ACTUAL
2210  007202  012700  030002                MOV     #30002,R0       ;CTS,CARDET,DTR
2211  007206  020001                       CMP     R0,R1   ;EXPECTED VS ACTUAL
2212  007210  001401                       BEQ     .+4
2213  007212  104001                       ERROR   1       ;PREVIOUS READING OF RXCSR SHOULD
2214                                                        ;HAVE CLEARED DSC
2215  007214  052777  000004  172470       BIS     #RTS,@RXCSR
2216                                        ;WAIT FOR CABLE DELAYS
2217                                        ;*************************************
2218                                        ;MODIFY "HOLD:"  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2219                                        ;*************************************
2220  007222  016702  171672                MOV     HOLD,R2 ;SET DELAY TIME
2221  007226  005302                       DEC     R2
2222  007230  001376                       BNE     .-2     ;WAIT THIS TIME
2223                                        ;OK NOW FALL THRU AND CONTINUE TESTING.....
2224                                        ;EXIT STAGE LEFT....CHINNNG!
2225  007232  017701  172454                MOV     @RXCSR,R1
2226  007236  012700  170006                MOV     #170006,R0      ;DSC,RING,CTS,CARDET,RTS,DTR
2227  007242  020001                       CMP     R0,R1   ;EXPECTED VS ACTUAL
2228  007244  001401                       BEQ     .+4
2229  007246  104001                       ERROR   1       ;CHECK BYPASS CONNECTOR
2230  007250  017701  172436                MOV     @RXCSR,R1
2231  007254  012700  070006                MOV     #70006,R0       ;RING,CTS,CARDET,RTS,DTR
2232  007260  020001                       CMP     R0,R1   ;EXPECTED VS ACTUAL
2233  007262  001401                       BEQ     .+4
2234  007264  104001                       ERROR   1       ;PREVIOUS READING OF RXCSR SHOULD
2235                                                        ;HAVE CLEARED DSC
2236  007266  105767  171655                TSTB    SEXMIT  ;IS SEC XMIT JUMPER IN ?
2237  007272  100112                       BPL     OUT2    ;NO
2238  007274  105767  171650                TSTB    SEREC   ;IS SEC REC JUMPER IN ?
2239  007300  100163                       BPL     OUT3    ;NO
2240  007302  052777  000010  172402       BIS     #STD,@RXCSR
2241                                        ;WAIT FOR CABLE DELAYS
2242                                        ;*************************************
2243                                        ;MODIFY "HOLD:"  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2244                                        ;*************************************
2245  007310  016702  171604                MOV     HOLD,R2 ;SET DELAY TIME
2246  007314  005302                       DEC     R2
2247  007316  001376                       BNE     .-2     ;WAIT THIS TIME
2248                                        ;OK NOW FALL THRU AND CONTINUE TESTING.....
2249                                        ;EXIT STAGE LEFT....CHINNNG!
2250  007320  017701  172366                MOV     @RXCSR,R1
2251  007324  012700  173016        MASK1:  MOV     #173016,R0      ;DSC,RING,CTS,CARDET,SRD,DSR
2252                                                        ;STD,RTS,DTR
2253  007330  020001                       CMP     R0,R1   ;EXPECTED VS ACTUAL
2254  007332  001401                       BEQ     .+4
```

```
2255  007334  104001                          ERROR   1       ;CHECK BYPASS CONNECTOR
2256  007336  017701  172350                  MOV     @RXCSR,R1
2257  007342  012700  073016          MASK2:  MOV     #73016,R0       ;RING,CTS,CARDET,SRD,DSR,STD
2258                                                                  ;RTS,DTR
2259  007346  020001                          CMP     R0,R1   ;EXPECTED VS ACTUAL
2260  007350  001401                          BEQ     .+4
2261  007352  104001                          ERROR   1       ;PREVIOUS READING OF RXCSR SHOULD
2262                                                          ;HAVE CLEARED DSC
2263  007354  042777  000002  172330          BIC     #DTR,@RXCSR
2264                                          ;WAIT FOR CABLE DELAYS
2265                                          ;*****************************************
2266                                          ;MODIFY "HOLD:"  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2267                                          ;*****************************************
2268  007362  016702  171532                  MOV     HOLD,R2 ;SET DELAY TIME
2269  007366  005302                          DEC     R2
2270  007370  001376                          BNE     .-2     ;WAIT THIS TIME
2271                                          ;OK NOW FALL THRU AND CONTINUE TESTING.....
2272                                          ;EXIT STAGE LEFT....CHINNNG!
2273  007372  017701  172314                  MOV     @RXCSR,R1
2274  007376  012700  143014                  MOV     #143014,R0      ;DSC,RING,SRD,DSR,STD,RTS
2275  007402  020001                          CMP     R0,R1   ;EXPECTED VS ACTUAL
2276  007404  001401                          BEQ     .+4
2277  007406  104001                          ERROR   1       ;DSC SHOULD BE SET
2278  007410  042777  000004  172274          BIC     #RTS,@RXCSR
2279                                          ;WAIT FOR CABLE DELAYS
2280                                          ;*****************************************
2281                                          ;MODIFY "HOLD:"  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2282                                          ;*****************************************
2283  007416  016702  171476                  MOV     HOLD,R2 ;SET DELAY TIME
2284  007422  005302                          DEC     R2
2285  007424  001376                          BNE     .-2     ;WAIT THIS TIME
2286                                          ;OK NOW FALL THRU AND CONTINUE TESTING.....
2287                                          ;EXIT STAGE LEFT....CHINNNG!
2288  007426  017701  172260                  MOV     @RXCSR,R1
2289  007432  012700  103010          MASK3:  MOV     #103010,R0      ;DSC,SRD,DSR,STD
2290  007436  020001                          CMP     R0,R1   ;EXPECTED VS ACTUAL
2291  007440  001401                          BEQ     .+4
2292  007442  104001                          ERROR   1       ;DSC SHOULD BE SET
2293  007444  042777  000010  172240          BIC     #STD,@RXCSR
2294                                          ;WAIT FOR CABLE DELAYS
2295                                          ;*****************************************
2296                                          ;MODIFY "HOLD:"  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2297                                          ;*****************************************
2298  007452  016702  171442                  MOV     HOLD,R2 ;SET DELAY TIME
2299  007456  005302                          DEC     R2
2300  007460  001376                          BNE     .-2     ;WAIT THIS TIME
2301                                          ;OK NOW FALL THRU AND CONTINUE TESTING.....
2302                                          ;EXIT STAGE LEFT....CHINNNG!
2303  007462  017701  172224                  MOV     @RXCSR,R1
2304  007466  012700  100000                  MOV     #100000,R0      ;DSC
2305  007472  020001                          CMP     R0,R1   ;EXPECTED VS ACTUAL
2306  007474  001401                          BEQ     .+4
2307  007476  104001                          ERROR   1       ;DSC SHOULD BE SET
2308  007500  017701  172206                  MOV     @RXCSR,R1
2309  007504  005000                          CLR     R0      ;NONE
2310  007506  005701                          TST     R1
```

```
2311  007510  001401                          BEQ     .+4
2312  007512  104001                          ERROR   1       ;DSC SHOULD BE CLEARED FROM PREVIOUS
2313                                                          ;READING OF RXCSR
2314  007514  000167  000254                  JMP     OUT1    ;JUMP AROUND
2315                                ;THE FOLLOWING ROUTINE HANDLES THE SITUATION WHERE SEC XMIT
2316                                ;AND SEC REC JUMPERS ARE NOT ON
2317  007520  052777  000010  172164  OUT2:   BIS     #STD,@RXCSR
2318                                          ;WAIT FOR CABLE DELAYS
2319                                          ;*************************************
2320                                          ;MODIFY "HOLD:"  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2321                                          ;*************************************
2322  007526  016702  171366                  MOV     HOLD,R2 ;SET DELAY TIME
2323  007532  005302                          DEC     R2
2324  007534  001376                          BNE     .-2     ;WAIT THIS TIME
2325                                          ;OK NOW FALL THRU AND CONTINUE TESTING.....
2326                                          ;EXIT STAGE LEFT....CHINNNG!
2327  007536  017701  172150                  MOV     @RXCSR,R1       ;ACTUAL
2328  007542  012700  070016                  MOV     #70016,R0       ;EXPECTED: RING ,CTS,CARDET,STD,RTS,DTR
2329  007546  020001                          CMP     R0,R1   ;EXPECTED VS ACTUAL
2330  007550  001401                          BEQ     .+4
2331  007552  104001                          ERROR   1       ;CHECK SEC XMIT & SEC REC JUMPERS
2332  007554  042777  000004  172130          BIC     #RTS,@RXCSR
2333                                          ;WAIT FOR CABLE DELAYS
2334                                          ;*************************************
2335                                          ;MODIFY "HOLD:"  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2336                                          ;*************************************
2337  007562  016702  171332                  MOV     HOLD,R2 ;SET DELAY TIME
2338  007566  005302                          DEC     R2
2339  007570  001376                          BNE     .-2     ;WAIT THIS TIME
2340                                          ;OK NOW FALL THRU AND CONTINUE TESTING.....
2341                                          ;EXIT STAGE LEFT....CHINNNG!
2342  007572  017701  172114                  MOV     @RXCSR,R1       ;ACTUAL
2343  007576  012700  130012                  MOV     #130012,R0      ;DSC,CTS,CARDET,DTR,STD
2344                                          ;NOTE THAT DSC STILL ASSERTS EVEN THO THE SEC XMIT JUMPER # 6 IS NOT ON
2345  007602  020001                          CMP     R0,R1   ;EXPECTED VS ACTUAL
2346  007604  001401                          BEQ     .+4
2347  007606  104001                          ERROR   1       ;CHECK BYPASS CONNECTOR
2348  007610  042777  000002  172074          BIC     #DTR,@RXCSR
2349                                          ;WAIT FOR CABLE DELAYS
2350                                          ;*************************************
2351                                          ;MODIFY "HOLD:"  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2352                                          ;*************************************
2353  007616  016702  171276                  MOV     HOLD,R2 ;SET DELAY TIME
2354  007622  005302                          DEC     R2
2355  007624  001376                          BNE     .-2     ;WAIT THIS TIME
2356                                          ;OK NOW FALL THRU AND CONTINUE TESTING.....
2357                                          ;EXIT STAGE LEFT....CHINNNG!
2358  007626  017701  172060                  MOV     @RXCSR,R1       ;ACTUAL
2359  007632  012700  100010                  MOV     #100010,R0      ;DSC,STD
2360  007636  020001                          CMP     R0,R1   ;EXPECTED VS ACTUAL
2361  007640  001401                          BEQ     .+4
2362  007642  104001                          ERROR   1       ;ONLY DSC & STD  SHOULD BE SET
2363  007644  000167  000124                  JMP     OUT1    ;JUMP AROUND
2364  007650  052777  000010  172034  OUT3:   BIS     #STD,@RXCSR
2365                                          ;WAIT FOR CABLE DELAYS
2366                                          ;*************************************
```

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2367                                        ;MODIFY "HOLD:"  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2368                                        ;*****************************************
2369  007656  016702  171236                MOV     HOLD,R2 ;SET DELAY TIME
2370  007662  005302                        DEC     R2
2371  007664  001376                        BNE     .-2     ;WAIT THIS TIME
2372                                        ;OK NOW FALL THRU AND CONTINUE TESTING.....
2373                                        ;EXIT STAGE LEFT....CHINNNG!
2374  007666  017701  172020                MOV     @RXCSR,R1       ;ACTUAL
2375  007672  012700  171016                MOV     #171016,R0      ;EXPECTED: DSC,RING,CTS,CARDET,DSR,STD,RTS,DTR
2376  007676  020001                        CMP     R0,R1   ;EXPECTED VS ACTUAL
2377  007700  001401                        BEQ     .+4
2378  007702  104001                        ERROR   1       ;CHECK SEC REC JUMPER
2379  007704  042777  000004  172000        BIC     #RTS,@RXCSR
2380                                        ;WAIT FOR CABLE DELAYS
2381                                        ;*****************************************
2382                                        ;MODIFY "HOLD:"  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2383                                        ;*****************************************
2384  007712  016702  171202                MOV     HOLD,R2 ;SET DELAY TIME
2385  007716  005302                        DEC     R2
2386  007720  001376                        BNE     .-2     ;WAIT THIS TIME
2387                                        ;OK NOW FALL THRU AND CONTINUE TESTING.....
2388                                        ;EXIT STAGE LEFT....CHINNNG!
2389  007722  017701  171764                MOV     @RXCSR,R1       ;ACTUAL
2390  007726  012700  131012                MOV     #131012,R0      ;EXPECTED: DSC,CTS,CARDET,DSR,STD,DTR
2391  007732  020001                        CMP     R0,R1   ;EXPECTED VS ACTUAL
2392  007734  001401                        BEQ     .+4
2393  007736  104001                        ERROR   1       ;CHECK H315 CONNECTOR
2394  007740  042777  000002  171744        BIC     #DTR,@RXCSR
2395                                        ;WAIT FOR CABLE DELAYS
2396                                        ;*****************************************
2397                                        ;MODIFY "HOLD:"  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2398                                        ;*****************************************
2399  007746  016702  171146                MOV     HOLD,R2 ;SET DELAY TIME
2400  007752  005302                        DEC     R2
2401  007754  001376                        BNE     .-2     ;WAIT THIS TIME
2402                                        ;OK NOW FALL THRU AND CONTINUE TESTING.....
2403                                        ;EXIT STAGE LEFT....CHINNNG!
2404  007756  017701  171730                MOV     @RXCSR,R1       ;ACTUAL
2405  007762  012700  101010                MOV     #101010,R0      ;EXPECTED: DSC,DSR,STD
2406  007766  020001                        CMP     R0,R1   ;EXPECTED VS ACTUAL
2407  007770  001401                        BEQ     .+4
2408  007772  104001                        ERROR   1       ;CHECK H315 CONNECTOR
2409  007774                        OUT1:
2410
2411                                        ;;THIS TEST VERIFYS THAT RECACT (REC ACTIVE) ASSERTS
2412                                        ;;IMMED. WHEN SYNC EXTERNAL MODE IS SELECTED
2413                                        ;;AND SYNC SEARCH IS SET
2414                                        ;;
2415                                ;;**************************************************************************
2416  007774  000004                TST52:  SCOPE
2417  007776  052777  000400  171722        BIS     #MRESET,@TXCSR  ;MASTER RESET
2418  010004  012777  020000  171710        MOV     #SYNEXT,@PARCSR ;SET THE MODE
2419  010012  052777  000400  171706        BIS     #MRESET,@TXCSR  ;MASTER RESET
2420
2421                                ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
2422  010020  012777  064001  171700        MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
```

```
2423
2424                                    ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
2425  010026  012777  026026  171666            MOV     #SYNEXT!EIGHT!NOPAR!26,@PARCSR
2426  010034  032777  004000  171650            BIT     #RECACT,@RXCSR
2427  010042  001401                            BEQ     .+4
2428  010044  104004                            ERROR   4                       ;RECACT SHOULD NOT BE SET
2429  010046  052777  000020  171636            BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
2430  010054  032777  004000  171630            BIT     #RECACT,@RXCSR
2431  010062  001001                            BNE     .+4
2432  010064  104004                            ERROR   4                       ;RECACT DID NOT ASSERT
2433  010066  042777  000020  171616            BIC     #SYNSCH,@RXCSR  ;DROP SEARCH SYNC
2434  010074  032777  004000  171610            BIT     #RECACT,@RXCSR  ;IS IT =0?
2435  010102  001401                            BEQ     .+4
2436  010104  104004                            ERROR   4       ;RECACT SHOULD BE 0
2437
2438                                            ;;THIS TEST VERIFYS THAT RECACT (REC ACTIVE) ASSERTS
2439                                            ;;IMMED. WHEN ISOCRONOUS MODE IS SELECTED
2440                                            ;;AND SYNC SEARCH IS SET
2441                                            ;;
2442                                    ;;**************************************************************************
2443  010106  000004                    TST53:  SCOPE
2444  010110  052777  000400  171610            BIS     #MRESET,@TXCSR  ;MASTER RESET
2445  010116  012777  000000  171576            MOV     #ISYMOD,@PARCSR ;SET THE MODE
2446  010124  052777  000400  171574            BIS     #MRESET,@TXCSR  ;MASTER RESET
2447
2448                                    ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
2449  010132  012777  064001  171566            MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
2450
2451                                    ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
2452  010140  012777  006026  171554            MOV     #ISYMOD!EIGHT!NOPAR!26,@PARCSR
2453  010146  032777  004000  171536            BIT     #RECACT,@RXCSR
2454  010154  001401                            BEQ     .+4
2455  010156  104004                            ERROR   4                       ;RECACT SHOULD NOT BE SET
2456  010160  052777  000020  171524            BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
2457  010166  032777  004000  171516            BIT     #RECACT,@RXCSR
2458  010174  001001                            BNE     .+4
2459  010176  104004                            ERROR   4                       ;RECACT DID NOT ASSERT
2460  010200  042777  000020  171504            BIC     #SYNSCH,@RXCSR  ;DROP SEARCH SYNC
2461  010206  032777  004000  171476            BIT     #RECACT,@RXCSR  ;IS IT =0?
2462  010214  001401                            BEQ     .+4
2463  010216  104004                            ERROR   4       ;RECACT SHOULD BE 0
2464
2465                                            ;;VERIFY THE MATCH DETECT & DATA RDY FLAGS BY PUMPING
2466                                            ;;IN TWO * SYNC CHARS THRU MAINT DATA BIT
2467                                            ;;WATCH THE RECACT BIT
2468                                            ;;ON THE THIRD * CHARACTER IT SHOULD SET RXDONE
2469                                            ;;*: DEPENDENT ON MONITOR.............
2470                                            ;;IF ONE SYNC STRAP IS SELECTED THEN IT WILL ONLY
2471                                            ;;TAKE ONE SYNC CHARACTER FOR RXDONE TO ASSERT
2472                                            ;;ON THE SECOND CHARACTER
2473                                            ;;ALSO CHECK THIS CHARACTER IN RXDBUF
2474                                            ;;AND CHECK OPERATION OF SYNSCH
2475                                            ;;MODE: SYNC INTERNAL
2476                                            ;;LENGTH:FIVE
2477                                            ;;
2478                                    ;;**************************************************************************
```

```
2479  010220  000004                    TST54:  SCOPE
2480  010222  052777  000400  171476            BIS     #MRESET,@TXCSR  ;MASTER RESET
2481  010230  012777  030000  171464            MOV     #SYNINT,@PARCSR ;SET THE MODE
2482  010236  052777  000400  171462            BIS     #MRESET,@TXCSR  ;MASTER RESET
2483
2484                                    ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
2485  010244  012777  064001  171454            MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
2486
2487                                    ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
2488  010252  012777  030026  171442            MOV     #SYNINT!FIVE!NOPAR!26,@PARCSR
2489  010260  016703  171432                    MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
2490  010264  052777  000020  171420            BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
2491                                            ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
2492  010272  042777  020000  171426            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2493  010300  052777  020000  171420            BIS     #CLK,@TXCSR     ;POKE CLK UP
2494                                    ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
2495  010306  042777  020000  171412            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2496  010314  052777  020000  171404            BIS     #CLK,@TXCSR     ;POKE CLK UP
2497  010322  012767  000002  170574            MOV     #2,COUNT
2498  010330  012767  000005  170564  1$:       MOV     #5,SHIFT        ;# OF SHIFTS
2499  010336  012767  000026  171134            MOV     #26,$TMP1       ;SYNC CHARACTER
2500  010344  004767  006554                    JSR     PC,RPOKE
2501  010350  005367  170550                    DEC     COUNT
2502  010354  001403                            BEQ     2$
2503                                            ;TEST SYNCNO TO SEE HOW MANY SYNC CHARS WERE SELECTED
2504  010356  105767  170564                    TSTB    SYNCNO
2505  010362  100762                            BMI     1$      ;TWO SYNC CHARS
2506  010364  105777  171322          2$:       TSTB    @RXCSR  ;CHECK REC DONE BIT
2507  010370  100001                            BPL     .+4
2508  010372  104004                            ERROR   4               ;RXDONE SHOULD NOT BE ASSERTED
2509  010374  032777  004000  171310            BIT     #RECACT,@RXCSR
2510  010402  001001                            BNE     .+4
2511  010404  104004                            ERROR   4               ;RECACT SHOULD BE ASSERTED
2512  010406  012767  000005  170506            MOV     #5,SHIFT
2513  010414  012767  000021  171056            MOV     #21,$TMP1       ;ANY CHARACTER
2514  010422  004767  006476                    JSR     PC,RPOKE
2515  010426  105777  171260                    TSTB    @RXCSR  ;CHECK RXDONE
2516  010432  100401                            BMI     .+4
2517  010434  104004                            ERROR   4               ;RXDONE SHOULD BE ASSERTED
2518  010436  032777  004000  171246            BIT     #RECACT,@RXCSR
2519  010444  001001                            BNE     .+4
2520  010446  104004                            ERROR   4               ;RECACT SHOULD STILL BE ASSERTED
2521  010450  042777  000020  171234            BIC     #SYNSCH,@RXCSR  ;CLR SYNC SEARCH
2522  010456  032777  004000  171226            BIT     #RECACT,@RXCSR  ;IT SHOULD DROP IMMEDIATELY
2523  010464  001401                            BEQ     .+4
2524  010466  104004                            ERROR   4               ;RECACT SHOULD BE CLR
2525  010470  105777  171216                    TSTB    @RXCSR  ;RXDONE
2526  010474  100401                            BMI     .+4
2527  010476  104004                            ERROR   4               ;RXDONE SHOULD STILL BE ASSERTED
2528  010500  012700  000021                    MOV     #21,R0  ;EXPECTED DATA
2529  010504  017701  171206                    MOV     @RXDBUF,R1      ;ACTUAL DATA
2530  010510  020001                            CMP     R0,R1   ;COMPARE EXP VS ACT
2531  010512  001401                            BEQ     .+4
2532  010514  104002                            ERROR   2               ;DATA CHARS SHOULD COMPARE
2533  010516  105777  171170                    TSTB    @RXCSR  ;CHECK RXDONE
2534  010522  100001                            BPL     .+4
```

```
2535  010524  104004                          ERROR   4       ;RXDONE SHOULD BE CLR FROM
2536                                                          ;PREVIOUS READING OF RXDBUF
2537
2538                                          ;;VERIFY THE MATCH DETECT & DATA RDY FLAGS BY PUMPING
2539                                          ;;IN TWO * SYNC CHARS THRU MAINT DATA BIT
2540                                          ;;WATCH THE RECACT BIT
2541                                          ;;ON THE THIRD * CHARACTER IT SHOULD SET RXDONE
2542                                          ;;*: DEPENDENT ON MONITOR.............
2543                                          ;;IF ONE SYNC STRAP IS SELECTED THEN IT WILL ONLY
2544                                          ;;TAKE ONE SYNC CHARACTER FOR RXDONE TO ASSERT
2545                                          ;;ON THE SECOND CHARACTER
2546                                          ;;ALSO CHECK THIS CHARACTER IN RXDBUF
2547                                          ;;AND CHECK OPERATION OF SYNSCH
2548                                          ;;MODE: SYNC INTERNAL
2549                                          ;;LENGTH:SIX
2550                                          ;;
2551                                      ;;*****************************************************************
2552  010526  000004                      TST55:  SCOPE
2553  010530  052777  000400  171170              BIS     #MRESET,@TXCSR  ;MASTER RESET
2554  010536  012777  030000  171156              MOV     #SYNINT,@PARCSR ;SET THE MODE
2555  010544  052777  000400  171154              BIS     #MRESET,@TXCSR  ;MASTER RESET
2556
2557                                      ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
2558  010552  012777  064001  171146              MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
2559
2560                                      ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
2561  010560  012777  032026  171134              MOV     #SYNINT!SIX!NOPAR!26,@PARCSR
2562  010566  016703  171124                      MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
2563  010572  052777  000020  171112              BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
2564                                              ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
2565  010600  042777  020000  171120              BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2566  010606  052777  020000  171112              BIS     #CLK,@TXCSR     ;POKE CLK UP
2567                                      ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
2568  010614  042777  020000  171104              BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2569  010622  052777  020000  171076              BIS     #CLK,@TXCSR     ;POKE CLK UP
2570  010630  012767  000002  170266              MOV     #2,COUNT
2571  010636  012767  000006  170256  1$:         MOV     #6,SHIFT        ;# OF SHIFTS
2572  010644  012767  000026  170626              MOV     #26,$TMP1       ;SYNC CHARACTER
2573  010652  004767  006246                      JSR     PC,RPOKE
2574  010656  005367  170242                      DEC     COUNT
2575  010662  001403                              BEQ     2$
2576                                              ;TEST SYNCNO TO SEE HOW MANY SYNC CHARS WERE SELECTED
2577  010664  105767  170256                      TSTB    SYNCNO
2578  010670  100762                              BMI     1$      ;TWO SYNC CHARS
2579  010672  105777  171014          2$:         TSTB    @RXCSR  ;CHECK REC DONE BIT
2580  010676  100001                              BPL     .+4
2581  010700  104004                              ERROR   4               ;RXDONE SHOULD NOT BE ASSERTED
2582  010702  032777  004000  171002              BIT     #RECACT,@RXCSR
2583  010710  001001                              BNE     .+4
2584  010712  104004                              ERROR   4               ;RECACT SHOULD BE ASSERTED
2585  010714  012767  000006  170200              MOV     #6,SHIFT
2586  010722  012767  000021  170550              MOV     #21,$TMP1       ;ANY CHARACTER
2587  010730  004767  006170                      JSR     PC,RPOKE
2588  010734  105777  170752                      TSTB    @RXCSR  ;CHECK RXDONE
2589  010740  100401                              BMI     .+4
2590  010742  104004                              ERROR   4               ;RXDONE SHOULD BE ASSERTED
```

```
2591  010744  032777  004000  170740          BIT     #RECACT,@RXCSR
2592  010752  001001                          BNE     .+4
2593  010754  104004                          ERROR   4               ;RECACT SHOULD STILL BE ASSERTED
2594  010756  042777  000020  170726          BIC     #SYNSCH,@RXCSR  ;CLR SYNC SEARCH
2595  010764  032777  004000  170720          BIT     #RECACT,@RXCSR  ;IT SHOULD DROP IMMEDIATELY
2596  010772  001401                          BEQ     .+4
2597  010774  104004                          ERROR   4               ;RECACT SHOULD BE CLR
2598  010776  105777  170710                  TSTB    @RXCSR  ;RXDONE
2599  011002  100401                          BMI     .+4
2600  011004  104004                          ERROR   4               ;RXDONE SHOULD STILL BE ASSERTED
2601  011006  012700  000021                  MOV     #21,R0  ;EXPECTED DATA
2602  011012  017701  170700                  MOV     @RXDBUF,R1      ;ACTUAL DATA
2603  011016  020001                          CMP     R0,R1   ;COMPARE EXP VS ACT
2604  011020  001401                          BEQ     .+4
2605  011022  104002                          ERROR   2       ;DATA CHARS SHOULD COMPARE
2606  011024  105777  170662                  TSTB    @RXCSR  ;CHECK RXDONE
2607  011030  100001                          BPL     .+4
2608  011032  104004                          ERROR   4       ;RXDONE SHOULD BE CLR FROM
2609                                          ;PREVIOUS READING OF RXDBUF
2610
2611                                  ;;VERIFY THE MATCH DETECT & DATA RDY FLAGS BY PUMPING
2612                                  ;;IN TWO * SYNC CHARS THRU MAINT DATA BIT
2613                                  ;;WATCH THE RECACT BIT
2614                                  ;;ON THE THIRD * CHARACTER IT SHOULD SET RXDONE
2615                                  ;;*: DEPENDENT ON MONITOR.....
2616                                  ;;IF ONE SYNC STRAP IS SELECTED THEN IT WILL ONLY
2617                                  ;;TAKE ONE SYNC CHARACTER FOR RXDONE TO ASSERT
2618                                  ;;ON THE SECOND CHARACTER
2619                                  ;;ALSO CHECK THIS CHARACTER IN RXDBUF
2620                                  ;;AND CHECK OPERATION OF SYNSCH
2621                                  ;;MODE: SYNC INTERNAL
2622                                  ;;LENGTH:SEVEN
2623                                  ;;
2624                          ;;**************************************************************************
2625  011034  000004          TST56:  SCOPE
2626  011036  052777  000400  170662          BIS     #MRESET,@TXCSR  ;MASTER RESET
2627  011044  012777  030000  170650          MOV     #SYNINT,@PARCSR ;SET THE MODE
2628  011052  052777  000400  170646          BIS     #MRESET,@TXCSR  ;MASTER RESET
2629
2630                          ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
2631  011060  012777  064001  170640          MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
2632
2633                          ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
2634  011066  012777  034026  170626          MOV     #SYNINT!SEVEN!NOPAR!26,@PARCSR
2635  011074  016703  170616                  MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
2636  011100  052777  000020  170604          BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
2637                                          ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
2638  011106  042777  020000  170612          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2639  011114  052777  020000  170604          BIS     #CLK,@TXCSR     ;POKE CLK UP
2640                          ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
2641  011122  042777  020000  170576          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2642  011130  052777  020000  170570          BIS     #CLK,@TXCSR     ;POKE CLK UP
2643  011136  012767  000002  167760          MOV     #2,COUNT
2644  011144  012767  000007  167750  1$:     MOV     #7,SHIFT        ;# OF SHIFTS
2645  011152  012767  000026  170320          MOV     #26,$TMP1       ;SYNC CHARACTER
2646  011160  004767  005740                  JSR     PC,RPOKE
```

```
2647  011164  005367  167734                  DEC     COUNT
2648  011170  001403                          BEQ     2$
2649                                          ;TEST SYNCNO TO SEE HOW MANY SYNC CHARS WERE SELECTED
2650  011172  105767  167750                  TSTB    SYNCNO
2651  011176  100762                          BMI     1$      ;TWO SYNC CHARS
2652  011200  105777  170506          2$:     TSTB    @RXCSR  ;CHECK REC DONE BIT
2653  011204  100001                          BPL     .+4
2654  011206  104004                          ERROR   4               ;RXDONE SHOULD NOT BE ASSERTED
2655  011210  032777  004000  170474          BIT     #RECACT,@RXCSR
2656  011216  001001                          BNE     .+4
2657  011220  104004                          ERROR   4               ;RECACT SHOULD BE ASSERTED
2658  011222  012767  000007  167672          MOV     #7,SHIFT
2659  011230  012767  000021  170242          MOV     #21,$TMP1       ;ANY CHARACTER
2660  011236  004767  005662                  JSR     PC,RPOKE
2661  011242  105777  170444                  TSTB    @RXCSR  ;CHECK RXDONE
2662  011246  100401                          BMI     .+4
2663  011250  104004                          ERROR   4               ;RXDONE SHOULD BE ASSERTED
2664  011252  032777  004000  170432          BIT     #RECACT,@RXCSR
2665  011260  001001                          BNE     .+4
2666  011262  104004                          ERROR   4               ;RECACT SHOULD STILL BE ASSERTED
2667  011264  042777  000020  170420          BIC     #SYNSCH,@RXCSR  ;CLR SYNC SEARCH
2668  011272  032777  004000  170412          BIT     #RECACT,@RXCSR  ;IT SHOULD DROP IMMEDIATELY
2669  011300  001401                          BEQ     .+4
2670  011302  104004                          ERROR   4               ;RECACT SHOULD BE CLR
2671  011304  105777  170402                  TSTB    @RXCSR  ;RXDONE
2672  011310  100401                          BMI     .+4
2673  011312  104004                          ERROR   4               ;RXDONE SHOULD STILL BE ASSERTED
2674  011314  012700  000021                  MOV     #21,R0  ;EXPECTED DATA
2675  011320  017701  170372                  MOV     @RXDBUF,R1      ;ACTUAL DATA
2676  011324  020001                          CMP     R0,R1   ;COMPARE EXP VS ACT
2677  011326  001401                          BEQ     .+4
2678  011330  104002                          ERROR   2       ;DATA CHARS SHOULD COMPARE
2679  011332  105777  170354                  TSTB    @RXCSR  ;CHECK RXDONE
2680  011336  100001                          BPL     .+4
2681  011340  104004                          ERROR   4       ;RXDONE SHOULD BE CLR FROM
2682                                                        ;PREVIOUS READING OF RXDBUF
2683
2684                                          ;;VERIFY THE MATCH DETECT & DATA RDY FLAGS BY PUMPING
2685                                          ;;IN TWO * SYNC CHARS THRU MAINT DATA BIT
2686                                          ;;WATCH THE RECACT BIT
2687                                          ;;ON THE THIRD * CHARACTER IT SHOULD SET RXDONE
2688                                          ;;*: DEPENDENT ON MONITOR.....
2689                                          ;;IF ONE SYNC STRAP IS SELECTED THEN IT WILL ONLY
2690                                          ;;TAKE ONE SYNC CHARACTER FOR RXDONE TO ASSERT
2691                                          ;;ON THE SECOND CHARACTER
2692                                          ;;ALSO CHECK THIS CHARACTER IN RXDBUF
2693                                          ;;AND CHECK OPERATION OF SYNSCH
2694                                          ;;MODE: SYNC INTERNAL
2695                                          ;;LENGTH:EIGHT
2696                                          ;;
2697                                  ;;**************************************************************************
2698  011342  000004                  TST57:  SCOPE
2699  011344  052777  000400  170354          BIS     #MRESET,@TXCSR  ;MASTER RESET
2700  011352  012777  030000  170342          MOV     #SYNINT,@PARCSR ;SET THE MODE
2701  011360  052777  000400  170340          BIS     #MRESET,@TXCSR  ;MASTER RESET
2702
```

```
2703                                    ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
2704  011366  012777  064001  170332            MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
2705
2706                                    ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
2707  011374  012777  036026  170320            MOV     #SYNINT!EIGHT!NOPAR!26,@PARCSR
2708  011402  016703  170310                  MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
2709  011406  052777  000020  170276            BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
2710                                          ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
2711  011414  042777  020000  170304            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2712  011422  052777  020000  170276            BIS     #CLK,@TXCSR     ;POKE CLK UP
2713                                    ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
2714  011430  042777  020000  170270            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2715  011436  052777  020000  170262            BIS     #CLK,@TXCSR     ;POKE CLK UP
2716  011444  012767  000002  167452            MOV     #2,COUNT
2717  011452  012767  000010  167442  1$:       MOV     #8.,SHIFT       ;# OF SHIFTS
2718  011460  012767  000026  170012            MOV     #26,$TMP1       ;SYNC CHARACTER
2719  011466  004767  005432                    JSR     PC,RPOKE
2720  011472  005367  167426                    DEC     COUNT
2721  011476  001403                            BEQ     2$
2722                                          ;TEST SYNCNO TO SEE HOW MANY SYNC CHARS WERE SELECTED
2723  011500  105767  167442                    TSTB    SYNCNO
2724  011504  100762                            BMI     1$      ;TWO SYNC CHARS
2725  011506  105777  170200          2$:       TSTB    @RXCSR  ;CHECK REC DONE BIT
2726  011512  100001                            BPL     .+4
2727  011514  104004                            ERROR   4               ;RXDONE SHOULD NOT BE ASSERTED
2728  011516  032777  004000  170166            BIT     #RECACT,@RXCSR
2729  011524  001001                            BNE     .+4
2730  011526  104004                            ERROR   4               ;RECACT SHOULD BE ASSERTED
2731  011530  012767  000010  167364            MOV     #8.,SHIFT
2732  011536  012767  000021  167734            MOV     #21,$TMP1       ;ANY CHARACTER
2733  011544  004767  005354                    JSR     PC,RPOKE
2734  011550  105777  170136                    TSTB    @RXCSR  ;CHECK RXDONE
2735  011554  100401                            BMI     .+4
2736  011556  104004                            ERROR   4               ;RXDONE SHOULD BE ASSERTED
2737  011560  032777  004000  170124            BIT     #RECACT,@RXCSR
2738  011566  001001                            BNE     .+4
2739  011570  104004                            ERROR   4               ;RECACT SHOULD STILL BE ASSERTED
2740  011572  042777  000020  170112            BIC     #SYNSCH,@RXCSR  ;CLR SYNC SEARCH
2741  011600  032777  004000  170104            BIT     #RECACT,@RXCSR  ;IT SHOULD DROP IMMEDIATELY
2742  011606  001401                            BEQ     .+4
2743  011610  104004                            ERROR   4               ;RECACT SHOULD BE CLR
2744  011612  105777  170074                    TSTB    @RXCSR  ;RXDONE
2745  011616  100401                            BMI     .+4
2746  011620  104004                            ERROR   4               ;RXDONE SHOULD STILL BE ASSERTED
2747  011622  012700  000021                    MOV     #21,R0  ;EXPECTED DATA
2748  011626  017701  170064                    MOV     @RXDBUF,R1      ;ACTUAL DATA
2749  011632  020001                            CMP     R0,R1   ;COMPARE EXP VS ACT
2750  011634  001401                            BEQ     .+4
2751  011636  104002                            ERROR   2       ;DATA CHARS SHOULD COMPARE
2752  011640  105777  170046                    TSTB    @RXCSR  ;CHECK RXDONE
2753  011644  100001                            BPL     .+4
2754  011646  104004                            ERROR   4       ;RXDONE SHOULD BE CLR FROM
2755                                          ;PREVIOUS READING OF RXDBUF
2756
2757                                    ;;THIS TEST VERIFYS WORD LENGTH SELECT OF THE
2758                                    ;;RECEIVER SECTION,IT USES THE ERROR FLAGS
```

```
                                                ;;TO DETERMINE THAT IT WAS SELECTED CORRECTLY
                                                ;;(OVRRUN,RXERR)
                                                ;;MODE:ISYMOD
                                                ;;LENGTH:FIVE
                                                ;;CHAR:25
                                                ;;
                                        ;;**************************************************************************
011650  000004                          TST60:  SCOPE
011652  052777  000400  170046                  BIS     #MRESET,@TXCSR  ;MASTER RESET
011660  012777  000000  170034                  MOV     #ISYMOD,@PARCSR ;SET THE MODE
011666  052777  000400  170032                  BIS     #MRESET,@TXCSR  ;MASTER RESET

                                        ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
011674  012777  064001  170024                  MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR

                                        ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
011702  012777  000000  170012                  MOV     #ISYMOD!FIVE!NOPAR!0,@PARCSR
011710  052777  000020  167774                  BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
                                                ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
011716  042777  020000  170002                  BIC     #CLK,@TXCSR     ;POKE CLK DOWN
011724  052777  020000  167774                  BIS     #CLK,@TXCSR     ;POKE CLK UP
                                        ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
011732  042777  020000  167766                  BIC     #CLK,@TXCSR     ;POKE CLK DOWN
011740  052777  020000  167760                  BIS     #CLK,@TXCSR     ;POKE CLK UP
011746  016703  167744                          MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
011752  012700  000025                          MOV     #25,R0  ;EXPECTED
011756  012767  000007  167136                  MOV     #7,$SHIFT       ;# OF SHIFTS
011764  012767  000152  167506                  MOV     #152,$TMP1      ;DATA CHAR
011772  004767  005126                          JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
011776  105777  167710                          TSTB    @RXCSR  ;RXDONE ?
012002  100401                                  BMI     .+4
012004  104004                                  ERROR   4       ;RXDONE SHOULD BE SET
012006  017701  167704                          MOV     @RXDBUF,R1      ;ACTUAL
012012  020001                                  CMP     R0,R1   ;COMPARE EXPECTED VS. ACTUAL
012014  001401                                  BEQ     .+4
012016  104002                                  ERROR   2       ;RECEIVED DATA DID NOT MATCH
                                                ;EXPECTED DATA - CHECK MAINT DATA
                                                ;OR RECEIVER LOGIC
012020  012767  000007  167074                  MOV     #7,SHIFT        ;# OF SHIFTS
012026  012767  000152  167444                  MOV     #152,$TMP1      ;DATA CHAR
012034  004767  005064                          JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
                                        ;NOW SHIFT IN A SECOND CHARACTER WITHOUT READING RXDBUF
012040  012767  000007  167054                  MOV     #7,SHIFT        ;# OF SHIFTS
012046  012767  000152  167424                  MOV     #152,$TMP1      ;DATA CHAR
012054  004767  005044                          JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
012060  012700  140025                          MOV     #140000!25,R0   ;EXPECTED DATA PLUS
                                                ;RXERR & OVRRUN
012064  017701  167626                          MOV     @RXDBUF,R1      ;ACTUAL
012070  020001                                  CMP     R0,R1   ;COMPARE EXP VS. ACT
012072  001401                                  BEQ     .+4
012074  104002                                  ERROR   2       ;SPECIFICALLY LOOK AT RXERR &
                                                ;OVRRUN BITS...THEY BOTH SHOULD BE SET

                                                ;;THIS TEST VERIFYS WORD LENGTH SELECT OF THE
                                                ;;RECEIVER SECTION,IT USES THE ERROR FLAGS
                                                ;;TO DETERMINE THAT IT WAS SELECTED CORRECTLY
```

```
2815                                            ;;(OVRRUN,RXERR)
2816                                            ;;MODE:ISYMOD
2817                                            ;;LENGTH:FIVE
2818                                            ;;CHAR:12
2819                                            ;;
2820                                    ;;**************************************************************************
2821  012076  000004                    TST61:  SCOPE
2822  012100  052777  000400  167620            BIS     #MRESET,@TXCSR  ;MASTER RESET
2823  012106  012777  000000  167606            MOV     #ISYMOD,@PARCSR ;SET THE MODE
2824  012114  052777  000400  167604            BIS     #MRESET,@TXCSR  ;MASTER RESET
2825
2826                                    ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
2827  012122  012777  064001  167576            MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
2828
2829                                    ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
2830  012130  012777  000000  167564            MOV     #ISYMOD!FIVE!NOPAR!0,@PARCSR
2831  012136  052777  000020  167546            BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
2832                                            ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
2833  012144  042777  020000  167554            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2834  012152  052777  020000  167546            BIS     #CLK,@TXCSR     ;POKE CLK UP
2835                                    ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
2836  012160  042777  020000  167540            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2837  012166  052777  020000  167532            BIS     #CLK,@TXCSR     ;POKE CLK UP
2838  012174  016703  167516                    MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
2839  012200  012700  000012                    MOV     #12,R0  ;EXPECTED
2840  012204  012767  000007  166710            MOV     #7,SHIFT        ;# OF SHIFTS
2841  012212  012767  000124  167260            MOV     #124,$TMP1      ;DATA CHAR
2842  012220  004767  004700                    JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
2843  012224  105777  167462                    TSTB    @RXCSR  ;RXDONE ?
2844  012230  100401                            BMI     .+4
2845  012232  104004                            ERROR   4       ;RXDONE SHOULD BE SET
2846  012234  017701  167456                    MOV     @RXDBUF,R1      ;ACTUAL
2847  012240  020001                            CMP     R0,R1   ;COMPARE EXPECTED VS. ACTUAL
2848  012242  001401                            BEQ     .+4
2849  012244  104002                            ERROR   2       ;RECEIVED DATA DID NOT MATCH
2850                                                            ;EXPECTED DATA - CHECK MAINT DATA
2851                                                            ;OR RECEIVER LOGIC
2852  012246  012767  000007  166646            MOV     #7,SHIFT        ;# OF SHIFTS
2853  012254  012767  000124  167216            MOV     #124,$TMP1      ;DATA CHAR
2854  012262  004767  004636                    JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
2855                                    ;NOW SHIFT IN A SECOND CHARACTER WITHOUT READING RXDBUF
2856  012266  012767  000007  166626            MOV     #7,SHIFT        ;# OF SHIFTS
2857  012274  012767  000124  167176            MOV     #124,$TMP1      ;DATA CHAR
2858  012302  004767  004616                    JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
2859  012306  012700  140012                    MOV     #140000!12,R0   ;EXPECTED DATA PLUS
2860                                                            ;RXERR & OVRRUN
2861  012312  017701  167400                    MOV     @RXDBUF,R1      ;ACTUAL
2862  012316  020001                            CMP     R0,R1   ;COMPARE EXP VS. ACT
2863  012320  001401                            BEQ     .+4
2864  012322  104002                            ERROR   2       ;SPECIFICALLY LOOK AT RXERR &
2865                                                            ;OVRRUN BITS...THEY BOTH SHOULD BE SET
2866
2867
2868
2869                                            ;END OF PASS
2870                                            ;TYPE NAME OF TEST
```

```
                                        ;UPDATE PASS COUNT
                                        ;CHECK FOR EXIT TO ACT-11
                                        ;RESTART TEST
                                        
012324  000004                  .EOP:   SCOPE
012326  004767  000340                  JSR     PC,CKSWR
012332  104401                          TYPE                            ;TYPE NAME OF TEST
012334  015463                          MEPASS
012336  104413  012570                  CONVRT  ,OUTCRY
012342  104401  015302                  TYPE    ,DEVICE
012346  105767  166600                  TSTB    MULTD   ;ARE YOU RUNNING MULTIPLE DEVICES ?
012352  001511                          BEQ     CCC     ;NO,JUMP AROUND
012354  005767  166606                  TST     ACTREG  ;ARE ANY DEVICES ACTIVE ?
012360  001007                          BNE     RUNIT   ;YES
012362  104401  015314                  TYPE    ,MCOW   ;NO
012366  016700  166574                  MOV     ACTREG,R0       ;DISPLAY ACTREG
012372  000000                          HALT            ;SELECT SOMETHING TO RUN @ ACTREG:
                                        ;SELECT SWITCHES & HIT CONTINUE (PUT SW00 =1)
012374  000167  167552                  JMP     .START  ;START OVER AGAIN.....YOU DESELECTED EVERYTHING
012400  062767  000010  166546  RUNIT:  ADD     #10,BASEADD     ;NEXT BLOCK (ADDRESSES)
012406  062767  000010  166546  ZERO:   ADD     #10,BASEIV      ;NEXT BLOCK (VECTORS)
012414  000241                          CLC
012416  006167  166546                  ROL     ROTADD  ;UP DATE ROTATING POINTER
012422  103410                          BCS     2$      ;IS IT THE LAST DEVICE
                                                        ;TO BE TESTED IN THIS PASS ?
012424  036767  166540  166534          BIT     ROTADD,ACTREG   ;TEST THIS DEVICE FOR ACTIVE STATUS
012432  001762                          BEQ     RUNIT   ;IF NOT ACTIVE, TRY NEXT ADDRESS
012434  004767  000034                  JSR     PC,REPLAY       ;CALCULATE NEW PARAMETERS
012440  000167  000210                  JMP     RESTRT  ;YES IT WAS ACTIVE,TEST THIS DEVICE
012444  012767  000001  166516  2$:     MOV     #1,ROTADD       ;OK!,NOW SET UP  ROTATING
                                                        ;POINTER FOR NEXT MULTIPLE PASS
012452  016767  166500  166474          MOV     KEEPADD,BASEADD ;RESTORE BASE ADDRESS
012460  016767  166500  166474          MOV     KEEPIV,BASEIV   ;RESTORE BASE INTERRUPT VECTORS
012466  004767  000002                  JSR     PC,REPLAY       ;CALC NEW PARAMETERS
012472  000441                          BR      CCC     ;JUMP AROUND REPLAY
012474  016767  166454  004420  REPLAY: MOV     BASEADD,DUBASE  ;SET UP FOR NEW ADDRESSES
012502  004767  004262                  JSR     PC,DUADDR       ;CREATE NEW ADDRESSES
012506  016767  166450  167222          MOV     BASEIV,DURIV    ;CREATE DURIV
012514  062767  000002  166440          ADD     #2,BASEIV
012522  016767  166434  167210          MOV     BASEIV,DURIS    ;CREATE DURIS
012530  062767  000002  166424          ADD     #2,BASEIV
012536  016767  166420  167176          MOV     BASEIV,DUTIV    ;CREATE DUTIV
012544  062767  000002  166410          ADD     #2,BASEIV
012552  016767  166404  167164          MOV     BASEIV,DUTIS    ;CREATE DUTIS
012560  016767  167152  166374          MOV     DURIV,BASEIV    ;RESTORE
012566  000207                          RTS     PC
                                        
012570  000001                  OUTCRY: 1
012572     006     002                  .BYTE   6,2
012574  001712                          RXCSR
                                        
012576                          CCC:
012576  005067  166600                  CLR     $TSTNM                  ;CLEAR TEST NUMBER
012602  005067  166610                  CLR     $ERRPC                  ;CLEAR LAST ERROR PC
012606  005067  166571                  CLR     $ERFLG                  ;CLEAR ERROR FLAG
012612  005267  166274                  INC     PASCNT                  ;UPDATE PASS COUNT
```

```
2927  012616  016767  166270  166256          MOV     PASCNT,LIGHTS           ;DISPLAY PASS COUNT
2928  012624  016767  166262  166702          MOV     PASCNT,$PASS            ;PASS COUNT TO APT
2929  012632  013701  000042                  MOV     @#42,R1                 ;CHECK FOR ACT-11 OR DDP
2930  012636  001406                          BEQ     RESTRT          ;IF NO CONTINUE TESTING
2931  012640  000005                          RESET
2932  012642  000005                          RESET
2933  012644  004711                  $ENDAD: JSR     PC,(R1)
2934  012646  000240                          NOP
2935  012650  000240                          NOP
2936  012652  000240                          NOP
2937  012654                          RESTRT:
2938  012654  012767  003376  166524          MOV     #TST1+2,$LPADR  ;LOAD LAST ADDR
2939  012662  004767  000004                  JSR     PC,CKSWR
2940  012666  000167  170416                  JMP     .BEGIN
2941
2942                                          ;CHECK SWITCH REGISTER ROUTINE.
2943                                          ;CHECKS TO ALLOW FOR <^G> TO ALLOW
2944                                          ;THE CHANGING OF LOCATION 176
2945
2946  012672  005737  000042          CKSWR:  TST     @#42
2947  012676  001040                          BNE     OUT
2948  012700  022767  000176  166532          CMP     #SWREG,SWR      ;SOFTWARE SWR PRESENT?
2949  012706  001034                          BNE     OUT             ;NO--LEAVE
2950  012710  105777  166530                  TSTB    @$TKS           ;CHECK TTY READY
2951  012714  100031                          BPL     OUT             ;NO--LEAVE
2952  012716  017767  166524  000422          MOV     @$TKB,.MSG      ;GET CHARACTER
2953  012724  042767  177600  000414          BIC     #177600,.MSG    ;STRIP JUNK
2954  012732  122767  000007  000406          CMPB    #7,.MSG         ;IS IT <^G> ?
2955  012740  001017                          BNE     OUT             ;NO
2956  012742  104401  016070                  TYPE    ,MCNTG
2957  012746  005137  013006          CNTLU:  COM     @#RDSW
2958  012752  104401  016100                  TYPE    ,MMSWR
2959  012756  104413                          CONVRT
2960  012760  013010                          SWREGL
2961  012762  104406  016111                  INSTR,MMNEW
2962  012766  104410                          PARAM
2963  012770  000000                          0
2964  012772  177777                          177777
2965  012774  000176                          SWREG
2966  012776     000      001          .BYTE   0,1
2967  013000  005037  013006          OUT:    CLR     @#RDSW
2968  013004  000207                          RTS     PC
2969  013006  000000                  RDSW:   .WORD   0
2970  013010  000001                  SWREGL: 1
2971  013012     006      002                  .BYTE   6,2
2972  013014  000176                          SWREG
2973
2974  013016  000005                          5
2975
2976                                          ;CHECK FOR FREEZE ON CURRENT DATA
2977
2978  013020  004767  177646          .SCOP1: JSR     PC,CKSWR
2979  013024  032777  001000  166406          BIT     #SW09,@SWR
2980  013032  001402                          BEQ     1$
2981  013034  016716  166050                  MOV     LOCK,(SP)
2982  013040  000002                  1$:     RTI
```

```
                                        .SBTTL  TYPE ROUTINE

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

013042  105767  166411          $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
013046  100002                          BPL     1$              ;;BR IF YES
013050  000000                          HALT                    ;;HALT HERE IF NO TERMINAL
013052  000430                          BR      3$              ;;LEAVE
013054  010046                  1$:     MOV     R0,-(SP)        ;;SAVE R0
013056  017600  000002                  MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
013062  122767  000001  166456          CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
013070  001011                          BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
013072  132767  000100  166447          BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
013100  001405                          BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
013102  010067  000004                  MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
013106  004767  164674                  JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
013112  000000                  61$:    .WORD   0               ;;MESSAGE ADDRESS
013114  132767  000040  166425  62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
013122  001003                          BNE     60$             ;;YES,SKIP TYPE OUT
013124  112046                  2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
013126  001005                          BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
013130  005726                          TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
013132  012600                  60$:    MOV     (SP)+,R0        ;;RESTORE R0
013134  062716  000002          3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
013140  000002                          RTI                     ;;RETURN
013142  122716  000011          4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
013146  001430                          BEQ     8$
013150  122716  000200                  CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
013154  001006                          BNE     5$
013156  005726                          TST     (SP)+           ;;POP  <CR><LF> EQUIV
013160  104401                          TYPE                    ;;TYPE A CR AND LF
013162  001523                          $CRLF
013164  105067  000130                  CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
013170  000755                          BR      2$              ;;GET NEXT CHARACTER
013172  004767  000056          5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
013176  126726  166254          6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
013202  001350                          BNE     2$              ;;IF NO GO GET NEXT CHAR.
013204  016746  166244                  MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
                                                                ;;AND THE NULL CHAR.
013210  105366  000001          7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
013214  002770                          BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
013216  004767  000032                  JSR     PC,$TYPEC       ;;GO TYPE A NULL
013222  105367  000072                  DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
```

```
3039  013226  000770                          BR      7$              ;;LOOP
3040
3041                                  ;HORIZONTAL TAB PROCESSOR
3042
3043  013230  112716  000040          8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
3044  013234  004767  000014          9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
3045  013240  132767  000007  000052          BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
3046  013246  001372                          BNE     9$              ;;TAB STOP
3047  013250  005726                          TST     (SP)+           ;;POP SPACE OFF STACK
3048  013252  000724                          BR      2$              ;;GET NEXT CHARACTER
3049  013254  105777  166170          $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
3050  013260  100375                          BPL     $TYPEC
3051  013262  116677  000002  166162          MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
3052  013270  122766  000015  000002          CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
3053  013276  001003                          BNE     1$              ;;BRANCH IF NO
3054  013300  105067  000014                  CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
3055  013304  000406                          BR      $TYPEX          ;;EXIT
3056  013306  122766  000012  000002  1$:     CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
3057  013314  001402                          BEQ     $TYPEX          ;;BRANCH IF YES
3058  013316  105227                          INCB    (PC)+           ;;COUNT THE CHARACTER
3059  013320  000000          $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
3060  013322  000207          $TYPEX: RTS     PC
3061
3062
3063                                  ;ASCII STRING INPUT ROUTINE
3064
3065  013324  017667  000000  000014  .INSTR: MOV     @(SP),.MSG      ;PICK UP MESSAGE
3066  013332  062716  000002                  ADD     #2,(SP)         ;JUMP AROUND MESSAGE FOR RTI
3067  013336  105767  166204                  TSTB    $ENV            ;APT CONTROL
3068  013342  001036                          BNE     INSTR2          ;YES NO TYPE
3069  013344  104401          .INST1: TYPE
3070  013346  000000          .MSG:   0
3071  013350  012704  016124                  MOV     #INBUF,R4       ;GET STARTING LOC OF INBUF
3072  013354  012703  000007                  MOV     #7,R3           ;MAX # OF CHARS
3073  013360  105777  166060          1$:     TSTB    @$TKS   ;TTY FLAG
3074  013364  100375                          BPL     1$
3075  013366  117714  166054                  MOVB    @$TKB,(R4)      ;TAKE CHAR
3076  013372  142714  000200                  BICB    #200,(R4)       ;STRIP
3077  013376  121427  000025                  CMPB    (R4),#25        ;IS IT <^G>
3078  013402  001760                          BEQ     .INST1
3079  013404  122427  000015                  CMPB    (R4)+,#15       ;CHECK FOR CR
3080  013410  001413                          BEQ     INSTR2
3081  013412  105777  166032          2$:     TSTB    @$TPS   ;TEST FLAG
3082  013416  100375                          BPL     2$
3083  013420  117777  166022  166024          MOVB    @$TKB,@$TPB     ;ECHO CHARACTER
3084  013426  005303                          DEC     R3      ;DID YOU TYPE TOO MANY CHARS ?
3085  013430  001353                          BNE     1$
3086  013432  104401          .INSTE: TYPE
3087  013434  015410                          MQM     ;?
3088  013436  000742                          BR      .INST1  ;RETRY
3089  013440  000002          INSTR2: RTI
3090
3091                                  ;CONVERT ASCII STRING TO OCTAL
3092
3093  013442  011605          .PARAM: MOV     (SP),R5 ;PUT CONTENTS OF SP INTO R5
3094  013444  012567  000162                  MOV     (R5)+,LOLIM     ;PUT LOW LIMIT INTO LOLIM
```

```
3095  013450  012567  000160            MOV     (R5)+,HILIM     ;PUT HIGH LIMIT INTO HILIM
3096  013454  012567  000156            MOV     (R5)+,DEVADR    ;PUT STORE LOC INTO DEVADR
3097  013460  112567  000154            MOVB    (R5)+,LOBITS    ;PUT MASK INTO LOBITS
3098  013464  112567  000151            MOVB    (R5)+,ADRCNT    ;PUT COUNT INTO ADRCNT
3099  013470  010516                    MOV     R5,(SP) ;RESTORE RETURN ADDR ON STACK FOR RTI
3100  013472  005005            PARAM1: CLR     R5
3101  013474  012704  016124            MOV     #INBUF,R4
3102  013500  122714  000015            CMPB    #15,(R4)        ;CR ?
3103  013504  001420                    BEQ     PARERR  ;YOU TYPED CR TOO SOON !
3104  013506  121427  000060    1$:     CMPB    (R4),#60        ;LOW LIMIT ASCII 0
3105  013512  002415                    BLT     PARERR
3106  013514  121427  000067            CMPB    (R4),#67        ;HIGH LIMIT ASCII 7
3107  013520  003012                    BGT     PARERR
3108  013522  142714  000060            BICB    #60,(R4)        ;CONVERT TO OCTAL
3109  013526  152405                    BISB    (R4)+,R5        ;STORE AWAY ITS AN OK CHAR
3110  013530  122714  000015            CMPB    #15,(R4)        ;CR ?
3111  013534  001414                    BEQ     LIMITS  ;NOW CHECK FOR HIGH &LOW LIMIT CONDS
3112  013536  006305                    ASL     R5      ;ALLOCATE ROOM FOR NEXT CHAR
3113  013540  006305                    ASL     R5
3114  013542  006305                    ASL     R5
3115  013544  000760                    BR      1$
3116  013546  122714  000015    PARERR: CMPB    #15,(R4)        ;CR?
3117  013552  001003                    BNE     120$
3118  013554  005737  013006            TST     @#RDSW          ;CK SWR USED
3119  013560  001023                    BNE     PARTI
3120  013562  104407            120$:   INSTER  ;RETRY
3121  013564  000742                    BR      PARAM1
3122
3123                                    ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
3124
3125  013566  020567  000042    LIMITS: CMP     R5,HILIM
3126  013572  101365                    BHI     PARERR  ;THE # IS TOO HIGH
3127  013574  020567  000032            CMP     R5,LOLIM
3128  013600  103762                    BLO     PARERR  ;THE # IS TOO LOW
3129  013602  136705  000032            BITB    LOBITS,R5       ;TEST BY MASKINGTHE #
3130  013606  001357                    BNE     PARERR
3131
3132                                    ;STORE NUMBER AT SPECIFIED ADDRESS
3133
3134  013610  016704  000022            MOV     DEVADR,R4       ;GET STARTING ADDR OF
3135  013614  010524            1$:     MOV     R5,(R4)+        ;STORE AT THIS ADDR
3136  013616  062705  000002            ADD     #2,R5
3137  013622  105367  000013            DECB    ADRCNT  ;HOW MANY TIMES + 2 ?
3138  013626  001372                    BNE     1$
3139  013630  000002            PARTI:  RTI
3140  013632  000000            LOLIM:  0
3141  013634  000000            HILIM:  0
3142  013636  000000            DEVADR: 0
3143  013640  000000            LOBITS: 0
3144          013641            ADRCNT=LOBITS+1
3145
3146                                    ;SAVE PC OF TEST THAT FAILED AND R0-R5
3147
3148  013642  016667  000004  165256  .SAV05: MOV     4(SP),SAVPC
3149
3150                                    ;SAVE R0-R5
```

```
3151
3152  013650  010567  165620          SV05:   MOV     R5,$REG5
3153  013654  010467  165612                  MOV     R4,$REG4
3154  013660  010367  165604                  MOV     R3,$REG3
3155  013664  010267  165576                  MOV     R2,$REG2
3156  013670  010167  165570                  MOV     R1,$REG1
3157  013674  010067  165562                  MOV     R0,$REG0
3158  013700  000002                          RTI
3159
3160                                          ;RESTORE R0-R5
3161
3162  013702  016700  165554          .RES05: MOV     $REG0,R0
3163  013706  016701  165552                  MOV     $REG1,R1
3164  013712  016702  165550                  MOV     $REG2,R2
3165  013716  016703  165546                  MOV     $REG3,R3
3166  013722  016704  165544                  MOV     $REG4,R4
3167  013726  016705  165542                  MOV     $REG5,R5
3168  013732  000002                          RTI
3169
3170                                          ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
3171
3172  013734  104401                  .CONVR: TYPE
3173  013736  015414                          MCRLF   ;CR  LF
3174  013740  017601  000000                  MOV     @(SP),R1        ;PICK UP DATA POINTER
3175  013744  062716  000002                  ADD     #2,(SP) ;SET UP SP FOR RTI
3176  013750  012167  000130                  MOV     (R1)+,WRDCNT    ;PICK UP # OF WORDS FROM TABLE
3177  013754  112167  000126          1$:     MOVB    (R1)+,CHRCNT    ;PICK UP # OF CHARS FROM TABLE
3178  013760  112167  000123                  MOVB    (R1)+,SPACNT    ;PICK UP # OF SPACES FROM TABLE
3179  013764  013167  000120                  MOV     @(R1)+,BINWRD   ;PICK UP ADDRESS OF  MSG
3180                                                                  ;FROM TABLE
3181  013770  016704  000114          2$:     MOV     BINWRD,R4       ;SAVE
3182  013774  116705  000106                  MOVB    CHRCNT,R5       ;SAVE
3183  014000  012700  016166                  MOV     #TEMP,R0        ;STARTING ADDRESS OF TEMP BLOCK
3184  014004  010403                  3$:     MOV     R4,R3           ;SAVE
3185  014006  042703  177770                  BIC     #177770,R3      ;CLR OUT UPPER BITS .. SAVE CHAR
3186  014012  062703  000260                  ADD     #260,R3 ;CONVERT TO ASCII
3187  014016  110320                          MOVB    R3,(R0)+        ;STORE AWAY
3188  014020  006204                          ASR     R4      ;SHIFT FOR NEXT #
3189  014022  006204                          ASR     R4      ;DITTO
3190  014024  006204                          ASR     R4      ;DITTO
3191  014026  005305                          DEC     R5      ;DEC CHAR COUNT
3192  014030  001365                          BNE     3$      ;DO IT AGAIN ?
3193  014032  012703  016230                  MOV     #MDATA,R3       ;STARTING ADDRESS OF MDATA BLOCK
3194  014036  114023          4$:     MOVB    -(R0),(R3)+     ;REVERSE THE ORDER OF NUMBERS
3195  014040  105367  000042                  DECB    CHRCNT  ;DEC CHAR COUNT
3196  014044  001374                          BNE     4$      ;DO IT AGAIN ?
3197  014046  105767  000035                  TSTB    SPACNT  ;HOW MANY SPACES ?
3198  014052  001405                          BEQ     6$      ;TYPE # IF BR =0
3199  014054  112723  000240          5$:     MOVB    #240,(R3)+      ;"SPACE" IN ASCII
3200  014060  105367  000023                  DECB    SPACNT  ;DEC # OF SPACE COUNT
3201  014064  001373                          BNE     5$      ;DO IT AGAIN ?
3202  014066  105013          6$:     CLRB    (R3)    ;INSERT "0" FOR TTY OUTPUT ROUTINE
3203  014070  104401                          TYPE
3204  014072  016230                          MDATA   ;THIS MESSAGE
3205  014074  005367  000004                  DEC     WRDCNT  ;HOW MANY #'S ?
3206  014100  001325                          BNE     1$      ;DO THIS ROUTINE AGAIN IF NOT EQUAL TO 0
```

```
3207  014102  000002                        RTI     ;RETURN TO PROGRAM
3208  014104  000000                WRDCNT: 0
3209  014106  000000                CHRCNT: 0
3210          014107                SPACNT=CHRCNT+1
3211  014110  000000                BINWRD: 0
3212
3213                                        ;COMPARE THE FIRST CHARACTER IN THE TELETYPE INPUT
3214                                        ;BUFFER TO THE CHARACTERS "N" AND "Y".
3215                                        ;IF THE CHARACTER IS "N" CLEAR THE FLAG
3216                                        ;IF THE CHARACTER IS "Y" SET THE FLAG
3217
3218  014112  017605  000000        .SETFLG:MOV     @(SP),R5
3219  014116  122767  000116  002000        CMPB    #'N,INBUF       ;IS IT "N" ?
3220  014124  001002                        BNE     1$
3221  014126  105015                        CLRB    (R5)    ;000
3222  014130  000406                        BR      2$
3223  014132  122767  000131  001764  1$:   CMPB    #'Y,INBUF       ;IS IT "Y" ?
3224  014140  001005                        BNE     3$
3225  014142  112715  177777                MOVB    #-1,(R5)        ;377
3226  014146  062716  000002          2$:   ADD     #2,(SP)
3227  014152  000002                        RTI
3228  014154  104407                3$:     INSTER  ;RETRY
3229  014156  000755                        BR      .SETFLG
3230                                .SBTTL  ERROR HANDLER ROUTINE
3231
3232                                ;;**********************************************************************
3233                                ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
3234                                ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
3235                                ;*AND GO TO SAVIT ON ERROR
3236                                ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
3237                                ;*SW15=1         HALT ON ERROR
3238                                ;*SW13=1         INHIBIT ERROR TYPEOUTS
3239                                ;*SW10=1         BELL ON ERROR
3240                                ;*SW09=1         LOOP ON ERROR
3241                                ;*CALL
3242                                ;*      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER
3243
3244  014160                        $ERROR:
3245  014160  105267  165217        7$:     INCB    $ERFLG          ;;SET THE ERROR FLAG
3246  014164  001775                        BEQ     7$              ;;DON'T LET THE FLAG GO TO ZERO
3247  014166  016777  165210  165246        MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
3248  014174  032777  002000  165236        BIT     #BIT10,@SWR     ;;BELL ON ERROR?
3249  014202  001402                        BEQ     1$              ;;NO - SKIP
3250  014204  104401  001516                TYPE    ,$BELL          ;;RING BELL
3251  014210  005267  165176        1$:     INC     $ERTTL          ;;COUNT THE NUMBER OF ERRORS
3252  014214  011667  165176                MOV     (SP),$ERRPC     ;;GET ADDRESS OF ERROR INSTRUCTION
3253  014220  162767  000002  165170        SUB     #2,$ERRPC
3254  014226  117767  165164  165160        MOVB    @$ERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
3255  014234  032777  020000  165176        BIT     #BIT13,@SWR     ;;SKIP TYPEOUT IF SET
3256  014242  001004                        BNE     20$             ;;SKIP TYPEOUTS
3257  014244  004767  000072                JSR     PC,SAVIT        ;;GO TO USER ERROR ROUTINE
3258  014250  104401  001523                TYPE    ,$CRLF
3259  014254                        20$:
3260  014254  122767  000001  165264        CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
3261  014262  001007                        BNE     2$              ;;NO,SKIP APT ERROR REPORT
3262  014264  116767  165124  000004        MOVB    $ITEMB,21$      ;;SET ITEM NUMBER AS ERROR NUMBER
```

```
3263  014272  004767  163520              JSR     PC,$ATY4        ;;REPORT FATAL ERROR TO APT
3264  014276     000            21$:     .BYTE   0
3265  014277     000                     .BYTE   0
3266  014300  000777            22$:     BR      22$             ;;APT ERROR LOOP
3267  014302  005777  165132    2$:      TST     @SWR            ;;HALT ON ERROR
3268  014306  100001                     BPL     3$              ;;SKIP IF CONTINUE
3269  014310  000000                     HALT                    ;;HALT ON ERROR!
3270  014312  032777  001000  165120 3$: BIT     #BIT09,@SWR     ;;LOOP ON ERROR SWITCH SET?
3271  014320  001402                     BEQ     4$              ;;BR IF NO
3272  014322  016716  165062             MOV     $LPERR,(SP)     ;;FUDGE RETURN FOR LOOPING
3273  014326  005767  165162    4$:      TST     $ESCAPE         ;;CHECK FOR AN ESCAPE ADDRESS
3274  014332  001402                     BEQ     5$              ;;BR IF NONE
3275  014334  016716  165154             MOV     $ESCAPE,(SP)    ;;FUDGE RETURN ADDRESS FOR ESCAPE
3276  014340                     5$:
3277  014340  000002                     RTI                     ;;RETURN
3278  014342  010067  164562    SAVIT:   MOV     R0,HLD0
3279  014346  010167  164560             MOV     R1,HLD1
3280  014352  010267  164556             MOV     R2,HLD2
3281  014356  010367  164554             MOV     R3,HLD3
3282  014362  010467  164552             MOV     R4,HLD4
3283  014366  010567  164550             MOV     R5,HLD5
3284  014372  016767  165004  164544     MOV     $TSTNM,HLD6
3285
3286                             .SBTTL  ERROR MESSAGE TYPEOUT ROUTINE
3287
3288                             ;;**************************************************************************
3289                             ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
3290                             ;*ERROR IS TO BE REPORTED. IT THEN OBTAINS, FROM THE "ERROR TABLE" ($ERRTB),
3291                             ;*AND REPORTS THE APPROPRIATE INFORMATION CONCERNING THE ERROR.
3292
3293  014400             $ERRTYP:
3294  014400  104401  001523             TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
3295  014404  010046                     MOV     R0,-(SP)        ;;SAVE R0
3296  014406  005000                     CLR     R0              ;;PICKUP THE ITEM INDEX
3297  014410  153700  001414             BISB    @#$ITEMB,R0
3298  014414  001004                     BNE     1$              ;;IF ITEM NUMBER IS ZERO, JUST
3299                                                             ;;TYPE THE PC OF THE ERROR
3300  014416  016746  164774             MOV     $ERRPC,-(SP)    ;;SAVE $ERRPC FOR TYPEOUT
3301                                                             ;;ERROR ADDRESS
3302  014422  104402                     TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
3303  014424  000426                     BR      6$              ;;GET OUT
3304  014426  005300            1$:      DEC     R0              ;;ADJUST THE INDEX SO THAT IT WILL
3305  014430  006300                     ASL     R0              ;;       WORK FOR THE ERROR TABLE
3306  014432  006300                     ASL     R0
3307  014434  006300                     ASL     R0
3308  014436  062700  001652             ADD     #$ERRTB,R0      ;;FORM TABLE POINTER
3309  014442  012067  000004             MOV     (R0)+,2$        ;;PICKUP "ERROR MESSAGE" POINTER
3310  014446  001404                     BEQ     3$              ;;SKIP TYPEOUT IF NO POINTER
3311  014450  104401                     TYPE                    ;;TYPE THE "ERROR MESSAGE"
3312  014452  000000            2$:      .WORD   0               ;;"ERROR MESSAGE" POINTER GOES HERE
3313  014454  104401  001523             TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
3314  014460  012067  000004    3$:      MOV     (R0)+,4$        ;;PICKUP "DATA HEADER" POINTER
3315  014464  001404                     BEQ     5$              ;;SKIP TYPEOUT IF 0
3316  014466  104401                     TYPE                    ;;TYPE THE "DATA HEADER"
3317  014470  000000            4$:      .WORD   0               ;;"DATA HEADER" POINTER GOES HERE
3318  014472  104401  001523             TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
```

```
3319  014476  011000                  5$:     MOV     (R0),R0         ;;PICKUP "DATA TABLE" POINTER
3320  014500  001004                          BNE     7$              ;;GO TYPE THE DATA
3321  014502  012600                  6$:     MOV     (SP)+,R0        ;;RESTORE R0
3322  014504  104401  001523                  TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
3323  014510  000207                          RTS     PC              ;;RETURN
3324  014512                          7$:
3325  014512  013046                          MOV     @(R0)+,-(SP)    ;;SAVE @(R0)+ FOR TYPEOUT
3326  014514  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
3327  014516  005710                          TST     (R0)            ;;IS THERE ANOTHER NUMBER?
3328  014520  001770                          BEQ     6$              ;;BR IF NO
3329  014522  104401  014530                  TYPE    ,8$             ;;TYPE TWO(2) SPACES
3330  014526  000771                          BR      7$              ;;LOOP
3331  014530  020040      000         8$:     .ASCIZ  /  /            ;;TWO(2) SPACES
3332          014534                          .EVEN
3333                                  .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
3334
3335                                  ;;**********************************************************************
3336                                  ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
3337                                  ;*OCTAL (ASCII) NUMBER AND TYPE IT.
3338                                  ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
3339                                  ;*CALL:
3340                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
3341                                  ;*      TYPOS                   ;;CALL FOR TYPEOUT
3342                                  ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
3343                                  ;*      .BYTE   M               ;;M=1 OR 0
3344                                  ;*                                      ;;1=TYPE LEADING ZEROS
3345                                  ;*                                      ;;0=SUPPRESS LEADING ZEROS
3346                                  ;*
3347                                  ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
3348                                  ;*$TYPOS OR $TYPOC
3349                                  ;*CALL:
3350                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
3351                                  ;*      TYPON                   ;;CALL FOR TYPEOUT
3352                                  ;*
3353                                  ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
3354                                  ;*CALL:
3355                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
3356                                  ;*      TYPOC                   ;;CALL FOR TYPEOUT
3357
3358  014534  017646  000000          $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
3359  014540  116667  000001  000211          MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
3360  014546  112667  000207                  MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
3361  014552  062716  000002                  ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
3362  014556  000406                          BR      $TYPON
3363  014560  112767  000001  000171  $TYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
3364  014566  112767  000006  000165          MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
3365  014574  112767  000005  000154  $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
3366  014602  010346                          MOV     R3,-(SP)        ;;SAVE R3
3367  014604  010446                          MOV     R4,-(SP)        ;;SAVE R4
3368  014606  010546                          MOV     R5,-(SP)        ;;SAVE R5
3369  014610  116704  000145                  MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
3370  014614  005404                          NEG     R4
3371  014616  062704  000006                  ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
3372  014622  110467  000132                  MOVB    R4,$OMODE       ;;SAVE IT FOR USE
3373  014626  116704  000125                  MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
3374  014632  016605  000012                  MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
```

```
3375  014636  005003                          CLR     R3              ;;CLEAR THE OUTPUT WORD
3376  014640  006105                  1$:     ROL     R5              ;;ROTATE MSB INTO "C"
3377  014642  000404                          BR      3$              ;;GO DO MSB
3378  014644  006105                  2$:     ROL     R5              ;;FORM THIS DIGIT
3379  014646  006105                          ROL     R5
3380  014650  006105                          ROL     R5
3381  014652  010503                          MOV     R5,R3
3382  014654  006103                  3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
3383  014656  105367  000076                  DECB    $OMODE          ;;TYPE THIS DIGIT?
3384  014662  100016                          BPL     7$              ;;BR IF NO
3385  014664  042703  177770                  BIC     #177770,R3      ;;GET RID OF JUNK
3386  014670  001002                          BNE     4$              ;;TEST FOR 0
3387  014672  005704                          TST     R4              ;;SUPPRESS THIS 0?
3388  014674  001403                          BEQ     5$              ;;BR IF YES
3389  014676  005204                  4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
3390  014700  052703  000060                  BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
3391  014704  052703  000040          5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
3392  014710  110367  000040                  MOVB    R3,8$           ;;SAVE FOR TYPING
3393  014714  104401  014754                  TYPE    ,8$             ;;GO TYPE THIS DIGIT
3394  014720  105367  000032          7$:     DECB    $OCNT           ;;COUNT BY 1
3395  014724  003347                          BGT     2$              ;;BR IF MORE TO DO
3396  014726  002402                          BLT     6$              ;;BR IF DONE
3397  014730  005204                          INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
3398  014732  000744                          BR      2$              ;;GO DO THE LAST DIGIT
3399  014734  012605                  6$:     MOV     (SP)+,R5        ;;RESTORE R5
3400  014736  012604                          MOV     (SP)+,R4        ;;RESTORE R4
3401  014740  012603                          MOV     (SP)+,R3        ;;RESTORE R3
3402  014742  016666  000002  000004          MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
3403  014750  012616                          MOV     (SP)+,(SP)
3404  014752  000002                          RTI                     ;;RETURN
3405  014754     000                  8$:     .BYTE   0               ;;STORAGE FOR ASCII DIGIT
3406  014755     000                          .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
3407  014756     000                  $OCNT:  .BYTE   0               ;;OCTAL DIGIT COUNTER
3408  014757     000                  $OFILL: .BYTE   0               ;;ZERO FILL SWITCH
3409  014760  000000                  $OMODE: .WORD   0               ;;NUMBER OF DIGITS TO TYPE
3410                                          ;ENTER HERE ON POWER FAILURE
3411
3412
3413  014762                          $PWRDN:
3414  014762  010046                  .PFAIL: MOV     R0,-(SP)                ;SAVE R0-R5 ON PROCESSOR STACK
3415  014764  010146                          MOV     R1,-(SP)
3416  014766  010246                          MOV     R2,-(SP)
3417  014770  010346                          MOV     R3,-(SP)
3418  014772  010446                          MOV     R4,-(SP)
3419  014774  010546                          MOV     R5,-(SP)
3420  014776  016746  163022                  MOV     24,-(SP)
3421  015002  010667  164110                  MOV     SP,SAVSP                ;SAVE STACK POINTER
3422  015006  012767  015020  163010          MOV     #RESTART,24             ;SET UP FOR POWER UP TRAP
3423  015014  000000                          HALT                            ;HALT ON POWER DOWN NORMAL
3424  015016  000777                          BR      .
3425
3426                                          ;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED
3427
3428  015020  016706  164072          RESTAR: MOV     SAVSP,SP                ;RESTORE STACK POINTER
3429  015024  012605                          MOV     (SP)+,R5                ;RESTORE R0-R5
3430  015026  012604                          MOV     (SP)+,R4
```

```
3431  015030  012603                          MOV     (SP)+,R3
3432  015032  012602                          MOV     (SP)+,R2
3433  015034  012601                          MOV     (SP)+,R1
3434  015036  012600                          MOV     (SP)+,R0
3435  015040  012767  014762  162756          MOV     #.PFAIL,24              ;SET UP FOR POWER FAILURE
3436  015046  106427  000340                  MTPS    #340
3437  015052  012706  001100                  MOV     #STACK,SP
3438  015056  005067  001104                  CLR     TEMP
3439  015062  005267  001100                  INC     TEMP
3440  015066  001375                          BNE     .-4
3441  015070  104413                          CONVRT
3442  015072  015114                          PFTAB
3443  015074  104401                          TYPE
3444  015076  015417                          MPFAIL
3445  015100  005067  164277                  CLR     $ERFLG
3446  015104  005067  164306                  CLR     $ERRPC
3447  015110  000177  163770                  JMP     @RETURN
3448  015114  000001              PFTAB:      1
3449  015116     006     002                  .BYTE   6,2
3450  015120  000207                          RETURN
3451  015122  005015  041412  042132  MTITLE: .ASCIZ  <15><12><12>/CZDUQ-C0 DUV11 TAPE A /<15><12>
3452  015130  050525  041455  020060
3453  015136  052504  030526  020061
3454  015144  040524  042520  040440
3455  015152  006440  000012
3456  015156  005015  042526  020103  MVECTO: .ASCIZ  <15><12>/VEC ADD-/
3457  015164  042101  026504     000
3458  015171     015  030412  052123  MREGAD: .ASCIZ  <15><12>/1ST DEV: REC CSR ADD-/
3459  015176  042040  053105  020072
3460  015204  042522  020103  051503
3461  015212  020122  042101  026504
3462  015220     000
3463  015221     015  046412  046125  MMULT:  .ASCIZ  <15><12>/MULT DEV ? (Y OR N)-/
3464  015226  020124  042504  020126
3465  015234  020077  054450  047440
3466  015242  020122  024516  000055
3467  015250  005015  040514  052123  MLASTD: .ASCIZ  <15><12>/LAST DEV: REC CSR ADDR-/
3468  015256  042040  053105  020072
3469  015264  042522  020103  051503
3470  015272  020122  042101  051104
3471  015300  000055
3472  015302  042075  053105  041511  DEVICE: .ASCIZ  /=DEVICE  /
3473  015310  020105  000040
3474  015314  005015  042523  042514  MCOW:   .ASCIZ  <15><12>/SELECT TO RUN @ACTREG/
3475  015322  052103  052040  020117
3476  015330  052522  020116  040500
3477  015336  052103  042522  000107
3478  015344  005015  053117  046106  MRANGE: .ASCIZ  <15><12>/OVFLO:RETYPE LAST DEV RXCSR ADDS-/
3479  015352  035117  042522  054524
3480  015360  042520  046040  051501
3481  015366  020124  042504  020126
3482  015374  054122  051503  020122
3483  015402  042101  051504  000055
3484  015410  020040  000077          MQM:    .ASCIZ  /  ?/
3485  015414  005015     000          MCRLF:  .ASCIZ   <15><12>
3486  015417     120  040506  046111  MPFAIL: .ASCIZ  /PFAIL,  RESTART AT TEST IN PROGRESS/
```

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 3487  015424  020054  051040  051505
 3488  015432  040524  052122  040440
 3489  015440  020124  042524  052123
 3490  015446  044440  020116  051120
 3491  015454  043517  042522  051523
 3492  015462     000
 3493  015463     015  042412  042116  MEPASS: .ASCIZ  <15><12>/END OF PASS TAPE A/
 3494  015470  047440  020106  040520
 3495  015476  051523  052040  050101
 3496  015504  020105  000101
 3497  015510  005015  000122          MR:     .ASCIZ  <15><12>/R/
 3498  015514  005015  042524  052123  MTSTPC: .ASCIZ  <15><12>/TEST PC-/
 3499  015522  050040  026503     000
 3500  015527     015  046012  041517  MLOCK:  .ASCIZ  <15><12>/LOCK ON  TEST? (Y OR N)-/
 3501  015534  020113  047117  020040
 3502  015542  042524  052123  020077
 3503  015550  054450  047440  020122
 3504  015556  024516  000055
 3505  015562  005015  020043  043117  MSYNC:  .ASCIZ  <15><12>/# OF SYNC CHARS SELECTED ( 1 OR 2)-/
 3506  015570  051440  047131  020103
 3507  015576  044103  051101  020123
 3508  015604  042523  042514  052103
 3509  015612  042105  024040  030440
 3510  015620  047440  020122  024462
 3511  015626  000055
 3512  015630  005015  051511  051440  MWIRE6: .ASCIZ  <15><12>/IS SEC XMIT SWITCH E55-2 IN? (Y OR N)-/
 3513  015636  041505  054040  044515
 3514  015644  020124  053523  052111
 3515  015652  044103  042440  032465
 3516  015660  031055  044440  037516
 3517  015666  024040  020131  051117
 3518  015674  047040  026451     000
 3519  015701     015  044412  020123  MWIRE5: .ASCIZ  <15><12>/IS SEC REC SWITCH E55-3 IN? (Y OR N)-/
 3520  015706  042523  020103  042522
 3521  015714  020103  053523  052111
 3522  015722  044103  042440  032465
 3523  015730  031455  044440  037516
 3524  015736  024040  020131  051117
 3525  015744  047040  026451     000
 3526  015751     015  044412  020123  MWIRE4: .ASCIZ  <15><12>/IS OPT CLR ENABLE SWITCH E55-1 IN? (Y OR N)-/
 3527  015756  050117  020124  046103
 3528  015764  020122  047105  041101
 3529  015772  042514  051440  044527
 3530  016000  041524  020110  032505
 3531  016006  026465  020061  047111
 3532  016014  020077  054450  047440
 3533  016022  020122  024516  000055
 3534  016030  005015  044012  030463  MEXTJ:  .ASCIZ  <15><12><12>/H315 CONNECTOR ON ?(Y OR N)-/
 3535  016036  020065  047503  047116
 3536  016044  041505  047524  020122
 3537  016052  047117  037440  054450
 3538  016060  047440  020122  024516
 3539  016066  000055
 3540  016070  005015  057040  020107  MCNTG:  .ASCIZ  <15><12>/ ^G  /
 3541  016076  000040
 3542  016100  051440  051127  020075  MMSWR:  .ASCIZ  / SWR=   /
```

```
3543  016106  020040      000
3544  016111     040  020040  042516  MMNEW:  .ASCIZ  /   NEW=  /
3545  016116  036527  020040     000
3546          016124                  .EVEN
3547
3548                                          ;BUFFERS FOR INPUT-OUTPUT
3549
3550  016124  000000                  INBUF:  0
3551          016166                  .=.+40
3552  016166  000000                  TEMP:   0
3553          016230                  .=.+40
3554  016230  000000                  MDATA:  0
3555          016272                  .=.+40
3556                                  .SBTTL  SCOPE HANDLER ROUTINE
3557
3558                                  ;;**********************************************************************
3559                                  ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
3560                                  ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
3561                                  ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
3562                                  ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
3563                                  ;*SW14=1         LOOP ON TEST
3564                                  ;*SW11=1         INHIBIT ITERATIONS
3565                                  ;*SW09=1         LOOP ON ERROR
3566                                  ;*SW08=1         LOOP ON TEST IN SWR<7:0>
3567                                  ;*CALL
3568                                  ;*      SCOPE           ;;SCOPE=IOT
3569
3570  016272                          $SCOPE:
3571
3572                                          ;SCOPE LOOP AND INTERATION HANDLER
3573
3574  016272                          .SCOPE:
3575  016272  004767  174374                  JSR     PC,CKSWR
3576  016276  005067  163114                  CLR     $ERRPC          ;CLEAR LAST ERROR PC
3577  016302  022716  003376                  CMP     #TST1+2,(SP)    ;IS SCOPE AT BEGINING OF TEST 1?
3578  016306  001422                          BEQ     $XTSTR          ;YES NO LOOP.
3579
3580  016310  032777  040000  163122  TTST:   BIT     #BIT14,@SWR     ;THIS CODE IS FOR TESTING FOR BIT 14
3581  016316  001412                          BEQ     1$              ;ON LSI WHICH SYSMAC CANNOT HANDLE
3582  016320  016767  163056  163060          MOV     $TSTNM,$LPADR
3583  016326  000406                          BR      1$
3584  016330  105777  163110                  TSTB    @$TKS           ;KEYBOARD DONE?
3585  016334  100123                          BPL     $OVER           ;BR IF NO
3586  016336  017766  163104  177776          MOV     @$TKB,-2(SP)    ;CLEAR DONE BIT
3587  016344  032777  040000  163066  1$:     BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
3588  016352  001114                          BNE     $OVER           ;;YES IF SW14=1
3589                                  ;#####START OF CODE FOR THE XOR TESTER#####
3590  016354  000416                  $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
3591                                                                  ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
3592  016356  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
3593  016362  012737  016402  000004          MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
3594  016370  005737  177060                  TST     @#177060        ;;TIME OUT ON XOR?
3595  016374  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
3596  016400  000463                          BR      $SVLAD          ;;GO TO THE NEXT TEST
3597  016402  022626                  5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
3598  016404  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
```

```
3599  016410  000423                        BR      7$              ;;LOOP ON THE PRESENT TEST
3600  016412                          6$:;#####END OF CODE FOR THE XOR TESTER#####
3601  016412  032777  000400  163020        BIT     #BIT08,@SWR     ;;LOOP ON SPEC. TEST?
3602  016420  001404                        BEQ     2$              ;;BR IF NO
3603  016422  127767  163012  162752        CMPB    @SWR,$TSTNM     ;;ON THE RIGHT TEST?    SWR<7:0>
3604  016430  001465                        BEQ     $OVER           ;;BR IF YES
3605  016432  105767  162745          2$:   TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
3606  016436  001421                        BEQ     3$              ;;BR IF NO
3607  016440  126767  162751  162735        CMPB    $ERMAX,$ERFLG   ;;MAX. ERRORS FOR THIS TEST OCCURRED?
3608  016446  101015                        BHI     3$              ;;BR IF NO
3609  016450  032777  001000  162762        BIT     #BIT09,@SWR     ;;LOOP ON ERROR?
3610  016456  001404                        BEQ     4$              ;;BR IF NO
3611  016460  016767  162724  162720  7$:   MOV     $LPERR,$LPADR   ;;SET LOOP ADDRESS TO LAST SCOPE
3612  016466  000446                        BR      $OVER
3613  016470  105067  162707          4$:   CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
3614  016474  005067  163012                CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
3615  016500  000415                        BR      1$              ;;ESCAPE TO THE NEXT TEST
3616  016502  032777  004000  162730  3$:   BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
3617  016510  001011                        BNE     1$              ;;BR IF YES
3618  016512  005767  163016                TST     $PASS           ;;IF FIRST PASS OF PROGRAM
3619  016516  001406                        BEQ     1$              ;;      INHIBIT ITERATIONS
3620  016520  005267  162660                INC     $ICNT           ;;INCREMENT ITERATION COUNT
3621  016524  026767  162762  162652        CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
3622  016532  002024                        BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
3623  016534  012767  000001  162642  1$:   MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
3624  016542  016767  000056  162742        MOV     $MXCNT,$TIMES   ;;SET NUMBER OF ITERATIONS TO DO
3625  016550  105267  162626          $SVLAD: INCB  $TSTNM          ;;COUNT TEST NUMBERS
3626  016554  116767  162622  162750        MOVB    $TSTNM,$TESTN   ;;SET TEST NUMBER IN APT MAILBOX
3627  016562  011667  162620                MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
3628  016566  011667  162616                MOV     (SP),$LPERR     ;;SAVE ERROR LOOP ADDRESS
3629  016572  005067  162716                CLR     $ESCAPE         ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
3630  016576  112767  000001  162611        MOVB    #1,$ERMAX       ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
3631  016604  016777  162572  162630  $OVER:  MOV    $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
3632  016612  016716  162570                MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
3633  016616  000002                  4$:   RTI
3634  016620  001407                  BRW:  1407
3635  016622  000432                  BRX:  432
3636  016624  000005                  $MXCNT: 5                       ;;MAX. NUMBER OF ITERATIONS
3637                                  .SBTTL  TRAP DECODER
3638
3639                                  ;;**************************************************************
3640                                  ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
3641                                  ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
3642                                  ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
3643                                  ;*GO TO THAT ROUTINE.
3644
3645  016626  010046                  $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
3646  016630  016600  000002                  MOV     2(SP),R0        ;;GET TRAP ADDRESS
3647  016634  005740                          TST     -(R0)           ;;BACKUP BY 2
3648  016636  111000                          MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
3649  016640  006300                          ASL     R0              ;;POSITION FOR INDEXING
3650  016642  016000  016662                  MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
3651  016646  000200                          RTS     R0              ;;GO TO ROUTINE
3652
3653
3654                                  ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
```

```
3655
3656  016650  011646                    $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
3657  016652  016666  000004  000002            MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
3658  016660  000002                            RTI                     ;;RESTORE THE PSW
3659
3660                                    .SBTTL  TRAP TABLE
3661
3662                                    ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
3663                                    ;*BY THE "TRAP" INSTRUCTION.
3664
3665                                    ;       ROUTINE
3666                                    ;       -------
3667  016662  016650                    $TRPAD: .WORD   $TRAP2
3668  016664  013042                            $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
3669  016666  014560                            $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
3670  016670  014534                            $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
3671  016672  014574                            $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
3672
3673
3674  016674  013020                            .SCOP1  ;;CALL=SCOP1    TRAP+5(104405)
3675  016676  013324                            .INSTR  ;;CALL=INSTR    TRAP+6(104406)
3676  016700  013432                            .INSTER ;;CALL=INSTER   TRAP+7(104407)
3677  016702  013442                            .PARAM  ;;CALL=PARAM    TRAP+10(104410)
3678  016704  013642                            .SAV05  ;;CALL=SAV05    TRAP+11(104411)
3679  016706  013702                            .RES05  ;;CALL=RES05    TRAP+12(104412)
3680  016710  013734                            .CONVRT ;;CALL=CONVRT   TRAP+13(104413)
3681  016712  014112                            .SETFLG ;;CALL=SETFLG   TRAP+14(104414)
3682                                    ;*************************************************************
3683                                    ;UTILITIES
3684                                    ;*************************************************************
3685
3686                                    ;THIS UTILITY CALCULATES PRIORITY LEVEL
3687  016714  006367  000044            DULEV:  ASL     DUPRT   ;SHIFT LEFT
3688  016720  006367  000040                    ASL     DUPRT   ;
3689  016724  006367  000034                    ASL     DUPRT   ;
3690  016730  006367  000030                    ASL     DUPRT   ;
3691  016734  006367  000024                    ASL     DUPRT   ;
3692  016740  016767  000020  000020           MOV     DUPRT,LESS1     ;MOVE THIS TO LESS1
3693  016746  162767  000001  000012           SUB     #1,LESS1        ;CREATE LESS1
3694  016754  042767  000037  000004           BIC     #37,LESS1       ;CLEAR TNZVC
3695  016762  000207                           RTS     PC
3696  016764  000240                    DUPRT:  PR5
3697  016766  000200                    LESS1:  PR4     ;LEVEL TO ALLOW INTERRUPTS
3698
3699                                            ;NEW DU ADDRESSES
3700  016770  016767  000126  162714    DUADDR: MOV     DUBASE,RXCSR    ;XXX0
3701  016776  005267  000120                    INC     DUBASE
3702  017002  016767  000114  162704            MOV     DUBASE,HRXCSR   ;XXX1
3703  017010  005267  000106                    INC     DUBASE
3704  017014  016767  000102  162674            MOV     DUBASE,RXDBUF   ;XXX2
3705  017022  016767  000074  162672            MOV     DUBASE,PARCSR   ;XXX2
3706  017030  005267  000066                    INC     DUBASE
3707  017034  016767  000062  162656            MOV     DUBASE,HRXDBUF  ;XXX3
3708  017042  016767  000054  162654            MOV     DUBASE,HPARCSR  ;XXX3
3709  017050  005267  000046                    INC     DUBASE
3710  017054  016767  000042  162644            MOV     DUBASE,TXCSR    ;XXX4
```

```
3711  017062  005267  000034                  INC     DUBASE
3712  017066  016767  000030  162634          MOV     DUBASE,HTXCSR   ;XXX5
3713  017074  005267  000022                  INC     DUBASE
3714  017100  016767  000016  162624          MOV     DUBASE,TXDBUF   ;XXX6
3715  017106  005267  000010                  INC     DUBASE
3716  017112  016767  000004  162614          MOV     DUBASE,HTXDBUF  ;XXX7
3717  017120  000207                          RTS     PC
3718  017122  000000                  DUBASE: 0
3719
3720                                          ;THIS UTILITY POKES THE MAINT DATA BASED UPON THE
3721                                          ;INFORMATION CONTAINED IN $TMP1 AND IT IS
3722                                          ;SHIFTED IN BY THE CONTENTS OF SHIFT
3723  017124  042777  040000  162574  RPOKE:  BIC     #MTDATA,@TXCSR
3724  017132  005067  162344                  CLR     $TMP2
3725  017136  006067  162336                  ROR     $TMP1   ;FORCE CARRY
3726  017142  006067  162334                  ROR     $TMP2   ;PICK UP CARRY IN BIT 15
3727  017146  006267  162330                  ASR     $TMP2   ;SHIFT INTO BIT 14
3728  017152  042767  100000  162322          BIC     #BIT15,$TMP2    ;CLR BIT 15
3729  017160  056777  162316  162540          BIS     $TMP2,@TXCSR    ;POKE MAINT DATA
3730  017166  042777  020000  162532          BIC     #CLK,@TXCSR     ;POKE CLK
3731  017174  052777  020000  162524          BIS     #CLK,@TXCSR     ;
3732  017202  005367  161714                  DEC     SHIFT
3733  017206  001346                          BNE     RPOKE
3734  017210  000207                          RTS     PC
3735
3736                                          ;THIS ROUTINE CALCULATES ODD PARITY FOR AN 8 BIT CHAR
3737  017212  016767  162262  162262  ODD8:   MOV     $TMP1,$TMP2     ;SAVE TEMP1
3738  017220  005067  162260                  CLR     $TMP3
3739  017224  012727  000010                  MOV     #8.,(PC)+
3740  017230  000000                  4$:     0
3741  017232  006067  162244          1$:     ROR     $TMP2
3742  017236  005567  162242                  ADC     $TMP3
3743  017242  005367  177762                  DEC     4$
3744  017246  001371                          BNE     1$
3745  017250  006067  162230                  ROR     $TMP3
3746  017254  103404                          BCS     2$
3747  017256  052767  000400  162214          BIS     #BIT8,$TMP1     ;SET ODD PARITY
3748  017264  000403                          BR      3$
3749  017266  042767  000400  162204  2$:     BIC     #BIT8,$TMP1     ;CLR EVEN PARITY
3750                                          ;$TMP1 NOW HAS ODD PARITY CHARACTER
3751  017274  000207                  3$:     RTS     PC
3752
3753                                          ;THIS ROUTINE CALCULATES EVEN PARITY FOR AN 8 BIT CHARACTER
3754  017276  016767  162176  162176  EVEN8:  MOV     $TMP1,$TMP2     ;SAVE TEMP1
3755  017304  005067  162174                  CLR     $TMP3
3756  017310  012727  000010                  MOV     #8.,(PC)+
3757  017314  000000                  4$:     0
3758  017316  006067  162160          1$:     ROR     $TMP2
3759  017322  005567  162156                  ADC     $TMP3
3760  017326  005367  177762                  DEC     4$
3761  017332  001371                          BNE     1$
3762  017334  006067  162144                  ROR     $TMP3
3763  017340  103004                          BCC     2$
3764  017342  052767  000400  162130          BIS     #BIT8,$TMP1     ;SET EVEN PARITY
3765  017350  000403                          BR      3$
3766  017352  042767  000400  162120  2$:     BIC     #BIT8,$TMP1     ;CLR ODD PARITY
```

```
3767                                        ;$TMP1 NOW HAS EVEN PARITY CHARACTER
3768  017360  000207                3$:     RTS     PC
3769  017362  062716  000002        TRPREG: ADD     #2,(SP) ;ALLOW IT TO "CRUNCH" INTO ERROR BACK
3770                                                        ;IN MAIN PART OF THE PROGRAM
3771  017366  000002                        RTI
3772          000001                .END
```

```
AAA     003200          1364#
ABASE = 000000           947     988
ACDW1 = 000000           947     990
ACDW2 = 000000           947     991
ACPUOP= 000000           947     962
ACTREG  001166           806#   1320*   1334*   1335*   1342*   2883    2886    2896
ADDW0 = 000000           947     992
ADDW1 = 000000           947     993
ADDW10= 000000           947    1002
ADDW11= 000000           947    1003
ADDW12= 000000           947    1004
ADDW13= 000000           947    1005
ADDW14= 000000           947    1006
ADDW15= 000000           947    1007
ADDW2 = 000000           947     994
ADDW3 = 000000           947     995
ADDW4 = 000000           947     996
ADDW5 = 000000           947     997
ADDW6 = 000000           947     998
ADDW7 = 000000           947     999
ADDW8 = 000000           947    1000
ADDW9 = 000000           947    1001
ADEVCT= 000000           947     953
ADEVM = 000000           947     989
ADRCNT= 013641          3098*   3137*   3144#
AENV  = 000000           947     958
AENVM = 000000           947     959
AFATAL= 000000           947     950
AMADR1= 000000           947     975
AMADR2= 000000           947     979
AMADR3= 000000           947     982
AMADR4= 000000           947     985
AMAMS1= 000000           947     969
AMAMS2= 000000           947     977
AMAMS3= 000000           947     980
AMAMS4= 000000           947     983
AMSGAD= 000000           947     955
AMSGLG= 000000           947     956
AMSGTY= 000000           947     949
AMTYP1= 000000           947     970
AMTYP2= 000000           947     978
AMTYP3= 000000           947     981
AMTYP4= 000000           947     984
APASS = 000000           947     952
APRIOR= 000000           947
APTCSU= 000040           606#   3013
APTENV= 000001           562     604#    3006    3260
APTSIZ= 000200           603#   1239
APTSPO= 000100           564     605#    3008
ASWREG= 000000           947     960
ATESTN= 000000           947     951
AUNIT = 000000           947     954
AUSWR = 000000           947     961
AVECT1= 000000           947     986
AVECT2= 000000           947     987
BASEAD  001154           801#   1302*   1339*   1340    1346*   1348*   2890*   2902*   2906
```

```
BASEIV  001162            804#  1312*  2891*  2903*  2908   2909*  2910   2911*  2912  2913*  2914  2915*
BBB     003026           1319   1323#
BINWRD  014110           3179*  3181   3211#
BITW  = 002000            873#  1066#  1928   1935   1947   1954   1964   1979   1983  1990
BIT0  = 000001            736#   849    880   1042   1073   1915
BIT00 = 000001            726#   736
BIT01 = 000002            725#   735
BIT02 = 000004            724#   734
BIT03 = 000010            723#   733
BIT04 = 000020            722#   732
BIT05 = 000040            721#   731
BIT06 = 000100            720#   730
BIT07 = 000200            719#   729
BIT08 = 000400            718#   728   3601
BIT09 = 001000            717#   727   3270   3609
BIT1  = 000002            735#   848   1041
BIT10 = 002000            716#   839    873   1032   1066   3248
BIT11 = 004000            715#   838   1031   1782   1783   1786   1787   1791  1793  3616
BIT12 = 010000            714#   837    854   1030   1047   1804   1805   1808  1809  1813  1815
BIT13 = 020000            713#   836    853    872   1029   1046   1065   3255
BIT14 = 040000            712#   835    852    871   1028   1045   1064   3580  3587
BIT15 = 100000            711#   834    851    870   1027   1044   1063   3728
BIT2  = 000004            734#   847   1040
BIT3  = 000010            733#   846    879   1039   1072
BIT4  = 000020            732#   845    878   1038   1071
BIT5  = 000040            731#   844    877   1037   1070   1926
BIT6  = 000100            730#   843    876   1036   1069
BIT7  = 000200            729#   842    875   1035   1068
BIT8  = 000400            728#   841    857    874   1034   1050   1067   3747  3749  3764  3766
BIT9  = 001000            727#   840    856   1033   1049
BPTVEC= 000014            743#
BREAK = 000001            880#  1073#  1680   1681   1684   1685   1689   1691  1945  1960  1977  1989  2422
                         2449   2485   2558   2631   2704   2772   2827
BRW     016620           3634#
BRX     016622           3635#
CARDET= 010000            837#  1030#
CCC     012576           2882   2905   2922#
CHRCNT  014106           3177*  3182   3195*  3209#  3210
CKSWR   012672           2876   2939   2946#  2978   3575
CLK   = 020000            872#  1065#  1824   1825   1828   1829   1833   1835  2422  2449  2485  2492  2493
                         2495   2496   2558   2565   2566   2568   2569   2631  2638  2639  2641  2642  2704
                         2711   2712   2714   2715   2772   2778   2779   2781  2782  2827  2833  2834  2836
                         2837   3730   3731
CNTLU   012746           1269   2957#
CONVRT= 104413           2879   2959   3441   3680#
COUNT   001124            781#  2497*  2501*  2570*  2574*  2643*  2647*  2716*  2720*
CR    = 000015            651#  3052   3062
CRLF  = 000200            652#  3023   3062
CTS   = 020000            836#  1029#
DDISP = 177570            658#   914   1227
DEVADR  013636           3096*  3134   3142#
DEVICE  015302           2880   3472#
DF1     002132           1098   1102   1106   1110   1156#
DH1     002067           1096   1100   1104   1145#
DISPLA  001442            914#  1227*  1235*  1260*  3247*  3631*
DISPRE  000174            755#  1235   1260
```

```
DNA    = 100000            870#   1063#  2045
DNAINT= 000040             877#   1070#  1740   1741   1744   1745   1749   1751
DSC    = 100000            834#   1027#  2024
DSINTE= 000040             844#   1037#  1620   1621   1624   1625   1629   1631
DSR    = 001000            840#   1033#
DSWR   = 177570            657#    913   1226
DTR    = 000002            848#   1041#  1504   1505   1508   1509   1513   1519   1523   2194   2263   2348   2394
DT1      002116           1097    1101   1105   1151#
DT4      002126           1109    1154#
DUADDR   016770           1301    2907   3700#
DUBASE   017122           1297    1300   2906*  3700   3701*  3702   3703*  3704   3705   3706*  3707   3708   3709*
                          3710    3711*  3712   3713*  3714   3715*  3716   3718#
DULEV    016714           1359    3687#
DUPRT    016764           1358*   3687*  3688*  3689*  3690*  3691*  3692   3696#
DURIS    001740           1125#   2910*
DURIV    001736           1124#   1308   1311   1312   2908*  2915
DUTIS    001744           1127#   2914*
DUTIV    001742           1126#   2912*
EIGHT  = 006000            865#   1058#  2425   2452   2707
EMTVEC= 000030             746#   1211*  1212*
EM1      001762           1095    1131#
EM2      002022           1099    1137#
EM3      002043           1103    1140#
EM4      001746           1107    1129#
ERRCNT   001114            774#
ERRVEC= 000004             739#   1224   1225*  1236*  3592   3593*  3595*  3598*
EVEN8    017276           3754#
EVEPAR= 001400             868#   1061#
EVPAR  = 000400            857#   1050#
FIVE   = 000000            862#   1055#  2488   2775   2830
FRMERR= 020000             853#   1046#  2079
GNS    = ****** U         3668    3669   3670   3671   3674   3675   3676   3677   3678   3679   3680   3681
HDXEN  = 000010            879#   1072#  1700   1701   1704   1705   1709   1711
HILIM    013634           3095*   3125   3141#
HLD0     001130            783#   1151   3278*
HLD1     001132            784#   1151   3279*
HLD2     001134            785#   3280*
HLD3     001136            786#   3281*
HLD4     001140            787#   3282*
HLD5     001142            788#   3283*
HLD6     001144            789#   3284*
HOLD     001120            779#   1431*  1561   1885   2136   2199   2220   2245   2268   2283   2298   2322   2337
                          2353    2369   2384   2399
HPARCS   001724           1118#   1456*  3708*
HRXCSR   001714           1114#   1425*  1915*  3702*
HRXDBU   001720           1116#   1441*  3707*
HT     = 000011            649#   3021   3062
HTXCSR   001730           1120#   1471*  1926*  3712*
HTXDBU   001734           1122#   1486*  3716*
INBUF    016124           1367    1371   3071   3101   3219   3223   3550#
INIFLG   001172            814#   1270   1273*
INSTER= 104407            1375    3120   3228   3676#
INSTR  = 104406           1292    1303   1313   1324   1349   1365   1378   1382   1386   1390   1401   2961   3675#
INSTR2   013440           3068    3080   3089#
IOTVEC= 000020             744#   1209*  1210*
ISYMOD= 000000             861#   1054#  2445   2452   2768   2775   2823   2830
```

```
JMRBY   001153            797#  1278*  1393  1975  2183
KEEPAD  001156            802#  1300*  1302  1346  1348  2902
KEEPIV  001164            805#  1311*  2903
LASTAD  001160            803#  1329   1340  1354
LESS1   016766           3692*  3693*  3694* 3697#
LF    = 000012            650#  3056   3062
LIGHTS  001102            764#  2927*
LIMITS  013566           3111   3125#
LOBITS  013640           3097*  3129   3143#  3144
LOCK    001110            772#  2981
LOKFLG  001174            816#
LOLIM   013632           3094*  3127   3140#
MASK1   007324           2251#
MASK2   007342           2257#
MASK3   007432           2289#
MCNTG   016070           2956   3540#
MCOW    015314           2885   3474#
MCRLF   015414           3173   3485#
MDATA   016230           3193   3204   3554#
MEPASS  015463           2878   3493#
MEXT  = 010000            884#  1077#  1977  1989
MEXTJ   016030           1391   3534#
MINT  = 004000            883#  1076#  1945  1960  2422  2449  2485  2558  2631  2704  2772  2827
MLASTD  015250           1325   3467#
MLOCK   015527           3500#
MMNEW   016111           2961   3544#
MMSWR   016100           2958   3542#
MMULT   015221           1314   3463#
MPFAIL  015417           3444   3486#
MQM     015410           3087   3484#
MR      015510           1412   3497#
MRANGE  015344           1350   3478#
MREGAD  015171           1293   3458#
MRESET= 000400            874#  1067#  1514  1543  1581  1610  1630  1650  1670  1690  1710  1730  1750
                         1770   1792   1814  1834  1854  1896  1897  1900  1901  1910  1925  1959  1988
                         2001   2012   2023  2034  2044  2055  2067  2078  2089  2100  2111  2149  2162
                         2178   2417   2419  2444  2446  2480  2482  2553  2555  2626  2628  2699  2701
                         2767   2769   2822  2824
MSYNC   015562           1366   3505#
MTDATA= 040000            871#  1064#  1844  1845  1848  1849  1853  1855  1945  1950  1958  1977  1982
                         1987   2422   2449  2485  2558  2631  2704  2772  2827  3723
MTITLE  015122           1272   3451#
MTSTPC  015514           1402   3498#
MULTD   001152            796#  1316   1317  2881
MVECTO  015156           1304   3456#
MWIRE4  015751           1387   3526#
MWIRE5  015701           1383   3519#
MWIRE6  015630           1379   3512#
NEXT    001106            771#
NOPAR = 000000            866#  1059#  2425  2452  2488  2561  2634  2707  2775  2830
ODDPAR= 001000            867#  1060#
ODDB    017212           3737#
ONCE    002610           1271   1274#
OPTCLR  001151            795#  1389   1517  1546  1584  1870  1911  2114
OUT     013000           2947   2949   2951  2955  2967#
OUTCRY  012570           2879   2918#
```

```
OUTMUL  003166            1322    1347    1358#
OUT1    007774            2186    2314    2363    2409#
OUT2    007520            2237    2317#
OUT3    007650            2239    2364#
OVRRUN= 040000             852#   1045#   2090
PARAM = 104410            1294    1305    1326    1351    1403    2962    3677#
PARAM1  013472            3100#   3121
PARCSR  001722            1117#   1453*   2418*   2425*   2445*   2452*   2481*   2488*   2554*   2561*   2627*   2634*   2700*
                          2707*   2768*   2775*   2823*   2830*   3705*
PAREN = 001000             856#   1049#
PARER = 010000             854#   1047#   2068
PARERR  013546            3103    3105    3107    3116#   3126    3128    3130
PARTI   013630            3119    3139#
PASCNT  001112             773#   1247*   2926*   2927    2928
PFTAB   015114            3442    3448#
PIRQ  = 177772             656#
PIRQVE= 000240             750#
POPR0 = 012600             829#   1022#
POP1SP= 005726             827#   1020#
POP2SP= 022626             831#   1024#
PR0   = 000000             673#
PR1   = 000040             674#
PR2   = 000100             675#
PR3   = 000140             676#
PR4   = 000200             677#   3697
PR5   = 000240             678#   3696
PR6   = 000300             679#
PR7   = 000340             680#   1421    1437    1452    1467    1482
PS    = 177776             653#    654
PSW   = 177776             654#
PUSHR0= 010046             828#   1021#
PUSH1S= 005746             826#   1019#
PUSH2S= 024646             830#   1023#
PWRVEC= 000024             745#   1215*   1216*
RDSW    013006            2957*   2967*   2969#   3118
RECACT= 004000             838#   1031#   2013    2426    2430    2434    2453    2457    2461    2509    2518    2522    2582
                          2591    2595    2655    2664    2668    2728    2737    2741
REPLAY  012474            2898    2904    2906#
RESTAR  015020            3422    3428#
RESTRT  012654            2899    2930    2937#
RESVEC= 000010             740#
RESO5 = 104412            3679#
RETURN  001104             770#   1252*   1409*   1411*   1413    3447
RING  = 040000             835#   1028#
RINTEN= 000100             843#   1036#   1640    1641    1644    1645    1649    1651
ROTADD  001170             809#   1321*   1333*   1335    1337*   1342    1345*   2893*   2896    2900*
RPOKE   017124            2500    2514    2573    2587    2646    2660    2719    2733    2787    2799    2803    2842    2854
                          2858    3723#   3733
RTS   = 000004             847#   1040#   1533    1534    1537    1538    1542    1548    1552    2215    2278    2332    2379
RUNA  = 000000                1      54     143     516
RUNB  = ****** U             21      59     146     521
RUNC  = ****** U             21      59     146     521
RUND  = ****** U             21      59     146     521
RUNE  = ****** U             21      59     146     521
RUNF  = ****** U             21      59     146     521
RUNIT   012400            2884    2890#   2897
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RXCSR   001712          1113#  1422*  1504*  1505   1508*  1509   1513*  1519   1523   1533*  1534   1537*  1538
                        1542*  1548   1552   1571*  1572   1575*  1576   1580*  1586   1590   1600*  1601   1604*
                        1605   1609*  1611   1620*  1621   1624*  1625   1629*  1631   1640*  1641   1644*  1645
                        1649*  1651   1660*  1661   1664*  1665   1669*  1671   1864*  1868   1913*  1914   1916
                        1920*  1921   2002   2013   2024   2110*  2112   2113   2177*  2188   2189   2194*  2204
                        2209   2215*  2225   2230   2240*  2250   2256   2263*  2273   2278*  2288   2293*  2303
                        2308   2317*  2327   2332*  2342   2348*  2358   2364*  2374   2379*  2389   2394*  2404
                        2426   2429*  2430   2433*  2434   2453   2456*  2457   2460*  2461   2490*  2506   2509
                        2515   2518   2521*  2522   2525   2533   2563*  2579   2582   2588   2591   2594*  2595
                        2598   2606   2636*  2652   2655   2661   2664   2667*  2668   2671   2679   2709*  2725
                        2728   2734   2737   2740*  2741   2744   2752   2776*  2788   2831*  2843   2920   3700*
RXDBUF  001716          1115#  1438*  2056   2058   2068   2079   2090   2101   2163   2164   2489   2529   2562
                        2602   2635   2675   2708   2748   2783   2791   2806   2838   2846   2861   3704*
RXDONE= 000200           842#  1035#  2002
RXERR = 100000           851#  1044#  2101
SAVIT   014342          3257   3278#
SAVPC   001126           782#  3148*
SAVSP   001116           775#  3421*  3428
SAV05 = 104411          3678#
SCOP1 = 104405          3674#
SEND  = 000020           878#  1071#  1720   1721   1724   1725   1729   1731
SEREC   001150           794#  1385   2238
SETFLG= 104414          1315   1380   1384   1388   1392   3681#
SEVEN = 004000           864#  1057#  2634
SEXMIT  001147           793#  1381   2236
SHIFT   001122           780#  2498*  2512*  2571*  2585*  2644*  2658*  2717*  2731*  2785*  2797*  2801*  2840*
                        2852*  2856*  3732*
SIX   = 002000           863#  1056#  2561
SPACNT= 014107          3178*  3197   3200*  3210#
SRD   = 002000           839#  1032#
STACK = 001100           644#  1207   1243   1397   3437
STD   = 000010           846#  1039#  1571   1572   1575   1576   1580   1586   1590   2240   2293   2317   2364
STFLG   001173           815#  1246*
STKLMT= 177774           655#
STPSYN= 000400           841#  1034#  1660   1661   1664   1665   1669   1671
SV05    013650          3152#
SWR     001440           913#  1205   1226*  1228   1234*  1241*  1257   1259*  1264   1280   1399   2948   2979
                        3248   3255   3267   3270   3580   3587   3601   3603   3609   3616
SWREG   000176           756#  1234   1259   1264   2948   2965   2972
SWREGL  013010          2960   2970#
SW0   = 000001           708#
SW00  = 000001           698#   708   1280
SW01  = 000002           697#   707   1399
SW02  = 000004           696#   706
SW03  = 000010           695#   705
SW04  = 000020           694#   704
SW05  = 000040           693#   703
SW06  = 000100           692#   702
SW07  = 000200           691#   701
SW08  = 000400           690#   700
SW09  = 001000           689#   699   2979
SW1   = 000002           707#
SW10  = 002000           688#
SW11  = 004000           687#
SW12  = 010000           686#
SW13  = 020000           685#
```

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SW14   = 040000            684#
SW15   = 100000            683#
SW2    = 000004            706#
SW3    = 000010            705#
SW4    = 000020            704#
SW5    = 000040            703#
SW6    = 000100            702#
SW7    = 000200            701#
SW8    = 000400            700#
SW9    = 001000            699#
SYNCNO  001146             792#  1369*  1373*  2504   2577   2650   2723
SYNEXT= 020000             860#  1053#  2418   2425
SYNINT= 030000             859#  1052#  2481   2488   2554   2561   2627   2634   2700   2707
SYNSCH= 000020             845#  1038#  1600   1601   1604   1605   1609   1611   2429   2433   2456   2460   2490
                          2521   2563   2594   2636   2667   2709   2740   2776   2831
SYSTST= 014000             885#  1078#
TBITVE= 000014             741#
TEMP    016166            3183   3438*  3439*  3552#
TKVEC  = 000060             748#
TPVEC  = 000064             749#
TRAPVE= 000034             747#  1213*  1214*
TRPREG  017362            1420   1436   1451   1466   1481   3769#
TRTVEC= 000014              742#
TST1    003374            1404   1411   1419#  2938   3577
TST10   004054            1532#
TST11   004200            1570#
TST12   004314            1599#
TST13   004404            1619#
TST14   004474            1639#
TST15   004564            1659#
TST16   004654            1679#
TST17   004744            1699#
TST2    003454            1435#
TST20   005034            1719#
TST21   005124            1739#
TST22   005214            1759#
TST23   005304            1781#
TST24   005374            1803#
TST25   005464            1823#
TST26   005554            1843#
TST27   005644            1863#
TST3    003526            1450#
TST30   005746            1895#
TST31   006010            1909#
TST32   006162            1944#
TST33   006300            1972#
TST34   006404            2000#
TST35   006426            2011#
TST36   006450            2022#
TST37   006472            2033#
TST4    003600            1465#
TST40   006514            2043#
TST41   006536            2054#
TST42   006570            2066#
TST43   006612            2077#
TST44   006634            2088#
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TST45   006656          2099#
TST46   006700          2109#
TST47   007002          2147#
TST5    003652          1480#
TST50   007042          2161#
TST51   007074          2176#
TST52   007774          2416#
TST53   010106          2443#
TST54   010220          2479#
TST55   010526          2552#
TST56   011034          2625#
TST57   011342          2698#
TST6    003724          1495#
TST60   011650          2766#
TST61   012076          2821#
TST7    003740          1503#
TTST    016310          3580#
TXCSR   001726          1119#   1468*   1514*   1543*   1581*   1610*   1630*   1650*   1670*   1680*   1681    1684*   1685
                        1689*   1690*   1691    1700*   1701    1704*   1705    1709*   1710*   1711    1720*   1721    1724*
                        1725    1729*   1730*   1731    1740*   1741    1744*   1745    1749*   1750*   1751    1760*   1761
                        1764*   1765    1769*   1770*   1771    1782*   1783    1786*   1787    1791*   1792*   1793    1804*
                        1805    1808*   1809    1813*   1814*   1815    1824*   1825    1828*   1829    1833*   1834*   1835
                        1844*   1845    1848*   1849    1853*   1854*   1855    1865*   1869    1896*   1897    1900*   1901
                        1910*   1925*   1927    1933*   1934    1945*   1947    1950*   1954    1958*   1959*   1960*   1964
                        1977*   1979    1982*   1983    1987*   1988*   1989*   1990    2001*   2012*   2023*   2034*   2035
                        2044*   2045    2055*   2067*   2078*   2089*   2100*   2111*   2148*   2149*   2150    2151    2162*
                        2178*   2417*   2419*   2422*   2444*   2446*   2449*   2480*   2482*   2485*   2492*   2493*   2495*
                        2496*   2553*   2555*   2558*   2565*   2566*   2568*   2569*   2626*   2628*   2631*   2638*   2639*
                        2641*   2642*   2699*   2701*   2704*   2711*   2712*   2714*   2715*   2767*   2769*   2772*   2778*
                        2779*   2781*   2782*   2822*   2824*   2827*   2833*   2834*   2836*   2837*   3710*   3723*   3729*
                        3730*   3731*
TXDBUF  001732          1121#   1483*   1496    3714*
TXDONE= 000200           875#   1068#   2035
TXINTE= 000100           876#   1069#   1760    1761    1764    1765    1769    1771
TYPE  = 104401          1272    1412    2877    2880    2885    2956    2958    3026    3069    3086    3172    3203    3250
                        3258    3294    3311    3313    3316    3318    3322    3329    3393    3443    3668#
TYPOC = 104402          3302    3326    3669#
TYPON = 104404          3671#
TYPOS = 104403          3670#
USER  = 000000           882#   1075#
VOID  = 000001           849#   1042#
WRDCNT  014104          3176*   3205*   3208#
ZERO    012406          2891#
$APTHD  002136          1178    1184#
$ASTAT= ****** U         584     599
$ATYC   000024           555     557#
$ATY1   000000           553#
$ATY3   000006           554#   3011
$ATY4   000016           556#   3263
$AUTOB  001434           910#
$BASE   001602           988#
$BDADR  001422           905#
$BDDAT  001426           907#
$BELL   001516           939#   3250    3278
$CDW1   001606           990#
$CDW2   001610           991#
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$CKSWR= ****** U        3674
$CMTAG  001400           893#  1202   1203   1211   1217   1218
$CM1   = 000006          925#   926#   927#   928#   929#   930#   931#
$CM2   = 000014          925#   926#   927#   928#   929#   930#   931#
$CM3   = 000006          923#   925
$CM4   = 000006          931#   932#   933#   934#   935#   936#   937#
$CPUOP  001554           962#
$CRLF   001523           941#  3027   3062   3258   3278   3294   3313   3318   3322
$DDW0   001612           992#
$DDW1   001614           993#
$DDW10  001636          1002#
$DDW11  001640          1003#
$DDW12  001642          1004#
$DDW13  001644          1005#
$DDW14  001646          1006#
$DDW15  001650          1007#
$DDW2   001616           994#
$DDW3   001620           995#
$DDW4   001622           996#
$DDW5   001624           997#
$DDW6   001626           998#
$DDW7   001630           999#
$DDW8   001632          1000#
$DDW9   001634          1001#
$DEVCT  001536           953#
$DEVM   001604           989#
$E     = 000002           548#
$ENDAD  012644          1165   2933#
$ENV    001546           562    586    958#  1274   3006   3067   3260
$ENVM   001547           564    959#  1239   3008   3013
$ERFLG  001403           896#  1248*  2925*  3245*  3278   3445*  3561   3605   3607   3613*  3637
$ERMAX  001415           902#  1219*  3607   3630*  3637
$ERROR  014160          1211   3244#
$ERRPC  001416           903#  1151   1154   1250*  2924*  3252*  3253*  3254   3278   3300   3446*  3576*
$ERRTB  001652          1093#  3308
$ERRTY  014400          3293#
$ERTTL  001412           900#  1249*  3251*  3278
$ESCAP  001514           938#  1218*  3273   3275   3278   3629*
$ETABL  001546           957#
$ETEND  001652          1010#  1190
$FATAL  001530           590*   950#
$FFLG   000244           553*   556*   584    593*   601#
$FILLC  001456           921#  3031   3062
$FILLS  001455           920#  3062
$GDADR  001420           904#
$GDDAT  001424           906#
$GTSWR= ****** U        3673
$HIBTS  002136          1185#
$ICNT   001404           897#  3620*  3621   3623*  3636
$INTAG  001435           911#
$ITEMB  001414           901#  3254*  3262   3278   3297
$LF     001524           942#  3062   3278
$LFLG   000243           594*   600#
$LPADR  001406           898#  1220*  2938*  3582*  3611*  3627*  3632   3636
$LPERR  001410           899#  1221*  3272   3611   3628*  3636
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$MADR1  001560            975#
$MADR2  001564            979#
$MADR3  001570            982#
$MADR4  001574            985#
$MAIL   001526            948#   1186    1190    1238    3006    3260    3626
$MAMS1  001556            969#
$MAMS2  001562            977#
$MAMS3  001566            980#
$MAMS4  001572            983#
$MBADR  002140           1186#
$MFLG   000242            554*    560     595*    599#
$MSGAD  001542            570*    573     955#
$MSGLG  001544            575*    956#
$MSGTY  001526             568    576*    588     592*    949#
$MTYP1  001557            970#
$MTYP2  001563            978#
$MTYP3  001567            981#
$MTYP4  001573            984#
$MXCNT  016624           3624    3636#
$N    = 000000            548#   2869#
$NULL   001454            919#   3033    3062
$NWTST= 000000           1418#   1434#   1449#   1464#   1479#   1494#   1502#   1531#   1569#   1598#   1618#   1638#   1658#
                         1678#   1698#   1718#   1738#   1758#   1780#   1802#   1822#   1842#   1862#   1894#   1908#   1943#
                         1971#   1999#   2010#   2021#   2032#   2042#   2053#   2065#   2076#   2087#   2098#   2108#   2146#
                         2160#   2175#   2415#   2442#   2478#   2551#   2624#   2697#   2765#   2820#
$OCNT   014756           3365*   3394*   3407#
$OMODE  014760           3360*   3364*   3369    3372*   3383*   3409#
$OVER   016604           3585    3588    3604    3612    3622    3631#
$PASS   001534            952#   1238*   2928*   3618    3637
$PASTM  002144           1188#
$PWRDN  014762           1215    3413#
$QUES   001522            940#   3062    3278
$RDCHR= ****** U         3674
$RDDEC= ****** U         3674
$RDLIN= ****** U         3674
$RDOCT= ****** U         3674
$REGAD  001460            923#
$REG0   001462            925#   3157*   3162
$REG1   001464            926#   3156*   3163
$REG2   001466            927#   3155*   3164
$REG3   001470            928#   3154*   3165
$REG4   001472            929#   3153*   3166
$REG5   001474            930#   3152*   3167
$R2A  = ****** U         3674
$SAVRE= ****** U         3674
$SCOPE  016272           1209    3570#
$SETUP= 000017           1191#   1208    1209    1211    1213    1215    1217    1218    1220    3245    3270    3277    3571
$STUP = 177777           1191#
$SVLAD  016550           3596    3625#
$SVPC = 002136           1163#   1168
$SWR  = 177400            539#    937     938     939    1217    1218    1220    1221    1420    1436    1451    1466    1481
                         1496    1504    1533    1571    1600    1620    1640    1660    1680    1700    1720    1740    1760
                         1782    1804    1824    1844    1864    1896    1910    1945    1973    2001    2012    2023    2034
                         2044    2055    2067    2078    2089    2100    2110    2148    2162    2177    2417    2444    2480
                         2553    2626    2699    2767    2822    3236    3237    3238    3239    3240    3248    3255    3267
                         3270    3278    3562    3563    3564    3565    3566    3587    3599    3601    3602    3605    3606
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                    3607    3614    3615    3616    3628    3631    3636
$SWREG  001550       960#   1241
$SWRMK= 000000      3566    3567    3603
$TESTN  001532       951#   3626*
$TIMES  001512       937#   1217*   3614*   3621    3624*   3636
$TKB    001446       916#   2952    3075    3083    3586
$TKS    001444       915#   2950    3073    3584
$TMP0   001476       931#
$TMP1   001500       932#   2499*   2513*   2572*   2586*   2645*   2659*   2718*   2732*   2786*   2798*   2802*   2841*
                    2853*   2857*   3725*   3737    3747*   3749*   3754    3764*   3766*
$TMP2   001502       933#   3724*   3726*   3727*   3728*   3729    3737*   3741*   3754*   3758*
$TMP3   001504       934#   3738*   3742*   3745*   3755*   3759*   3762*
$TMP4   001506       935#
$TMP5   001510       936#
$TN   = 000062       607#   1418    1420#   1434    1436#   1449    1451#   1464    1466#   1479    1481#   1494    1496#
                    1502    1504#   1531    1533#   1569    1571#   1598    1600#   1618    1620#   1638    1640#   1658
                    1660#   1678    1680#   1698    1700#   1718    1720#   1738    1740#   1758    1760#   1780    1782#
                    1802    1804#   1822    1824#   1842    1844#   1862    1864#   1894    1896#   1908    1910#   1943
                    1945#   1971    1973#   1999    2001#   2010    2012#   2021    2023#   2032    2034#   2042    2044#
                    2053    2055#   2065    2067#   2076    2078#   2087    2089#   2098    2100#   2108    2110#   2146
                    2148#   2160    2162#   2175    2177#   2415    2417#   2442    2444#   2478    2480#   2551    2553#
                    2624    2626#   2697    2699#   2765    2767#   2820    2822#
$TPB    001452       918#   3051*   3062    3083*
$TPFLG  001457       922#   3000    3062
$TPS    001450       917#   3049    3062    3081
$TRAP   016626      1213    3645#
$TRAP2  016650      3656#   3667
$TRP  = 000015      3660#   3669#   3670#   3671#   3672#   3674    3675#   3676#   3677#   3678#   3679#   3680#   3681#
                    3682#
$TRPAD  016662      3650    3667#
$TSTM   002142      1187#
$TSTNM  001402       895#   1251*   1406    1409    2923*   3247    3278    3284    3561    3582    3603    3625*   3626
                    3631    3637
$TYPBN= ****** U    3672
$TYPDS= ****** U    3672
$TYPE   013042       581    3000#   3660    3668
$TYPEC  013254      3030    3037    3044    3049#   3050
$TYPEX  013322      3055    3057    3060#
$TYPOC  014560      3363#   3669
$TYPON  014574      3362    3365#   3671
$TYPOS  014534      3358#   3670
$UNIT   001540       954#
$UNITM  002146      1189#
$USWR   001552       961#   1276
$VECT1  001576       986#
$VECT2  001600       987#
$XTSTR  016354      3578    3590#
$OFILL  014757      3359*   3363*   3373    3408#
$40CAT= ****** U    3257    3587
.     = 017370       602#    641#    754#    757#    762#    817#    818#    892#    943    1149#   1163    1164#   1166#
                    1168#   1174    1175#   1177#   1179#   1206    1220    1221    1423    1426    1439    1442    1454
                    1457    1469    1472    1484    1487    1497    1506    1510    1520    1524    1535    1539    1549
                    1553    1563    1573    1577    1587    1591    1602    1606    1612    1622    1626    1632    1642
                    1646    1652    1662    1666    1672    1682    1686    1692    1702    1706    1712    1722    1726
                    1732    1742    1746    1752    1762    1766    1772    1784    1788    1794    1806    1810    1816
                    1826    1830    1836    1846    1850    1856    1875    1879    1887    1898    1902    1918    1923
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                    1931    1937    1948    1955    1965    1980    1984    1991    2003    2014    2025    2036    2046
                    2060    2069    2080    2091    2102    2120    2127    2138    2154    2167    2184    2192    2201
                    2207    2212    2222    2228    2233    2247    2254    2260    2270    2276    2285    2291    2300
                    2306    2311    2324    2330    2339    2346    2355    2361    2371    2377    2386    2392    2401
                    2407    2427    2431    2435    2454    2458    2462    2507    2510    2516    2519    2523    2526
                    2531    2534    2580    2583    2589    2592    2596    2599    2604    2607    2653    2656    2662
                    2665    2669    2672    2677    2680    2726    2729    2735    2738    2742    2745    2750    2753
                    2789    2793    2808    2844    2848    2863    3062    3278    3332#   3424    3440    3546#   3551#
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.INSTR  013324      3065#   3675
.INST1  013344      3069#   3078    3088
.MSG    013346      2952*   2953*   2954    3065*   3070#
.PARAM  013442      3093#   3677
.PFAIL  014762      1245    3414#   3435
.RESO5  013702      3162#   3679
.SAVO5  013642      3148#   3678
.SCOPE  016272      3574#
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.SETFL  014112      3218#   3229    3681
.START  002152       758    1200#   1252    2889
.$ASTA= ****** U     554     557
.$X   = 002136      1174#   1179
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ENDCOM     1#    751#
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        1525   1536   1540   1550   1554   1574   1578   1588   1592   1603   1607   1613   1623   1627   1633
        1643   1647   1653   1663   1667   1673   1683   1687   1693   1703   1707   1713   1723   1727   1733
        1743   1747   1753   1763   1767   1773   1785   1789   1795   1807   1811   1817   1827   1831   1837
        1847   1851   1857   1876   1880   1899   1903   1919   1924   1932   1938   1949   1956   1966   1981
        1985   1992   2004   2015   2026   2037   2047   2061   2070   2081   2092   2103   2121   2128   2155
        2168   2193   2208   2213   2229   2234   2255   2261   2277   2292   2307   2312   2331   2347   2362
        2378   2393   2408   2428   2432   2436   2455   2459   2463   2508   2511   2517   2520   2524   2527
        2532   2535   2581   2584   2590   2593   2597   2600   2605   2608   2654   2657   2663   2666   2670
        2673   2678   2681   2727   2730   2736   2739   2743   2746   2751   2754   2790   2794   2809   2845
        2849   2864
ESCAPE     1#    751#
GETPRI     1#    751#
GETSWR     1#    751#
MULT       1#    751#
NEWTST     1#    751#   1418   1434   1449   1464   1479   1494   1502   1531   1569   1598   1618   1638   1658
        1678   1698   1718   1738   1758   1780   1802   1822   1842   1862   1894   1908   1943   1971   1999
        2010   2021   2032   2042   2053   2065   2076   2087   2098   2108   2146   2160   2175   2415   2442
        2478   2551   2624   2697   2765   2820
POP        1#    596    597    751#
PRGEND   629#   2868
PRGFRT   608#    630
PUSH       1#    557    559    580    751#
PUSSYF   626#
REPORT     1#    539#   751#
RSETUP   613#   2417   2444   2480   2553   2626   2699   2767   2822
SC       548#   3571
SCOPE    646#   1419   1435   1450   1465   1480   1495   1503   1532   1570   1599   1619   1639   1659   1679
        1699   1719   1739   1759   1781   1803   1823   1843   1863   1895   1909   1944   1972   2000   2011
        2022   2033   2043   2054   2066   2077   2088   2099   2109   2147   2161   2176   2416   2443   2479
        2552   2625   2698   2766   2821   2875
SC1      548#   3633
SETPRI     1#    751#
SETTRA   539#   3660#  3669   3670   3671   3674   3675   3676   3677   3678   3679   3680   3681
SETUP      1#    751#   1200
SKIP       1#    751#
SLASH      1#    751#
SPACE    751#
STARS      1#    552    751#   888    943    946   1161   1171   1173   1180   1418   1434   1449   1464   1479
        1494   1502   1531   1569   1598   1618   1638   1658   1678   1698   1718   1738   1758   1780   1802
        1822   1842   1862   1894   1908   1943   1971   1999   2010   2021   2032   2042   2053   2065   2076
        2087   2098   2108   2146   2160   2175   2415   2442   2478   2551   2624   2697   2765   2820   2985
        3232   3288   3335   3558   3639
SWRSU      1#    751#   1222#
TRMTRP   3660#
TSETUP   614#
TYPBIN     1#    751#
TYPDEC     1#    751#
TYPNAM     1#    751#
TYPNUM     1#    751#
TYPOCS     1#    751#
TYPOCT     1#    751#   3300   3324
TYPTXT     1#    751#
$BEGIN   548#   1394
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         2395
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$CLRVE    548#   1274
$CONVR    607#   3169
$DNA      623#
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$INSTR    607#   3062
$ISOB     621#
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         1819   1839
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         2089   2100   2111   2149   2162   2178   2417   2419   2444   2446   2480   2482   2553   2555   2626
         2628   2699   2701   2767   2769   2822   2824
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$STRIP    622#
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$SYNCR    618#   2490   2563   2636   2709   2776   2831
$TRPAR    624#
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         1698   1718   1738   1758   1780   1802   1822   1842   1862   1894   1908   1943   1971   1999   2010
         2021   2032   2042   2053   2065   2076   2087   2098   2108   2146   2160   2175   2415   2442   2478
         2551   2624   2697   2765   2820
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$VARIA    546#    761
$WORDF    619#
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$WORDP    620#
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$$CMTM    886#    931    932    933    934    935    936
$$ESCA      1#   751#
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$$NEWT      1#    751#   1418   1434   1449   1464   1479   1494   1502   1531   1569   1598   1618   1638   1658
         1678    1698   1718   1738   1758   1780   1802   1822   1842   1862   1894   1908   1943   1971   1999
         2010    2021   2032   2042   2053   2065   2076   2087   2098   2108   2146   2160   2175   2415   2442
         2478    2551   2624   2697   2765   2820
$$SET    3660#   3669   3670   3671   3674   3675   3676   3677   3678   3679   3680   3681
$$SETM   1238#
$$SKIP      1#    751#
.EQUAT      1#    539#    641
.HEADE      1#    539#
.KT11       1#
.SETUP      1#    539#   1191
.SWRHI      1#
.$ACT1      1#    539#   1159
.$APTB      1#    539#    944#
.$APTH      1#    539#   1169
.$APTY      1#    539#    550
.$ASTA      1#
.$CATC      1#    539#
.$CMTA      1#    539#    886
.$DB2D      1#
.$DB2O      1#
.$DIV       1#
.$EOP       1#    539#
.$ERRO      1#    539#   3230
.$ERRT      1#    539#   3286
.$MULT      1#
.$POWE      1#    539#
.$RAND      1#
.$RDDE      1#
.$RDOC      1#
.$READ      1#
.$R2AZ      1#
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.$SB2O      1#
.$SCOP      1#    539#   3556
.$SIZE      1#
.$SUPR      1#
.$TRAP      1#    539#   3637
.$TYPB      1#
.$TYPD      1#
.$TYPE      1#    539#   2983
.$TYPO      1#    539#   3333
.$40CA      1#
.1170       1#

. ABS.  017370     000

 ERRORS DETECTED:  0

 CZDUQC,CZDUQC/CRF/SOL/NL:TOC=CZDUQC.SML,CZDUQ3/EQ:RUNA,CZDUQ4,CZDUQC.M11
 RUN-TIME: 50 63 4 SECONDS
 RUN-TIME RATIO: 229/119=1.9
 CORE USED:  43K  (85 PAGES)
```