DU11

OFF-LINE LOGIC TEST

CZDUAE0

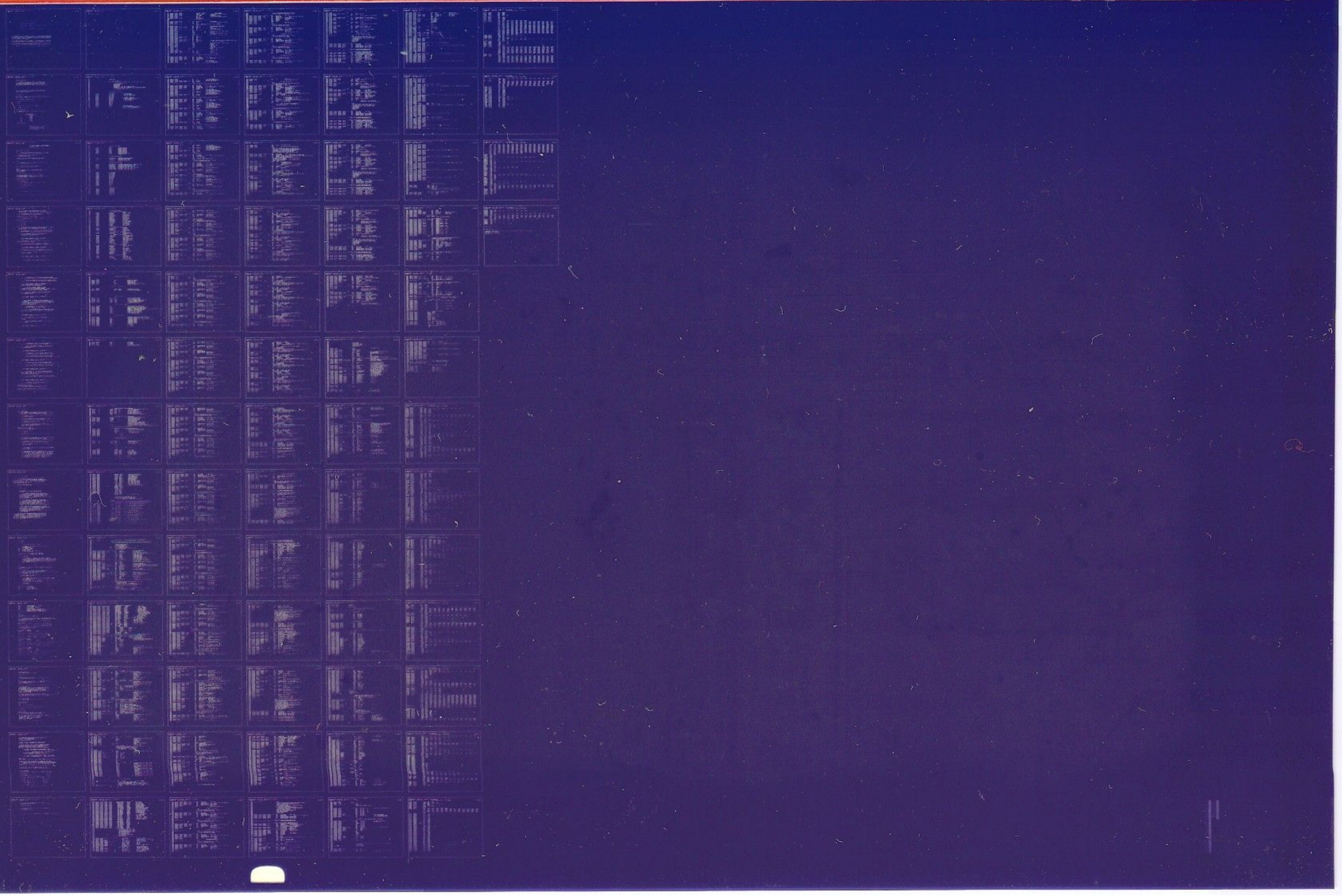
AH-8677E-MC

FICHE 1 OF 1

JAN 1979

digital

MADE IN USA



I D E N T I F I C A T I O N
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PRODUCT CODE: AC-8676E-MC

PRODUCT NAME: CZDUAE0 DU11 OFFLINE LOGIC TESTS

RELEASE DATE: JUN 1978

MAINTAINER : DIAGNOSTICS

GENERAL DESCRIPTION

THIS DIAGNOSTIC CAN CHAIN 16 DU11'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.

1. THE DU11 OFFLINE LOGIC TESTS VERIFY THAT ALL REGISTERS EXIST
,AND ALL RESPECTIVE BITS CAN BE MASTER CLEARED, READ,
WRITTEN AND/OR READ/WRITTEN

2. REQUIREMENTS

PDP-11 FAMILY STANDARD COMPUTER WITH OR WITHOUT HARDWARE SWITCH
REGISTER (LOC. 177570)

DU11 SYNCRONOUS/ISOCRONOUS OPTION

ONE CONSOLE TELETYPE OR EQUIVALENT

2.2 STORAGE

THE PROGRAM LOADS AND RUNS IN 8K OF MEMORY.

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

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NOTE: BEFORE PROCEEDING IT IS IMPORTANT TO
TO REALIZE IF ONE DOESNOT
HAVE THE DU11 SET UP TO THE
DEFAULT PARAMETERS (SEE SECTION

8 OF THIS DOCUMENT) , THEN ONE MUST
SET SW00 = 1, AND ANSWER THE PARAMETER
QUESTION ROUTINE.

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4.1 CONTROL SWITCH SETTINGS

NOTE: SOFTWARE SWITCH REGISTER IS DEFINED AS LOC. 176, WHILE
THE SOFTWARE DISPLAY REGISTER IS DEFINED AS LOC. 174.

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

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

SW00=1

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

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

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

4.2 STARTING ADDRESS

THE STARTING ADDRESS FOR ALL TESTS IS 000200

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

4.3 PROGRAM AND/OR OPERATOR ACTION

4.3.1 INITIAL PROGRAM START

4.3.1.1 LOAD PROGRAM INTO MEMORY WITH ABSOLUTE LOADER

4.3.1.2 LOAD ADDRESS 000200

4.3.1.3 CLEAR CONSOLE SWITCHES

4.3.1.4 PRESS START

4.3.1.5 THE PROGRAM WILL TYPE ''DU11 CZDUA-E TAPE A'' (ONCE ONLY)

NOTE:IF THE SOFTWARE SWITCH REGISTER IS SELECTED THEN THE FOLLOWING

WILL BE TYPED AFTER THE PROGRAM IDENTIFIES ITSELF:
SWR=XXXXXX NEW= (REFER TO SECTION 5. FOR OPERATOR'S OPTION)

4.3.1.7 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 LOAD ADDRESS 000200

4.3.3.2 SET SW00=1

4.3.3.3 PRESS START

NOTE:IF THE SOFTWARE SWITCH REGISTER IS SELECTED THEN THE FOLLOWING WILL BE TYPED AFTER THE PROGRAM IDENTIFIES ITSELF:
SWR=XXXXXX NEW= (REFER TO SECTION 5. FOR OPERATOR'S OPTION)

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 DU11 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 DU11 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 DU11 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 DU11 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 ''DU PRIORITY LEVEL-'' AND WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD

4.3.3.13 TYPE IN THE APPROPRIATE DEVICE PRIORITY LEVEL OF THE DU11 OR DU11'S TO BE TESTED FOLLOWED BY A <CARRIAGE RETURN> (NOTE THAT ALL MULTIPLE DEVICES MUST BE AT THE SAME PRIORITY LEVEL). IE ''5''

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

4.3.3.14 THE PROGRAM WILL TYPE ''# OF SYNC CHARS SELECTED (1 OR 2)-'' AND WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD

4.3.3.15 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 4.3.3.14

4.3.3.16 THE PROGRAM WILL TYPE '' IS SEC XMIT JUMPER #6 IN ? (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 THAT ALL MULTIPLE DEVICES
MUST BE THE SAME)

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

4.3.3.18 THE PROGRAM WILL TYPE ''IS SEC REC JUMPER # 5 IN ?
(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 ''IS OPT CLR ENABLE JUMPER
4 IN ? (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 ''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

4.3.3.23 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 4.3.3.22

4.3.3.24 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 LOAD 000200

4.3.4.2 SET SW01=1

4.3.4.3 PRESS START
NOTE:IF THE SOFTWARE SWITCH REGISTER IS SELECTED THEN THE FOLLOWING
WILL BE TYPED AFTER THE PROGRAM IDENTIFIES ITSELF:
SWR=XXXXXX NEW= (REFER TO SECTION 5. FOR OPERATOR'S OPTION)

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

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

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

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

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

4.3.5.1 LOAD ADDRESS 000200

4.3.5.2 SET SW02 =1
NOTE: IT MAY BE ADVANTAGEOUS TO SET SW01=1 (OPTIONAL)

4.3.5.3 PRESS START

NOTE:IF THE SOFTWARE SWITCH REGISTER IS SELECTED THEN THE FOLLOWING
WILL BE TYPED AFTER THE PROGRAM IDENTIFIES ITSELF:
SWR=XXXXXX NEW= (REFER TO SECTION 5. FOR OPERATOR'S OPTION)

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

4.4 STATUS MAP

THE STATUS MAP IS AN AREA OF THE DU11 DIAGNOSTICS, WHICH WILL ALLOW THE TRANSFER OF PARAMETERS BETWEEN DIAGNOSTICS. IF YOU WISH TO TEST A DU11 , WHICH IS NOT AT THE DEFAULT VALUES ,YOU NEED ONLY GO THROUGH THE TEDIOUS QUESTIONING AND ANSWERING ROUTINE ONCE.

THE FOLLOWING COMBINATIONS OF SWITCH REGISTER SETTINGS WILL ALLOW YOU ACCESS TO THE STATUS MAP.

1) SW07=1

2) START AT 200

3) THE DIAGNOSTIC WILL GO TO THE STATUS MAP AND BYPASS ALL OF THE QUESTIONING ROUTINE.

NOTE: IT IS EXTREMELY IMPORTANT THAT EITHER YOU HAVE JUST ANSWERED THESE QUESTIONS DURING A PRIOR DIAGNOSTIC OR THAT YOU HAVE MANUALLY ENTERED THE CORRECT VALUES FOR VECTOR ADDRESSES ETC.,IN THE AREA DESIGNATED FOR THE STATUS MAP. IT IS IMPORTANT THAT THIS BE PERFORMED BEFORE STARTING AT 200.

THE DIAGNOSTIC HAS NO METHOD TO DETERMINE THAT THE STATUS MAP HAS INDEED BEEN LOADED CORRECTLY. THE DIAGNOSTIC ASSUMES THAT WHEN SW07=1 THE VALUES IN THE STATUS MAP ARE THE VALUES TO BE USED . THESE VALUES CAN BE THE WRONG VALUES , BUT THE DIAGNOSTIC WILL NOT REALIZE THAT A MISTAKE HAS BEEN MADE.

IF BOTH SW07 AND SW00 (SWITCH REGISTER SWITCHES) ARE SET ,(EQUAL TO 1), THE PROGRAM WILL IGNORE SW00 AND SEEING SW07 SET, THE VALUES FROM THE STATUS MAP WILL BE USED. TO USE THE DEFAULT VALUES FOR THE DU11'S THE OPERATOR MUST SET SW00=0 AND SW07=0. THE USE OF SW00 IS EXPLAINED IN GREATER DETAIL IN SECTION 4.3 OF THIS DOCUMENT.

THE FIRST TIME A PROGRAM IS LOADED OR THE FIRST TIME A PROGRAM IS ALTERED VIA THE PARAMETER RESELECTION QUESTION AND ANSWER ROUTINE, A PARTIAL STATUS MAP WILL BE PRINTED. THIS MAP WILL BE PRINTED ONCE FOR ANY COMBINATION OF SWITCHES EXCEPT SW01. RESTARTING THE PROGRAM WILLNOT PRINT OUT A MAP UNLESS THE PROGRAM PARAMETERS ARE BEING RESELECTED BY PUTTING SW00=1.(ON)

THE MAP WILL LOOK LIKE:

STATUS MAP

1300/ 177777

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            1302/ 000000

            1304/ 177777

                    THE BYTES ARE DEFINED AS FOLLOWS:

            1300    THE NUMBER OF SYNCHRONOUS CHARACTERS REQUIRED FOR
                    SYNCHRONIZATION.
            1301    SEC  TRANSMIT JUMPER
            1302    SEC RECEIVER JUMPER
            1303    OPTIONAL JUMPER
            1304    MULTIPLE DEVICES (NO=0 , YES=   1)
            1305    EXTERNAL MODEM BYPASS? (NO=0 ,YES=      1)

            IF THE BYTE IS 0 , THE JUMPER IS NOT CONNECTED
    AND IF THE BYTE IS 377 ETC. THE JUMPER SHOULD BE CONNECTED.

    5.      OPERATING PROCEDURE

                    IF THE DIAGNOSTIC IS RUN ON A CPU WITHOUT A SWITCH
                    REGISTER THEN A SOFTWARE SWITCH REGISTER IS USED WHICH ALLOWS
                    THE USER THE SAME SWITCH OPTIONS AS THE HARDWARE SWITCH REGISTER.
                    IF THE HARDWARE SWITCH REGISTER DOES NOT EXIST OR IF ONE DOES
                    AND IT CONTAINS ALL ONES (177777) THEN THE SOFTWARE SWITCH
                    REGISTER (LOC. 176) IS USED.


            CONTROL:

            THIS PROGRAM ALSO SUPPORTS THE DYNAMIC LOADING OF THE SOFTWARE SWITCH
            REGISTER (LOC. 176) FROM THE TTY. THIS CAN BE ACCOMPLISHED BY
            DOING THE FOLLOWING:

            1) TYPE CONTROL G <^G>; THIS WILL ALLOW THE TTY TO ENTER DATA INTO
               LOC. 176 AT SELECTED POINTS WITHIN THE PROGRAM.
            2) THE MACHINE WILL THEN TYPE: SWR=XXXXXXNEW= (XXXXXX IS THE OCTAL CONTENTS
               OF THE SOFTWARE SWITCH REGISTER.)

            3) AFTER THE ''NEW='' HAS BEEN TYPED THEN THE OPERATOR CAN DO ONE
               OF THE FOLLOWING AT THE TTY:

                 A) TYPE A NUMBER TO BE LOADED INTO LOC. 176 FOLLOWED BY A <CR>.
                    (ONLY NUMBERS BETWEEN 0-7 WILL BE ACCEPTED AND ONLY 6 NUMBERS
                    WILL BE ALLOWED)
                    IF A <CR> IS THE FIRST KEY DEPRESSED THE SOFTWARE SWITCH
                    REGISTER CONTENTS WILL NOT BE CHANGED.

                 B) IF A CONTROL U <^U> IS DEPRESSED THEN THE PROGRAM WILL SEND YOU
                    BACK TO STEP 2.

5.1         OPERATIONAL SWITCH SETTINGS
            SW15 =1          HALT ON ERROR
            SW14 =1          LOOP ON CURRENT TEST
            SW13 =1          INHIBIT ERROR TYPEOUT
            SW11 =1          INHIBIT ITERATIONS
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                SW10 =1         ESCAPE TO NEXT TEST ON ERROR
                SW08 =1         LOOP ON ERROR
                SW07 =1         USE STATUS MAP PARAMETERS
                SW02 =1         LOCK ON TEST
                SW01 =1         RESTART PROGRAM AT SELECTED TEST
                SW00 =1         RESELECT VECTOR AND CONTROL REGISTER ADRESSES
                                &PARAMETERS AFTER A PROGRAM RESTART
                TO INHIBIT 'END OF PASS'' TYPEOUT - TURN TELETYPE OFF

        6.      ERRORS

        6.1     ERROR HALTS
                THERE ARE FOUR DISTINCT ERROR TYPEOUTS

                NOTE: IF THE SOFTWARE SWITCH REGISTER IS TO BE CHANGED AFTER A HALT
                THE THE OPERATOR IS REQUIRED TO TYPE A <^G> BEFORE DEPRESSING CONTINUE.
                THE FOLLOWING WILL BE TYPED:
                SWR=XXXXXX  NEW=   (REFER TO SECTION 5. FOR OPERATOR OPTION)

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

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

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

        6.1.2   PC +2 = REGISTER ERROR PC
                REGISTER        EXPECTED        ACTUAL
                16XXXX          YYYYYY          ZZZZZZ

                WHERE 16XXXX IS THE ADDRESS OF THE FAILING DEVICE REGISTER

                WHERE YYYYYY IS THE EXPECTED CONTENTS OF THAT REGISTER

                WHERE ZZZZZZ IS THE ACTUAL CONTENTS OF THAT REGISTER

        6.1.3   PC +2 = RECEIVER ERROR PC
                REGISTER        EXPECTED        ACTUAL
                16XXXX          YYYYYY          ZZZZZZ

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

                WHERE YYYYYY IS THE EXPECTED DATA CONTENTS OF THAT REGISTER

                WHERE ZZZZZZ IS THE ACTUAL DATA CONTENTS OF THAT REGISTER

        6.1.4   PC +2 = TRANSMITTER ERROR PC
                REGISTER        EXPECTED        ACTUAL
                16XXXX          YYYYYY          ZZZZZZ

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

                WHERE YYYYYY IS THE EXPECTED CONTENTS OF THAT REGISTER

                WHERE ZZZZZZ IS THE ACTUAL CONTENTS OF THAT REGISTER
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6.1.5 ERROR DESCRIPTIONS
SEE LISTINGS FOR DETAILS OF ERRORS

6.2 ERROR RECOVERY

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

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

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

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

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

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

END OF PASS TAPE Y
16XXXX = DEVICE

WHERE Y IS THE TAPE LOADED

WHERE 16XXXX IS THE DEVICE'S BASE REGISTER ADDRESS

TO INHIBIT THIS TYPEOUT - TURN TELETYPE OFF

7. RESTRICTIONS

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

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

7.2 DISQUALIFYING DEVICES WHEN RUNNING MULTIPLE DEVICES

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

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

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

7.2.2.1 TO RESTART...LOAD 000200 IN SWR AND DEPRESS START....
THE PROGRAM WILL CONTINUE WITH THE DEVICE IT WAS IN BEFORE HALTING.

7.2.2.2 .....OR .....LOAD 000200 WITH SW00 =1 AND DEPRESS START....
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.....LOAD & START AT 000200

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 11/20 MACHINE.
IF RUNNING ON AN 11/40 OR AN 11/45 'HOLD:' MUST BE PATCHED TO 40 .

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

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

8. DEFAULT PARAMETERS:
1ST DEVICE: RECEIVER CONTROL REGISTER ADDRESS- RXCSR: 160040

VECTOR ADDRESS- DURIV: 770

ARE YOU RUNNING MULTIPLE DEVICES ?- NO MULTD: 0

LAST DEVICE: RECEIVER CONTROL REGISTER ADDRESS- LASTADD: 0

DU PRIORITY LEVEL- LEVEL 5 DUPRT: LEVEL 5

OF SYNC CHARS SELECTED - 2 SYNCNO: 377

IS SEC XMIT JUMPER # 6 IN ?- YES SEXMIT: 377

IS SEC REC JUMPER # 5 IN ?- YES SEREC: 377

IS OPT CLR ENABLE JUMPER # 4 IN ?- YES OPTCLR: 377

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

9. PROGRAM DESCRIPTION

9.1 THIS PROGRAM PERFORMS THE OFFLINE LOGIC BIT BANGING
OF THE DEVICE
SEE LISTING FOR DETAILS

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

11. LISTINGS

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   675  000000' 000000G                    D
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                                .ENABLE ABS

                                ;DU11 CZDUA-E TAPE A
                                ;COPYRIGHT 1973, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754

                                        ;STARTING PROCEDURE
                                        ;LOAD PROGRAM
                                        ;PRESS START
                                        ;PROGRAM WILL TYPE 'DU11 CZDUA-E 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


                                ;SWITCH REGISTER OPTIONS

    100000                      SW15=100000             ;=1,HALT ON ERROR
    040000                      SW14=40000              ;=1,LOOP ON CURRENT TEST
    020000                      SW13=20000              ;=1,INHIBIT ERROR TYPEOUT
    010000                      SW12=10000
    004000                      SW11=4000               ;=1,INHIBIT ITERATIONS
    002000                      SW10=2000               ;=1,ESCAPE TO NEXT TEST ON ERROR
    001000                      SW09=1000               ;=1,LOOP WITH CURRENT DATA
    000400                      SW08=400                ;=1,LOOP ON ERROR
    000200                      SW07=200                ;+  =1, USE STATUS MAP
    000100                      SW06=100
    000040                      SW05=40
    000020                      SW04=20
    000010                      SW03=10
    000004                      SW02=4                  ;LOCK ON TEST SELECT
    000002                      SW01=2                  ;RESTART PROGRAM AT SELECTED TEST
    000001                      SW00=1                  ;RESELECT VECTOR AND CONTROL REGISTER
                                                        ;ADDRESS AFTER PROGRAM RESTART
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                        ;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                  SP=%6           ;PROCESSOR STACK POINTER
000007                  PC=%7           ;PROGRAM COUNTER

                        ;LOCATION EQUIVALENCIES

177570                  DSWR=177570     ;HARDWARE SWITCH REGISTER LOC.
177570                  DLIGHTS=177570  ;HARDWARE DISPLAY REGISTER LOC.
177776                  PS=177776       ;PROCESSOR STATUS WORD
001100                  STACK=1100      ;START OF PROCESSOR STACK

                        ;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)+
                        .EQUIV  EMT,HLT ;BASIC DEFINITION OF ERROR CALL


100000                  BIT15=100000
040000                  BIT14=40000
020000                  BIT13=20000
010000                  BIT12=10000
004000                  BIT11=4000
002000                  BIT10=2000
001000                  BIT9=1000
000400                  BIT8=400
000200                  BIT7=200
000100                  BIT6=100
000040                  BIT5=40
000020                  BIT4=20
000010                  BIT3=10
000004                  BIT2=4
000002                  BIT1=2
000001                  BIT0=1

                        ;PROCESSER LEVELS
000340                  LEVEL7=340
000300                  LEVEL6=300
000240                  LEVEL5=240
000200                  LEVEL4=200
000140                  LEVEL3=140
000100                  LEVEL2=100
000040                  LEVEL1=040
000000                  LEVEL0=000
```

```
                        ;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
000040                  DNAINTE=BIT5            ;DNA INTR ENAB
000020                  SEND=BIT4               ;SEND
000010                  HDXEN=BIT3              ;HDX/FDX
000001                  BREAK=BIT0              ;BREAK
                                ;TXCSR WRD DEFINITIONS
000000                  USER=0                  ;USER MODE
004000                  MINT=4000               ;MAINT INT MODE
010000                  MEXT=10000              ;MAINT EXT MODE
014000                  SYSTST=14000            ;SYSTEM TEST MODE
                        ;TRAPCATCHER FOR ILLEGAL INTERRUPTS
```

```
                                        ;STANDARD INTERRUPT VECTORS

                    000024              .=24
000024  016250                          .PFAIL              ;POWER FAIL HANDLER
000026  000340                          340                 ;SERVICE AT LEVEL 7
000030  016000                          .HLT                ;ERROR HANDLER
000032  000340                          340                 ;SERVICE AT LEVEL 7
000034  015746                          .TRPSRV             ;GENERAL HANDLER DISPATCH SERVICE
000036  000340                          340                 ;SERVICE AT LEVEL 7

                                        ;SOFTWARE SWITCH REGISTER

                    000174              .=174
000174  000000                  DISPREG:.WORD 0             ;SOFTWARE DISPLAY REG.
000176  000000                  SWREG:  .WORD 0             ;SOFTWARE SWITCH REGISTER
000200  000167  001214          JMP     .START              ;GO TO START OF PROGRAM


                    001100              .=1100

                                        ;INDIRECT POINTERS

001100  177570          SWR:    177570                      ;SWITCH REGISTER POINTER
001102  177570          LIGHTS:177570                       ;DISPLAY REGISTER POINTER
001104  177560          TKCSR:  177560                      ;TELETYPE KEYBOARD CONTROL REGISTER
001106  177562          TKDBR:  177562                      ;TELETYPE KEYBOARD DATA BUFFER
001110  177564          TPCSR:  177564                      ;TELEPRINTER CONTROL REGISTER
001112  177566          TPDBR:  177566                      ;TELEPRINTER DATA BUFFER

                                        ;PROGRAM CONTROL PARAMETERS

001114  000000          RTRN:   0                           ;SCOPE ADDRESS FOR LOOP ON TEST
001116  000000          NEXT:   0                           ;ADDRESS OF NEXT TEST TO BE EXECUTED
001120  000000          LOCK:   0                           ;ADDRESS FOR LOCK ON CURRENT DATA
001122  000000          ICOUNT: 0                           ;NUMBER OF ITERATIONS THAT CURRENT TEST WILL BE EXECUTED
001124  000000          LPCNT:  0                           ;NUMBER OF ITEREATIONS COMPLETED
001126  000000          TSTNO:  0                           ;NUMBER OF TEST IN PROGRESS
001130  000000          PASCNT: 0                           ;NUMBER OF PASSES COMPLETED
001132  000000          ERRCNT: 0                           ;TOTAL NUMBER OF ERRORS
001134  000000          LSTERR: 0                           ;PC OF LAST ERROR CALL

                                        ;PROGRAM VARIABLES

001136  000020          HOLD:   20                          ;TEMPORARY STORAGE=DELAY TIME FOR CABLES
001140  000000          SHIFT:  0                           ;TEMPORARY STORAGE= # OF SHIFTS PER CHAR
001142  000000          COUNT:  0                           ;TEMPORARY STORAGE= # OF TIMES A CHAR WILL BE SENT
001144  000000          TEMP1:  0                           ;TEMPORARY STORAGE
001146  000000          TEMP2:  0                           ;TEMPORARY STORAGE
001150  000000          TEMP3:  0                           ;TEMPORARY STORAGE
001152  000000          TEMP4:  0                           ;TEMPORARY STORAGE
001154  000000          TEMP5:  0                           ;TEMPORARY STORAGE
001156  000000          SAVR0:  0                           ;R0 STORAGE
001160  000000          SAVR1:  0                           ;R1 STORAGE
001162  000000          SAVR2:  0                           ;R2 STORAGE
```

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   877  001164  000000                SAVR3:  0               ;R3 STORAGE
   878  001166  000000                SAVR4:  0               ;R4 STORAGE
   879  001170  000000                SAVR5:  0               ;R5 STORAGE
   880  001172  000000                SAVSP:  0               ;STACK POINTER STORAGE
   881  001174  000000                SAVPC:  0               ;PROGRAM COUNTER STORAGE
```

```
                                        ;PROGRAM CONVERSATIONAL PARAMETERS
001176      377         SYNCNO: .BYTE   377             ;# OF SYNC CHARS REQ'D FOR SYNC'ZATION
001177      377         SEXMIT: .BYTE   377             ;SEC XMIT JUMPER ''IN''
001200      377         SEREC:  .BYTE   377             ;SEC REC JUMPER ''IN''
001201      377         OPTCLR: .BYTE   377             ;OPTIONAL JUMPER CLR ''IN''
001202      000         MULTD:  .BYTE   0               ;NO MULTIPLE DEVICE FLAG
001203      377         JMRBY:  .BYTE   377             ;EXTERNAL MODEM BYPASS JUMPER ''IN''
                        .EVEN

                                        ;PROGRAM MULTIPLE DEVICE PARAMETERS
001204  000000          BASEADD:        0               ;PROG CONTROLLED 1ST DEVICE ADDR
001206  000000          KEEPADD:        0               ;SAVED 1ST DEVICE ADDR
001210  000000          LASTADD:        0               ;LAST DEVICE RXCSR ADDR
001212  000000          BASEIV:         0               ;PROG CONTROLLED IV
001214  000000          KEEPIV:         0               ;SAVED INTR VECTOR
001216  000000          ACTREG:         0               ;ACTIVE REGISTER ,,,MODIFY THIS
                                                        ;LOCATION TO DISQUALIFY OR QUALIFY
                                                        ;DEVICES (1= RUN,,,0= DON'T RUN)
001220  000000          ROTADD:         0               ;ROTATING POINTER FOR ACTREG..POINTS
                                                        ;TO DEVICE PRESENTLY UNDER TEST WHEN RUNNING MULTIPLE DE
                        ;****************************************

                        ; THESE ARE STORAGE FOR THE STATUS MAP PRINT OUT
001222  000000                FLAG:0          ; FLAGS FOR STATUS MAP PRINT OUT (SSP)
001224  000000                HOLD0: 0                ; HOLDS  R0 IN STATUS MAP PRINT
001226  000000                HOLD1:0                 ; R1 ETC.
001230  000000                COUNT1:0                ; FOR COUNTING 3 WORDS
001232  000002                TABLE   : 2             ; FOR CONVRT ROUTINE
001234  003006                            3006
001236  000000                          0
001240  003006                            3006
001242  000000                                  0
                                ;**********************************
                                ;PROGRAM CONTROL FLAGS


001244      000         INIFLG: .BYTE   0               ;PROGRAM INITIALIZATION FLAG
001245      000         STFLG:  .BYTE   0               ;TEST START FLAG
001246      000         ERRFLG: .BYTE   0               ;ERROR OCCURED FLAG
001247      000         LOKFLG: .BYTE   0               ;LOCK ON CURRENT TEST FLAG

                        .EVEN

                        ;*******    STATUS  MAP   *******

            001300      .=1300
001300  000001          STATUS: NOSYNC: .BLKB 1         ;SYNC CHARS
001301  000001                  MITSEX: .BLKB 1         ;XMIT JUMPER
001302  000001                  RESEC: .BLKB 1          ;REC SEC JUMPER
001303  000001                  CLROPT: .BLKB 1         ;OPTIONAL JUMPER
001304  000001                  DMULT: .BLKB 1          ;MULTIPLE DEVICE FLAG
001305  000001                  BYJMR: .BLKB 1          ;EXTERNAL MODEM

                        ; MULTIPLE    DEVICE PARAMETERS

001306  000001                ADDBASE: .BLKW 1        ;PROG CONTROLLED 1ST DEVICE ADDR
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                                        ADDKEEP: .BLKW 1        ;SAVED 1ST DEVICE ADDR
                                        ADDLAST: .BLKW 1        ;LAST DEVICE  RXCSR  ADDR
                                        IVBASE: .BLKW 1         ;PROG CONTROLLED IV
                                        IVKEEP: .BLKW 1         ;SAVED INTR VECTOR
                                        REGACT: .BLKW 1         ;ACTIVE REGISTER
                                        ADDROT: .BLKW 1         ;ROTATING POINTER
                                        PRTDU:  .BLKW 1         ;DU11 PRIORITY
                                        RIVDU:  .BLKW 1         ;DU11 REC INTR VECTOR
                                        TIVDU:  .BLKW 1         ;DU11 XMIT INTR VECTOR
                                        TISDU:  .BLKW 1         ;DU11 XMIT INTR STATUS
                                        RISDU:  .BLKW 1         ;DU11  REC INTR STATUS
                                        L1ESS: .BLKW 1          ;PRIORITY TO ALLOW INTR
                                        CSRRX: .BLKW 1          ; DEFAULT OR ALTERED PARAMETERS
                                        CSRHRX: .BLKW 1         ;
                                        BUFRXD: .BLKW 1
                                        BUFHRXD: .BLKW 1
                                        CSRPAR: .BLKW   1
                                        CSRHPAR:.BLKW   1
                                        CSRTX: .BLKW 1
                                        CSRHTX: .BLKW 1
                                        BUFTXD: .BLKW 1
                                        BUFHTXD:.BLKW 1
                                        BASEDU: .BLKW 1         ;DU11 RXCSR BASE ADDR
                                        .EVEN

                                        ;DEFINITIONS FOR TRAP SUBROUTINE CALLS
                                        ;POINTERS TO SUBROUTINES CAN BE FOUND
                                        ;IN THE TABLE IMMEDIATLY FOLLOWING THE DEFINITIONS

001366                          .TRPTAB:
                                ;*************************************************************************
                                ;*************************************************************************
        104400                          SCOPE=TRAP+0    ;CALL TO SCOPE LOOP AND ITERATION HANDLER
001366  014532                  .SCOPE
        104401                          SCOP1=TRAP+1    ;CALL TO LOOP ON CURRENT DATA HANDLER
001370  014716                  .SCOP1
        104402                          TYPE=TRAP+2     ;CALL TO TELETYPE OUTPUT ROUTINE
001372  014736                  .TYPE
        104403                          INSTR=TRAP+3    ;CALL TO ASCII STRING INPUT ROUTINE
001374  014776                  .INSTR
        104404                          INSTER=TRAP+4   ;CALL TO INPUT ERROR HANDLER
001376  015114                  .INSTER
        104405                          PARAM=TRAP+5    ;CALL TO NUMERICAL DATA INPUT ROUTINE
001400  015146                  .PARAM
        104406                          SAV05=TRAP+6    ;CALL TO REGISTER SAVE ROUTINE
001402  015362                  .SAV05
        104407                          RES05=TRAP+7    ;CALL TO REGISTER RESTORE ROUTINE
001404  015422                  .RES05
        104410                          CONVRT=TRAP+10  ;CALL TO DATA OUTPUT ROUTINE
001406  015454                  .CONVRT
        104411                          CNVRT=TRAP+11   ;CALL TO DATA OUTPUT ROUTINE WITHOUT CR/LF
001410  015460                  .CNVRT
        104412                          SETFLG=TRAP+12  ;CALL TO FLAG SET ROUTINE
001412  015700                  .SETFLG
        104413                          CKSWR=TRAP+13   ;CALL TO ALLOW SWREG TO BE LOADED FROM TTY
001414  016414                  .CKSWR
```

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                104414                          CNTLU=TRAP+14   ;CALL TO ALLOW LOADING  OF SWREG FROM TTY
001416  016470                          .CNTLU
                                        ;*************************************************************************
                                        ;*************************************************************************

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

001420  012767  000340  176350  .START: MOV     #340,PS                 ;LOCK OUT INTERRUPTS
001426  012706  001100                  MOV     #STACK,SP               ;SET UP STACK
001432  012737  016250  000024          MOV     #.PFAIL,@#24            ;SET UP POWER FAIL VECTOR
001440  005067  177460                  CLR     LPCNT                   ;CLEAR # OF ITERATION COMPLETED LOCATION
001444  105067  177575                  CLRB    STFLG                   ;CLEAR START FLAG
001450  005067  177454                  CLR     PASCNT                  ;CLEAR PASS COUNT
001454  105067  177566                  CLRB    ERRFLG                  ;CLEAR ERROR FLAG
001460  005067  177446                  CLR     ERRCNT                  ;CLEAR ERROR COUNT
001464  005067  177444                  CLR     LSTERR                  ;CLEAR LAST ERROR POINTER
001470  012767  000001  177430          MOV     #1,TSTNO                ;SET UP FOR TEST 1
001476  012767  001420  177410          MOV     #.START,RTRN            ;SET UP FOR POWER FAIL BEFORE
                                                                        ;TESTING STARTS
001504  105767  177534                  TSTB    INIFLG                  ;HAS INITIALIZATION BEEN PERFORMED
001510  001004                          BNE     ONCE
001512  104402  016570                  TYPE    ,MTITLE                 ;TYPE TITLE MESSAGE
001516  105167  177522                  COMB    INIFLG                  ;IF NOT SET FLAG AND DO
001522  012767  177570  177350  ONCE:  MOV     #DSWR,SWR               ;RELOAD HARDWARE SWITCH REGISTER INTO POINTER
001530  012767  177570  177344          MOV     #DLIGHTS,LIGHTS         ;RELOAD HARDWARE DISPLAY REGISTER INTO POINTER
001536  013746  000006                  MOV     @#6,-(SP)               ;SAVE VECTORS
001542  013746  000004                  MOV     @#4,-(SP)
001546  012737  001566  000004          MOV     #64$,@#4                ;SET UP FOR TIMEOUT
001554  022777  177777  177316          CMP     #-1,@SWR                ;REFERENCE HARDWARE SWITCH REGISTER
001562  001402                          BEQ     65$
001564  000407                          BR      66$
001566  022626                  64$:    CMP     (SP)+,(SP)+             ;ADJUST STACK
001570  012767  000176  177302  65$:    MOV     #SWREG,SWR              ;POINT TO SOFTWARE SWITCH REG
001576  012767  000174  177276          MOV     #DISPREG,LIGHTS         ;POINT TO SOFT DISPLAY REG
001604  012637  000004          66$:    MOV     (SP)+,@#4               ;RESTORE VECTORS
001610  012637  000006                  MOV     (SP)+,@#6
001614  005737  000042                  TST     @#42                    ;UNDER MONITOR
001620  001005                          BNE     MAP
001622  022767  000176  177250          CMP     #SWREG,SWR              ;IS SWREG USED
001630  001001                          BNE     MAP                       ; BRANCH TO CHECK FOR STATUS MAP
001632  104414                          CNTLU
                                        ;*************************************************************
                                        ; CODE FOR STATUS MAP
                                        ; CODE ADDED FOR REV. E OF DIAGNOSTICS
                                        ; IF SW07= 1 ,THEN YOU USE THE STATUS MAP PREVIOUSLY
                                        ; SETUP, OR REENTER QUESTIONING ROUTINE

001634  032777  000200  177236  MAP:    BIT #SW07, @SWR                 ; IS SW07=1?
001642  001537                          BEQ $67                         ; IF NOT, GO TO TEST FOR SW00=1
                                        ; NOW SET UP MAP VALUES FOR PROGRAM
                                        ; THESE VALUES FROM THE STATUS MAP WILL BE USED IN THE
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1050
1051   001644   116767   177430   177324          ; OPERATION OF THIS  PROGRAM.
1052   001652   116767   177423   177317          MOVB NOSYNC      ,SYNCNO                ; SYNC CHAR
1053   001660   116767   177416   177312          MOVB MITSEX      ,SEXMIT                ; XMIT   JUMPER
1054   001666   116767   177411   177305          MOVB RESEC       ,SEREC                 ; SEC REC JUMPER
1055   001674   116767   177404   177300          MOVB CLROPT      ,OPTCLR                ;OPTIONAL JUMPER
1056   001702   116767   177377   177273          MOVB DMULT       ,MULTD                 ;MULTIPLE DEVICE
1057   001710   016767   177372   177266          MOVB BYJMR       ,JMRBY                 ;EXTERNAL MODEM
1058   001716   016767   177366   177262          MOV ADDBASE      ,BASEADD               ;PROG 1ST DEVICE ADDR
1059   001724   016767   177362   177256          MOV ADDKEEP      ,KEEPADD               ; SAVED 1ST DEVICE ADDR
1060   001732   016767   177360   177254          MOV  ADDLAST     ,LASTADD               ; LAST DEVICE RXCSR ADDR
1061   001740   016767   177354   177250          MOV IVKEEP       ,KEEPIV                ; SAVED INTR VECTOR
1062   001746   016767   177350   177244          MOV REGACT       ,ACTREG                ;ACTIVE REGISTER
1063   001754   016767   177334   177230          MOV ADDROT       ,ROTADD                ;ROTATING POINTER
1064   001762   016767   177220   177214          MOV IVBASE,      BASEIV           ; BASE INTR VECTOR
1065   001770   016767   177332   016736          MOV KEEPADD      , BASEADD              ;RELOAD BASEADD
1066   001776   016767   177332   016732          MOV RIVDU,       DURIV            ; REC INTR VECTOR
1067   002004   016767   177320   016726          MOV RISDU,       DURIS            ; REC INTR STATUS
1068   002012   016767   177314   016722          MOV TIVDU,       DUTIV            ; XMIT INTR VECTOR
1069   002020   016767   177312   016230          MOV TISDU,       DUTIS            ; XMIT INTR STATUS
1070   002026   013737   001324   020254          MOV L1ESS,       LESS1            ; PRIORITY TO ALLOW INTR
1071   002034   016767   177324   016350          MOV @#PRTDU,     @#DUPRT          ; PRIORITY RELOADED
1072   002042   016767   177272   016640          MOV     BASEDU,  DUBASE           ;'
1073   002050   016767   177266   016634          MOV CSRRX,       RXCSR
1074   002056   016767   177262   016630          MOV CSRHRX,      HRXCSR
1075   002064   016767   177256   016624          MOV     BUFRXD,  RXDBUF
1076   002072   016767   177252   016620          MOV     BUFHRXD,         HRXDBUF
1077   002100   016767   177246   016614          MOV     CSRPAR,          PARCSR
1078   002106   016767   177242   016610          MOV     CSRHPAR,         HPARCSR
1079   002114   016767   177236   016604          MOV     CSRTX,   TXCSR
1080   002122   016767   177232   016600          MOV     CSRHTX,          HTXCSR
1081   002130   016767   177226   016574          MOV BUFTXD,      TXDBUF
1082   002136   000167   000466                   MOV BUFHTXD,     HTXDBUF
1083                                              JMP .BEGIN                              ;BRANCH TO BEGIN TESTING
1084   002142   032777   000001   176730  $67:    ;*************************************************************
1085   002150   001002                           BIT     #SW00    ,@SWR   ; RESELECT VECTOR $ CONTROL REG?
1086   002152   000167   000452                   BNE     1$               ; BRANCH  TO QUESTIONING
1087   002156   005037   001222          1$:      JMP .BEGIN               ; GO TO  LOAD STATUS MAP ETC.
1088   002162   012700   000300                   CLR @#FLAG                       ; CLEAR FLAG SO STATUS MAP PRINTS OUT
1089   002166   012701   000302                   MOV     #300,R0                  ;RESTORE VECTOR AREA TO TRAPCATCHER
1090   002172   012702   000004                   MOV     #302,R1                  ;START AT LOCATION 300
1091   002176   010110                           MOV     #4,R2
1092   002200   005011                   2$:     MOV     R1,(R0)
1093   002202   060200                           CLR     (R1)
1094   002204   060201                           ADD     R2,R0
1095   002206   022701   001000                   ADD     R2,R1
1096   002212   002771                           CMP     #1000,R1                 ;END AT LOCATION 776
1097   002214   104403                           BLT     2$
1098   002216   016644                           INSTR                            ;OUTPUT MESSAGE & GET INPUT STRING
1099   002220   104405                           MREGAD                           ;MESSAGE
1100   002222   160000                           PARAM                            ;CONVERT STRING
1101   002224   167776                           160000                           ;LOW LIMIT
1102   002226   020412                           167776                           ;HIGH LIMIT
1103   002230      001                           DUBASE                           ;STORE AT THIS LOCATION
1104   002231      001                   .BYTE   1                                ;MASK
1105   002232   016767   016154   176746  .BYTE   1                                ;HOW MANY TIMES + 2
                                                 MOV     DUBASE,KEEPADD   ;SAVE
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 1106  002240  004767  016014                    JSR     PC,DUADDR
 1107  002244  016767  176736  176732            MOV     KEEPADD,BASEADD ;RESTORE FOR ROTATION
 1108  002252  104403                            INSTR                   ;OUTPUT MESSAGE & GET INPUT STRING
 1109  002254  016622                            MVECTO                  ;MESSAGE
 1110  002256  104405                            PARAM                   ;CONVERT STRING
 1111  002260  000300                            300                     ;LOW LIMIT
 1112  002262  000776                            776                     ;HIGH LIMIT
 1113  002264  020734                            DURIV                   ;STORE AT THIS LOCATION
 1114  002266     001                .BYTE   1                            ;MASK
 1115  002267     004                .BYTE   4                            ;HOW MANY TIMES + 2
 1116  002270  016767  016440  176716            MOV     DURIV,KEEPIV    ;SAVE
 1117  002276  016767  016432  176706            MOV     DURIV,BASEIV    ;SET UP FOR ROTATION
 1118  002304  104403                            INSTR                   ;OUTPUT MESSAGE & GET INPUT STRING
 1119  002306  016725                            MMULT                   ;MESSAGE
 1120  002310  104412                            SETFLG                  ;SET FLAG BASED UPON INPUT STRING
 1121  002312  001202                            MULTD                   ;THIS FLAG
 1122  002314  105767  176662                    TSTB    MULTD   ;ARE THERE MULTIPLE DEVICES
 1123                                            ;ON THE SYSTEM ?
 1124  002320  100406                            BMI     BBB     ;YES,ASK NEXT QUESTION
 1125  002322  005067  176670                    CLR     ACTREG
 1126  002326  005067  176666                    CLR     ROTADD
 1127  002332  000167  000140                    JMP     OUTMUL  ;JUMP AROUND NEXT QUESTION
 1128  002336                            BBB:
 1129  002336  104403                            INSTR                   ;OUTPUT MESSAGE & GET INPUT STRING
 1130  002340  017004                            MLASTD                  ;MESSAGE
 1131  002342  104405                            PARAM                   ;CONVERT STRING
 1132  002344  160000                            160000                  ;LOW LIMIT
 1133  002346  167776                            167776                  ;HIGH LIMIT
 1134  002350  001210                            LASTADD                 ;STORE AT THIS LOCATION
 1135  002352     001                .BYTE   1                            ;MASK
 1136  002353     001                .BYTE   1                            ;HOW MANY TIMES + 2
 1137                                    ;THE FOLLOWING ROUTINE SETS UP ACTREG FOR THE FIRST TIME
 1138  002354  012767  000001  176636    1$:     MOV     #1,ROTADD       ;SET UP POINTER
 1139  002362  005067  176630                    CLR     ACTREG  ;CLR ACTIVE REGISTER
 1140  002366  056767  176626  176622    2$:     BIS     ROTADD,ACTREG   ;MAKE THIS DEVICE ACTIVE
 1141  002374  000241                            CLC
 1142  002376  006167  176616                    ROL     ROTADD  ;SET UP POINTER
 1143  002402  103421                            BCS     3$      ;ARE YOU OUT OF RANGE ?
 1144  002404  062767  000010  176572            ADD     #10,BASEADD     ;SET UP BASE ADDRESS
 1145  002412  026767  176572  176564            CMP     LASTADD,BASEADD ;IS THIS THE LAST DEVICE ?
 1146  002420  101362                            BHI     2$      ;NO DO IT AGAIN
 1147  002422  056767  176572  176566            BIS     ROTADD,ACTREG   ;THIS ASSUMES THAT THERE ARE AT
 1148                                            ;LEAST TWO DEVICES WHEN YOU ANSWER YES TO
 1149                                            ;MULTIPLE DEVICE QUESTION
 1150  002430  012767  000001  176562    4$:     MOV     #1,ROTADD       ;SET UP FOR LATER USE IN END OF PASS ROUTINE
 1151  002436  016767  176544  176540            MOV     KEEPADD,BASEADD ;DITTO
 1152  002444  000414                            BR      OUTMUL  ;CONTINUE QUESTIONS
 1153  002446  016767  176534  176530    3$:     MOV     KEEPADD,BASEADD ;RESTORE
 1154  002454  104403                            INSTR                   ;OUTPUT MESSAGE & GET INPUT STRING
 1155  002456  017167                            MRANGE                  ;MESSAGE
 1156  002460  104405                            PARAM                   ;CONVERT STRING
 1157  002462  160000                            160000                  ;LOW LIMIT
 1158  002464  167776                            167776                  ;HIGH LIMIT
 1159  002466  001210                            LASTADD                 ;STORE AT THIS LOCATION
 1160  002470     001                .BYTE   1                            ;MASK
 1161  002471     001                .BYTE   1                            ;HOW MANY TIMES + 2
```

```
1162  002472  000167  177656              JMP     1$      ;DO IT AGAIN
1163  002476                      OUTMUL:
1164  002476  104403                      INSTR                           ;OUTPUT MESSAGE & GET INPUT STRING
1165  002500  017453                      MLEVEL                          ;MESSAGE
1166  002502  104405                      PARAM                           ;CONVERT STRING
1167  002504  000004                      4                               ;LOW LIMIT
1168  002506  000007                      7                               ;HIGH LIMIT
1169  002510  020254                      DUPRT                           ;STORE AT THIS LOCATION
1170  002512     000              .BYTE   0                               ;MASK
1171  002513     001              .BYTE   1                               ;HOW MANY TIMES + 2
1172  002514  004767  015464              JSR     PC,DULEV
1173                                      ;COMPARE THE FIRST CHARACTER IN THE TELETYPE INPUT
1174                                      ;BUFFER TO THE CHARACTERS '1' AND '2'.
1175                                      ;IF THE CHARACTER IS '1' CLEAR THE FLAG
1176                                      ;IF THE CHARACTER IS '2' SET THE FLAG
1177  002520                      AAA:
1178  002520  104403                      INSTR                           ;OUTPUT MESSAGE & GET INPUT STRING
1179  002522  017500                      MSYNC                           ;MESSAGE
1180  002524  122767  000061  015312 3$:  CMPB    #'1,INBUF               ;IS IT '1' ?
1181  002532  001003                      BNE     1$
1182  002534  105067  176436              CLRB    SYNCNO                  ;000
1183  002540  000412                      BR      4$
1184  002542  122767  000062  015274 1$:  CMPB    #'2,INBUF               ;IS IT '2' ?
1185  002550  001004                      BNE     2$
1186  002552  112767  177777  176416      MOVB    #-1,SYNCNO                      ;377
1187  002560  000402                      BR      4$
1188  002562  104404                2$:   INSTER                          ;RETRY
1189  002564  000757                      BR      3$
1190  002566  000240                4$:   NOP
1191  002570  104403                      INSTR                           ;OUTPUT MESSAGE & GET INPUT STRING
1192  002572  017546                      MWIRE6                          ;MESSAGE
1193  002574  104412                      SETFLG                          ;SET FLAG BASED UPON INPUT STRING
1194  002576  001177                      SEXMIT                          ;THIS FLAG
1195  002600  104403                      INSTR                           ;OUTPUT MESSAGE & GET INPUT STRING
1196  002602  017614                      MWIRE5                          ;MESSAGE
1197  002604  104412                      SETFLG                          ;SET FLAG BASED UPON INPUT STRING
1198  002606  001200                      SEREC                           ;THIS FLAG
1199  002610  104403                      INSTR                           ;OUTPUT MESSAGE & GET INPUT STRING
1200  002612  017661                      MWIRE4                          ;MESSAGE
1201  002614  104412                      SETFLG                          ;SET FLAG BASED UPON INPUT STRING
1202  002616  001201                      OPTCLR                          ;THIS FLAG
1203  002620  104403                      INSTR                           ;OUTPUT MESSAGE & GET INPUT STRING
1204  002622  017735                      MEXTJ                           ;MESSAGE
1205  002624  104412                      SETFLG                          ;SET FLAG BASED UPON INPUT STRING
1206  002626  001203                      JMRBY                           ;THIS FLAG
1207
1208
1209                                      ;TEST START AND RESTART
1210
1211  002630  012767  000340  175140 .BEGIN: MOV     #340,PS                 ;LOCK OUT INTERRUPTS
1212                                      ; ******   LOAD STATUS MAP ******
1213                                      ;THE VALUES NOW BEING LOADED INTO THE STATUS MAP WILL BE
1214                                      ; USED IN THIS PROGRAM AND   WILL BE  PASSED  TO ANY
1215                                      ;OTHER DU11 PROGRAMS LOADED IMMEDIATELY FOLLOWING THIS PROG.
1216  002636  032777  000200  176234      BIT #SW07       ,@SWR   ; SW07 SET , IF YES BRANCH
1217  002644  001132                      BNE HEREU
```

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1218  002646  116767  176324  176424          MOVB SYNCNO     ,NOSYNC         ;SYNC CHARS
1219  002654  116767  176317  176417          MOVB SEXMIT     ,MITSEX         ;XMIT JUMPER
1220  002662  116767  176312  176412          MOVB SEREC      ,RESEC          ;SEC REC JUMPER
1221  002670  116767  176305  176405          MOVB OPTCLR     ,CLROPT         ;OPTIONAL JUMPER
1222  002676  116767  176300  176400          MOVB MULTD      ,DMULT          ; MULTIPLE DEVICES
1223  002704  116767  176273  176373          MOVB JMRBY      ,BYJMR          ;EXTERNAL MODEM
1224  002712  016767  176266  176366          MOV  BASEADD    ,ADDBASE        ;PROG CONTROLLED 1ST ADDR
1225  002720  016767  176262  176362          MOV  KEEPADD    ,ADDKEEP        ;SAVED 1ST DEVICE ADDR
1226  002726  016767  176256  176356          MOV  LASTADD    ,ADDLAST        ;LAST DEVICE RXCSR ADDR
1227  002734  016767  176254  176354          MOV  KEEPIV     ,IVKEEP         ;SAVED INTR VECTOR
1228  002742  016767  176244  176344          MOV  BASEIV     ,IVBASE         ; RELOAD BASE INTR VECTOR
1229  002750  016767  176242  176342          MOV  ACTREG     ,REGACT         ;ACTIVE REGISTER
1230  002756  016767  176236  176336          MOV  ROTADD     ,ADDROT         ;ROTATING POINTER
1231  002764  013737  020254  001324          MOV  @#DUPRT    ,@#PRTDU                ;DU11 PRIORITY
1232  002772  016767  015736  176326          MOV  DURIV      ,RIVDU          ;REC INTR VECTOR
1233  003000  016767  015732  176326          MOV  DURIS      ,RISDU          ; REC INTR STATUS
1234  003006  016767  015726  176314          MOV  DUTIV      ,TIVDU          ; XMIT INTR     VECTOR
1235  003014  016767  015722  176310          MOV  DUTIS      ,TISDU          ; XMIT  INTR  STATUS
1236  003022  016767  015230  176306          MOV  LESS1      ,L1ESS          ; PRIORITY TO ALLOW INTR
1237  003030  016767  015356  176326          MOV  DUBASE     ,BASEDU         ;RXCSR BASE ADDRESS
1238  003036  016767  015646  176274          MOV  RXCSR,     CSRRX
1239  003044  016767  015642  176270          MOV  HRXCSR,    CSRHRX
1240  003052  016767  015636  176264          MOV  RXDBUF,    BUFRXD
1241  003060  016767  015632  176260          MOV  HRXDBUF,   BUFHRXD
1242  003066  016767  015626  176254          MOV  PARCSR,    CSRPAR
1243  003074  016767  015622  176250          MOV  HPARCSR,   CSRHPAR
1244  003102  016767  015616  176244          MOV  TXCSR,     CSRTX
1245  003110  016767  015612  176240          MOV  HTXCSR,    CSRHTX
1246  003116  016767  015606  176234          MOV  TXDBUF,    BUFTXD
1247  003124  016767  015602  176230          MOV  HTXDBUF,   BUFHTXD
1248                                  ;****************************************
1249                                  ; THE FOLLOWING CODE WILL PRINT
1250                                  ; THE CONVERSATIONALLY SET JUMPER
1251                                  ; SETTINGS FROM THE STATUS MAP
1252                                  ; ON THE FIRST PASS OF
1253                                  ; THIS DIAGNOSTIC OR
1254                                  ; JUST AFTER THE QUESTIONING
1255                                  ; AND ANSWERING .
1256                                  ;****************************************
1257
1258  003132  005737  001222          HEREU:          TST @#FLAG              ; TEST IF 1ST PASS
1259  003136  001402                                  BEQ     SETFG           ; IF FIRST PASS SET FLAG/PRINT
1260  003140  000167  000116                          JMP THRU                ; AROUND IF PASS > 1
1261  003144  104402  020012          SETFG:          TYPE , MSTATUS          ; PRINT 'STATUS MAP'
1262  003150  062737  000001  001222                  ADD #1, @#FLAG          ; SET FLAG ON 1ST PASS
1263  003156  010067  176042                          MOV R0, HOLD0           ; SAVE R0
1264  003162  010167  176040                          MOV R1, HOLD1           ; SAVE R1
1265  003166  012767  000003  176034                  MOV #3, COUNT1          ;COUNTER FOR WORDS PRINTED
1266  003174  012700  000002'                         MOV #BUFF1, R0
1267  003200  012701  001300                          MOV #STATUS, R1         ; (BUFF1)=STATUS  ETC.
1268  003204  010120                  FILBUF: MOV R1, (R0)+           ; LOAD BUFF AS ABOVE
1269  003206  062701  000002                          ADD #2 ,R1              ; PREPARE STATUS ADDRESS
1270  003212  020127  001306                          CMP R1, #STATUS+6       ; CHECK IF 3 WORDS LOADED
1271  003216  001372                                  BNE FILBUF              ; BACK  TO LOAD NEXT ADDRESS
1272  003220  012700  000002'                         MOV #BUFF1 ,R0          ; LOAD FOR PRINT OUT
1273  003224  010067  176006          UP:     MOV R0 , TABLE+4        ;LOAD ADDRESS TO PRINT
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1274  003230  012067  176006                        MOV (R0)+, TABLE+10             ; LOAD CONTENTS
1275  003234  104410  001232                        CONVRT , TABLE          ; PRINT ADDRESS/CONTENTS PAIR
1276  003240  104402  017254                        TYPE, MCRLF             ; CR AND LF
1277  003244  005367  175760                        DEC COUNT1              ;COUNT WORDS PRINTED
1278  003250  001365                                BNE UP                  ; GO PRINT NEXT ADDRESS/CONTENTS
1279  003252  016700  175746                        MOV HOLD0,R0
1280  003256  016701  175744                        MOV HOLD1, R1
1281                                          ;*********************************
1282
1283  003262  012706  001100          THRU:  MOV     #STACK,SP               ;SET UP STACK
1284  003266  005737  000042                 TST     @#42                    ;IS PROGRAM UNDER MONITOR CONTROL
1285  003272  001056                         BNE     3$
1286  003274  105767  175702                TSTB    MULTD   ;DON'T ALLOW LOCK ON TEST IF RUNNING
1287                                                  ;MULTIPLE DEVICES
1288  003300  001407                         BEQ     5$                      ;IF NO,TEST FOR LOCK ON TEST
1289  003302  016767  011404  011304        MOV     BRW,TTST                ;RESTORE NORMAL SCOPE LOOP
1290  003310  016767  011400  011300        MOV     BRX,TTST+2              ;DITTO
1291  003316  000444                         BR      3$                      ;JUMP AROUND IF YES
1292  003320  032777  000004  175552  5$:    BIT     #BIT2,@SWR              ;CHECK FOR LOCK ON TEST
1293  003326  001416                         BEQ     1$
1294  003330  104403                         INSTR                           ;OUTPUT MESSAGE & GET INPUT STRING
1295  003332  017410                         MLOCK                           ;MESSAGE
1296  003334  104412                         SETFLG                          ;SET FLAG BASED UPON INPUT STRING
1297  003336  001247                         LOKFLG                          ;THIS FLAG
1298  003340  105767  175703                TSTB    LOKFLG                  ;IS LOCK ON TEST OPTION SELECTED
1299  003344  001407                         BEQ     1$
1300  003346  012767  000240  011240        MOV     #NOP,TTST
1301  003354  012767  000240  011234        MOV     #NOP,TTST+2             ;SET UP TO LOCK
1302  003362  000406                         BR      2$
1303  003364  016767  011322  011222  1$:    MOV     BRW,TTST
1304  003372  016767  011316  011216        MOV     BRX,TTST+2              ;LOCK NOT SELECTED, SET UP FOR NORMAL SCOPE LOOP
1305  003400  032777  000002  175472  2$:    BIT     #SW01,@SWR              ;IF SW01=1, GET STARTING PC
1306  003406  001410                         BEQ     3$
1307  003410  104403                         INSTR                           ;OUTPUT MESSAGE & GET INPUT STRING
1308  003412  017375                         MTSTPC                          ;MESSAGE
1309  003414  104405                         PARAM                           ;CONVERT STRING
1310  003416  003446                         TST1                            ;LOW LIMIT
1311  003420  013740                         TLAST                           ;HIGH LIMIT
1312  003422  001114                         RTRN                            ;STORE AT THIS LOCATION
1313  003424     001                  .BYTE   1                               ;MASK
1314  003425     001                  .BYTE   1                               ;HOW MANY TIMES + 2
1315  003426  000403                         BR      4$
1316  003430  012767  003446  175456  3$:    MOV     #TST1,RTRN              ;START AT TEST 1
1317  003436  104402  017371          4$:    TYPE    ,MR                     ;TYPE R
1318  003442  000177  175446                JMP     @RTRN                   ;START TESTING
1319
1320                                          ;;THIS TEST PROVES EXISTANCE OF DEVICE REGISTERS
1321                                          ;;
1322  003446  012767  000001  175452  TST1:  MOV     #1,TSTNO        ;SAVE THIS
1323  003454  012767  003534  175434        MOV     #TST2,NEXT                      ;GO TO THIS TEST WHEN THRU
1324  003462  012737  020652  000004        MOV     #TRPREG,@#4     ;SETUP TRAPCATCHER
1325  003470  012737  000340  000006        MOV     #LEVEL7,@#6     ;
1326  003476  105277  015206                INCB    @RXCSR          ;TEST THIS REG
1327  003502  000401                         BR      64$             ;IF OK JMP AROUND HLT
1328  003504  104000                         HLT                     ;CHECK DEVICE REG ADDRESSES
1329  003506  105277  015200          64$:   INCB    @HRXCSR ;TEST UPPER BYTE THIS REGISTER
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1330  003512  000401                          BR      65$             ;IF OK JMP AROUND HLT
1331  003514  104000                          HLT                     ;CHECK DEVICE REG ADDRESSES
1332  003516  012737  000006  000004  65$:    MOV     #6,@#4          ;RESTORE TRAPCATCHER
1333  003524  012737  000000  000006          MOV     #0,@#6          ;
1334  003532  104400                          SCOPE
1335                                          ;;THIS TEST PROVES EXISTANCE OF DEVICE REGISTERS
1336                                          ;;
1337  003534  012767  000002  175364  TST2:   MOV     #2,TSTNO        ;SAVE THIS
1338  003542  012767  003622  175346          MOV     #TST3,NEXT              ;GO TO THIS TEST WHEN THRU
1339  003550  012737  020652  000004          MOV     #TRPREG,@#4     ;SETUP TRAPCATCHER
1340  003556  012737  000340  000006          MOV     #LEVEL7,@#6     ;
1341  003564  105277  015124                  INCB    @RXDBUF         ;TEST THIS REG
1342  003570  000401                          BR      64$             ;IF OK JMP AROUND HLT
1343  003572  104000                          HLT                     ;CHECK DEVICE REG ADDRESSES
1344  003574  105277  015116          64$:    INCB    @HRXDBUF        ;TEST UPPER BYTE THIS REGISTER
1345  003600  000401                          BR      65$             ;IF OK JMP AROUND HLT
1346  003602  104000                          HLT                     ;CHECK DEVICE REG ADDRESSES
1347  003604  012737  000006  000004  65$:    MOV     #6,@#4          ;RESTORE TRAPCATCHER
1348  003612  012737  000000  000006          MOV     #0,@#6          ;
1349  003620  104400                          SCOPE
1350                                          ;;THIS TEST PROVES EXISTANCE OF DEVICE REGISTERS
1351                                          ;;
1352  003622  012767  000003  175276  TST3:   MOV     #3,TSTNO        ;SAVE THIS
1353  003630  012767  003710  175260          MOV     #TST4,NEXT              ;GO TO THIS TEST WHEN THRU
1354  003636  012737  020652  000004          MOV     #TRPREG,@#4     ;SETUP TRAPCATCHER
1355  003644  012737  000340  000006          MOV     #LEVEL7,@#6     ;
1356  003652  105277  015042                  INCB    @PARCSR         ;TEST THIS REG
1357  003656  000401                          BR      64$             ;IF OK JMP AROUND HLT
1358  003660  104000                          HLT                     ;CHECK DEVICE REG ADDRESSES
1359  003662  105277  015034          64$:    INCB    @HPARCSR        ;TEST UPPER BYTE THIS REGISTER
1360  003666  000401                          BR      65$             ;IF OK JMP AROUND HLT
1361  003670  104000                          HLT                     ;CHECK DEVICE REG ADDRESSES
1362  003672  012737  000006  000004  65$:    MOV     #6,@#4          ;RESTORE TRAPCATCHER
1363  003700  012737  000000  000006          MOV     #0,@#6          ;
1364  003706  104400                          SCOPE
1365                                          ;;THIS TEST PROVES EXISTANCE OF DEVICE REGISTERS
1366                                          ;;
1367  003710  012767  000004  175210  TST4:   MOV     #4,TSTNO        ;SAVE THIS
1368  003716  012767  003776  175172          MOV     #TST5,NEXT              ;GO TO THIS TEST WHEN THRU
1369  003724  012737  020652  000004          MOV     #TRPREG,@#4     ;SETUP TRAPCATCHER
1370  003732  012737  000340  000006          MOV     #LEVEL7,@#6     ;
1371  003740  105277  014760                  INCB    @TXCSR          ;TEST THIS REG
1372  003744  000401                          BR      64$             ;IF OK JMP AROUND HLT
1373  003746  104000                          HLT                     ;CHECK DEVICE REG ADDRESSES
1374  003750  105277  014752          64$:    INCB    @HTXCSR ;TEST UPPER BYTE THIS REGISTER
1375  003754  000401                          BR      65$             ;IF OK JMP AROUND HLT
1376  003756  104000                          HLT                     ;CHECK DEVICE REG ADDRESSES
1377  003760  012737  000006  000004  65$:    MOV     #6,@#4          ;RESTORE TRAPCATCHER
1378  003766  012737  000000  000006          MOV     #0,@#6          ;
1379  003774  104400                          SCOPE
1380                                          ;;THIS TEST PROVES EXISTANCE OF DEVICE REGISTERS
1381                                          ;;
1382  003776  012767  000005  175122  TST5:   MOV     #5,TSTNO        ;SAVE THIS
1383  004004  012767  004064  175104          MOV     #TST6,NEXT              ;GO TO THIS TEST WHEN THRU
1384  004012  012737  020652  000004          MOV     #TRPREG,@#4     ;SETUP TRAPCATCHER
1385  004020  012737  000340  000006          MOV     #LEVEL7,@#6     ;
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1386  004026  105277  014676                    INCB    @TXDBUF         ;TEST THIS REG
1387  004032  000401                            BR      64$             ;IF OK JMP AROUND HLT
1388  004034  104000                            HLT                     ;CHECK DEVICE REG ADDRESSES
1389  004036  105277  014670          64$:      INCB    @HTXDBUF        ;TEST UPPER BYTE THIS REGISTER
1390  004042  000401                            BR      65$             ;IF OK JMP AROUND HLT
1391  004044  104000                            HLT                     ;CHECK DEVICE REG ADDRESSES
1392  004046  012737  000006  000004  65$:      MOV     #6,@#4          ;RESTORE TRAPCATCHER
1393  004054  012737  000000  000006            MOV     #0,@#6          ;
1394  004062  104400                            SCOPE
1395                                            ;;BUS DRIVER TEST
1396                                            ;;
1397  004064  012767  000006  175034  TST6:     MOV     #6,TSTNO        ;SAVE THIS
1398  004072  012767  004114  175016            MOV     #TST7,NEXT              ;GO TO THIS TEST WHEN THRU
1399  004100  022777  177777  014622            CMP     #177777,@TXDBUF
1400  004106  001401                            BEQ     .+4
1401  004110  104000                            HLT     ;READING TXDBUF SHOULD BE ALL 1'S
1402  004112  104400                            SCOPE
1403                                            ;;THIS TEST PERFORMS MASTER RESET TESTING &
1404                                            ;;TESTING OF READ/WRITE BIT DTR
1405                                            ;;
1406  004114  012767  000007  175004  TST7:     MOV     #7,TSTNO        ;SAVE THIS
1407  004122  012767  004244  174766            MOV     #TST8,NEXT              ;GO TO THIS TEST WHEN THRU
1408  004130  052777  000002  014552            BIS     #DTR,@RXCSR     ;SET THIS BIT
1409  004136  032777  000002  014544            BIT     #DTR,@RXCSR     ;TEST THIS BIT
1410  004144  001001                            BNE     64$     ;BR IF '1'
1411  004146  104000                            HLT                     ;THIS BIT SHOULD BE SET
1412  004150                          64$:
1413  004150  042777  000002  014532            BIC     #DTR,@RXCSR     ;CLR THIS BIT
1414  004156  032777  000002  014524            BIT     #DTR,@RXCSR     ;TEST THIS BIT
1415  004164  001401                            BEQ     65$             ;BR IF '0'
1416  004166  104000                            HLT                     ;THIS BIT SHOULD BE CLR
1417  004170                          65$:
1418                                            ;NOW SET THIS BIT
1419  004170  052777  000002  014512            BIS     #DTR,@RXCSR
1420  004176  052777  000400  014520            BIS     #MRESET,@TXCSR  ;MASTER RESET
1421                                            ;;CHECK EXISTANCE OF OPTIONAL CLEAR JUMPER
1422                                            ;;
1423  004204  105767  174771                    TSTB    OPTCLR          ;TEST FLAG
1424  004210  100006                            BPL     1$              ;OPTIONAL CLR JUMPER IS NOT IN
1425  004212  032777  000002  014470            BIT     #DTR,@RXCSR     ;TEST THIS BIT
1426  004220  001401                            BEQ     66$             ;BR IF '0'
1427  004222  104000                            HLT                     ;CHECK OUT MASTER RESET LOGIC
1428  004224                          66$:
1429  004224  000405                            BR      2$              ;JMP AROUND
1430  004226  032777  000002  014454  1$:       BIT     #DTR,@RXCSR     ;TEST THIS BIT
1431  004234  001001                            BNE     67$     ;BR IF '1'
1432  004236  104000                            HLT                     ;CHECK OUT OPTIONAL CLR JUMPER
1433  004240                          67$:
1434  004240  000240                  2$:       NOP
1435  004242  104400                            SCOPE
1436                                            ;;THIS TEST PERFORMS MASTER RESET TESTING &
1437                                            ;;TESTING OF READ/WRITE BIT RTS
1438                                            ;;
1439  004244  012767  000010  174654  TST8:     MOV     #8,TSTNO        ;SAVE THIS
1440  004252  012767  004374  174636            MOV     #TST9,NEXT              ;GO TO THIS TEST WHEN THRU
1441  004260  052777  000004  014422            BIS     #RTS,@RXCSR     ;SET THIS BIT
```

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1442  004266  032777  000004  014414          BIT     #RTS,@RXCSR     ;TEST THIS BIT
1443  004274  001001                          BNE     64$     ;BR IF '1'
1444  004276  104000                          HLT                     ;THIS BIT SHOULD BE SET
1445  004300                          64$:
1446  004300  042777  000004  014402          BIC     #RTS,@RXCSR     ;CLR THIS BIT
1447  004306  032777  000004  014374          BIT     #RTS,@RXCSR     ;TEST THIS BIT
1448  004314  001401                          BEQ     65$             ;BR IF '0'
1449  004316  104000                          HLT                     ;THIS BIT SHOULD BE CLR
1450  004320                          65$:
1451                                          ;NOW SET THIS BIT
1452  004320  052777  000004  014362          BIS     #RTS,@RXCSR
1453  004326  052777  000400  014370          BIS     #MRESET,@TXCSR  ;MASTER RESET
1454                                          ;;CHECK EXISTANCE OF OPTIONAL CLEAR JUMPER
1455                                          ;;
1456  004334  105767  174641                  TSTB    OPTCLR          ;TEST FLAG
1457  004340  100006                          BPL     1$              ;OPTIONAL CLR JUMPER IS NOT IN
1458  004342  032777  000004  014340          BIT     #RTS,@RXCSR     ;TEST THIS BIT
1459  004350  001401                          BEQ     66$             ;BR IF '0'
1460  004352  104000                          HLT                     ;CHECK OUT MASTER RESET LOGIC
1461  004354                          66$:
1462  004354  000405                          BR      2$              ;JMP AROUND
1463  004356  032777  000004  014324  1$:     BIT     #RTS,@RXCSR     ;TEST THIS BIT
1464  004364  001001                          BNE     67$     ;BR IF '1'
1465  004366  104000                          HLT                     ;CHECK OUT OPTIONAL CLR JUMPER
1466  004370                          67$:
1467  004370  000240                  2$:     NOP
1468  004372  104400                          SCOPE
1469                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1470                                          ;;TESTING OF READ/WRITE BIT STD
1471                                          ;;
1472  004374  012767  000011  174524  TST9:   MOV     #9,TSTNO        ;SAVE THIS
1473  004402  012767  004524  174506          MOV     #TST10,NEXT             ;GO TO THIS TEST WHEN THRU
1474  004410  052777  000010  014272          BIS     #STD,@RXCSR     ;SET THIS BIT
1475  004416  032777  000010  014264          BIT     #STD,@RXCSR     ;TEST THIS BIT
1476  004424  001001                          BNE     64$     ;BR IF '1'
1477  004426  104000                          HLT                     ;THIS BIT SHOULD BE SET
1478  004430                          64$:
1479  004430  042777  000010  014252          BIC     #STD,@RXCSR     ;CLR THIS BIT
1480  004436  032777  000010  014244          BIT     #STD,@RXCSR     ;TEST THIS BIT
1481  004444  001401                          BEQ     65$             ;BR IF '0'
1482  004446  104000                          HLT                     ;THIS BIT SHOULD BE CLR
1483  004450                          65$:
1484                                          ;NOW SET THIS BIT
1485  004450  052777  000010  014232          BIS     #STD,@RXCSR
1486  004456  052777  000400  014240          BIS     #MRESET,@TXCSR  ;MASTER RESET
1487                                          ;;CHECK EXISTANCE OF OPTIONAL CLEAR JUMPER
1488                                          ;;
1489  004464  105767  174511                  TSTB    OPTCLR          ;TEST FLAG
1490  004470  100006                          BPL     1$              ;OPTIONAL CLR JUMPER IS NOT IN
1491  004472  032777  000010  014210          BIT     #STD,@RXCSR     ;TEST THIS BIT
1492  004500  001401                          BEQ     66$             ;BR IF '0'
1493  004502  104000                          HLT                     ;CHECK OUT MASTER RESET LOGIC
1494  004504                          66$:
1495  004504  000405                          BR      2$              ;JMP AROUND
1496  004506  032777  000010  014174  1$:     BIT     #STD,@RXCSR     ;TEST THIS BIT
1497  004514  001001                          BNE     67$     ;BR IF '1'
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1498  004516  104000                          HLT                     ;CHECK OUT OPTIONAL CLR JUMPER
1499  004520                          67$:
1500  004520  000240                  2$:     NOP
1501  004522  104400                          SCOPE
1502                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1503                                          ;;TESTING OF READ/WRITE BIT SYNSCH
1504                                          ;;
1505  004524  012767  000012  174374  TST10:  MOV     #10,TSTNO       ;SAVE THIS
1506  004532  012767  004630  174356          MOV     #TST11,NEXT             ;GO TO THIS TEST WHEN THRU
1507  004540  052777  000020  014142          BIS     #SYNSCH,@RXCSR  ;SET THIS BIT
1508  004546  032777  000020  014134          BIT     #SYNSCH,@RXCSR  ;TEST THIS BIT
1509  004554  001001                          BNE     64$     ;BR IF '1'
1510  004556  104000                          HLT                     ;THIS BIT SHOULD BE SET
1511  004560                          64$:
1512  004560  042777  000020  014122          BIC     #SYNSCH,@RXCSR  ;CLR THIS BIT
1513  004566  032777  000020  014114          BIT     #SYNSCH,@RXCSR  ;TEST THIS BIT
1514  004574  001401                          BEQ     65$             ;BR IF '0'
1515  004576  104000                          HLT                     ;THIS BIT SHOULD BE CLR
1516  004600                          65$:
1517                                          ;NOW SET THIS BIT
1518  004600  052777  000020  014102          BIS     #SYNSCH,@RXCSR
1519  004606  052777  000400  014110          BIS     #MRESET,@TXCSR  ;MASTER RESET
1520  004614  032777  000020  014066          BIT     #SYNSCH,@RXCSR  ;TEST THIS BIT
1521  004622  001401                          BEQ     66$             ;BR IF '0'
1522  004624  104000                          HLT                     ;CHECK OUT MASTER RESET LOGIC
1523  004626                          66$:
1524  004626  104400                          SCOPE
1525                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1526                                          ;;TESTING OF READ/WRITE BIT DSINTE
1527                                          ;;
1528  004630  012767  000013  174270  TST11:  MOV     #11,TSTNO       ;SAVE THIS
1529  004636  012767  004734  174252          MOV     #TST12,NEXT             ;GO TO THIS TEST WHEN THRU
1530  004644  052777  000040  014036          BIS     #DSINTE,@RXCSR  ;SET THIS BIT
1531  004652  032777  000040  014030          BIT     #DSINTE,@RXCSR  ;TEST THIS BIT
1532  004660  001001                          BNE     64$     ;BR IF '1'
1533  004662  104000                          HLT                     ;THIS BIT SHOULD BE SET
1534  004664                          64$:
1535  004664  042777  000040  014016          BIC     #DSINTE,@RXCSR  ;CLR THIS BIT
1536  004672  032777  000040  014010          BIT     #DSINTE,@RXCSR  ;TEST THIS BIT
1537  004700  001401                          BEQ     65$             ;BR IF '0'
1538  004702  104000                          HLT                     ;THIS BIT SHOULD BE CLR
1539  004704                          65$:
1540                                          ;NOW SET THIS BIT
1541  004704  052777  000040  013776          BIS     #DSINTE,@RXCSR
1542  004712  052777  000400  014004          BIS     #MRESET,@TXCSR  ;MASTER RESET
1543  004720  032777  000040  013762          BIT     #DSINTE,@RXCSR  ;TEST THIS BIT
1544  004726  001401                          BEQ     66$             ;BR IF '0'
1545  004730  104000                          HLT                     ;CHECK OUT MASTER RESET LOGIC
1546  004732                          66$:
1547  004732  104400                          SCOPE
1548                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1549                                          ;;TESTING OF READ/WRITE BIT RINTEN
1550                                          ;;
1551  004734  012767  000014  174164  TST12:  MOV     #12,TSTNO       ;SAVE THIS
1552  004742  012767  005040  174146          MOV     #TST13,NEXT             ;GO TO THIS TEST WHEN THRU
1553  004750  052777  000100  013732          BIS     #RINTEN,@RXCSR  ;SET THIS BIT
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1554  004756  032777  000100  013724          BIT     #RINTEN,@RXCSR  ;TEST THIS BIT
1555  004764  001001                          BNE     64$     ;BR IF '1'
1556  004766  104000                          HLT                     ;THIS BIT SHOULD BE SET
1557  004770                          64$:
1558  004770  042777  000100  013712          BIC     #RINTEN,@RXCSR  ;CLR THIS BIT
1559  004776  032777  000100  013704          BIT     #RINTEN,@RXCSR  ;TEST THIS BIT
1560  005004  001401                          BEQ     65$             ;BR IF '0'
1561  005006  104000                          HLT                     ;THIS BIT SHOULD BE CLR
1562  005010                          65$:
1563                                          ;NOW SET THIS BIT
1564  005010  052777  000100  013672          BIS     #RINTEN,@RXCSR
1565  005016  052777  000400  013700          BIS     #MRESET,@TXCSR  ;MASTER RESET
1566  005024  032777  000100  013656          BIT     #RINTEN,@RXCSR  ;TEST THIS BIT
1567  005032  001401                          BEQ     66$             ;BR IF '0'
1568  005034  104000                          HLT                     ;CHECK OUT MASTER RESET LOGIC
1569  005036                          66$:
1570  005036  104400                          SCOPE
1571                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1572                                          ;;TESTING OF READ/WRITE BIT STPSYN
1573                                          ;;
1574  005040  012767  000015  174060  TST13:  MOV     #13,TSTNO       ;SAVE THIS
1575  005046  012767  005144  174042          MOV     #TST14,NEXT             ;GO TO THIS TEST WHEN THRU
1576  005054  052777  000400  013626          BIS     #STPSYN,@RXCSR  ;SET THIS BIT
1577  005062  032777  000400  013620          BIT     #STPSYN,@RXCSR  ;TEST THIS BIT
1578  005070  001001                          BNE     64$     ;BR IF '1'
1579  005072  104000                          HLT                     ;THIS BIT SHOULD BE SET
1580  005074                          64$:
1581  005074  042777  000400  013606          BIC     #STPSYN,@RXCSR  ;CLR THIS BIT
1582  005102  032777  000400  013600          BIT     #STPSYN,@RXCSR  ;TEST THIS BIT
1583  005110  001401                          BEQ     65$             ;BR IF '0'
1584  005112  104000                          HLT                     ;THIS BIT SHOULD BE CLR
1585  005114                          65$:
1586                                          ;NOW SET THIS BIT
1587  005114  052777  000400  013566          BIS     #STPSYN,@RXCSR
1588  005122  052777  000400  013574          BIS     #MRESET,@TXCSR  ;MASTER RESET
1589  005130  032777  000400  013552          BIT     #STPSYN,@RXCSR  ;TEST THIS BIT
1590  005136  001401                          BEQ     66$             ;BR IF '0'
1591  005140  104000                          HLT                     ;CHECK OUT MASTER RESET LOGIC
1592  005142                          66$:
1593  005142  104400                          SCOPE
1594                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1595                                          ;;TESTING OF READ/WRITE BIT BREAK
1596                                          ;;
1597  005144  012767  000016  173754  TST14:  MOV     #14,TSTNO       ;SAVE THIS
1598  005152  012767  005250  173736          MOV     #TST15,NEXT             ;GO TO THIS TEST WHEN THRU
1599  005160  052777  000001  013536          BIS     #BREAK,@TXCSR   ;SET THIS BIT
1600  005166  032777  000001  013530          BIT     #BREAK,@TXCSR   ;TEST THIS BIT
1601  005174  001001                          BNE     64$     ;BR IF '1'
1602  005176  104000                          HLT                     ;THIS BIT SHOULD BE SET
1603  005200                          64$:
1604  005200  042777  000001  013516          BIC     #BREAK,@TXCSR   ;CLR THIS BIT
1605  005206  032777  000001  013510          BIT     #BREAK,@TXCSR   ;TEST THIS BIT
1606  005214  001401                          BEQ     65$             ;BR IF '0'
1607  005216  104000                          HLT                     ;THIS BIT SHOULD BE CLR
1608  005220                          65$:
1609                                          ;NOW SET THIS BIT
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1610  005220  052777  000001  013476          BIS     #BREAK,@TXCSR
1611  005226  052777  000400  013470          BIS     #MRESET,@TXCSR  ;MASTER RESET
1612  005234  032777  000001  013462          BIT     #BREAK,@TXCSR   ;TEST THIS BIT
1613  005242  001401                          BEQ     66$             ;BR IF '0'
1614  005244  104000                          HLT                     ;CHECK OUT MASTER RESET LOGIC
1615  005246                          66$:
1616  005246  104400                          SCOPE
1617                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1618                                          ;;TESTING OF READ/WRITE BIT HDXEN
1619                                          ;;
1620  005250  012767  000017  173650  TST15:  MOV     #15,TSTNO       ;SAVE THIS
1621  005256  012767  005354  173632          MOV     #TST16,NEXT             ;GO TO THIS TEST WHEN THRU
1622  005264  052777  000010  013432          BIS     #HDXEN,@TXCSR   ;SET THIS BIT
1623  005272  032777  000010  013424          BIT     #HDXEN,@TXCSR   ;TEST THIS BIT
1624  005300  001001                          BNE     64$     ;BR IF '1'
1625  005302  104000                          HLT                     ;THIS BIT SHOULD BE SET
1626  005304                          64$:
1627  005304  042777  000010  013412          BIC     #HDXEN,@TXCSR   ;CLR THIS BIT
1628  005312  032777  000010  013404          BIT     #HDXEN,@TXCSR   ;TEST THIS BIT
1629  005320  001401                          BEQ     65$             ;BR IF '0'
1630  005322  104000                          HLT                     ;THIS BIT SHOULD BE CLR
1631  005324                          65$:
1632                                          ;NOW SET THIS BIT
1633  005324  052777  000010  013372          BIS     #HDXEN,@TXCSR
1634  005332  052777  000400  013364          BIS     #MRESET,@TXCSR  ;MASTER RESET
1635  005340  032777  000010  013356          BIT     #HDXEN,@TXCSR   ;TEST THIS BIT
1636  005346  001401                          BEQ     66$             ;BR IF '0'
1637  005350  104000                          HLT                     ;CHECK OUT MASTER RESET LOGIC
1638  005352                          66$:
1639  005352  104400                          SCOPE
1640                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1641                                          ;;TESTING OF READ/WRITE BIT SEND
1642                                          ;;
1643  005354  012767  000020  173544  TST16:  MOV     #16,TSTNO       ;SAVE THIS
1644  005362  012767  005460  173526          MOV     #TST17,NEXT             ;GO TO THIS TEST WHEN THRU
1645  005370  052777  000020  013326          BIS     #SEND,@TXCSR    ;SET THIS BIT
1646  005376  032777  000020  013320          BIT     #SEND,@TXCSR    ;TEST THIS BIT
1647  005404  001001                          BNE     64$     ;BR IF '1'
1648  005406  104000                          HLT                     ;THIS BIT SHOULD BE SET
1649  005410                          64$:
1650  005410  042777  000020  013306          BIC     #SEND,@TXCSR    ;CLR THIS BIT
1651  005416  032777  000020  013300          BIT     #SEND,@TXCSR    ;TEST THIS BIT
1652  005424  001401                          BEQ     65$             ;BR IF '0'
1653  005426  104000                          HLT                     ;THIS BIT SHOULD BE CLR
1654  005430                          65$:
1655                                          ;NOW SET THIS BIT
1656  005430  052777  000020  013266          BIS     #SEND,@TXCSR
1657  005436  052777  000400  013260          BIS     #MRESET,@TXCSR  ;MASTER RESET
1658  005444  032777  000020  013252          BIT     #SEND,@TXCSR    ;TEST THIS BIT
1659  005452  001401                          BEQ     66$             ;BR IF '0'
1660  005454  104000                          HLT                     ;CHECK OUT MASTER RESET LOGIC
1661  005456                          66$:
1662  005456  104400                          SCOPE
1663                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1664                                          ;;TESTING OF READ/WRITE BIT DNAINTE
1665                                          ;;
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1666  005460  012767  000021  173440  TST17:  MOV     #17,TSTNO       ;SAVE THIS
1667  005466  012767  005564  173422          MOV     #TST18,NEXT             ;GO TO THIS TEST WHEN THRU
1668  005474  052777  000040  013222          BIS     #DNAINTE,@TXCSR ;SET THIS BIT
1669  005502  032777  000040  013214          BIT     #DNAINTE,@TXCSR ;TEST THIS BIT
1670  005510  001001                          BNE     64$     ;BR IF '1'
1671  005512  104000                          HLT                     ;THIS BIT SHOULD BE SET
1672  005514                          64$:
1673  005514  042777  000040  013202          BIC     #DNAINTE,@TXCSR ;CLR THIS BIT
1674  005522  032777  000040  013174          BIT     #DNAINTE,@TXCSR ;TEST THIS BIT
1675  005530  001401                          BEQ     65$             ;BR IF '0'
1676  005532  104000                          HLT                     ;THIS BIT SHOULD BE CLR
1677  005534                          65$:
1678                                          ;NOW SET THIS BIT
1679  005534  052777  000040  013162          BIS     #DNAINTE,@TXCSR
1680  005542  052777  000400  013154          BIS     #MRESET,@TXCSR  ;MASTER RESET
1681  005550  032777  000040  013146          BIT     #DNAINTE,@TXCSR ;TEST THIS BIT
1682  005556  001401                          BEQ     66$             ;BR IF '0'
1683  005560  104000                          HLT                     ;CHECK OUT MASTER RESET LOGIC
1684  005562                          66$:
1685  005562  104400                          SCOPE
1686                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1687                                          ;;TESTING OF READ/WRITE BIT TXINTE
1688                                          ;;
1689  005564  012767  000022  173334  TST18:  MOV     #18,TSTNO       ;SAVE THIS
1690  005572  012767  005670  173316          MOV     #TST19,NEXT             ;GO TO THIS TEST WHEN THRU
1691  005600  052777  000100  013116          BIS     #TXINTE,@TXCSR  ;SET THIS BIT
1692  005606  032777  000100  013110          BIT     #TXINTE,@TXCSR  ;TEST THIS BIT
1693  005614  001001                          BNE     64$     ;BR IF '1'
1694  005616  104000                          HLT                     ;THIS BIT SHOULD BE SET
1695  005620                          64$:
1696  005620  042777  000100  013076          BIC     #TXINTE,@TXCSR  ;CLR THIS BIT
1697  005626  032777  000100  013070          BIT     #TXINTE,@TXCSR  ;TEST THIS BIT
1698  005634  001401                          BEQ     65$             ;BR IF '0'
1699  005636  104000                          HLT                     ;THIS BIT SHOULD BE CLR
1700  005640                          65$:
1701                                          ;NOW SET THIS BIT
1702  005640  052777  000100  013056          BIS     #TXINTE,@TXCSR
1703  005646  052777  000400  013050          BIS     #MRESET,@TXCSR  ;MASTER RESET
1704  005654  032777  000100  013042          BIT     #TXINTE,@TXCSR  ;TEST THIS BIT
1705  005662  001401                          BEQ     66$             ;BR IF '0'
1706  005664  104000                          HLT                     ;CHECK OUT MASTER RESET LOGIC
1707  005666                          66$:
1708  005666  104400                          SCOPE
1709                                          ;;TEST MAINT MODE BIT 0
1710                                          ;;
1711                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1712                                          ;;TESTING OF READ/WRITE BIT BIT11
1713                                          ;;
1714  005670  012767  000023  173230  TST19:  MOV     #19,TSTNO       ;SAVE THIS
1715  005676  012767  005774  173212          MOV     #TST20,NEXT             ;GO TO THIS TEST WHEN THRU
1716  005704  052777  004000  013012          BIS     #BIT11,@TXCSR   ;SET THIS BIT
1717  005712  032777  004000  013004          BIT     #BIT11,@TXCSR   ;TEST THIS BIT
1718  005720  001001                          BNE     64$     ;BR IF '1'
1719  005722  104000                          HLT                     ;THIS BIT SHOULD BE SET
1720  005724                          64$:
1721  005724  042777  004000  012772          BIC     #BIT11,@TXCSR   ;CLR THIS BIT
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 1722  005732  032777  004000  012764          BIT     #BIT11,@TXCSR   ;TEST THIS BIT
 1723  005740  001401                          BEQ     65$             ;BR IF '0'
 1724  005742  104000                          HLT                     ;THIS BIT SHOULD BE CLR
 1725  005744                          65$:
 1726                                          ;NOW SET THIS BIT
 1727  005744  052777  004000  012752          BIS     #BIT11,@TXCSR
 1728  005752  052777  000400  012744          BIS     #MRESET,@TXCSR  ;MASTER RESET
 1729  005760  032777  004000  012736          BIT     #BIT11,@TXCSR   ;TEST THIS BIT
 1730  005766  001401                          BEQ     66$             ;BR IF '0'
 1731  005770  104000                          HLT                     ;CHECK OUT MASTER RESET LOGIC
 1732  005772                          66$:
 1733  005772  104400                          SCOPE
 1734                                          ;;TEST MAINT MODE BIT 1
 1735                                          ;;
 1736                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
 1737                                          ;;TESTING OF READ/WRITE BIT BIT12
 1738                                          ;;
 1739  005774  012767  000024  173124  TST20:  MOV     #20,TSTNO       ;SAVE THIS
 1740  006002  012767  006100  173106          MOV     #TST21,NEXT             ;GO TO THIS TEST WHEN THRU
 1741  006010  052777  010000  012706          BIS     #BIT12,@TXCSR   ;SET THIS BIT
 1742  006016  032777  010000  012700          BIT     #BIT12,@TXCSR   ;TEST THIS BIT
 1743  006024  001001                          BNE     64$     ;BR IF '1'
 1744  006026  104000                          HLT                     ;THIS BIT SHOULD BE SET
 1745  006030                          64$:
 1746  006030  042777  010000  012666          BIC     #BIT12,@TXCSR   ;CLR THIS BIT
 1747  006036  032777  010000  012660          BIT     #BIT12,@TXCSR   ;TEST THIS BIT
 1748  006044  001401                          BEQ     65$             ;BR IF '0'
 1749  006046  104000                          HLT                     ;THIS BIT SHOULD BE CLR
 1750  006050                          65$:
 1751                                          ;NOW SET THIS BIT
 1752  006050  052777  010000  012646          BIS     #BIT12,@TXCSR
 1753  006056  052777  000400  012640          BIS     #MRESET,@TXCSR  ;MASTER RESET
 1754  006064  032777  010000  012632          BIT     #BIT12,@TXCSR   ;TEST THIS BIT
 1755  006072  001401                          BEQ     66$             ;BR IF '0'
 1756  006074  104000                          HLT                     ;CHECK OUT MASTER RESET LOGIC
 1757  006076                          66$:
 1758  006076  104400                          SCOPE
 1759                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
 1760                                          ;;TESTING OF READ/WRITE BIT CLK
 1761                                          ;;
 1762  006100  012767  000025  173020  TST21:  MOV     #21,TSTNO       ;SAVE THIS
 1763  006106  012767  006204  173002          MOV     #TST22,NEXT             ;GO TO THIS TEST WHEN THRU
 1764  006114  052777  020000  012602          BIS     #CLK,@TXCSR     ;SET THIS BIT
 1765  006122  032777  020000  012574          BIT     #CLK,@TXCSR     ;TEST THIS BIT
 1766  006130  001001                          BNE     64$     ;BR IF '1'
 1767  006132  104000                          HLT                     ;THIS BIT SHOULD BE SET
 1768  006134                          64$:
 1769  006134  042777  020000  012562          BIC     #CLK,@TXCSR     ;CLR THIS BIT
 1770  006142  032777  020000  012554          BIT     #CLK,@TXCSR     ;TEST THIS BIT
 1771  006150  001401                          BEQ     65$             ;BR IF '0'
 1772  006152  104000                          HLT                     ;THIS BIT SHOULD BE CLR
 1773  006154                          65$:
 1774                                          ;NOW SET THIS BIT
 1775  006154  052777  020000  012542          BIS     #CLK,@TXCSR
 1776  006162  052777  000400  012534          BIS     #MRESET,@TXCSR  ;MASTER RESET
 1777  006170  032777  020000  012526          BIT     #CLK,@TXCSR     ;TEST THIS BIT
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1778  006176  001401                          BEQ     66$             ;BR IF '0'
1779  006200  104000                          HLT                     ;CHECK OUT MASTER RESET LOGIC
1780  006202                          66$:
1781  006202  104400                          SCOPE
1782                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1783                                          ;;TESTING OF READ/WRITE BIT MTDATA
1784                                          ;;
1785  006204  012767  000026  172714  TST22:  MOV     #22,TSTNO       ;SAVE THIS
1786  006212  012767  006310  172676          MOV     #TST23,NEXT             ;GO TO THIS TEST WHEN THRU
1787  006220  052777  040000  012476          BIS     #MTDATA,@TXCSR  ;SET THIS BIT
1788  006226  032777  040000  012470          BIT     #MTDATA,@TXCSR  ;TEST THIS BIT
1789  006234  001001                          BNE     64$     ;BR IF '1'
1790  006236  104000                          HLT                     ;THIS BIT SHOULD BE SET
1791  006240                          64$:
1792  006240  042777  040000  012456          BIC     #MTDATA,@TXCSR  ;CLR THIS BIT
1793  006246  032777  040000  012450          BIT     #MTDATA,@TXCSR  ;TEST THIS BIT
1794  006254  001401                          BEQ     65$             ;BR IF '0'
1795  006256  104000                          HLT                     ;THIS BIT SHOULD BE CLR
1796  006260                          65$:
1797                                          ;NOW SET THIS BIT
1798  006260  052777  040000  012436          BIS     #MTDATA,@TXCSR
1799  006266  052777  000400  012430          BIS     #MRESET,@TXCSR  ;MASTER RESET
1800  006274  032777  040000  012422          BIT     #MTDATA,@TXCSR  ;TEST THIS BIT
1801  006302  001401                          BEQ     66$             ;BR IF '0'
1802  006304  104000                          HLT                     ;CHECK OUT MASTER RESET LOGIC
1803  006306                          66$:
1804  006306  104400                          SCOPE
1805                                          ;;THIS TEST VERIFYS THAT INIT (RESET) CLEARS BITS IN THE
1806                                          ;;RXCSR & TXCSR
1807                                          ;;
1808  006310  012767  000027  172610  TST23:  MOV     #23,TSTNO       ;SAVE THIS
1809  006316  012767  006420  172572          MOV     #TST24,NEXT             ;GO TO THIS TEST WHEN THRU
1810  006324  012777  177777  012356          MOV     #177777,@RXCSR  ;SET ALL POSSIBLE BITS
1811  006332  012777  177777  012364          MOV     #177777,@TXCSR  ;DITTO
1812  006340  000005                          RESET
1813  006342  012767  000340  171426          MOV     #LEVEL7,PS      ;RESTORE NON INTERRUPT STATUS
1814  006350  017701  012334                  MOV     @RXCSR,R1       ;SAVE
1815  006354  017702  012344                  MOV     @TXCSR,R2       ;SAVE
1816  006360  105767  172615                  TSTB    OPTCLR  ;IS THE OPTIONAL CLR JUMPER ON ?
1817  006364  100402                          BMI     1$      ;YES
1818  006366  042701  000016                  BIC     #16,R1  ;CLR THE NON RESETABLE BITS
1819  006372  042701  073000          1$:     BIC     #073000,R1      ;CLR ALL NON-CLEARABLE BITS
1820  006376  005701                          TST     R1      ;ARE THEY ALL 0 ?
1821  006400  001401                          BEQ     .+4
1822  006402  104000                          HLT     ;ALL SPECIFIED BITS SHOULD BE CLEAR
1823  006404  042702  002200                  BIC     #002200,R2      ;CLEAR ALL NON-CLEARABLE BITS
1824  006410  005702                          TST     R2      ;ARE THEY ALL 0 ?
1825  006412  001401                          BEQ     .+4
1826  006414  104000                          HLT     ;ALL SPECIFIED BITS SHOULD BE CLEAR
1827  006416  104400                          SCOPE
1828                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
1829                                          ;;TESTING OF WRITE ONLY BIT MRESET
1830                                          ;;
1831  006420  012767  000030  172500  TST24:  MOV     #24,TSTNO       ;SAVE THIS
1832  006426  012767  006476  172462          MOV     #TST25,NEXT             ;GO TO THIS TEST WHEN THRU
1833  006434  052777  000400  012262          BIS     #MRESET,@TXCSR  ;TRY TO SET THIS BIT
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1834  006442  032777  000400  012254          BIT     #MRESET,@TXCSR  ;TEST THIS BIT
1835  006450  001401                          BEQ     64$             ;BR IF '0'
1836  006452  104000                          HLT                     ;THIS BIT SHOULD NOT BE SET
1837  006454                          64$:
1838  006454  052777  000400  012242          BIS     #MRESET,@TXCSR  ;MASTER RESET
1839  006462  032777  000400  012234          BIT     #MRESET,@TXCSR  ;TEST THIS BIT
1840  006470  001401                          BEQ     65$             ;BR IF '0'
1841  006472  104000                          HLT                     ;THIS BIT SHOULD NOT BE SET
1842  006474                          65$:
1843                                                                  ;CHECK MASTER RESET LOGIC
1844  006474  104400                          SCOPE
1845                                  ;;THIS TEST VERIFYS THAT THE RXCSR & TXCSR CAN BE BYTE ADDRESSED (DATOB)
1846                                  ;;
1847  006476  012767  000031  172422  TST25:  MOV     #25,TSTNO       ;SAVE THIS
1848  006504  012767  006664  172404          MOV     #TST26,NEXT             ;GO TO THIS TEST WHEN THRU
1849  006512  052777  000400  012204          BIS     #MRESET,@TXCSR  ;MASTER RESET
1850  006520  105767  172455                  TSTB    OPTCLR  ;IS THE OPTIONAL CLR JUMPER ON ?
1851  006524  100405                          BMI     1$      ;YES
1852  006526  012777  000000  012154          MOV     #0,@RXCSR       ;CLR OUT NON RESETABLE BITS
1853  006534  005777  012150                  TST     @RXCSR  ;CLR OUT DSC BY READING RXCSR
1854  006540  152777  000001  012144  1$:     BISB    #BIT0,@HRXCSR   ;SET STRIP SYNC  UPPER BYTE
1855  006546  017701  012136                  MOV     @RXCSR,R1       ;SAVE RXCSR
1856  006552  022701  000400                  CMP     #400,R1 ;TEST RXCSR
1857  006556  001401                          BEQ     .+4
1858  006560  104000                          HLT     ;ONLY STRIP SYNC SHOULD BE SET
1859  006562  105077  012122                  CLRB    @RXCSR  ;CLR LOWER BYTE
1860  006566  017701  012116                  MOV     @RXCSR,R1       ;SAVE RXCSR
1861  006572  022701  000400                  CMP     #400,R1 ;TEST RXCSR
1862  006576  001401                          BEQ     .+4
1863  006600  104000                          HLT     ;ONLY STRIP SYNC SHOULD BE SET
1864  006602  052777  000400  012114          BIS     #MRESET,@TXCSR  ;MASTER RESET
1865  006610  152777  000040  012110          BISB    #BIT5,@HTXCSR   ;SET MAINT CLK  UPPER BYTE
1866  006616  017701  012102                  MOV     @TXCSR,R1       ;SAVE TXCSR
1867  006622  042701  002000                  BIC     #BITW,R1        ;CLR BIT WINDOW (DEPENDENT
1868                                                          ;ON H315 CONNECTOR EXISTANCE)
1869  006626  022701  020200                  CMP     #20200,R1       ;TEST TXCSR
1870  006632  001401                          BEQ     .+4
1871  006634  104000                          HLT     ;ONLY MAINT CLK BIT & TXDONE SHOULD BE SET
1872  006636  105077  012062                  CLRB    @TXCSR  ;CLR LOWER BYTE
1873  006642  017701  012056                  MOV     @TXCSR,R1       ;SAVE TXCSR
1874  006646  042701  002000                  BIC     #BITW,R1        ;CLR BIT WINDOW (DITTO)
1875  006652  022701  020200                  CMP     #20200,R1       ;TEST TXCSR
1876  006656  001401                          BEQ     .+4
1877  006660  104000                          HLT     ;ONLY MAINT CLK BIT & TXDONE SHOULD BE SET
1878  006662  104400                          SCOPE
1879                                  ;;THIS TEST PERFORMS MASTER RESET TESTING &
1880                                  ;;TESTING OF READ ONLY BIT BITW
1881                                  ;;MAINT INTERNAL
1882                                  ;;
1883  006664  012767  000032  172234  TST26:  MOV     #26,TSTNO       ;SAVE THIS
1884  006672  012767  007016  172216          MOV     #TST27,NEXT             ;GO TO THIS TEST WHEN THRU
1885  006700  012777  044001  012016          MOV     #MINT!MTDATA!BREAK,@TXCSR       ;SET MAINT INT.,BREAK,
1886                                                          ;&MTDATA
1887  006706  032777  002000  012010          BIT     #BITW,@TXCSR    ;TEST BITW
1888  006714  001001                          BNE     .+2
1889  006716  104000                          HLT             ;BIT WINDOW SHOULD BE SET
```

```
 1890  006720  042777  040000  011776          BIC     #MTDATA,@TXCSR
 1891  006726  013702  001136                  MOV     @#HOLD,R2
 1892  006732  005302                  1$:     DEC     R2
 1893  006734  001376                          BNE     1$
 1894  006736  032777  002000  011760          BIT     #BITW,@TXCSR
 1895  006744  001401                          BEQ     .+4
 1896  006746  104000                          HLT                     ;BIT SHOULD BE CLR
 1897                                          ;NOW SET THE MTDATA
 1898  006750  052777  040000  011746          BIS     #MTDATA,@TXCSR
 1899  006756  052777  000400  011740          BIS     #MRESET,@TXCSR  ;MASTER RESET
 1900  006764  052777  004001  011732          BIS     #MINT!BREAK,@TXCSR
 1901  006772  013702  001136                  MOV     @#HOLD,R2
 1902  006776  005302                  2$:     DEC     R2
 1903  007000  001376                          BNE     2$
 1904  007002  032777  002000  011714          BIT     #BITW,@TXCSR
 1905  007010  001401                          BEQ     .+4
 1906  007012  104000                          HLT     ;BITW SHOULD BE CLR BY MASTER RESET
 1907  007014  104400                          SCOPE
 1908                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
 1909                                          ;;TESTING OF READ ONLY BIT BITW
 1910                                          ;;MAINT EXTERNAL
 1911                                          ;;
 1912  007016  012767  000033  172102  TST27:  MOV     #27,TSTNO       ;SAVE THIS
 1913  007024  012767  007156  172064          MOV     #TST28,NEXT             ;GO TO THIS TEST WHEN THRU
 1914                                          ;TEST TO SEE IF EXTERNAL MODEM BYPASS CONNECTOR
 1915                                          ;IS ON (H315)....IF 'NO' JUMP AROUND TEST
 1916  007032  105767  172145                  TSTB    JMRBY
 1917  007036  100046                          BPL     1$      ;IT IS NOT ON
 1918  007040  012777  050001  011656          MOV     #MEXT!MTDATA!BREAK,@TXCSR       ;SET MAINT EXT.,BREAK,
 1919                                                                  ;&MTDATA
 1920  007046  032777  002000  011650          BIT     #BITW,@TXCSR    ;TEST BITW
 1921  007054  001001                          BNE     .+4
 1922  007056  104000                          HLT                     ;BIT WINDOW SHOULD BE SET
 1923  007060  042777  040000  011636          BIC     #MTDATA,@TXCSR
 1924  007066  013702  001136                  MOV     @#HOLD,R2
 1925  007072  005302                  2$:     DEC     R2
 1926  007074  001376                          BNE     2$
 1927  007076  032777  002000  011620          BIT     #BITW,@TXCSR
 1928  007104  001401                          BEQ     .+4
 1929  007106  104000                          HLT                     ;BIT SHOULD BE CLR
 1930                                          ;NOW SET THE MTDATA
 1931  007110  052777  040000  011606          BIS     #MTDATA,@TXCSR
 1932  007116  052777  000400  011600          BIS     #MRESET,@TXCSR  ;MASTER RESET
 1933  007124  052777  010001  011572          BIS     #MEXT!BREAK,@TXCSR
 1934  007132  013702  001136                  MOV     @#HOLD,R2
 1935  007136  005302                  3$:     DEC     R2
 1936  007140  001376                          BNE     3$
 1937  007142  032777  002000  011554          BIT     #BITW,@TXCSR
 1938  007150  001401                          BEQ     .+4
 1939  007152  104000                          HLT     ;BITW SHOULD BE CLR BY MASTER RESET
 1940  007154  104400                  1$:     SCOPE
 1941
 1942
 1943                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
 1944                                          ;;TESTING OF READ ONLY BIT RXDONE
 1945                                          ;;
```

```
 1946  007156  012767  000034  171742  TST28:  MOV     #28,TSTNO       ;SAVE THIS
 1947  007164  012767  007214  171724          MOV     #TST29,NEXT             ;GO TO THIS TEST WHEN THRU
 1948  007172  052777  000400  011524          BIS     #MRESET,@TXCSR  ;MASTER RESET
 1949  007200  032777  000200  011502          BIT     #RXDONE,@RXCSR  ;TEST THIS BIT
 1950  007206  001401                          BEQ     64$             ;BR IF '0'
 1951  007210  104000                          HLT                     ;CHECK MASTER RESET LOGIC
 1952  007212                          64$:
 1953                                                  ;OR SHORT ON THIS BIT
 1954  007212  104400                          SCOPE
 1955                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
 1956                                          ;;TESTING OF READ ONLY BIT RECACT
 1957                                          ;;
 1958  007214  012767  000035  171704  TST29:  MOV     #29,TSTNO       ;SAVE THIS
 1959  007222  012767  007252  171666          MOV     #TST30,NEXT             ;GO TO THIS TEST WHEN THRU
 1960  007230  052777  000400  011466          BIS     #MRESET,@TXCSR  ;MASTER RESET
 1961  007236  032777  004000  011444          BIT     #RECACT,@RXCSR  ;TEST THIS BIT
 1962  007244  001401                          BEQ     64$             ;BR IF '0'
 1963  007246  104000                          HLT                     ;CHECK MASTER RESET LOGIC
 1964  007250                          64$:
 1965                                                  ;OR SHORT ON THIS BIT
 1966  007250  104400                          SCOPE
 1967                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
 1968                                          ;;TESTING OF READ ONLY BIT DSC
 1969                                          ;;
 1970  007252  012767  000036  171646  TST30:  MOV     #30,TSTNO       ;SAVE THIS
 1971  007260  012767  007310  171630          MOV     #TST31,NEXT             ;GO TO THIS TEST WHEN THRU
 1972  007266  052777  000400  011430          BIS     #MRESET,@TXCSR  ;MASTER RESET
 1973  007274  032777  100000  011406          BIT     #DSC,@RXCSR     ;TEST THIS BIT
 1974  007302  001401                          BEQ     64$             ;BR IF '0'
 1975  007304  104000                          HLT                     ;CHECK MASTER RESET LOGIC
 1976  007306                          64$:
 1977                                                  ;OR SHORT ON THIS BIT
 1978  007306  104400                          SCOPE
 1979                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
 1980                                          ;;TESTING OF READ ONLY BIT TXDONE
 1981                                          ;;
 1982  007310  012767  000037  171610  TST31:  MOV     #31,TSTNO       ;SAVE THIS
 1983  007316  012767  007346  171572          MOV     #TST32,NEXT             ;GO TO THIS TEST WHEN THRU
 1984  007324  052777  000400  011372          BIS     #MRESET,@TXCSR  ;MASTER RESET
 1985  007332  032777  000200  011364          BIT     #TXDONE,@TXCSR  ;TEST THIS BIT
 1986  007340  001001                          BNE     .+4                     ;BR IF '1'
 1987  007342  104000                          HLT             ;CHECK MASTER RESET LOGIC
 1988                                                  ;OR SHORT ON THIS BIT
 1989  007344  104400                          SCOPE
 1990                                          ;;THIS TEST PERFORMS MASTER RESET TESTING &
 1991                                          ;;TESTING OF READ ONLY BIT DNA
 1992                                          ;;
 1993  007346  012767  000040  171552  TST32:  MOV     #32,TSTNO       ;SAVE THIS
 1994  007354  012767  007404  171534          MOV     #TST33,NEXT             ;GO TO THIS TEST WHEN THRU
 1995  007362  052777  000400  011334          BIS     #MRESET,@TXCSR  ;MASTER RESET
 1996  007370  032777  100000  011326          BIT     #DNA,@TXCSR     ;TEST THIS BIT
 1997  007376  001401                          BEQ     64$             ;BR IF '0'
 1998  007400  104000                          HLT                     ;CHECK MASTER RESET LOGIC
 1999  007402                          64$:
 2000                                                  ;OR SHORT ON THIS BIT
 2001  007402  104400                          SCOPE
```

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2002                                            ;;THIS TEST PERFORMS MASTER RESET TESTING &
2003                                            ;;TESTING OF READ  ONLY WORD RECEIVE DATA
2004                                            ;;
2005  007404  012767  000041  171514  TST33:    MOV     #33,TSTNO       ;SAVE THIS
2006  007412  012767  007452  171476            MOV     #TST34,NEXT             ;GO TO THIS TEST WHEN THRU
2007  007420  052777  000400  011276            BIS     #MRESET,@TXCSR  ;MASTER RESET
2008  007426  016703  011262                    MOV     RXDBUF,R3       ;FOR ERROR MESSAGE
2009  007432  012700  000377                    MOV     #377,R0         ;EXPECTED
2010  007436  017701  011252                    MOV     @RXDBUF,R1      ;ACTUAL
2011  007442  120001                            CMPB    R0,R1
2012  007444  001401                            BEQ     .+4             ;BR IF '0'
2013  007446  104002                            HLT     2               ;REC DATA SHOULD BE ALL 1'S
2014  007450  104400                            SCOPE
2015                                            ;;THIS TEST PERFORMS MASTER RESET TESTING &
2016                                            ;;TESTING OF READ ONLY BIT PARER
2017                                            ;;
2018  007452  012767  000042  171446  TST34:    MOV     #34,TSTNO       ;SAVE THIS
2019  007460  012767  007510  171430            MOV     #TST35,NEXT             ;GO TO THIS TEST WHEN THRU
2020  007466  052777  000400  011230            BIS     #MRESET,@TXCSR  ;MASTER RESET
2021  007474  032777  010000  011212            BIT     #PARER,@RXDBUF  ;TEST THIS BIT
2022  007502  001401                            BEQ     64$             ;BR IF '0'
2023  007504  104000                            HLT                     ;CHECK MASTER RESET LOGIC
2024  007506                            64$:
2025                                                    ;OR SHORT ON THIS BIT
2026  007506  104400                            SCOPE
2027                                            ;;THIS TEST PERFORMS MASTER RESET TESTING &
2028                                            ;;TESTING OF READ ONLY BIT FRMERR
2029                                            ;;
2030  007510  012767  000043  171410  TST35:    MOV     #35,TSTNO       ;SAVE THIS
2031  007516  012767  007546  171372            MOV     #TST36,NEXT             ;GO TO THIS TEST WHEN THRU
2032  007524  052777  000400  011172            BIS     #MRESET,@TXCSR  ;MASTER RESET
2033  007532  032777  020000  011154            BIT     #FRMERR,@RXDBUF ;TEST THIS BIT
2034  007540  001401                            BEQ     64$             ;BR IF '0'
2035  007542  104000                            HLT                     ;CHECK MASTER RESET LOGIC
2036  007544                            64$:
2037                                                    ;OR SHORT ON THIS BIT
2038  007544  104400                            SCOPE
2039                                            ;;THIS TEST PERFORMS MASTER RESET TESTING &
2040                                            ;;TESTING OF READ ONLY BIT OVRRUN
2041                                            ;;
2042  007546  012767  000044  171352  TST36:    MOV     #36,TSTNO       ;SAVE THIS
2043  007554  012767  007604  171334            MOV     #TST37,NEXT             ;GO TO THIS TEST WHEN THRU
2044  007562  052777  000400  011134            BIS     #MRESET,@TXCSR  ;MASTER RESET
2045  007570  032777  040000  011116            BIT     #OVRRUN,@RXDBUF ;TEST THIS BIT
2046  007576  001401                            BEQ     64$             ;BR IF '0'
2047  007600  104000                            HLT                     ;CHECK MASTER RESET LOGIC
2048  007602                            64$:
2049                                                    ;OR SHORT ON THIS BIT
2050  007602  104400                            SCOPE
2051                                            ;;THIS TEST PERFORMS MASTER RESET TESTING &
2052                                            ;;TESTING OF READ ONLY BIT RXERR
2053                                            ;;
2054  007604  012767  000045  171314  TST37:    MOV     #37,TSTNO       ;SAVE THIS
2055  007612  012767  007642  171276            MOV     #TST38,NEXT             ;GO TO THIS TEST WHEN THRU
2056  007620  052777  000400  011076            BIS     #MRESET,@TXCSR  ;MASTER RESET
2057  007626  032777  100000  011060            BIT     #RXERR,@RXDBUF  ;TEST THIS BIT
```

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2058  007634  001401                          BEQ     64$             ;BR IF '0'
2059  007636  104000                          HLT                     ;CHECK MASTER RESET LOGIC
2060  007640                          64$:
2061                                                  ;OR SHORT ON THIS BIT
2062  007640  104400                          SCOPE
2063                                          ;;THIS TEST VERIFYS THAT THE DEVICE REGISTER RXCSR
2064                                          ;;IS CLEARED BY MASTER RESET
2065  007642  012767  000046  171256  TST38:  MOV     #38,TSTNO       ;SAVE THIS
2066  007650  012767  007750  171240          MOV     #TST39,NEXT             ;GO TO THIS TEST WHEN THRU
2067  007656  012777  177777  011024          MOV     #177777,@RXCSR  ;SET ALL POSSIBLE BITS
2068  007664  052777  000400  011032          BIS     #MRESET,@TXCSR  ;MASTER RESET
2069  007672  016703  011012                  MOV     RXCSR,R3        ;FOR ERROR MESSAGE
2070  007676  017701  011006                  MOV     @RXCSR,R1       ;SAVE ACTUAL
2071  007702  105767  171273                  TSTB    OPTCLR          ;TEST THE OPT CLR JUMPER FLAG
2072  007706  100010                          BPL     1$              ;NO ,ITS NOT IN
2073  007710  042701  173000                  BIC     #173000,R1      ;CLR NON-MASTER RESETTABLE
2074                                          ;BITS(SINCE THESE ARE DEPENDENT ON H315 CONNECTORS EXISTANCE)
2075  007714  012700  000000                  MOV     #0,R0   ;EXPECTED
2076  007720  020001                          CMP     R0,R1   ;EXPECTED VS ACTUAL
2077  007722  001401                          BEQ     .+4
2078  007724  104001                          HLT     1       ;ALL MASTER RESETABLE BITS SHOULD BE CLR
2079  007726  000407                          BR      2$              ;JUMP AROUND
2080  007730  042701  073000          1$:     BIC     #73000,R1       ;CLR NON-MASTER RESETABLE
2081                                          ;BITS(SINCE THESE ARE DEPENDENT ON H315 CONNECTORS EXISTANCE)
2082  007734  012700  000016                  MOV     #16,R0          ;EXPECTED
2083  007740  020001                          CMP     R0,R1   ;EXPECTED VS ACTUAL
2084  007742  001401                          BEQ     .+4
2085  007744  104001                          HLT     1       ;ONLY STD,RTS,DTR BITS SHOULD BE SET
2086                                          ;NOTE THAT STD IS READ =1 INDEPENDENT OF
2087                                          ;SEC XMIT #6 STRAP
2088  007746  104400                  2$:     SCOPE
2089
2090                                          ;;THIS TEST VERIFYS THAT THE DEVICE REGISTER TXCSR
2091                                          ;;IS CLEARED BY MASTER RESET
2092                                          ;;
2093  007750  012767  000047  171150  TST39:  MOV     #39,TSTNO       ;SAVE THIS
2094  007756  012767  010024  171132          MOV     #TST40,NEXT             ;GO TO THIS TEST WHEN THRU
2095  007764  012777  177777  010732          MOV     #177777,@TXCSR  ;SET ALL POSSIBLE BITS
2096  007772  052777  000400  010724          BIS     #MRESET,@TXCSR  ;MASTER RESET
2097  010000  016703  010720                  MOV     TXCSR,R3        ;FOR ERROR MESSAGE
2098  010004  017701  010714                  MOV     @TXCSR,R1       ;SAVE ACTUAL
2099  010010  012700  000200                  MOV     #200,R0 ;EXPECTED
2100  010014  020001                          CMP     R0,R1   ;EXPECTED VS ACTUAL
2101  010016  001401                          BEQ     .+4
2102  010020  104001                          HLT     1       ;ONLY TXDONE SHOULD BE SET
2103  010022  104400                          SCOPE
2104
2105                                          ;;THIS TEST VERIFYS THAT THE DEVICE REGISTER RXDBUF
2106                                          ;;IS CLEARED BY MASTER RESET
2107                                          ;;
2108  010024  012767  000050  171074  TST40:  MOV     #40,TSTNO       ;SAVE THIS
2109  010032  012767  010072  171056          MOV     #TST41,NEXT             ;GO TO THIS TEST WHEN THRU
2110  010040  052777  000400  010656          BIS     #MRESET,@TXCSR  ;MASTER RESET
2111  010046  016703  010642                  MOV     RXDBUF,R3       ;FOR ERROR MESSAGE
2112  010052  017701  010636                  MOV     @RXDBUF,R1      ;SAVE
2113  010056  012700  000377                  MOV     #377,R0 ;EXPECTED
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2114  010062  020001                          CMP     R0,R1   ;EXPECTED VS ACTUAL
2115  010064  001401                          BEQ     .+4
2116  010066  104002                          HLT     2       ;ONLY REC DATA BITS SHOULD BE SET
2117  010070  104400                          SCOPE
2118                                          ;;THIS TEST VERIFYS BITS RING,CTS,CARDET,SRD,DSR
2119                                          ;;ALSO DSC IS GENERATED WHEN ANY OF THESE BITS ARE SET
2120                                          ;;OR CLEARED.....IT ALSO CHECKS THE MODEM BYPASS
2121                                          ;;JUMPER AND THAT THESE BITS CAN BE READ
2122                                          ;;NOTE: THE MODEM BYPASS JUMPER MUST BE ON (H315)
2123                                          ;;
2124  010072  012767  000051  171026  TST41:  MOV     #41,TSTNO       ;SAVE THIS
2125  010100  012767  011006  171010          MOV     #TST42,NEXT             ;GO TO THIS TEST WHEN THRU
2126  010106  005077  010576                  CLR     @RXCSR  ;TO GET RID OF STD ,RTS,DTR IF OPTCLR JUMPER #4 IS NOT ON
2127  010112  052777  000400  010604          BIS     #MRESET,@TXCSR  ;MASTER RESET
2128                                          ;TEST THAT A 'YES'' ANSWER WAS GIVEN TO QUESTION IN
2129                                          ;THE MONITOR OR BY DEFAULT
2130                                          ;THIS TEST WILL BE BYPASSED  IF THE EXTERNAL BYPASS
2131                                          ;JUMPER IS NOT INSTALLED
2132  010120  105767  171057                  TSTB    JMRBY
2133  010124  100402                          BMI     .+6     ;THE ANSWER WAS YES.....
2134                                                          ; PERFORM THIS TEST
2135  010126  000167  000652                  JMP     OUT1    ;JUMP AROUND THIS TEST IF THE ANSWER
2136                                                          ;WAS NO
2137  010132  016703  010552                  MOV     RXCSR,R3        ;SET UP FOR ERROR MESSAGE
2138  010136  017701  010546                  MOV     @RXCSR,R1       ;ACTUAL
2139  010142  005000                          CLR     R0      ;EXPECTED
2140  010144  005701                          TST     R1      ;IS IT = 0 ?
2141  010146  001401                          BEQ     .+4
2142  010150  104001                          HLT     1       ;RXCSR SHOULD BE CLR
2143  010152  052777  000002  010530          BIS     #DTR,@RXCSR     ;SET DTR
2144                                          ;WAIT FOR CABLE DELAYS
2145                                          ;****************************************
2146                                          ;MODIFY 'HOLD:'' ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2147                                          ;****************************************
2148  010160  016702  170752                  MOV     HOLD,R2 ;SET DELAY TIME
2149  010164                          64$:
2150  010164  005302                          DEC     R2
2151  010166  001376                          BNE     64$     ;WAIT THIS TIME
2152                                          ;OK NOW FALL THRU AND CONTINUE TESTING.....
2153                                          ;EXIT STAGE LEFT....CHINNNG!
2154  010170  017701  010514                  MOV     @RXCSR,R1       ;ACTUAL
2155  010174  012700  130002                  MOV     #130002,R0      ;DSC,CTS,CARDET,DTR
2156  010200  020001                          CMP     R0,R1   ;EXPECTED VS ACTUAL
2157  010202  001401                          BEQ     .+4
2158  010204  104001                          HLT     1       ;CHECK BYPASS CONNECTOR
2159  010206  017701  010476                  MOV     @RXCSR,R1       ;ACTUAL
2160  010212  012700  030002                  MOV     #30002,R0       ;CTS,CARDET,DTR
2161  010216  020001                          CMP     R0,R1   ;EXPECTED VS ACTUAL
2162  010220  001401                          BEQ     .+4
2163  010222  104001                          HLT     1       ;PREVIOUS READING OF RXCSR SHOULD
2164                                                          ;HAVE CLEARED DSC
2165  010224  052777  000004  010456          BIS     #RTS,@RXCSR
2166                                          ;WAIT FOR CABLE DELAYS
2167                                          ;****************************************
2168                                          ;MODIFY ''OLD:'' ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2169                                          ;****************************************
```

```
2170  010232  016702  170700                MOV     HOLD,R2 ;SET DELAY TIME
2171  010236                          65$:
2172  010236  005302                        DEC     R2
2173  010240  001376                        BNE     65$     ;WAIT THIS TIME
2174                                        ;OK NOW FALL THRU AND CONTINUE TESTING.....
2175                                        ;EXIT STAGE LEFT....CHINNNG!
2176  010242  017701  010442                MOV     @RXCSR,R1
2177  010246  012700  170006                MOV     #170006,R0      ;DSC,RING,CTS,CARDET,RTS,DTR
2178  010252  020001                        CMP     R0,R1   ;EXPECTED VS ACTUAL
2179  010254  001401                        BEQ     .+4
2180  010256  104001                        HLT     1       ;CHECK BYPASS CONNECTOR
2181  010260  017701  010424                MOV     @RXCSR,R1
2182  010264  012700  070006                MOV     #70006,R0       ;RING,CTS,CARDET,RTS,DTR
2183  010270  020001                        CMP     R0,R1   ;EXPECTED VS ACTUAL
2184  010272  001401                        BEQ     .+4
2185  010274  104001                        HLT     1       ;PREVIOUS READING OF RXCSR SHOULD
2186                                                        ;HAVE CLEARED DSC
2187  010276  105767  170675                TSTB    SEXMIT  ;IS SEC XMIT JUMPER IN ?
2188  010302  100112                        BPL     OUT2    ;NO
2189  010304  105767  170670                TSTB    SEREC   ;IS SEC REC JUMPER IN ?
2190  010310  100163                        BPL     OUT3    ;NO
2191  010312  052777  000010  010370        BIS     #STD,@RXCSR
2192                                        ;WAIT FOR CABLE DELAYS
2193                                        ;**************************************
2194                                        ;MODIFY 'HOLD:'  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2195                                        ;**************************************
2196  010320  016702  170612                MOV     HOLD,R2 ;SET DELAY TIME
2197  010324                          66$:
2198  010324  005302                        DEC     R2
2199  010326  001376                        BNE     66$     ;WAIT THIS TIME
2200                                        ;OK NOW FALL THRU AND CONTINUE TESTING.....
2201                                        ;EXIT STAGE LEFT....CHINNNG!
2202  010330  017701  010354                MOV     @RXCSR,R1
2203  010334  012700  173016          MASK1: MOV    #173016,R0      ;DSC,RING,CTS,CARDET,SRD,DSR
2204                                                        ;STD,RTS,DTR
2205  010340  020001                        CMP     R0,R1   ;EXPECTED VS ACTUAL
2206  010342  001401                        BEQ     .+4
2207  010344  104001                        HLT     1       ;CHECK BYPASS CONNECTOR
2208  010346  017701  010336                MOV     @RXCSR,R1
2209  010352  012700  073016          MASK2: MOV    #73016,R0       ;RING,CTS,CARDET,SRD,DSR,STD
2210                                                        ;RTS,DTR
2211  010356  020001                        CMP     R0,R1   ;EXPECTED VS ACTUAL
2212  010360  001401                        BEQ     .+4
2213  010362  104001                        HLT     1       ;PREVIOUS READING OF RXCSR SHOULD
2214                                                        ;HAVE CLEARED DSC
2215  010364  042777  000002  010316        BIC     #DTR,@RXCSR
2216                                        ;WAIT FOR CABLE DELAYS
2217                                        ;**************************************
2218                                        ;MODIFY 'HOLD:'  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2219                                        ;**************************************
2220  010372  016702  170540                MOV     HOLD,R2 ;SET DELAY TIME
2221  010376                          64$:
2222  010376  005302                        DEC     R2
2223  010400  001376                        BNE     64$     ;WAIT THIS TIME
2224                                        ;OK NOW FALL THRU AND CONTINUE TESTING.....
2225                                        ;EXIT STAGE LEFT....CHINNNG!
```

```
2226  010402  017701  010302                    MOV     @RXCSR,R1
2227  010406  012700  143014                    MOV     #143014,R0      ;DSC,RING,SRD,DSR,STD,RTS
2228  010412  020001                            CMP     R0,R1   ;EXPECTED VS ACTUAL
2229  010414  001401                            BEQ     .+4
2230  010416  104001                            HLT     1       ;DSC SHOULD BE SET
2231  010420  042777  000004  010262            BIC     #RTS,@RXCSR
2232                                            ;WAIT FOR CABLE DELAYS
2233                                            ;*************************************
2234                                            ;MODIFY 'HOLD:'  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2235                                            ;*************************************
2236  010426  016702  170504                    MOV     HOLD,R2 ;SET DELAY TIME
2237  010432                            65$:
2238  010432  005302                            DEC     R2
2239  010434  001376                            BNE     65$     ;WAIT THIS TIME
2240                                            ;OK NOW FALL THRU AND CONTINUE TESTING.....
2241                                            ;EXIT STAGE LEFT....CHINNNG!
2242  010436  017701  010246                    MOV     @RXCSR,R1
2243  010442  012700  103010            MASK3:  MOV     #103010,R0      ;DSC,SRD,DSR,STD
2244  010446  020001                            CMP     R0,R1   ;EXPECTED VS ACTUAL
2245  010450  001401                            BEQ     .+4
2246  010452  104001                            HLT     1       ;DSC SHOULD BE SET
2247  010454  042777  000010  010226            BIC     #STD,@RXCSR
2248                                            ;WAIT FOR CABLE DELAYS
2249                                            ;*************************************
2250                                            ;MODIFY 'HOLD:'  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2251                                            ;*************************************
2252  010462  016702  170450                    MOV     HOLD,R2 ;SET DELAY TIME
2253  010466                            64$:
2254  010466  005302                            DEC     R2
2255  010470  001376                            BNE     64$     ;WAIT THIS TIME
2256                                            ;OK NOW FALL THRU AND CONTINUE TESTING.....
2257                                            ;EXIT STAGE LEFT....CHINNNG!
2258  010472  017701  010212                    MOV     @RXCSR,R1
2259  010476  012700  100000                    MOV     #100000,R0      ;DSC
2260  010502  020001                            CMP     R0,R1   ;EXPECTED VS ACTUAL
2261  010504  001401                            BEQ     .+4
2262  010506  104001                            HLT     1       ;DSC SHOULD BE SET
2263  010510  017701  010174                    MOV     @RXCSR,R1
2264  010514  005000                            CLR     R0      ;NONE
2265  010516  005701                            TST     R1
2266  010520  001401                            BEQ     .+4
2267  010522  104001                            HLT     1       ;DSC SHOULD BE CLEARED FROM PREVIOUS
2268                                                            ;READING OF RXCSR
2269  010524  000167  000254                    JMP     OUT1    ;JUMP AROUND
2270                                    ;THE FOLLOWING ROUTINE HANDLES THE SITUATION WHERE SEC XMIT
2271                                    ;AND SEC REC JUMPERS ARE NOT ON
2272  010530  052777  000010  010152    OUT2:   BIS     #STD,@RXCSR
2273                                            ;WAIT FOR CABLE DELAYS
2274                                            ;*************************************
2275                                            ;MODIFY 'HOLD:'  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2276                                            ;*************************************
2277  010536  016702  170374                    MOV     HOLD,R2 ;SET DELAY TIME
2278  010542                            64$:
2279  010542  005302                            DEC     R2
2280  010544  001376                            BNE     64$     ;WAIT THIS TIME
2281                                            ;OK NOW FALL THRU AND CONTINUE TESTING.....
```

```
2282
2283  010546  017701  010136                    ;EXIT STAGE LEFT....CHINNNG!
2284  010552  012700  070016                    MOV     @RXCSR,R1       ;ACTUAL
2285  010556  020001                            MOV     #70016,R0       ;EXPECTED: RING ,CTS,CARDET,STD,RTS,DTR
2286  010560  001401                            CMP     R0,R1   ;EXPECTED VS ACTUAL
2287  010562  104001                            BEQ     .+4
2288  010564  042777  000004  010116            HLT     1       ;CHECK SEC XMIT & SEC REC JUMPERS
2289                                            BIC     #RTS,@RXCSR
2290                                            ;WAIT FOR CABLE DELAYS
2291                                            ;****************************************
2292                                            ;MODIFY 'HOLD:'  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2293  010572  016702  170340                    ;****************************************
2294  010576                            65$:    MOV     HOLD,R2 ;SET DELAY TIME
2295  010576  005302                            DEC     R2
2296  010600  001376                            BNE     65$     ;WAIT THIS TIME
2297                                            ;OK NOW FALL THRU AND CONTINUE TESTING.....
2298                                            ;EXIT STAGE LEFT....CHINNNG!
2299  010602  017701  010102                    MOV     @RXCSR,R1       ;ACTUAL
2300  010606  012700  130012                    MOV     #130012,R0      ;DSC,CTS,CARDET,DTR,STD
2301                                            ;NOTE THAT DSC STILL ASSERTS EVEN THO THE SEC XMIT JUMPER # 6 IS NOT ON
2302  010612  020001                            CMP     R0,R1   ;EXPECTED VS ACTUAL
2303  010614  001401                            BEQ     .+4
2304  010616  104001                            HLT     1       ;CHECK BYPASS CONNECTOR
2305  010620  042777  000002  010062            BIC     #DTR,@RXCSR
2306                                            ;WAIT FOR CABLE DELAYS
2307                                            ;****************************************
2308                                            ;MODIFY 'HOLD:'  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2309                                            ;****************************************
2310  010626  016702  170304                    MOV     HOLD,R2 ;SET DELAY TIME
2311  010632                            66$:
2312  010632  005302                            DEC     R2
2313  010634  001376                            BNE     66$     ;WAIT THIS TIME
2314                                            ;OK NOW FALL THRU AND CONTINUE TESTING.....
2315                                            ;EXIT STAGE LEFT....CHINNNG!
2316  010636  017701  010046                    MOV     @RXCSR,R1       ;ACTUAL
2317  010642  012700  100010                    MOV     #100010,R0      ;DSC,STD
2318  010646  020001                            CMP     R0,R1   ;EXPECTED VS ACTUAL
2319  010650  001401                            BEQ     .+4
2320  010652  104001                            HLT     1       ;ONLY DSC & STD  SHOULD BE SET
2321  010654  000167  000124                    JMP     OUT1    ;JUMP AROUND
2322  010660  052777  000010  010022  OUT3:     BIS     #STD,@RXCSR
2323                                            ;WAIT FOR CABLE DELAYS
2324                                            ;****************************************
2325                                            ;MODIFY 'HOLD:'  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2326                                            ;****************************************
2327  010666  016702  170244                    MOV     HOLD,R2 ;SET DELAY TIME
2328  010672                            64$:
2329  010672  005302                            DEC     R2
2330  010674  001376                            BNE     64$     ;WAIT THIS TIME
2331                                            ;OK NOW FALL THRU AND CONTINUE TESTING.....
2332                                            ;EXIT STAGE LEFT....CHINNNG!
2333  010676  017701  010006                    MOV     @RXCSR,R1       ;ACTUAL
2334  010702  012700  171016                    MOV     #171016,R0      ;EXPECTED: DSC,RING,CTS,CARDET,DSR,STD,RTS,DTR
2335  010706  020001                            CMP     R0,R1   ;EXPECTED VS ACTUAL
2336  010710  001401                            BEQ     .+4
2337  010712  104001                            HLT     1       ;CHECK SEC REC JUMPER
```

```
2338  010714  042777  000004  007766          BIC     #RTS,@RXCSR
2339                                          ;WAIT FOR CABLE DELAYS
2340                                          ;*************************************
2341                                          ;MODIFY 'HOLD:'  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2342                                          ;*************************************
2343  010722  016702  170210                  MOV     HOLD,R2 ;SET DELAY TIME
2344  010726                          65$:
2345  010726  005302                          DEC     R2
2346  010730  001376                          BNE     65$     ;WAIT THIS TIME
2347                                          ;OK NOW FALL THRU AND CONTINUE TESTING.....
2348                                          ;EXIT STAGE LEFT....CHINNNG!
2349  010732  017701  007752                  MOV     @RXCSR,R1       ;ACTUAL
2350  010736  012700  131012                  MOV     #131012,R0      ;EXPECTED: DSC,CTS,CARDET,DSR,STD,DTR
2351  010742  020001                          CMP     R0,R1   ;EXPECTED VS ACTUAL
2352  010744  001401                          BEQ     .+4
2353  010746  104001                          HLT     1       ;CHECK H315 CONNECTOR
2354  010750  042777  000002  007732          BIC     #DTR,@RXCSR
2355                                          ;WAIT FOR CABLE DELAYS
2356                                          ;*************************************
2357                                          ;MODIFY 'HOLD:'  ACCORDINGLY FOR FASTER OR SLOWER  MACHINE
2358                                          ;*************************************
2359  010756  016702  170154                  MOV     HOLD,R2 ;SET DELAY TIME
2360  010762                          66$:
2361  010762  005302                          DEC     R2
2362  010764  001376                          BNE     66$     ;WAIT THIS TIME
2363                                          ;OK NOW FALL THRU AND CONTINUE TESTING.....
2364                                          ;EXIT STAGE LEFT....CHINNNG!
2365  010766  017701  007716                  MOV     @RXCSR,R1       ;ACTUAL
2366  010772  012700  101010                  MOV     #101010,R0      ;EXPECTED: DSC,DSR,STD
2367  010776  020001                          CMP     R0,R1   ;EXPECTED VS ACTUAL
2368  011000  001401                          BEQ     .+4
2369  011002  104001                          HLT     1       ;CHECK H315 CONNECTOR
2370  011004  104400                  OUT1:   SCOPE
2371
2372                                          ;;THIS TEST VERIFYS THAT RECACT (REC ACTIVE) ASSERTS
2373                                          ;;IMMED. WHEN SYNC EXTERNAL MODE IS SELECTED
2374                                          ;;AND SYNC SEARCH IS SET
2375                                          ;;
2376  011006  012767  000052  170112  TST42:  MOV     #42,TSTNO       ;SAVE THIS
2377  011014  012767  011134  170074          MOV     #TST43,NEXT             ;GO TO THIS TEST WHEN THRU
2378  011022  052777  000400  007674          BIS     #MRESET,@TXCSR  ;MASTER RESET
2379  011030  012777  020000  007662          MOV     #SYNEXT,@PARCSR ;SET THE MODE
2380  011036  052777  000400  007660          BIS     #MRESET,@TXCSR  ;MASTER RESET
2381
2382                                  ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
2383  011044  012777  064001  007652          MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
2384
2385                                  ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
2386  011052  012777  026026  007640          MOV     #SYNEXT!EIGHT!NOPAR!26,@PARCSR
2387  011060  032777  004000  007622          BIT     #RECACT,@RXCSR
2388  011066  001401                          BEQ     64$
2389  011070  104000                          HLT             ;RECACT SHOULD NOT BE SET
2390  011072                          64$:
2391  011072  052777  000020  007610          BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
2392  011100  032777  004000  007602          BIT     #RECACT,@RXCSR
2393  011106  001001                          BNE     65$
```

```
 2394  011110  104000                          HLT             ;RECACT DID NOT ASSERT
 2395  011112                          65$:
 2396  011112  042777  000020  007570          BIC     #SYNSCH,@RXCSR  ;DROP SEARCH SYNC
 2397  011120  032777  004000  007562          BIT     #RECACT,@RXCSR  ;IS IT =0?
 2398  011126  001401                          BEQ     66$
 2399  011130  104000                          HLT     ;RECACT SHOULD BE 0
 2400  011132                          66$:
 2401  011132  104400                          SCOPE
 2402                                          ;;THIS TEST VERIFYS THAT RECACT (REC ACTIVE) ASSERTS
 2403                                          ;;IMMED. WHEN ISOCRONOUS MODE IS SELECTED
 2404                                          ;;AND SYNC SEARCH IS SET
 2405                                          ;;
 2406  011134  012767  000053  167764  TST43:  MOV     #43,TSTNO       ;SAVE THIS
 2407  011142  012767  011262  167746          MOV     #TST44,NEXT             ;GO TO THIS TEST WHEN THRU
 2408  011150  052777  000400  007546          BIS     #MRESET,@TXCSR  ;MASTER RESET
 2409  011156  012777  000000  007534          MOV     #ISYMOD,@PARCSR ;SET THE MODE
 2410  011164  052777  000400  007532          BIS     #MRESET,@TXCSR  ;MASTER RESET
 2411
 2412                                  ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
 2413  011172  012777  064001  007524          MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
 2414
 2415                                  ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
 2416  011200  012777  006026  007512          MOV     #ISYMOD!EIGHT!NOPAR!26,@PARCSR
 2417  011206  032777  004000  007474          BIT     #RECACT,@RXCSR
 2418  011214  001401                          BEQ     64$
 2419  011216  104000                          HLT             ;RECACT SHOULD NOT BE SET
 2420  011220                          64$:
 2421  011220  052777  000020  007462          BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
 2422  011226  032777  004000  007454          BIT     #RECACT,@RXCSR
 2423  011234  001001                          BNE     65$
 2424  011236  104000                          HLT             ;RECACT DID NOT ASSERT
 2425  011240                          65$:
 2426  011240  042777  000020  007442          BIC     #SYNSCH,@RXCSR  ;DROP SEARCH SYNC
 2427  011246  032777  004000  007434          BIT     #RECACT,@RXCSR  ;IS IT =0?
 2428  011254  001401                          BEQ     66$
 2429  011256  104000                          HLT     ;RECACT SHOULD BE 0
 2430  011260                          66$:
 2431  011260  104400                          SCOPE
 2432                                          ;;VERIFY THE MATCH DETECT & DATA RDY FLAGS BY PUMPING
 2433                                          ;;IN TWO * SYNC CHARS THRU MAINT DATA BIT
 2434                                          ;;WATCH THE RECACT BIT
 2435                                          ;;ON THE THIRD * CHARACTER IT SHOULD SET RXDONE
 2436                                          ;;*: DEPENDENT ON MONITOR.............
 2437                                          ;;IF ONE SYNC STRAP IS SELECTED THEN IT WILL ONLY
 2438                                          ;;TAKE ONE SYNC CHARACTER FOR RXDONE TO ASSERT
 2439                                          ;;ON THE SECOND CHARACTER
 2440                                          ;;ALSO CHECK THIS CHARACTER IN RXDBUF
 2441                                          ;;AND CHECK OPERATION OF SYNSCH
 2442                                          ;;MODE: SYNC INTERNAL
 2443                                          ;;LENGTH:FIVE
 2444                                          ;;
 2445  011262  012767  000054  167636  TST44:  MOV     #44,TSTNO       ;SAVE THIS
 2446  011270  012767  011604  167620          MOV     #TST45,NEXT             ;GO TO THIS TEST WHEN THRU
 2447  011276  052777  000400  007420          BIS     #MRESET,@TXCSR  ;MASTER RESET
 2448  011304  012777  030000  007406          MOV     #SYNINT,@PARCSR ;SET THE MODE
 2449  011312  052777  000400  007404          BIS     #MRESET,@TXCSR  ;MASTER RESET
```

```
2450
2451                                        ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
2452  011320  012777  064001  007376              MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
2453
2454                                        ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
2455  011326  012777  030026  007364              MOV     #SYNINT!FIVE!NOPAR!26,@PARCSR
2456  011334  016703  007354                    MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
2457  011340  052777  000020  007342              BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
2458                                              ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
2459  011346  042777  020000  007350              BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2460  011354  052777  020000  007342              BIS     #CLK,@TXCSR     ;POKE CLK UP
2461                                        ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
2462  011362  042777  020000  007334              BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2463  011370  052777  020000  007326              BIS     #CLK,@TXCSR     ;POKE CLK UP
2464  011376  012767  000002  167536              MOV     #2,COUNT
2465  011404  012767  000005  167526  1$:         MOV     #5,SHIFT        ;# OF SHIFTS
2466  011412  012767  000026  167524              MOV     #26,TEMP1       ;SYNC CHARACTER
2467  011420  004767  006770                      JSR     PC,RPOKE
2468  011424  005367  167512                      DEC     COUNT
2469  011430  001403                              BEQ     2$
2470                                              ;TEST SYNCNO TO SEE HOW MANY SYNC CHARS WERE SELECTED
2471  011432  105767  167540                      TSTB    SYNCNO
2472  011436  100762                              BMI     1$      ;TWO SYNC CHARS
2473  011440  105777  007244  2$:         TSTB    @RXCSR  ;CHECK REC DONE BIT
2474  011444  100001                              BPL     64$
2475  011446  104000                              HLT             ;RXDONE SHOULD NOT BE ASSERTED
2476  011450                              64$:
2477  011450  032777  004000  007232              BIT     #RECACT,@RXCSR
2478  011456  001001                              BNE     65$
2479  011460  104000                              HLT             ;RECACT SHOULD BE ASSERTED
2480  011462                              65$:
2481  011462  012767  000005  167450              MOV     #5,SHIFT
2482  011470  012767  000021  167446              MOV     #21,TEMP1       ;ANY CHARACTER
2483  011476  004767  006712                      JSR     PC,RPOKE
2484  011502  105777  007202                      TSTB    @RXCSR  ;CHECK RXDONE
2485  011506  100401                              BMI     66$
2486  011510  104000                              HLT             ;RXDONE SHOULD BE ASSERTED
2487  011512                              66$:
2488  011512  032777  004000  007170              BIT     #RECACT,@RXCSR
2489  011520  001001                              BNE     67$
2490  011522  104000                              HLT             ;RECACT SHOULD STILL BE ASSERTED
2491  011524                              67$:
2492  011524  042777  000020  007156              BIC     #SYNSCH,@RXCSR  ;CLR SYNC SEARCH
2493  011532  032777  004000  007150              BIT     #RECACT,@RXCSR  ;IT SHOULD DROP IMMEDIATELY
2494  011540  001401                              BEQ     68$
2495  011542  104000                              HLT             ;RECACT SHOULD BE CLR
2496  011544                              68$:
2497  011544  105777  007140                      TSTB    @RXCSR  ;RXDONE
2498  011550  100401                              BMI     69$
2499  011552  104000                              HLT             ;RXDONE SHOULD STILL BE ASSERTED
2500  011554                              69$:
2501  011554  012700  000021                      MOV     #21,R0  ;EXPECTED DATA
2502  011560  017701  007130                      MOV     @RXDBUF,R1      ;ACTUAL DATA
2503  011564  020001                              CMP     R0,R1   ;COMPARE EXP VS ACT
2504  011566  001401                              BEQ     70$
2505  011570  104002                              HLT     2       ;DATA CHARS SHOULD COMPARE
```

```
2506  011572                                70$:
2507  011572  105777  007112                      TSTB    @RXCSR  ;CHECK RXDONE
2508  011576  100001                              BPL     71$
2509  011600  104000                              HLT     ;RXDONE SHOULD BE CLR FROM
2510  011602                                71$:
2511                                              ;PREVIOUS READING OF RXDBUF
2512  011602  104400                              SCOPE
2513                                              ;;VERIFY THE MATCH DETECT & DATA RDY FLAGS BY PUMPING
2514                                              ;;IN TWO * SYNC CHARS THRU MAINT DATA BIT
2515                                              ;;WATCH THE RECACT BIT
2516                                              ;;ON THE THIRD * CHARACTER IT SHOULD SET RXDONE
2517                                              ;;*: DEPENDENT ON MONITOR.....
2518                                              ;;IF ONE SYNC STRAP IS SELECTED THEN IT WILL ONLY
2519                                              ;;TAKE ONE SYNC CHARACTER FOR RXDONE TO ASSERT
2520                                              ;;ON THE SECOND CHARACTER
2521                                              ;;ALSO CHECK THIS CHARACTER IN RXDBUF
2522                                              ;;AND CHECK OPERATION OF SYNSCH
2523                                              ;;MODE: SYNC INTERNAL
2524                                              ;;LENGTH:SIX
2525                                              ;;
2526  011604  012767  000055  167314  TST45:     MOV     #45,TSTNO       ;SAVE THIS
2527  011612  012767  012126  167276              MOV     #TST46,NEXT             ;GO TO THIS TEST WHEN THRU
2528  011620  052777  000400  007076              BIS     #MRESET,@TXCSR  ;MASTER RESET
2529  011626  012777  030000  007064              MOV     #SYNINT,@PARCSR ;SET THE MODE
2530  011634  052777  000400  007062              BIS     #MRESET,@TXCSR  ;MASTER RESET
2531
2532                                    ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
2533  011642  012777  064001  007054              MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
2534
2535                                    ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
2536  011650  012777  032026  007042              MOV     #SYNINT!SIX!NOPAR!26,@PARCSR
2537  011656  016703  007032                      MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
2538  011662  052777  000020  007020              BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
2539                                              ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
2540  011670  042777  020000  007026              BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2541  011676  052777  020000  007020              BIS     #CLK,@TXCSR     ;POKE CLK UP
2542                                    ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
2543  011704  042777  020000  007012              BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2544  011712  052777  020000  007004              BIS     #CLK,@TXCSR     ;POKE CLK UP
2545  011720  012767  000002  167214              MOV     #2,COUNT
2546  011726  012767  000006  167204  1$:         MOV     #6,SHIFT        ;# OF SHIFTS
2547  011734  012767  000026  167202              MOV     #26,TEMP1       ;SYNC CHARACTER
2548  011742  004767  006446                      JSR     PC,RPOKE
2549  011746  005367  167170                      DEC     COUNT
2550  011752  001403                              BEQ     2$
2551                                              ;TEST SYNCNO TO SEE HOW MANY SYNC CHARS WERE SELECTED
2552  011754  105767  167216                      TSTB    SYNCNO
2553  011760  100762                              BMI     1$      ;TWO SYNC CHARS
2554  011762  105777  006722          2$:         TSTB    @RXCSR  ;CHECK REC DONE BIT
2555  011766  100001                              BPL     64$
2556  011770  104000                              HLT             ;RXDONE SHOULD NOT BE ASSERTED
2557  011772                                64$:
2558  011772  032777  004000  006710              BIT     #RECACT,@RXCSR
2559  012000  001001                              BNE     65$
2560  012002  104000                              HLT             ;RECACT SHOULD BE ASSERTED
2561  012004                                65$:
```

```
2562  012004  012767  000006  167126          MOV     #6,SHIFT
2563  012012  012767  000021  167124          MOV     #21,TEMP1       ;ANY CHARACTER
2564  012020  004767  006370                  JSR     PC,RPOKE
2565  012024  105777  006660                  TSTB    @RXCSR  ;CHECK RXDONE
2566  012030  100401                          BMI     66$
2567  012032  104000                          HLT             ;RXDONE SHOULD BE ASSERTED
2568  012034                          66$:
2569  012034  032777  004000  006646          BIT     #RECACT,@RXCSR
2570  012042  001001                          BNE     67$
2571  012044  104000                          HLT             ;RECACT SHOULD STILL BE ASSERTED
2572  012046                          67$:
2573  012046  042777  000020  006634          BIC     #SYNSCH,@RXCSR  ;CLR SYNC SEARCH
2574  012054  032777  004000  006626          BIT     #RECACT,@RXCSR  ;IT SHOULD DROP IMMEDIATELY
2575  012062  001401                          BEQ     68$
2576  012064  104000                          HLT             ;RECACT SHOULD BE CLR
2577  012066                          68$:
2578  012066  105777  006616                  TSTB    @RXCSR  ;RXDONE
2579  012072  100401                          BMI     69$
2580  012074  104000                          HLT             ;RXDONE SHOULD STILL BE ASSERTED
2581  012076                          69$:
2582  012076  012700  000021                  MOV     #21,R0  ;EXPECTED DATA
2583  012102  017701  006606                  MOV     @RXDBUF,R1      ;ACTUAL DATA
2584  012106  020001                          CMP     R0,R1   ;COMPARE EXP VS ACT
2585  012110  001401                          BEQ     70$
2586  012112  104002                          HLT     2       ;DATA CHARS SHOULD COMPARE
2587  012114                          70$:
2588  012114  105777  006570                  TSTB    @RXCSR  ;CHECK RXDONE
2589  012120  100001                          BPL     71$
2590  012122  104000                          HLT     ;RXDONE SHOULD BE CLR FROM
2591  012124                          71$:
2592                                          ;PREVIOUS READING OF RXDBUF
2593  012124  104400                  SCOPE
2594                                  ;;VERIFY THE MATCH DETECT & DATA RDY FLAGS BY PUMPING
2595                                  ;;IN TWO * SYNC CHARS THRU MAINT DATA BIT
2596                                  ;;WATCH THE RECACT BIT
2597                                  ;;ON THE THIRD * CHARACTER IT SHOULD SET RXDONE
2598                                  ;;*: DEPENDENT ON MONITOR.............
2599                                  ;;IF ONE SYNC STRAP IS SELECTED THEN IT WILL ONLY
2600                                  ;;TAKE ONE SYNC CHARACTER FOR RXDONE TO ASSERT
2601                                  ;;ON THE SECOND CHARACTER
2602                                  ;;ALSO CHECK THIS CHARACTER IN RXDBUF
2603                                  ;;AND CHECK OPERATION OF SYNSCH
2604                                  ;;MODE: SYNC INTERNAL
2605                                  ;;LENGTH:SEVEN
2606                                  ;;
2607  012126  012767  000056  166772  TST46:  MOV     #46,TSTNO       ;SAVE THIS
2608  012134  012767  012450  166754          MOV     #TST47,NEXT             ;GO TO THIS TEST WHEN THRU
2609  012142  052777  000400  006554          BIS     #MRESET,@TXCSR  ;MASTER RESET
2610  012150  012777  030000  006542          MOV     #SYNINT,@PARCSR ;SET THE MODE
2611  012156  052777  000400  006540          BIS     #MRESET,@TXCSR  ;MASTER RESET
2612
2613                                  ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
2614  012164  012777  064001  006532          MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
2615
2616                                  ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
2617  012172  012777  034026  006520          MOV     #SYNINT!SEVEN!NOPAR!26,@PARCSR
```

```
2618  012200  016703  006510                    MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
2619  012204  052777  000020  006476            BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
2620                                            ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
2621  012212  042777  020000  006504            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2622  012220  052777  020000  006476            BIS     #CLK,@TXCSR     ;POKE CLK UP
2623                                    ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
2624  012226  042777  020000  006470            BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2625  012234  052777  020000  006462            BIS     #CLK,@TXCSR     ;POKE CLK UP
2626  012242  012767  000002  166672            MOV     #2,COUNT
2627  012250  012767  000007  166662  1$:       MOV     #7,SHIFT        ;# OF SHIFTS
2628  012256  012767  000026  166660            MOV     #26,TEMP1       ;SYNC CHARACTER
2629  012264  004767  006124                    JSR     PC,RPOKE
2630  012270  005367  166646                    DEC     COUNT
2631  012274  001403                            BEQ     2$
2632                                            ;TEST SYNCNO TO SEE HOW MANY SYNC CHARS WERE SELECTED
2633  012276  105767  166674                    TSTB    SYNCNO
2634  012302  100762                            BMI     1$      ;TWO SYNC CHARS
2635  012304  105777  006400          2$:       TSTB    @RXCSR  ;CHECK REC DONE BIT
2636  012310  100001                            BPL     64$
2637  012312  104000                            HLT             ;RXDONE SHOULD NOT BE ASSERTED
2638  012314                        64$:
2639  012314  032777  004000  006366            BIT     #RECACT,@RXCSR
2640  012322  001001                            BNE     65$
2641  012324  104000                            HLT             ;RECACT SHOULD BE ASSERTED
2642  012326                        65$:
2643  012326  012767  000007  166604            MOV     #7,SHIFT
2644  012334  012767  000021  166602            MOV     #21,TEMP1       ;ANY CHARACTER
2645  012342  004767  006046                    JSR     PC,RPOKE
2646  012346  105777  006336                    TSTB    @RXCSR  ;CHECK RXDONE
2647  012352  100401                            BMI     66$
2648  012354  104000                            HLT             ;RXDONE SHOULD BE ASSERTED
2649  012356                        66$:
2650  012356  032777  004000  006324            BIT     #RECACT,@RXCSR
2651  012364  001001                            BNE     67$
2652  012366  104000                            HLT             ;RECACT SHOULD STILL BE ASSERTED
2653  012370                        67$:
2654  012370  042777  000020  006312            BIC     #SYNSCH,@RXCSR  ;CLR SYNC SEARCH
2655  012376  032777  004000  006304            BIT     #RECACT,@RXCSR  ;IT SHOULD DROP IMMEDIATELY
2656  012404  001401                            BEQ     68$
2657  012406  104000                            HLT             ;RECACT SHOULD BE CLR
2658  012410                        68$:
2659  012410  105777  006274                    TSTB    @RXCSR  ;RXDONE
2660  012414  100401                            BMI     69$
2661  012416  104000                            HLT             ;RXDONE SHOULD STILL BE ASSERTED
2662  012420                        69$:
2663  012420  012700  000021                    MOV     #21,R0  ;EXPECTED DATA
2664  012424  017701  006264                    MOV     @RXDBUF,R1      ;ACTUAL DATA
2665  012430  020001                            CMP     R0,R1   ;COMPARE EXP VS ACT
2666  012432  001401                            BEQ     70$
2667  012434  104002                            HLT     2       ;DATA CHARS SHOULD COMPARE
2668  012436                        70$:
2669  012436  105777  006246                    TSTB    @RXCSR  ;CHECK RXDONE
2670  012442  100001                            BPL     71$
2671  012444  104000                            HLT     ;RXDONE SHOULD BE CLR FROM
2672  012446                        71$:
2673                                            ;PREVIOUS READING OF RXDBUF
```

```
 2674  012446  104400                          SCOPE
 2675                                          ;;VERIFY THE MATCH DETECT & DATA RDY FLAGS BY PUMPING
 2676                                          ;;IN TWO * SYNC CHARS THRU MAINT DATA BIT
 2677                                          ;;WATCH THE RECACT BIT
 2678                                          ;;ON THE THIRD * CHARACTER IT SHOULD SET RXDONE
 2679                                          ;;*: DEPENDENT ON MONITOR.............
 2680                                          ;;IF ONE SYNC STRAP IS SELECTED THEN IT WILL ONLY
 2681                                          ;;TAKE ONE SYNC CHARACTER FOR RXDONE TO ASSERT
 2682                                          ;;ON THE SECOND CHARACTER
 2683                                          ;;ALSO CHECK THIS CHARACTER IN RXDBUF
 2684                                          ;;AND CHECK OPERATION OF SYNSCH
 2685                                          ;;MODE: SYNC INTERNAL
 2686                                          ;;LENGTH:EIGHT
 2687                                          ;;
 2688  012450  012767  000057  166450  TST47:  MOV     #47,TSTNO       ;SAVE THIS
 2689  012456  012767  012772  166432          MOV     #TST48,NEXT             ;GO TO THIS TEST WHEN THRU
 2690  012464  052777  000400  006232          BIS     #MRESET,@TXCSR  ;MASTER RESET
 2691  012472  012777  030000  006220          MOV     #SYNINT,@PARCSR ;SET THE MODE
 2692  012500  052777  000400  006216          BIS     #MRESET,@TXCSR  ;MASTER RESET
 2693
 2694                                  ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
 2695  012506  012777  064001  006210          MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
 2696
 2697                                  ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
 2698  012514  012777  036026  006176          MOV     #SYNINT!EIGHT!NOPAR!26,@PARCSR
 2699  012522  016703  006166                  MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
 2700  012526  052777  000020  006154          BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
 2701                                          ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
 2702  012534  042777  020000  006162          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
 2703  012542  052777  020000  006154          BIS     #CLK,@TXCSR     ;POKE CLK UP
 2704                                  ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
 2705  012550  042777  020000  006146          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
 2706  012556  052777  020000  006140          BIS     #CLK,@TXCSR     ;POKE CLK UP
 2707  012564  012767  000002  166350          MOV     #2,COUNT
 2708  012572  012767  000010  166340  1$:     MOV     #8.,SHIFT       ;# OF SHIFTS
 2709  012600  012767  000026  166336          MOV     #26,TEMP1       ;SYNC CHARACTER
 2710  012606  004767  005602                  JSR     PC,RPOKE
 2711  012612  005367  166324                  DEC     COUNT
 2712  012616  001403                          BEQ     2$
 2713                                          ;TEST SYNCNO TO SEE HOW MANY SYNC CHARS WERE SELECTED
 2714  012620  105767  166352                  TSTB    SYNCNO
 2715  012624  100762                          BMI     1$      ;TWO SYNC CHARS
 2716  012626  105777  006056          2$:     TSTB    @RXCSR  ;CHECK REC DONE BIT
 2717  012632  100001                          BPL     64$
 2718  012634  104000                          HLT             ;RXDONE SHOULD NOT BE ASSERTED
 2719  012636                          64$:
 2720  012636  032777  004000  006044          BIT     #RECACT,@RXCSR
 2721  012644  001001                          BNE     65$
 2722  012646  104000                          HLT             ;RECACT SHOULD BE ASSERTED
 2723  012650                          65$:
 2724  012650  012767  000010  166262          MOV     #8.,SHIFT
 2725  012656  012767  000021  166260          MOV     #21,TEMP1       ;ANY CHARACTER
 2726  012664  004767  005524                  JSR     PC,RPOKE
 2727  012670  105777  006014                  TSTB    @RXCSR  ;CHECK RXDONE
 2728  012674  100401                          BMI     66$
 2729  012676  104000                          HLT             ;RXDONE SHOULD BE ASSERTED
```

```
 2730  012700                          66$:
 2731  012700  032777  004000  006002          BIT     #RECACT,@RXCSR
 2732  012706  001001                          BNE     67$
 2733  012710  104000                          HLT                     ;RECACT SHOULD STILL BE ASSERTED
 2734  012712                          67$:
 2735  012712  042777  000020  005770          BIC     #SYNSCH,@RXCSR  ;CLR SYNC SEARCH
 2736  012720  032777  004000  005762          BIT     #RECACT,@RXCSR  ;IT SHOULD DROP IMMEDIATELY
 2737  012726  001401                          BEQ     68$
 2738  012730  104000                          HLT                     ;RECACT SHOULD BE CLR
 2739  012732                          68$:
 2740  012732  105777  005752                  TSTB    @RXCSR  ;RXDONE
 2741  012736  100401                          BMI     69$
 2742  012740  104000                          HLT                     ;RXDONE SHOULD STILL BE ASSERTED
 2743  012742                          69$:
 2744  012742  012700  000021                  MOV     #21,R0  ;EXPECTED DATA
 2745  012746  017701  005742                  MOV     @RXDBUF,R1      ;ACTUAL DATA
 2746  012752  020001                          CMP     R0,R1   ;COMPARE EXP VS ACT
 2747  012754  001401                          BEQ     70$
 2748  012756  104002                          HLT     2       ;DATA CHARS SHOULD COMPARE
 2749  012760                          70$:
 2750  012760  105777  005724                  TSTB    @RXCSR  ;CHECK RXDONE
 2751  012764  100001                          BPL     71$
 2752  012766  104000                          HLT     ;RXDONE SHOULD BE CLR FROM
 2753  012770                          71$:
 2754                                          ;PREVIOUS READING OF RXDBUF
 2755  012770  104400                  SCOPE
 2756                                  ;;THIS TEST VERIFYS WORD LENGTH SELECT OF THE
 2757                                  ;;RECEIVER SECTION,IT USES THE ERROR FLAGS
 2758                                  ;;TO DETERMINE THAT IT WAS SELECTED CORRECTLY
 2759                                  ;;(OVRRUN,RXERR)
 2760                                  ;;MODE:ISYMOD
 2761                                  ;;LENGTH:FIVE
 2762                                  ;;CHAR:25
 2763                                  ;;
 2764  012772  012767  000060  166126  TST48:  MOV     #48,TSTNO       ;SAVE THIS
 2765  013000  012767  013234  166110          MOV     #TST49,NEXT             ;GO TO THIS TEST WHEN THRU
 2766  013006  052777  000400  005710          BIS     #MRESET,@TXCSR  ;MASTER RESET
 2767  013014  012777  000000  005676          MOV     #ISYMOD,@PARCSR ;SET THE MODE
 2768  013022  052777  000400  005674          BIS     #MRESET,@TXCSR  ;MASTER RESET
 2769
 2770                                  ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
 2771  013030  012777  064001  005666          MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
 2772
 2773                                  ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
 2774  013036  012777  000000  005654          MOV     #ISYMOD!FIVE!NOPAR!0,@PARCSR
 2775  013044  052777  000020  005636          BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
 2776                                          ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
 2777  013052  042777  020000  005644          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
 2778  013060  052777  020000  005636          BIS     #CLK,@TXCSR     ;POKE CLK UP
 2779                                  ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
 2780  013066  042777  020000  005630          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
 2781  013074  052777  020000  005622          BIS     #CLK,@TXCSR     ;POKE CLK UP
 2782  013102  016703  005606                  MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
 2783  013106  012700  000025                  MOV     #25,R0  ;EXPECTED
 2784  013112  012767  000007  166020          MOV     #7,SHIFT        ;# OF SHIFTS
 2785  013120  012767  000152  166016          MOV     #152,TEMP1      ;DATA CHAR
```

```
2786  013126  004767  005262                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
2787  013132  105777  005552                  TSTB    @RXCSR  ;RXDONE ?
2788  013136  100401                          BMI     64$
2789  013140  104000                          HLT     ;RXDONE SHOULD BE SET
2790  013142                          64$:
2791  013142  017701  005546                  MOV     @RXDBUF,R1      ;ACTUAL
2792  013146  020001                          CMP     R0,R1   ;COMPARE EXPECTED VS. ACTUAL
2793  013150  001401                          BEQ     65$
2794  013152  104002                          HLT     2       ;RECEIVED DATA DID NOT MATCH
2795                                                          ;EXPECTED DATA - CHECK MAINT DATA
2796                                                          ;OR RECEIVER LOGIC
2797  013154                          65$:
2798  013154  012767  000007  165756          MOV     #7,SHIFT        ;# OF SHIFTS
2799  013162  012767  000152  165754          MOV     #152,TEMP1      ;DATA CHAR
2800  013170  004767  005220                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
2801                          ;NOW SHIFT IN A SECOND CHARACTER WITHOUT READING RXDBUF
2802  013174  012767  000007  165736          MOV     #7,SHIFT        ;# OF SHIFTS
2803  013202  012767  000152  165734          MOV     #152,TEMP1      ;DATA CHAR
2804  013210  004767  005200                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
2805  013214  012700  140025                  MOV     #140000!25,R0   ;EXPECTED DATA PLUS
2806                                                          ;RXERR & OVRRUN
2807  013220  017701  005470                  MOV     @RXDBUF,R1      ;ACTUAL
2808  013224  020001                          CMP     R0,R1   ;COMPARE EXP VS. ACT
2809  013226  001401                          BEQ     66$
2810  013230  104002                          HLT     2       ;SPECIFICALLY LOOK AT RXERR &
2811                                                          ;OVRRUN BITS...THEY BOTH SHOULD BE SET
2812  013232                          66$:
2813  013232  104400                          SCOPE
2814                                          ;;THIS TEST VERIFYS WORD LENGTH SELECT OF THE
2815                                          ;;RECEIVER SECTION,IT USES THE ERROR FLAGS
2816                                          ;;TO DETERMINE THAT IT WAS SELECTED CORRECTLY
2817                                          ;;(OVRRUN,RXERR)
2818                                          ;;MODE:ISYMOD
2819                                          ;;LENGTH:FIVE
2820                                          ;;CHAR:12
2821                                          ;;
2822  013234  012767  000061  165664  TST49:  MOV     #49,TSTNO       ;SAVE THIS
2823  013242  012767  013476  165646          MOV     #TST50,NEXT             ;GO TO THIS TEST WHEN THRU
2824  013250  052777  000400  005446          BIS     #MRESET,@TXCSR  ;MASTER RESET
2825  013256  012777  000000  005434          MOV     #ISYMOD,@PARCSR ;SET THE MODE
2826  013264  052777  000400  005432          BIS     #MRESET,@TXCSR  ;MASTER RESET
2827
2828                          ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
2829  013272  012777  064001  005424          MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
2830
2831                          ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
2832  013300  012777  000000  005412          MOV     #ISYMOD!FIVE!NOPAR!0,@PARCSR
2833  013306  052777  000020  005374          BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
2834                                          ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
2835  013314  042777  020000  005402          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2836  013322  052777  020000  005374          BIS     #CLK,@TXCSR     ;POKE CLK UP
2837                          ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
2838  013330  042777  020000  005366          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2839  013336  052777  020000  005360          BIS     #CLK,@TXCSR     ;POKE CLK UP
2840  013344  016703  005344                  MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
2841  013350  012700  000012                  MOV     #12,R0  ;EXPECTED
```

```
 2842  013354  012767  000007  165556          MOV     #7,SHIFT        ;# OF SHIFTS
 2843  013362  012767  000124  165554          MOV     #124,TEMP1      ;DATA CHAR
 2844  013370  004767  005020                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
 2845  013374  105777  005310                  TSTB    @RXCSR  ;RXDONE ?
 2846  013400  100401                          BMI     64$
 2847  013402  104000                          HLT     ;RXDONE SHOULD BE SET
 2848  013404                          64$:
 2849  013404  017701  005304                  MOV     @RXDBUF,R1      ;ACTUAL
 2850  013410  020001                          CMP     R0,R1   ;COMPARE EXPECTED VS. ACTUAL
 2851  013412  001401                          BEQ     65$
 2852  013414  104002                          HLT     2       ;RECEIVED DATA DID NOT MATCH
 2853                                                          ;EXPECTED DATA - CHECK MAINT DATA
 2854                                                          ;OR RECEIVER LOGIC
 2855  013416                          65$:
 2856  013416  012767  000007  165514          MOV     #7,SHIFT        ;# OF SHIFTS
 2857  013424  012767  000124  165512          MOV     #124,TEMP1      ;DATA CHAR
 2858  013432  004767  004756                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
 2859                          ;NOW SHIFT IN A SECOND CHARACTER WITHOUT READING RXDBUF
 2860  013436  012767  000007  165474          MOV     #7,SHIFT        ;# OF SHIFTS
 2861  013444  012767  000124  165472          MOV     #124,TEMP1      ;DATA CHAR
 2862  013452  004767  004736                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
 2863  013456  012700  140012                  MOV     #140000!12,R0   ;EXPECTED DATA PLUS
 2864                                                          ;RXERR & OVRRUN
 2865  013462  017701  005226                  MOV     @RXDBUF,R1      ;ACTUAL
 2866  013466  020001                          CMP     R0,R1   ;COMPARE EXP VS. ACT
 2867  013470  001401                          BEQ     66$
 2868  013472  104002                          HLT     2       ;SPECIFICALLY LOOK AT RXERR &
 2869                                                          ;OVRRUN BITS...THEY BOTH SHOULD BE SET
 2870  013474                          66$:
 2871  013474  104400                          SCOPE
 2872                                          ;;THIS TEST VERIFYS WORD LENGTH SELECT OF THE
 2873                                          ;;RECEIVER SECTION,IT USES THE ERROR FLAGS
 2874                                          ;;TO DETERMINE THAT IT WAS SELECTED CORRECTLY
 2875                                          ;;(OVRRUN,RXERR)
 2876                                          ;;MODE:ISYMOD
 2877                                          ;;LENGTH:FIVE
 2878                                          ;;CHAR:37
 2879                                          ;;
 2880  013476  012767  000062  165422  TST50:  MOV     #50,TSTNO       ;SAVE THIS
 2881  013504  012767  013740  165404          MOV     #TST51,NEXT             ;GO TO THIS TEST WHEN THRU
 2882  013512  052777  000400  005204          BIS     #MRESET,@TXCSR  ;MASTER RESET
 2883  013520  012777  000000  005172          MOV     #ISYMOD,@PARCSR ;SET THE MODE
 2884  013526  052777  000400  005170          BIS     #MRESET,@TXCSR  ;MASTER RESET
 2885
 2886                          ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
 2887  013534  012777  064001  005162          MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
 2888
 2889                          ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
 2890  013542  012777  000000  005150          MOV     #ISYMOD!FIVE!NOPAR!0,@PARCSR
 2891  013550  052777  000020  005132          BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
 2892                                          ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
 2893  013556  042777  020000  005140          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
 2894  013564  052777  020000  005132          BIS     #CLK,@TXCSR     ;POKE CLK UP
 2895                          ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
 2896  013572  042777  020000  005124          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
 2897  013600  052777  020000  005116          BIS     #CLK,@TXCSR     ;POKE CLK UP
```

```
2898  013606  016703  005102                        MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
2899  013612  012700  000037                        MOV     #37,R0  ;EXPECTED
2900  013616  012767  000007  165314                MOV     #7,SHIFT        ;# OF SHIFTS
2901  013624  012767  000176  165312                MOV     #176,TEMP1      ;DATA CHAR
2902  013632  004767  004556                        JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
2903  013636  105777  005046                        TSTB    @RXCSR  ;RXDONE ?
2904  013642  100401                                BMI     64$
2905  013644  104000                                HLT     ;RXDONE SHOULD BE SET
2906  013646                                64$:
2907  013646  017701  005042                        MOV     @RXDBUF,R1      ;ACTUAL
2908  013652  020001                                CMP     R0,R1   ;COMPARE EXPECTED VS. ACTUAL
2909  013654  001401                                BEQ     65$
2910  013656  104002                                HLT     2       ;RECEIVED DATA DID NOT MATCH
2911                                                        ;EXPECTED DATA - CHECK MAINT DATA
2912                                                        ;OR RECEIVER LOGIC
2913  013660                                65$:
2914  013660  012767  000007  165252                MOV     #7,SHIFT        ;# OF SHIFTS
2915  013666  012767  000176  165250                MOV     #176,TEMP1      ;DATA CHAR
2916  013674  004767  004514                        JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
2917                                        ;NOW SHIFT IN A SECOND CHARACTER WITHOUT READING RXDBUF
2918  013700  012767  000007  165232                MOV     #7,SHIFT        ;# OF SHIFTS
2919  013706  012767  000176  165230                MOV     #176,TEMP1      ;DATA CHAR
2920  013714  004767  004474                        JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
2921  013720  012700  140037                        MOV     #140000!37,R0   ;EXPECTED DATA PLUS
2922                                                        ;RXERR & OVRRUN
2923  013724  017701  004764                        MOV     @RXDBUF,R1      ;ACTUAL
2924  013730  020001                                CMP     R0,R1   ;COMPARE EXP VS. ACT
2925  013732  001401                                BEQ     66$
2926  013734  104002                                HLT     2       ;SPECIFICALLY LOOK AT RXERR &
2927                                                        ;OVRRUN BITS...THEY BOTH SHOULD BE SET
2928  013736                                66$:
2929  013736  104400                                SCOPE
2930                                                ;;THIS TEST VERIFYS WORD LENGTH SELECT OF THE
2931                                                ;;RECEIVER SECTION,IT USES THE ERROR FLAGS
2932                                                ;;TO DETERMINE THAT IT WAS SELECTED CORRECTLY
2933                                                ;;(OVRRUN,RXERR)
2934                                                ;;MODE:ISYMOD
2935                                                ;;LENGTH:FIVE
2936                                                ;;CHAR:0
2937                                                ;;
2938  013740  012767  000063  165160        TST51:  MOV     #51,TSTNO       ;SAVE THIS
2939  013746  012767  014202  165142                MOV     #.EOP,NEXT              ;GO TO THIS TEST WHEN THRU
2940  013754  052777  000400  004742                BIS     #MRESET,@TXCSR  ;MASTER RESET
2941  013762  012777  000000  004730                MOV     #ISYMOD,@PARCSR ;SET THE MODE
2942  013770  052777  000400  004726                BIS     #MRESET,@TXCSR  ;MASTER RESET
2943
2944                                        ;SET MAINT DATA,CLK,BREAK,&MAINTENANCE MODE
2945  013776  012777  064001  004720                MOV     #MTDATA!CLK!MINT!BREAK,@TXCSR
2946
2947                                        ;SET MODE ,# OF BITS,PARITY SENSE,&LOAD SYNC REG
2948  014004  012777  000000  004706                MOV     #ISYMOD!FIVE!NOPAR!0,@PARCSR
2949  014012  052777  000020  004670                BIS     #SYNSCH,@RXCSR  ;SET SYNC SEARCH
2950                                                ;POKE CLK TO GET RECEIVER INTO SYNCROIZATION....
2951  014020  042777  020000  004676                BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2952  014026  052777  020000  004670                BIS     #CLK,@TXCSR     ;POKE CLK UP
2953                                        ;POKE CLK TO GET LOGIC INTO SYNCRONIZATION
```

```
2954  014034  042777  020000  004662          BIC     #CLK,@TXCSR     ;POKE CLK DOWN
2955  014042  052777  020000  004654          BIS     #CLK,@TXCSR     ;POKE CLK UP
2956  014050  016703  004640                  MOV     RXDBUF,R3       ;SET UP FOR ERROR MESSAGE
2957  014054  012700  000000                  MOV     #0,R0   ;EXPECTED
2958  014060  012767  000007  165052          MOV     #7,SHIFT        ;# OF SHIFTS
2959  014066  012767  000100  165050          MOV     #100,TEMP1      ;DATA CHAR
2960  014074  004767  004314                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
2961  014100  105777  004604                  TSTB    @RXCSR  ;RXDONE ?
2962  014104  100401                          BMI     64$
2963  014106  104000                          HLT     ;RXDONE SHOULD BE SET
2964  014110                          64$:
2965  014110  017701  004600                  MOV     @RXDBUF,R1      ;ACTUAL
2966  014114  020001                          CMP     R0,R1   ;COMPARE EXPECTED VS. ACTUAL
2967  014116  001401                          BEQ     65$
2968  014120  104002                          HLT     2               ;RECEIVED DATA DID NOT MATCH
2969                                                                  ;EXPECTED DATA - CHECK MAINT DATA
2970                                                                  ;OR RECEIVER LOGIC
2971  014122                          65$:
2972  014122  012767  000007  165010          MOV     #7,SHIFT        ;# OF SHIFTS
2973  014130  012767  000100  165006          MOV     #100,TEMP1      ;DATA CHAR
2974  014136  004767  004252                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
2975                          ;NOW SHIFT IN A SECOND CHARACTER WITHOUT READING RXDBUF
2976  014142  012767  000007  164770          MOV     #7,SHIFT        ;# OF SHIFTS
2977  014150  012767  000100  164766          MOV     #100,TEMP1      ;DATA CHAR
2978  014156  004767  004232                  JSR     PC,RPOKE        ;SHIFT IN THIS CHAR
2979  014162  012700  140000                  MOV     #140000!0,R0    ;EXPECTED DATA PLUS
2980                                                                  ;RXERR & OVRRUN
2981  014166  017701  004522                  MOV     @RXDBUF,R1      ;ACTUAL
2982  014172  020001                          CMP     R0,R1   ;COMPARE EXP VS. ACT
2983  014174  001401                          BEQ     66$
2984  014176  104002                          HLT     2               ;SPECIFICALLY LOOK AT RXERR &
2985                                                                  ;OVRRUN BITS...THEY BOTH SHOULD BE SET
2986  014200                          66$:
2987  014200  104400                          SCOPE
2988
```

```
2989
2990                                        ;END OF PASS
2991                                        ;TYPE NAME OF TEST
2992                                        ;UPDATE PASS COUNT
2993                                        ;CHECK FOR EXIT TO ACT-11
2994                                        ;RESTART TEST
2995
2996  014202  104402              .EOP:     TYPE                        ;TYPE NAME OF TEST
2997  014204  017344                        MEPASS
2998  014206  104410  014440               CONVRT  ,OUTCRY
2999  014212  104402  017065               TYPE    ,DEVICE
3000  014216  105767  164760               TSTB    MULTD               ;ARE YOU RUNNING MULTIPLE DEVICES ?
3001  014222  001511                       BEQ     CCC                 ;NO,JUMP AROUND
3002  014224  005767  164766               TST     ACTREG              ;ARE ANY DEVICES ACTIVE ?
3003  014230  001007                       BNE     RUNIT               ;YES
3004  014232  104402  017077               TYPE    ,MCOW               ;NO
3005  014236  016700  164754               MOV     ACTREG,R0           ;DISPLAY ACTREG
3006  014242  000000                       HALT                        ;SELECT SOMETHING TO RUN @ ACTREG:
3007                                        ;SELECT SWITCHES & HIT CONTINUE (PUT SW00 =1)
3008  014244  000167  165150               JMP     .START              ;START OVER AGAIN.....YOU DESELECTED EVERYTHING
3009  014250  062767  000010  164726 RUNIT: ADD     #10,BASEADD         ;NEXT BLOCK (ADDRESSES)
3010  014256  062767  000010  164726 ZERO:  ADD     #10,BASEIV          ;NEXT BLOCK (VECTORS)
3011  014264  000241                       CLC
3012  014266  006167  164726               ROL     ROTADD              ;UP DATE ROTATING POINTER
3013  014272  103410                       BCS     2$                  ;IS IT THE LAST DEVICE
3014                                                                    ;TO BE TESTED IN THIS PASS ?
3015  014274  036767  164720  164714       BIT     ROTADD,ACTREG       ;TEST THIS DEVICE FOR ACTIVE STATUS
3016  014302  001762                       BEQ     RUNIT               ;IF NOT ACTIVE, TRY NEXT ADDRESS
3017  014304  004767  000034               JSR     PC,REPLAY           ;CALCULATE NEW PARAMETERS
3018  014310  000167  000174               JMP     RESTRT              ;YES IT WAS ACTIVE,TEST THIS DEVICE
3019  014314  012767  000001  164676 2$:    MOV     #1,ROTADD           ;OK!,NOW SET UP  ROTATING
3020                                                                    ;POINTER FOR NEXT MULTIPLE PASS
3021  014322  016767  164660  164654       MOV     KEEPADD,BASEADD     ;RESTORE BASE ADDRESS
3022  014330  016767  164660  164654       MOV     KEEPIV,BASEIV       ;RESTORE BASE INTERRUPT VECTORS
3023  014336  004767  000002               JSR     PC,REPLAY           ;CALC NEW PARAMETERS
3024  014342  000441                       BR      CCC                 ;JUMP AROUND REPLAY
3025  014344  016767  164634  004040 REPLAY: MOV     BASEADD,DUBASE      ;SET UP FOR NEW ADDRESSES
3026  014352  004767  003702               JSR     PC,DUADDR           ;CREATE NEW ADDRESSES
3027  014356  016767  164630  004350       MOV     BASEIV,DURIV        ;CREATE DURIV
3028  014364  062767  000002  164620       ADD     #2,BASEIV
3029  014372  016767  164614  004336       MOV     BASEIV,DURIS        ;CREATE DURIS
3030  014400  062767  000002  164604       ADD     #2,BASEIV
3031  014406  016767  164600  004324       MOV     BASEIV,DUTIV        ;CREATE DUTIV
3032  014414  062767  000002  164570       ADD     #2,BASEIV
3033  014422  016767  164564  004312       MOV     BASEIV,DUTIS        ;CREATE DUTIS
3034  014430  016767  004300  164554       MOV     DURIV,BASEIV        ;RESTORE
3035  014436  000207                       RTS     PC
3036
3037  014440  000001              OUTCRY: 1
3038  014442     006     002               .BYTE   6,2
3039  014444  020710                       RXCSR
3040
3041  014446                      CCC:
3042  014446  005067  164462               CLR     LSTERR              ;CLEAR LAST ERROR PC
3043  014452  005067  164570               CLR     ERRFLG              ;CLEAR ERROR FLAG
3044  014456  005267  164446               INC     PASCNT              ;UPDATE PASS COUNT
```

```
 3045  014462  016777  164442  164412          MOV     PASCNT,@LIGHTS          ;DISPLAY PASS COUNT
 3046  014470  013701  000042                  MOV     @#42,R1                 ;CHECK FOR ACT-11 OR DDP
 3047  014474  001405                          BEQ     RESTRT                  ;IF NOT, CONTINUE TESTING
 3048  014476  000005                          RESET
 3049  014500  004711                LOGICAL:  JSR     PC,(R1)
 3050  014502  000240                          NOP
 3051  014504  000240                          NOP
 3052  014506  000240                          NOP
 3053  014510  012767  000340  163260  RESTRT: MOV     #340,PS                 ;PREVENT INTERRUPTS (PRIO: 7)
 3054  014516  104413                          CKSWR                           ;CHECK FOR ^G
 3055  014520  012767  003446  164366          MOV     #TST1,RTRN
 3056  014526  000167  166714                  JMP     TST1
 3057
 3058                                          ;SCOPE LOOP AND INTERATION HANDLER
 3059
 3060  014532                          .SCOPE:
 3061                                  ;**** START OF CODE FOR THE X OR TESTER ******
 3062  014532  000424                          BR      4$                      ;IF RUNNING ON THE X OR TESTER CHANGE
 3063                                                                          ;THIS INSTRUCTION TO A 'NOP''(NOP=240)
 3064  014534  013746  000004                  MOV     @#4,-(SP)               ;SAVE CONTENTS OF ERROR VECTOR
 3065  014540  012737  014560  000004          MOV     #1$,@#4                 ;SET FOR TIME OUT
 3066  014546  005737  177060                  TST     @#177060                ;TIME OUT ON  X OR ?
 3067  014552  012637  000004                  MOV     (SP)+,@#4               ;RESTORE ERROR VECTOR
 3068  014556  000404                          BR      2$                      ;GO TO NEXT TEST
 3069  014560  022626                  1$:     CMP     (SP)+,(SP)+             ;CLEAR THE STACK AFTER A TIMEOUT
 3070  014562  012637  000004                  MOV     (SP)+,@#4               ;RESTORE ERROR VECTOR
 3071  014566  000403                          BR      3$                      ;LOOP ON PRESENT TEST
 3072  014570  016767  164322  164316  2$:     MOV     NEXT,RTRN               ;SET UP NEXT TEST IN RTRN
 3073  014576  016716  164312          3$:     MOV     RTRN,(SP)               ;SET UP STACK FOR RTI
 3074  014602  000002                          RTI
 3075  014604                          4$:     ;**** END OF CODE FOR THE  X OR TESTER ******
 3076  014604  104413                          CKSWR                           ;CHECK FOR ^G
 3077  014606  032777  040000  164264          BIT     #SW14,@SWR              ;LOOP ON CURRENT TEST ?
 3078  014614  001407                  TTST:   BEQ     1$
 3079  014616  000432                          BR      3$
 3080  014620  105777  164260                  TSTB    @TKCSR                  ;TEST TTY FLAG
 3081  014624  100027                          BPL     3$
 3082  014626  017700  164254                  MOV     @TKDBR,R0               ;CLR DONE BIT
 3083  014632  000412                          BR      2$                      ;IF A TTY KEY IS STRUCK GO TO NEXT TST
 3084  014634  032777  004000  164236  1$:     BIT     #SW11,@SWR              ;INHIBIT ITERATIONS ?
 3085  014642  001006                          BNE     2$
 3086  014644  005267  164254                  INC     LPCNT
 3087  014650  026767  164250  164244          CMP     LPCNT,ICOUNT            ;CHECK FOR ITERATION CNT FINISH
 3088  014656  101412                          BLOS    3$
 3089  014660  105067  164362          2$:     CLRB    ERRFLG
 3090  014664  005067  164234                  CLR     LPCNT
 3091  014670  012767  000005  164224          MOV     #5,ICOUNT               ;SET UP ITERATION COUNT
 3092  014676  016767  164214  164210          MOV     NEXT,RTRN               ;SET UP NEXT TEST IN RTRN
 3093  014704  016716  164204          3$:     MOV     RTRN,(SP)               ;SET UP STACK FOR RTI
 3094  014710  000002                          RTI
 3095  014712  001407                  BRW:    1407                            ;RESTORE 'BEQ 1$'' INSTRUCTION
 3096  014714  000432                  BRX:    432                             ;RESTORE 'BR 3$'' INSTRUCTION
 3097
 3098                                          ;CHECK FOR FREEZE ON CURRENT DATA
 3099
 3100  014716  104413                  .SCOP1: CKSWR                           ;CHECK  FOR ^G
```

```
3101  014720  032777  001000  164152          BIT     #SW09,@SWR
3102  014726  001402                          BEQ     1$
3103  014730  016716  164164                  MOV     LOCK,(SP)
3104  014734  000002                  1$:     RTI
3105
3106                                          ;TELETYPE OUTPUT ROUTINE
3107
3108  014736  010546                  .TYPE:  MOV     R5,-(SP)
3109  014740  017605  000002                  MOV     @2(SP),R5
3110  014744  062766  000002  000002          ADD     #2,2(SP)
3111  014752  105715                  1$:     TSTB    (R5)                    ;LOOK FOR '0'
3112  014754  001406                          BEQ     3$
3113  014756  105777  164126          2$:     TSTB    @TPCSR                  ;TEST DONE BIT
3114  014762  100375                          BPL     2$
3115  014764  112577  164122                  MOVB    (R5)+,@TPDBR            ;TYPE CHAR
3116  014770  000770                          BR      1$                      ;DO IT AGAIN UNTIL '0' IS SEEN
3117  014772  012605                  3$:     MOV     (SP)+,R5
3118  014774  000002                          RTI
3119
3120                                          ;ASCII STRING INPUT ROUTINE
3121
3122  014776  010346                  .INSTR: MOV     R3,-(SP)
3123  015000  010446                          MOV     R4,-(SP)
3124  015002  017667  000004  000010          MOV     @4(SP),.MSG
3125  015010  062766  000002  000004          ADD     #2,4(SP)
3126  015016  104402                  .INST1: TYPE
3127  015020  000000                  .MSG:   0
3128  015022  012704  020044                  MOV     #INBUF,R4
3129  015026  012703  000007                  MOV     #7,R3
3130  015032  105777  164046          1$:     TSTB    @TKCSR
3131  015036  100375                          BPL     1$
3132  015040  117714  164042                  MOVB    @TKDBR,(R4)
3133  015044  142714  000200                  BICB    #200,(R4)
3134  015050  121427  000025                  CMPB    (R4),#25                ;IS IT <^U>
3135  015054  001003                          BNE     200$
3136  015056  104402  017254                  TYPE,MCRLF
3137  015062  000755                          BR      .INST1
3138  015064  122427  000015          200$:   CMPB    (R4)+,#15
3139  015070  001423                          BEQ     INSTR2
3140  015072  117777  164010  164012          MOVB    @TKDBR,@TPDBR
3141  015100  105777  164004          2$:     TSTB    @TPCSR
3142  015104  100375                          BPL     2$
3143  015106  005303                          DEC     R3
3144  015110  001350                          BNE     1$
3145  015112  000402                          BR      .INSTG
3146  015114  010346                  .INSTE: MOV     R3,-(SP)
3147  015116  010446                          MOV     R4,-(SP)
3148  015120  104402                  .INSTG: TYPE
3149  015122  017250                          MQM
3150  015124  005737  016412                  TST     @#RDSW
3151  015130  001402                          BEQ     400$
3152  015132  104402  017254                  TYPE,MCRLF
3153  015136  000727                  400$:   BR      .INST1
3154  015140  012604                  INSTR2: MOV     (SP)+,R4
3155  015142  012603                          MOV     (SP)+,R3
3156  015144  000002                          RTI
```

```

                                        ;CONVERT ASCII STRING TO OCTAL

015146  010546                  .PARAM: MOV     R5,-(SP)
015150  010446                          MOV     R4,-(SP)
015152  016605  000004                  MOV     4(SP),R5
015156  012567  000170                  MOV     (R5)+,LOLIM
015162  012567  000166                  MOV     (R5)+,HILIM
015166  012567  000164                  MOV     (R5)+,DEVADR
015172  112567  000162                  MOVB    (R5)+,LOBITS
015176  112567  000157                  MOVB    (R5)+,ADRCNT
015202  010566  000004                  MOV     R5,4(SP)
015206  005005                  PARAM1: CLR     R5
015210  012704  020044                  MOV     #INBUF,R4
015214  122714  000015                  CMPB    #15,(R4)
015220  001420                          BEQ     PARERR
015222  121427  000060          1$:     CMPB    (R4),#60
015226  002415                          BLT     PARERR
015230  121427  000067                  CMPB    (R4),#67
015234  003012                          BGT     PARERR
015236  142714  000060                  BICB    #60,(R4)
015242  152405                          BISB    (R4)+,R5
015244  122714  000015                  CMPB    #15,(R4)
015250  001414                          BEQ     LIMITS
015252  006305                          ASL     R5
015254  006305                          ASL     R5
015256  006305                          ASL     R5
015260  000760                          BR      1$
015262  122714  000015          PARERR: CMPB    #15,(R4)                ;IS FIRST CHARACTER A <CR>
015266  001003                          BNE     120$
015270  005737  016412                  TST     @#RDSW                  ;IS CKSWR ROUTINE BEING USED
015274  001023                          BNE     PARTI
015276  104404                  120$:   INSTER
015300  000742                          BR      PARAM1

                                        ;TEST TO SEE IF NUMBER IS WITHIN LIMITS

015302  020567  000046          LIMITS: CMP     R5,HILIM
015306  101365                          BHI     PARERR
015310  020567  000036                  CMP     R5,LOLIM
015314  103762                          BLO     PARERR
015316  136705  000036                  BITB    LOBITS,R5
015322  001357                          BNE     PARERR

                                        ;STORE NUMBER AT SPECIFIED ADDRESS

015324  016704  000026                  MOV     DEVADR,R4
015330  010524                  1$:     MOV     R5,(R4)+
015332  062705  000002                  ADD     #2,R5
015336  105367  000017                  DECB    ADRCNT
015342  001372                          BNE     1$
015344  012604                  PARTI:  MOV     (SP)+,R4
015346  012605                          MOV     (SP)+,R5
015350  000002                          RTI
015352  000000                  LOLIM:  0
015354  000000                  HILIM:  0
```

```
3213  015356  000000                  DEVADR: 0
3214  015360  000000                  LOBITS: 0
3215          015361                  ADRCNT=LOBITS+1
3216
3217                                  ;SAVE PC OF TEST THAT FAILED AND R0-R5
3218
3219  015362  016667  000004  163604  .SAV05: MOV     4(SP),SAVPC
3220
3221                                  ;SAVE R0-R5
3222
3223  015370  010567  163574          SV05:   MOV     R5,SAVR5
3224  015374  010467  163566                  MOV     R4,SAVR4
3225  015400  010367  163560                  MOV     R3,SAVR3
3226  015404  010267  163552                  MOV     R2,SAVR2
3227  015410  010167  163544                  MOV     R1,SAVR1
3228  015414  010067  163536                  MOV     R0,SAVR0
3229  015420  000002                  RES05:  RTI
3230
3231                                  ;RESTORE R0-R5
3232
3233  015422  016700  163530          .RES05: MOV     SAVR0,R0
3234  015426  016701  163526                  MOV     SAVR1,R1
3235  015432  016702  163524                  MOV     SAVR2,R2
3236  015436  016703  163522                  MOV     SAVR3,R3
3237  015442  016704  163520                  MOV     SAVR4,R4
3238  015446  016705  163516                  MOV     SAVR5,R5
3239  015452  000002                  RES05:  RTI
3240
3241                                  ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
3242
3243  015454  104402                  .CONVR: TYPE
3244  015456  017254                          MCRLF
3245  015460  010046                  .CNVRT: MOV     R0,-(SP)
3246  015462  010146                          MOV     R1,-(SP)
3247  015464  010346                          MOV     R3,-(SP)
3248  015466  010446                          MOV     R4,-(SP)
3249  015470  010546                          MOV     R5,-(SP)
3250  015472  017601  000012                  MOV     @12(SP),R1
3251  015476  016767  002402  163444          MOV     TEMP,TEMP3
3252  015504  062766  000002  000012          ADD     #2,12(SP)
3253  015512  012167  000154                  MOV     (R1)+,WRDCNT
3254  015516  112167  000152          1$:     MOVB    (R1)+,CHRCNT
3255  015522  112167  000147                  MOVB    (R1)+,SPACNT
3256  015526  013167  000144                  MOV     @(R1)+,BINWRD
3257  015532  016704  000140          2$:     MOV     BINWRD,R4
3258  015536  116705  000132                  MOVB    CHRCNT,R5
3259  015542  012700  020104                  MOV     #TEMP,R0
3260  015546  010403                  3$:     MOV     R4,R3
3261  015550  042703  177770                  BIC     #177770,R3
3262  015554  062703  000060                  ADD     #060,R3
3263  015560  110320                          MOVB    R3,(R0)+
3264  015562  006204                          ASR     R4              ;SHIFT FOR NEXT #
3265  015564  042704  100000                  BIC     #100000,R4      ;CLUGE TO STOP BIT 15 PROPAGATING.
3266  015570  006204                          ASR     R4              ;DITTO
3267  015572  006204                          ASR     R4              ;DITTO
3268  015574  005305                          DEC     R5
```

```
3269  015576  001363                          BNE     3$
3270  015600  012703  020144                  MOV     #MDATA,R3
3271  015604  114023                  4$:     MOVB    -(R0),(R3)+
3272  015606  105367  000062                  DECB    CHRCNT
3273  015612  001374                          BNE     4$
3274  015614  105767  000055                  TSTB    SPACNT
3275  015620  001405                          BEQ     6$
3276  015622  112723  000040          5$:     MOVB    #040,(R3)+
3277  015626  105367  000043                  DECB    SPACNT
3278  015632  001373                          BNE     5$
3279  015634  105013                  6$:     CLRB    (R3)
3280  015636  104402                          TYPE
3281  015640  020144                          MDATA
3282  015642  005367  000024                  DEC     WRDCNT
3283  015646  001323                          BNE     1$
3284  015650  016767  163274  002226          MOV     TEMP3,TEMP
3285  015656  012605                          MOV     (SP)+,R5
3286  015660  012604                          MOV     (SP)+,R4
3287  015662  012603                          MOV     (SP)+,R3
3288  015664  012601                          MOV     (SP)+,R1
3289  015666  012600                          MOV     (SP)+,R0
3290  015670  000002                          RTI
3291  015672  000000                  WRDCNT: 0
3292  015674  000000                  CHRCNT: 0
3293          015675                  SPACNT=CHRCNT+1
3294  015676  000000                  BINWRD: 0
3295
3296                                          ;COMPARE THE FIRST CHARACTER IN THE TELETYPE INPUT
3297                                          ;BUFFER TO THE CHARACTERS 'N' AND 'Y'.
3298                                          ;IF THE CHARACTER IS 'N' CLEAR THE FLAG
3299                                          ;IF THE CHARACTER IS 'Y' SET THE FLAG
3300
3301  015700  017605  000000          .SETFLG:MOV     @(SP),R5
3302  015704  122767  000116  002132          CMPB    #'N,INBUF       ;IS IT 'N' ?
3303  015712  001002                          BNE     1$
3304  015714  105015                          CLRB    (R5)    ;000
3305  015716  000406                          BR      2$
3306  015720  122767  000131  002116  1$:     CMPB    #'Y,INBUF               ;IS IT 'Y' ?
3307  015726  001005                          BNE     3$
3308  015730  112715  177777                  MOVB    #-1,(R5)                ;377
3309  015734  062716  000002          2$:     ADD     #2,(SP)
3310  015740  000002                          RTI
3311  015742  104404                  3$:     INSTER                          ;RETRY
3312  015744  000755                          BR      .SETFLG
3313                                          ;TRAP DISPATCH SERVICE
3314                                          ;ARGUMENT OF TRAP IS EXTRACTED
3315                                          ;AND USED AS OFFSET TO OBTAIN POINTER
3316                                          ;TO SELECTED SUBROUTINE
3317
3318  015746  011646                  .TRPSR: MOV     (SP),-(SP)              ;GET PC OF RETURN
3319  015750  162716  000002                  SUB     #2,(SP)                 ;=PC OF TRAP
3320  015754  017616  000000                  MOV     @(SP),(SP)              ;GET TRP
3321  015760  006316                  TRPOK:  ASL     (SP)                    ;MULTIPLY TRAP ARG BY 2
3322  015762  042716  177001                  BIC     #177001,(SP)            ;CLEAR UNWANTED BITS
3323  015766  062716  001366                  ADD     #.TRPTAB,(SP)           ;POINTER TO SUBROUTINE ADDRESS
3324  015772  017616  000000                  MOV     @(SP),(SP)              ;SUBROUTINE ADDRESS
```

```
3325  015776  000136                          JMP     @(SP)+                  ;GO TO SUBROUTINE
3326
3327                                          ;ERROR HANDLER
3328
3329  016000  104413                  .HLT:   CKSWR                           ;CHECK FOR ^G
3330  016002  032777  020000  163070          BIT     #SW13,@SWR              ;INHIBIT ERROR TYPE OUT ?
3331  016010  001061                          BNE     HALTS
3332  016012  021667  163116                  CMP     (SP),LSTERR
3333  016016  001404                          BEQ     1$
3334  016020  011667  163110                  MOV     (SP),LSTERR
3335  016024  105067  163216                  CLRB    ERRFLG
3336  016030  104406                  1$:     SAV05
3337  016032  011605                          MOV     (SP),R5
3338  016034  162705  000002                  SUB     #2,R5
3339  016040  011504                          MOV     (R5),R4
3340  016042  006304                          ASL     R4
3341  016044  061504                          ADD     (R5),R4
3342  016046  006304                          ASL     R4
3343  016050  042704  177001                  BIC     #177001,R4
3344  016054  062704  020660                  ADD     #.ERRTAB,R4
3345  016060  012467  000040                  MOV     (R4)+,ERRMSG
3346  016064  012467  000046                  MOV     (R4)+,DATAHD
3347  016070  011467  000054                  MOV     (R4),DATABP
3348  016074  105767  163146                  TSTB    ERRFLG
3349  016100  001403                          BEQ     TYPMSG
3350  016102  005767  000042                  TST     DATABP
3351  016106  001014                          BNE     TYPDAT
3352  016110  104410                  TYPMSG: CONVRT
3353  016112  016242                          ERTABO
3354  016114  112767  177777  163124          MOVB    #-1,ERRFLG
3355  016122  104402                          TYPE
3356  016124  000000                  ERRMSG: 0
3357  016126  005767  000004                  TST     DATAHD
3358  016132  001402                          BEQ     TYPDAT
3359  016134  104402                          TYPE
3360  016136  000000                  DATAHD: 0
3361  016140  005767  000004          TYPDAT: TST     DATABP
3362  016144  001402                          BEQ     RESREG
3363  016146  104410                          CONVRT
3364  016150  000000                  DATABP: 0
3365  016152  104407                  RESREG: RES05
3366  016154  005777  162720          HALTS:  TST     @SWR
3367  016160  100005                          BPL     EXITER
3368  016162  010046                          PUSHR0
3369  016164  016600  000002                  MOV     2(SP),R0
3370  016170  000000                          HALT
3371  016172  012600                          POPR0
3372  016174  104413                  EXITER: CKSWR                           ;CHECK FOR ^G
3373  016176  005267  162730                  INC     ERRCNT
3374  016202  032777  000400  162670          BIT     #SW08,@SWR              ;LOOP ON ERROR ?
3375  016210  001007                          BNE     1$
3376  016212  032777  002000  162660          BIT     #SW10,@SWR              ;ESCAPE TO NEXT ON ERROR ?
3377  016220  001407                          BEQ     2$
3378  016222  016767  162670  162664          MOV     NEXT,RTRN               ;SET UP FOR NEXT TEST
3379  016230  012706  001100          1$:     MOV     #STACK,SP               ;REINITIALIZE SP
3380  016234  000177  162654                  JMP     @RTRN
```

```
3381  016240  000002                  2$:     RTI
3382  016242  000001                  ERTABC: 1
3383  016244     006      002                 .BYTE   6,2
3384  016246  001174                          SAVPC
3385                                          ;ENTER HERE ON POWER FAILURE
3386
3387
3388  016250  010046                  .PFAIL: MOV     R0,-(SP)                ;SAVE R0-R5 ON PROCESSOR STACK
3389  016252  010146                          MOV     R1,-(SP)
3390  016254  010246                          MOV     R2,-(SP)
3391  016256  010346                          MOV     R3,-(SP)
3392  016260  010446                          MOV     R4,-(SP)
3393  016262  010546                          MOV     R5,-(SP)
3394  016264  016746  161534                  MOV     24,-(SP)
3395  016270  010667  162676                  MOV     SP,SAVSP                ;SAVE STACK POINTER
3396  016274  012767  016306  161522          MOV     #RESTART,24             ;SET UP FOR POWER UP TRAP
3397  016302  000000                          HALT                            ;HALT ON POWER DOWN NORMAL
3398  016304  000777                  1$:     BR      1$
3399
3400                                          ;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED
3401
3402  016306  016706  162660          RESTAR: MOV     SAVSP,SP                ;RESTORE STACK POINTER
3403  016312  012605                          MOV     (SP)+,R5                ;RESTORE R0-R5
3404  016314  012604                          MOV     (SP)+,R4
3405  016316  012603                          MOV     (SP)+,R3
3406  016320  012602                          MOV     (SP)+,R2
3407  016322  012601                          MOV     (SP)+,R1
3408  016324  012600                          MOV     (SP)+,R0
3409  016326  012767  016250  161470          MOV     #.PFAIL,24              ;SET UP FOR POWER FAILURE
3410  016334  012767  000340  161434          MOV     #340,PS
3411  016342  012706  001100                  MOV     #STACK,SP
3412  016346  005067  001532                  CLR     TEMP
3413  016352  005267  001526          1$:     INC     TEMP
3414  016356  001375                          BNE     1$
3415  016360  104410                          CONVRT
3416  016362  016404                          PFTAB
3417  016364  104402                          TYPE
3418  016366  017257                          MPFAIL
3419  016370  005067  162652                  CLR     ERRFLG
3420  016374  005067  162534                  CLR     LSTERR
3421  016400  000177  162510                  JMP     @RTRN
3422  016404  000001                  PFTAB:  1
3423  016406     006      002                 .BYTE   6,2
3424  016410  001114                          RTRN
3425
3426
3427                                          ;CHECK SWITCH REGISTER ROUTINE. CHECKS FOR ^G TO ALLOW CHANGING
3428                                          ;OF LOC.176.
3429                                          ;LOCATIONS USED:
3430  016412  000000                  RDSW:   .WORD   0
3431
3432
3433  016414  005737  000042          .CKSWR: TST     @#42
3434  016420  001042                          BNE     OUT
3435  016422  022767  000176  162450          CMP     #SWREG,SWR              ;SOFTWARE SWITCH REGISTER PRESENT
3436  016430  001036                          BNE     OUT                     ;NO, GET OUT
```

```
3437  016432  105777  162446                  TSTB    @TKCSR                  ;YES,WAIT FOR
3438  016436  100033                          BPL     OUT                     ;READY, GET CHARACTER
3439  016440  017767  162442  176352          MOV     @TKDBR,.MSG             ;AND STRIP OFF
3440  016446  042767  177600  176344          BIC     #177600,.MSG            ;THE GARBAGE
3441  016454  122767  000007  176336          CMPB    #7,.MSG                 ;IS IT A <^G>
3442  016462  001021                          BNE     OUT
3443  016464  104402  016542                  TYPE,$CNTG
3444  016470  005137  016412          .CNTLU: COM     @#RDSW
3445  016474  104402  016547                  TYPE,$MSWR
3446  016500  104411  016534                  CNVRT,SWREGC
3447  016504  104403  016557                  INSTR,$MNEW
3448  016510  104405                          PARAM
3449  016512  000000                          0
3450  016514  177777                          177777
3451  016516  000176                          SWREG
3452  016520     000     001                  .BYTE   0,1
3453  016522  104402  017254                  TYPE,MCRLF
3454  016526  005037  016412          OUT:    CLR     @#RDSW
3455  016532  000002                          RTI
3456  016534  000001                  SWREGC: 1
3457  016536     006     002                  .BYTE   6,2
3458  016540  000176                          SWREG
3459  016542  005015  043536     000  $CNTG:  .ASCIZ  <15><12>/^G/
3460  016547     015  051412  051127  $MSWR:  .ASCIZ  <15><12>/SWR= /
3461  016554  020075     000
3462  016557     040  047040  053505  $MNEW:  .ASCIZ  /  NEW= /
3463  016564  020075     000
3464          016570                          .EVEN
3465  016570  005015  042012  030525  MTITLE: .ASCIZ  <15><12><12>/DU11 CZDUA-E TAPE A /<15><12>
3466  016576  020061  055103  052504
3467  016604  026501  020105  040524
3468  016612  042520  040440  006440
3469  016620  000012
3470  016622  005015  042526  052103  MVECTO: .ASCIZ  <15><12>/VECTOR ADDRESS-/
3471  016630  051117  040440  042104
3472  016636  042522  051523  000055
3473  016644  005015  051461  020124  MREGAD: .ASCIZ  <15><12>/1ST DEVICE: RECEIVER CONTROL REGISTER ADDRESS-/
3474  016652  042504  044526  042503
3475  016660  020072  042522  042503
3476  016666  053111  051105  041440
3477  016674  047117  051124  046117
3478  016702  051040  043505  051511
3479  016710  042524  020122  042101
3480  016716  051104  051505  026523
3481  016724     000
3482  016725     015  040412  042522  MMULT:  .ASCIZ  <15><12>/ARE YOU RUNNING MULTIPLE DEVICES ? (Y OR N)-/
3483  016732  054440  052517  051040
3484  016740  047125  044516  043516
3485  016746  046440  046125  044524
3486  016754  046120  020105  042504
3487  016762  044526  042503  020123
3488  016770  020077  054450  047440
3489  016776  020122  024516  000055
3490  017004  005015  040514  052123  MLASTD: .ASCIZ  <15><12>/LAST DEVICE:RECEIVER CONTROL REGISTER ADDRESS-/
3491  017012  042040  053105  041511
3492  017020  035105  042522  042503
```

```
3493  017026  053111  051105  041440
3494  017034  047117  051124  046117
3495  017042  051040  043505  051511
3496  017050  042524  020122  042101
3497  017056  051104  051505  026523
3498  017064     000
3499  017065     075  042504  044526  DEVICE: .ASCIZ  /=DEVICE  /
3500  017072  042503  020040     000
3501  017077     015  044012  053517  MCOW:   .ASCIZ  <15><12>/HOW NOW BROWN COW? ...SELECT SOMETHING TO RUN @ACTREG/
3502  017104  047040  053517  041040
3503  017112  047522  047127  041440
3504  017120  053517  020077  027056
3505  017126  051456  046105  041505
3506  017134  020124  047523  042515
3507  017142  044124  047111  020107
3508  017150  047524  051040  047125
3509  017156  040040  041501  051124
3510  017164  043505     000
3511  017167     015  047412  052125  MRANGE: .ASCIZ  <15><12>/OUT OF RANGE:RETYPE LAST DEVICE RXCSR ADDRESS-/
3512  017174  047440  020106  040522
3513  017202  043516  035105  042522
3514  017210  054524  042520  046040
3515  017216  051501  020124  042504
3516  017224  044526  042503  051040
3517  017232  041530  051123  040440
3518  017240  042104  042522  051523
3519  017246  000055
3520  017250  020040  000077          MQM:    .ASCIZ  /  ?/
3521  017254  005015     000          MCRLF:  .ASCIZ   <15><12>
3522  017257     040  050040  053517  MPFAIL: .ASCIZ  /  POWER FAILURE, PROGRAM RESTART AT TEST IN PROGRESS/
3523  017264  051105  043040  044501
3524  017272  052514  042522  020054
3525  017300  051120  043517  040522
3526  017306  020115  042522  052123
3527  017314  051101  020124  052101
3528  017322  052040  051505  020124
3529  017330  047111  050040  047522
3530  017336  051107  051505  000123
3531  017344  005015  047105  020104  MEPASS: .ASCIZ  <15><12>/END OF PASS TAPE A/
3532  017352  043117  050040  051501
3533  017360  020123  040524  042520
3534  017366  040440     000
3535  017371     015  051012     000  MR:     .ASCIZ  <15><12>/R/
3536  017375     015  052012  051505  MTSTPC: .ASCIZ  <15><12>/TEST PC-/
3537  017402  020124  041520  000055
3538  017410  005015  047514  045503  MLOCK:  .ASCIZ  <15><12>/LOCK ON SELECTED TEST? (Y OR N)-/
3539  017416  047440  020116  042523
3540  017424  042514  052103  042105
3541  017432  052040  051505  037524
3542  017440  024040  020131  051117
3543  017446  047040  026451     000
3544  017453     015  042012  020125  MLEVEL: .ASCIZ  <15><12>/DU PRIORITY LEVEL-/
3545  017460  051120  047511  044522
3546  017466  054524  046040  053105
3547  017474  046105  000055
3548  017500  005015  020043  043117  MSYNC:  .ASCIZ  <15><12>/# OF SYNC CHARS SELECTED ( 1 OR 2)-/
```

```
3549  017506  051440  047131  020103
3550  017514  044103  051101  020123
3551  017522  042523  042514  052103
3552  017530  042105  024040  030440
3553  017536  047440  020122  024462
3554  017544  000055
3555  017546  005015  051511  051440  MWIRE6: .ASCIZ  <15><12>/IS SEC XMIT JUMPER #6 IN? (Y OR N)-/
3556  017554  041505  054040  044515
3557  017562  020124  052512  050115
3558  017570  051105  021440  020066
3559  017576  047111  020077  054450
3560  017604  047440  020122  024516
3561  017612  000055
3562  017614  005015  051511  051440  MWIRE5: .ASCIZ  <15><12>/IS SEC REC JUMPER #5 IN? (Y OR N)-/
3563  017622  041505  051040  041505
3564  017630  045040  046525  042520
3565  017636  020122  032443  044440
3566  017644  037516  024040  020131
3567  017652  051117  047040  026451
3568  017660     000
3569  017661     015  044412  020123  MWIRE4: .ASCIZ  <15><12>/IS OPT CLR ENABLE JUMPER #4 IN? (Y OR N)-/
3570  017666  050117  020124  046103
3571  017674  020122  047105  041101
3572  017702  042514  045040  046525
3573  017710  042520  020122  032043
3574  017716  044440  037516  024040
3575  017724  020131  051117  047040
3576  017732  026451     000
3577  017735     015  044412  020123  MEXTJ:  .ASCIZ  <15><12>/IS THE TEST CONNECTOR INSTALLED ?(Y OR N)-/
3578  017742  044124  020105  042524
3579  017750  052123  041440  047117
3580  017756  042516  052103  051117
3581  017764  044440  051516  040524
3582  017772  046114  042105  037440
3583  020000  054450  047440  020122
3584  020006  024516  000055
3585  020012  006412  020040  020040  MSTATUS: .ASCIZ  <12> <15>/    STATUS   MAP     / <12> <15>
3586  020020  052123  052101  051525
3587  020026  020040  046440  050101
3588  020034  020040  020040  005040
3589  020042  000015
3590                                  .EVEN
3591
3592                                          ;BUFFERS FOR INPUT-OUTPUT
3593
3594  020044  000040                  INBUF:  .BLKB   40
3595  020104  000040                  TEMP:   .BLKB   40
3596  020144  000040                  MDATA:  .BLKB   40
3597                                  ;*****************************************************************
3598                                          ;UTILITIES
3599                                  ;*****************************************************************
3600
3601                                  ;THIS UTILITY CALCULATES PRIORITY LEVEL
3602  020204  006367  000044          DULEV:  ASL     DUPRT   ;SHIFT LEFT
3603  020210  006367  000040                  ASL     DUPRT   ;
3604  020214  006367  000034                  ASL     DUPRT   ;
```

```
3605  020220  006367  000030                  ASL     DUPRT   ;
3606  020224  006367  000024                  ASL     DUPRT   ;
3607  020230  016767  000020  000020          MOV     DUPRT,LESS1     ;MOVE THIS TO LESS1
3608  020236  162767  000001  000012          SUB     #1,LESS1        ;CREATE LESS1
3609  020244  042767  000037  000004          BIC     #37,LESS1       ;CLEAR TNZVC
3610  020252  000207                          RTS     PC
3611  020254  000240                  DUPRT:  LEVEL5
3612  020256  000200                  LESS1:  LEVEL4  ;LEVEL TO ALLOW INTERRUPTS
3613
3614                                          ;NEW DU ADDRESSES
3615  020260  016767  000126  000422  DUADDR: MOV     DUBASE,RXCSR    ;XXX0
3616  020266  005267  000120                  INC     DUBASE
3617  020272  016767  000114  000412          MOV     DUBASE,HRXCSR   ;XXX1
3618  020300  005267  000106                  INC     DUBASE
3619  020304  016767  000102  000402          MOV     DUBASE,RXDBUF   ;XXX2
3620  020312  016767  000074  000400          MOV     DUBASE,PARCSR   ;XXX2
3621  020320  005267  000066                  INC     DUBASE
3622  020324  016767  000062  000364          MOV     DUBASE,HRXDBUF  ;XXX3
3623  020332  016767  000054  000362          MOV     DUBASE,HPARCSR  ;XXX3
3624  020340  005267  000046                  INC     DUBASE
3625  020344  016767  000042  000352          MOV     DUBASE,TXCSR    ;XXX4
3626  020352  005267  000034                  INC     DUBASE
3627  020356  016767  000030  000342          MOV     DUBASE,HTXCSR   ;XXX5
3628  020364  005267  000022                  INC     DUBASE
3629  020370  016767  000016  000332          MOV     DUBASE,TXDBUF   ;XXX6
3630  020376  005267  000010                  INC     DUBASE
3631  020402  016767  000004  000322          MOV     DUBASE,HTXDBUF  ;XXX7
3632  020410  000207                          RTS     PC
3633  020412  000000                  DUBASE: 0
3634
3635                                          ;THIS UTILITY POKES THE MAINT DATA BASED UPON THE
3636                                          ;INFORMATION CONTAINED IN TEMP1 AND IT IS
3637                                          ;SHIFTED IN BY THE CONTENTS OF SHIFT
3638  020414  042777  040000  000302  RPOKE:  BIC     #MTDATA,@TXCSR
3639  020422  005067  160520                  CLR     TEMP2
3640  020426  006067  160512                  ROR     TEMP1   ;FORCE CARRY
3641  020432  006067  160510                  ROR     TEMP2   ;PICK UP CARRY IN BIT 15
3642  020436  006267  160504                  ASR     TEMP2   ;SHIFT INTO BIT 14
3643  020442  042767  100000  160476          BIC     #BIT15,TEMP2    ;CLR BIT 15
3644  020450  056777  160472  000246          BIS     TEMP2,@TXCSR    ;POKE MAINT DATA
3645  020456  042777  020000  000240          BIC     #CLK,@TXCSR     ;POKE CLK
3646  020464  052777  020000  000232          BIS     #CLK,@TXCSR     ;
3647  020472  005367  160442                  DEC     SHIFT
3648  020476  001346                          BNE     RPOKE
3649  020500  000207                          RTS     PC
3650
3651                                          ;THIS ROUTINE CALCULATES ODD PARITY FOR AN 8 BIT CHAR
3652  020502  016767  160436  160436  ODD8:   MOV     TEMP1,TEMP2     ;SAVE TEMP1
3653  020510  005067  160434                  CLR     TEMP3
3654  020514  012727  000010                  MOV     #8.,(PC)+
3655  020520  000000                  1$:     0
3656  020522  006067  160420          2$:     ROR     TEMP2
3657  020526  005567  160416                  ADC     TEMP3
3658  020532  005367  177762                  DEC     1$
3659  020536  001371                          BNE     2$
3660  020540  006067  160404                  ROR     TEMP3
```

```
3661  020544  103404                        BCS     3$
3662  020546  052767  000400  160370        BIS     #BIT8,TEMP1     ;SET ODD PARITY
3663  020554  000403                        BR      4$
3664  020556  042767  000400  160360  3$:   BIC     #BIT8,TEMP1     ;CLR EVEN PARITY
3665                                        ;TEMP1 NOW HAS ODD PARITY CHARACTER
3666  020564  000207                  4$:   RTS     PC
3667
3668                                  ;THIS ROUTINE CALCULATES EVEN PARITY FOR AN 8 BIT CHARACTER
3669  020566  016767  160352  160352  EVEN8:  MOV     TEMP1,TEMP2     ;SAVE TEMP1
3670  020574  005067  160350                CLR     TEMP3
3671  020600  012727  000010                MOV     #8.,(PC)+
3672  020604  000000                  1$:   0
3673  020606  006067  160334            2$:   ROR     TEMP2
3674  020612  005567  160332                ADC     TEMP3
3675  020616  005367  177762                DEC     1$
3676  020622  001371                        BNE     2$
3677  020624  006067  160320                ROR     TEMP3
3678  020630  103004                        BCC     3$
3679  020632  052767  000400  160304        BIS     #BIT8,TEMP1     ;SET EVEN PARITY
3680  020640  000403                        BR      4$
3681  020642  042767  000400  160274  3$:   BIC     #BIT8,TEMP1     ;CLR ODD PARITY
3682                                        ;TEMP1 NOW HAS EVEN PARITY CHARACTER
3683  020650  000207                  4$:   RTS     PC
3684  020652  062716  000002            TRPREG: ADD     #2,(SP) ;ALLOW IT TO ''CRUNCH'' INTO HLT BACK
3685                                                        ;IN MAIN PART OF THE PROGRAM
3686  020656  000002                        RTI
3687                                        ;ERROR HLT TABLE
3688  020660  020744                  .ERRTAB:      EM0     ;HLT 0  BIT ERROR (GENERAL)
3689  020662  000000                              0
3690  020664  000000                              0
3691  020666  020760                              EM1     ;HLT 1  REGISTER ERROR
3692  020670  021131                              DH1
3693  020672  021152                              DT1
3694  020674  021022                              EM2     ;HLT 2  RECEIVER ERROR
3695  020676  021131                              DH1
3696  020700  021152                              DT1
3697  020702  021064                              EM3     ;HLT 3  TRANSMITTER ERROR
3698  020704  021131                              DH1
3699  020706  021152                              DT1
3700                                        ;DEFAULT DU ADDRESSES
3701  020710  160040                  RXCSR:  160040
3702  020712  160041                  HRXCSR: 160041
3703  020714  160042                  RXDBUF: 160042
3704  020716  160043                  HRXDBUF:        160043
3705  020720  160042                  PARCSR: 160042
3706  020722  160043                  HPARCSR:        160043
3707  020724  160044                  TXCSR:  160044
3708  020726  160045                  HTXCSR: 160045
3709  020730  160046                  TXDBUF: 160046
3710  020732  160047                  HTXDBUF:        160047
3711                                        ;DEFAULT DU VECTORS
3712  020734  000770                  DURIV:  770     ;REC INTR VECTOR
3713  020736  000772                  DURIS:  772     ;REC INTR STATUS
3714  020740  000774                  DUTIV:  774     ;XMIT INTR VECTOR
3715  020742  000776                  DUTIS:  776     ;XMIT INTR STATUS
3716                                        ;ERROR MESSAGES
```

```
 3717  020744  036440  042440  051122  EM0:    .ASCIZ  / = ERROR PC/
 3718  020752  051117  050040  000103
 3719  020760  036440  051040  043505  EM1:    .ASCIZ  / = REGISTER ERROR PC/<15><12><1>/REGISTER  /
 3720  020766  051511  042524  020122
 3721  020774  051105  047522  020122
 3722  021002  041520  005015  051001
 3723  021010  043505  051511  042524
 3724  021016  020122  000040
 3725  021022  036440  051040  041505  EM2:    .ASCIZ  / = RECEIVER ERROR PC/<15><12><1>/REGISTER  /
 3726  021030  044505  042526  020122
 3727  021036  051105  047522  020122
 3728  021044  041520  005015  051001
 3729  021052  043505  051511  042524
 3730  021060  020122  000040
 3731  021064  036440  052040  040522  EM3:    .ASCIZ  / = TRANSMITTER ERROR PC/<15><12><1>/REGISTER  /
 3732  021072  051516  044515  052124
 3733  021100  051105  042440  051122
 3734  021106  051117  050040  006503
 3735  021114  000412  042522  044507
 3736  021122  052123  051105  020040
 3737  021130     000
 3738                                  ;DATA HEADERS FOR ERROR MESSAGES
 3739  021131     105  050130  041505  DH1:    .ASCIZ  /EXPECTED  ACTUAL/
 3740  021136  042524  020104  040440
 3741  021144  052103  040525  000114
 3742                          .EVEN
 3743                                  ;DATA TABLES FOR ERROR MESSAGES
 3744  021152  000003                  DT1:    3
 3745  021154     006       004                .BYTE   6,4
 3746  021156  001164                        SAVR3   ;REGISTER
 3747  021160     006       004                .BYTE   6,4
 3748  021162  001156                        SAVR0   ;EXPECTED DATA
 3749  021164     006       002                .BYTE   6,2
 3750  021166  001160                        SAVR1   ;ACTUAL DATA
 3751          000001          .END
```

```
AAA     002520          1177#
ACTREG  001216           897#  1061*  1125*  1139*  1140*  1147*  1229   3002   3005   3015
ADDBAS  001306           937#  1057   1224*
ADDKEE  001310           938#  1058   1225*
ADDLAS  001312           939#  1059   1226*
ADDROT  001322           943#  1062   1230*
ADRCNT= 015361          3167*  3206*  3215#
A10010= ****** GX        676
BASEAD  001204           892#  1057*  1064*  1107*  1144*  1145   1151*  1153*  1224   3009*  3021*  3025
BASEDU  001364           960#  1071   1237*
BASEIV  001212           895#  1063*  1117*  1228   3010*  3022*  3027   3028*  3029   3030*  3031   3032*  3033
                        3034*
BBB     002336          1124   1128#
BINWRD  015676          3256*  3257   3294#
BITW  = 002000           807#  1867   1874   1887   1894   1904   1920   1927   1937
BIT0  = 000001           755#   783    814   1854
BIT1  = 000002           754#   782
BIT10 = 002000           745#   773    807
BIT11 = 004000           744#   772   1716   1717   1721   1722   1727   1729
BIT12 = 010000           743#   771    788   1741   1742   1746   1747   1752   1754
BIT13 = 020000           742#   770    787    806
BIT14 = 040000           741#   769    786    805
BIT15 = 100000           740#   768    785    804   3643
BIT2  = 000004           753#   781   1292
BIT3  = 000010           752#   780    813
BIT4  = 000020           751#   779    812
BIT5  = 000040           750#   778    811   1865
BIT6  = 000100           749#   777    810
BIT7  = 000200           748#   776    809
BIT8  = 000400           747#   775    791    808   3662   3664   3679   3681
BIT9  = 001000           746#   774    790
BREAK = 000001           814#  1599   1600   1604   1605   1610   1612   1885   1900   1918   1933   2383   2413
                        2452   2533   2614   2695   2771   2829   2887   2945
BRW     014712          1289   1303   3095#
BRX     014714          1290   1304   3096#
BUFF1   000002R          676#  1266   1272
BUFHRX  001346           953#  1075   1241*
BUFHTX  001362           959#  1081   1247*
BUFRXD  001344           952#  1074   1240*
BUFTXD  001360           958#  1080   1246*
BYJMP   001305           933#  1056   1223*
CARDET= 010000           771#
CCC     014446          3001   3024   3041#
CHRCNT  015674          3254*  3258   3272*  3292#  3293
CKSWR = 104413           992#  3054   3076   3100   3329   3372
CLK   = 020000           806#  1764   1765   1769   1770   1775   1777   2383   2413   2452   2459   2460   2462
                        2463   2533   2540   2541   2543   2544   2614   2621   2622   2624   2625   2695   2702
                        2703   2705   2706   2771   2777   2778   2780   2781   2829   2835   2836   2838   2839
                        2887   2893   2894   2896   2897   2945   2951   2952   2954   2955   3645   3646
CLROPT  001303           931#  1054   1221*
CNTLU = 104414           994#  1039
CNVRT = 104411           988#  3446
CONVRT= 104410           986#  1275   2998   3352   3363   3415
COUNT   001142           868#  2464*  2468*  2545*  2549*  2626*  2630*  2707*  2711*
COUNT1  001230           908#  1265*  1277*
CSRHPA  001352           955#  1077   1243*
```

```
CSRHRX  001342              951#   1073   1239*
CSRHTX  001356              957#   1079   1245*
CSRPAR  001350              954#   1076   1242*
CSRRX   001340              950#   1072   1238*
CSRTX   001354              956#   1078   1244*
CTS   = 020000              770#
D     = ****** GX           675
DATABP  016150             3347*  3350   3361   3364#
DATAHD  016136             3346*  3357   3360#
DEVADR  015356             3165*  3203   3213#
DEVICE  017065             2999   3499#
DH1     021131             3692   3695   3698   3739#
DISPRE  000174              835#  1032
DLIGHT= 177570              725#  1023
DMULT   001304              932#  1055   1222*
DNA   = 100000              804#  1996
DNAINT= 000040              811#  1668   1669   1673   1674   1679   1681
DSC   = 100000              768#  1973
DSINTE= 000040              778#  1530   1531   1535   1536   1541   1543
DSR   = 001000              774#
DSWR  = 177570              724#  1022
DTR   = 000002              782#  1408   1409   1413   1414   1419   1425   1430   2143   2215   2305   2354
DT1     021152             3693   3696   3699   3744#
DUADDR  020260             1106   3026   3615#
DUBASE  020412             1071*  1102   1105   1237   3025*  3615   3616*  3617   3618*  3619   3620   3621*  3622
                           3623   3624*  3625   3626*  3627   3628*  3629   3630*  3631   3633#
DULEV   020204             1172   3602#
DUPRT   020254             1070*  1169   1231   3602*  3603*  3604*  3605*  3606*  3607   3611#
DURIS   020736             1066*  1233   3029*  3713#
DURIV   020734             1065*  1113   1116   1117   1232   3027*  3034   3712#
DUTIS   020742             1068*  1235   3033*  3715#
DUTIV   020740             1067*  1234   3031*  3714#
EIGHT = 006000              799#  2386   2416   2698
EM0     020744             3688   3717#
EM1     020760             3691   3719#
EM2     021022             3694   3725#
EM3     021064             3697   3731#
ERRCNT  001132              861#  1013*  3373*
ERRFLG  001246              920#  1012*  3043*  3089*  3335*  3348   3354*  3419*
ERRMSG  016124             3345*  3356#
ERTABO  016242             3353   3382#
EVEN8   020566             3669#
EVEPAR= 001400              802#
EVPAR = 000400              791#
EXITER  016174             3367   3372#
FILBUF  003204             1268#  1271
FIVE  = 000000              796#  2455   2774   2832   2890   2948
FLAG    001222              905#  1087*  1258   1262*
FRMERR= 020000              787#  2033
HALTS   016154             3331   3366#
HDXEN = 000010              813#  1622   1623   1627   1628   1633   1635
HEREU   003132             1217   1258#
HILIM   015354             3164*  3194   3212#
HOLD    001136              866#  1891   1901   1924   1934   2148   2170   2196   2220   2236   2252   2277   2293
                           2310   2327   2343   2359
HOLDO   001224              906#  1263*  1279
```

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HOLD1   001226            907#  1264*  1280
HPARCS  020722           1077*  1243   1359*  3623*  3706#
HRXCSR  020712           1073*  1239   1329*  1854*  3617*  3702#
HRXDBU  020716           1075*  1241   1344*  3622*  3704#
HTXCSR  020726           1079*  1245   1374*  1865*  3627*  3708#
HTXDBU  020732           1081*  1247   1389*  3631*  3710#
ICOUNT  001122            857#  3087   3091*
INBUF   020044           1180   1184   3128   3170   3302   3306   3594#
INIFLG  001244            918#  1018   1021*
INSTER= 104404            978#  1188   3189   3311
INSTR = 104403            976#  1097   1108   1118   1129   1154   1164   1178   1191   1195   1199   1203   1294
                         1307   3447
INSTR2  015140           3139   3154#
ISYMOD= 000000            795#  2409   2416   2767   2774   2825   2832   2883   2890   2941   2948
IVBASE  001314            940#  1063   1228*
IVKEEP  001316            941#  1060   1227*
JMRBY   001203            888#  1056*  1206   1223   1916   2132
KEEPAD  001206            893#  1058*  1064   1105*  1107   1151   1153   1225   3021
KEEPIV  001214            896#  1060*  1116*  1227   3022
LASTAD  001210            894#  1059*  1134   1145   1159   1226
LESS1   020256           1069*  1236   3607*  3608*  3609*  3612#
LEVEL0= 000000            765#
LEVEL1= 000040            764#
LEVEL2= 000100            763#
LEVEL3= 000140            762#
LEVEL4= 000200            761#  3612
LEVEL5= 000240            760#  3611
LEVEL6= 000300            759#
LEVEL7= 000340            758#  1325   1340   1355   1370   1385   1813
LIGHTS  001102            846#  1023*  1032*  3045*
LIMITS  015302           3180   3194#
LOBITS  015360           3166*  3198   3214#  3215
LOCK    001120            856#  3103
LOGICA  014500           3049#
LOKFLG  001247            921#  1297   1298
LOLIM   015352           3163*  3196   3211#
LPCNT   001124            858#  1009*  3086*  3087   3090*
LSTERR  001134            862#  1014*  3042*  3332   3334*  3420*
L1ESS   001336            949#  1069   1236*
MAP     001634           1036   1038   1046#
MASK1   010334           2203#
MASK2   010352           2209#
MASK3   010442           2243#
MCOW    017077           3004   3501#
MCRLF   017254           1276   3136   3152   3244   3453   3521#
MDATA   020144           3270   3281   3596#
MEPASS  017344           2997   3531#
MEXT  = 010000            818#  1918   1933
MEXTJ   017735           1204   3577#
MINT  = 004000            817#  1885   1900   2383   2413   2452   2533   2614   2695   2771   2829   2887   2945
MITSEX  001301            929#  1052   1219*
MLASTD  017004           1130   3490#
MLEVEL  017453           1165   3544#
MLOCK   017410           1295   3538#
MMULT   016725           1119   3482#
MPFAIL  017257           3418   3522#
```

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MQM     017250          3149    3520#
MR      017371          1317    3535#
MRANGE  017167          1155    3511#
MREGAD  016644          1098    3473#
MRESET= 000400           808#   1420    1453    1486    1519    1542    1565    1588    1611    1634    1657    1680    1703
                        1728    1753    1776    1799    1833    1834    1838    1839    1849    1864    1899    1932    1948
                        1960    1972    1984    1995    2007    2020    2032    2044    2056    2068    2096    2110    2127
                        2378    2380    2408    2410    2447    2449    2528    2530    2609    2611    2690    2692    2766
                        2768    2824    2826    2882    2884    2940    2942
MSTATU  020012          1261    3585#
MSYNC   017500          1179    3548#
MTDATA= 040000           805#   1787    1788    1792    1793    1798    1800    1885    1890    1898    1918    1923    1931
                        2383    2413    2452    2533    2614    2695    2771    2829    2887    2945    3638
MTITLE  016570          1020    3465#
MTSTPC  017375          1308    3536#
MULTD   001202           887#   1055*   1121    1122    1222    1286    3000
MVECTO  016622          1109    3470#
MWIRE4  017661          1200    3569#
MWIRE5  017614          1196    3562#
MWIRE6  017546          1192    3555#
NEXT    001116           855#   1323*   1338*   1353*   1368*   1383*   1398*   1407*   1440*   1473*   1506*   1529*   1552*
                        1575*   1598*   1621*   1644*   1667*   1690*   1715*   1740*   1763*   1786*   1809*   1832*   1848*
                        1884*   1913*   1947*   1959*   1971*   1983*   1994*   2006*   2019*   2031*   2043*   2055*   2066*
                        2094*   2109*   2125*   2377*   2407*   2446*   2527*   2608*   2689*   2765*   2823*   2881*   2939*
                        3072    3092    3378
NOPAR = 000000           800#   2386    2416    2455    2536    2617    2698    2774    2832    2890    2948
NOSYNC  001300           928#   1051    1218*
ODDPAR= 001000           801#
ODD8    020502          3652#
ONCE    001522          1019    1022#
OPTCLR  001201           886#   1054*   1202    1221    1423    1456    1489    1816    1850    2071
OUT     016526          3434    3436    3438    3442    3454#
OUTCRY  014440          2998    3037#
OUTMUL  002476          1127    1152    1163#
OUT1    011004          2135    2269    2321    2370#
OUT2    010530          2188    2272#
OUT3    010660          2190    2322#
OVRRUN= 040000           786#   2045
PARAM = 104405           980#   1099    1110    1131    1156    1166    1309    3448
PARAM1  015206          3169#   3190
PARCSR  020720          1076*   1242    1356*   2379*   2386*   2409*   2416*   2448*   2455*   2529*   2536*   2610*   2617*
                        2691*   2698*   2767*   2774*   2825*   2832*   2883*   2890*   2941*   2948*   3620*   3705#
PAREN = 001000           790#
PARER = 010000           788#   2021
PARERR  015262          3172    3174    3176    3185#   3195    3197    3199
PARTI   015344          3188    3208#
PASCNT  001130           860#   1011*   3044*   3045
PFTAB   016404          3416    3422#
POPR0 = 012600           734#   3371
POP1SP= 005726           732#
POP2SP= 022626           736#
PRTDU   001324           944#   1070    1231*
PS      = 177776         726#   1006*   1211*   1813*   3053*   3410*
PUSHR0= 010046           733#   3368
PUSH1S= 005746           731#
PUSH2S= 024646           735#
```

```
RDSW    016412          3150    3187    3430#   3444*   3454*
RECACT= 004000           772#   1961    2387    2392    2397    2417    2422    2427    2477    2488    2493    2558    2569
                        2574    2639    2650    2655    2720    2731    2736
REGACT  001320           942#   1061    1229*
REPLAY  014344          3017    3023    3025#
RESEC   001302           930#   1053    1220*
RESREG  016152          3362    3365#
RESTAR  016306          3396    3402#
RESTRT  014510          3018    3047    3053#
RESOS = 104407           984#   3365
RING  = 040000           769#
RINTEN= 000100           777#   1553    1554    1558    1559    1564    1566
RISDU   001334           948#   1066    1233*
RIVDU   001326           945#   1065    1232*
ROTADD  001220           900#   1062*   1126*   1138*   1140    1142*   1147    1150*   1230    3012*   3015    3019*
RPOKE   020414          2467    2483    2548    2564    2629    2645    2710    2726    2786    2800    2804    2844    2858
                        2862    2902    2916    2920    2960    2974    2978    3638#   3648
RTRN    001114           854#   1016*   1312    1316*   1318    3055*   3072*   3073    3092*   3093    3378*   3380    3421
                        3424
RTS   = 000004           781#   1441    1442    1446    1447    1452    1458    1463    2165    2231    2288    2338
RUNA  = 000000             1      52      69     147     663
RUNB  = ****** U          20      57      69     150     668
RUNC  = ****** U          20      57      69     150     668
RUND  = ****** U          20      57      69     150     668
RUNE  = ****** U          20      57      72     150     668
RUNF  = ****** U          20      57      72     150     668
RUNIT   014250          3003    3009#   3016
RXCSR   020710          1072*   1238    1326*   1408*   1409    1413*   1414    1419*   1425    1430    1441*   1442    1446*
                        1447    1452*   1458    1463    1474*   1475    1479*   1480    1485*   1491    1496    1507*   1508
                        1512*   1513    1518*   1520    1530*   1531    1535*   1536    1541*   1543    1553*   1554    1558*
                        1559    1564*   1566    1576*   1577    1581*   1582    1587*   1589    1810*   1814    1852*   1853
                        1855    1859*   1860    1949    1961    1973    2067*   2069    2070    2126*   2137    2138    2143*
                        2154    2159    2165*   2176    2181    2191*   2202    2208    2215*   2226    2231*   2242    2247*
                        2258    2263    2272*   2283    2288*   2299    2305*   2316    2322*   2333    2338*   2349    2354*
                        2365    2387    2391*   2392    2396*   2397    2417    2421*   2422    2426*   2427    2457*   2473
                        2477    2484    2488    2492*   2493    2497    2507    2538*   2554    2558    2565    2569    2573*
                        2574    2578    2588    2619*   2635    2639    2646    2650    2654*   2655    2659    2669    2700*
                        2716    2720    2727    2731    2735*   2736    2740    2750    2775*   2787    2833*   2845    2891*
                        2903    2949*   2961    3039    3615*   3701#
RXDBUF  020714          1074*   1240    1341*   2008    2010    2021    2033    2045    2057    2111    2112    2456    2502
                        2537    2583    2618    2664    2699    2745    2782    2791    2807    2840    2849    2865    2898
                        2907    2923    2956    2965    2981    3619*   3703#
RXDONE= 000200           776#   1949
RXERR = 100000           785#   2057
SAVPC   001174           881#   3219*   3384
SAVR0   001156           874#   3228*   3233    3748
SAVR1   001160           875#   3227*   3234    3750
SAVR2   001162           876#   3226*   3235
SAVR3   001164           877#   3225*   3236    3746
SAVR4   001166           878#   3224*   3237
SAVR5   001170           879#   3223*   3238
SAVSP   001172           880#   3395*   3402
SAVOS = 104406           982#   3336
SCOPE = 104400           970#   1334    1349    1364    1379    1394    1402    1435    1468    1501    1524    1547    1570
                        1593    1616    1639    1662    1685    1708    1733    1758    1781    1804    1827    1844    1878
                        1907    1940    1954    1966    1978    1989    2001    2014    2026    2038    2050    2062    2088
```

```
                    2103    2117    2370    2401    2431    2512    2593    2674    2755    2813    2871    2929    2987
SCOP1 = 104401       972#
SEND  = 000020       812#    1645    1646    1650    1651    1656    1658
SEREC   001200       885#    1053*   1198    1220    2189
SETFG   003144      1259     1261#
SETFLG= 104412       990#    1120    1193    1197    1201    1205    1296
SEVEN = 004000       798#    2617
SEXMIT  001177       884#    1052*   1194    1219    2187
SHIFT   001140       867#    2465*   2481*   2546*   2562*   2627*   2643*   2708*   2724*   2784*   2798*   2802*   2842*
                    2856*    2860*   2900*   2914*   2918*   2958*   2972*   2976*   3647*
SIX   = 002000       797#    2536
SPACNT= 015675      3255*    3274    3277*   3293#
SRD   = 002000       773#
STACK = 001100       727#    1007    1283    3379    3411
STATUS  001300       928#    1267    1270
STD   = 000010       780#    1474    1475    1479    1480    1485    1491    1496    2191    2247    2272    2322
STFLG   001245       919#    1010*
STPSYN= 000400       775#    1576    1577    1581    1582    1587    1589
SV05    015370      3223#
SWR     001100       845#    1022*   1027    1031*   1037    1046    1084    1216    1292    1305    3077    3084    3101
                    3330     3366    3374    3376    3435
SWREG   000176       836#    1031    1037    3435    3451    3458
SWREGC  016534      3446     3456#
SW00  = 000001       707#    1084
SW01  = 000002       706#    1305
SW02  = 000004       705#
SW03  = 000010       704#
SW04  = 000020       703#
SW05  = 000040       702#
SW06  = 000100       701#
SW07  = 000200       700#    1046    1216
SW08  = 000400       699#    3374
SW09  = 001000       698#    3101
SW10  = 002000       697#    3376
SW11  = 004000       696#    3084
SW12  = 010000       695#
SW13  = 020000       694#    3330
SW14  = 040000       693#    3077
SW15  = 100000       692#
SYNCNO  001176       883#    1051*   1182*   1186*   1218    2471    2552    2633    2714
SYNEXT= 020000       794#    2379    2386
SYNINT= 030000       793#    2448    2455    2529    2536    2610    2617    2691    2698
SYNSCH= 000020       779#    1507    1508    1512    1513    1518    1520    2391    2396    2421    2426    2457    2492
                    2538     2573    2619    2654    2700    2735    2775    2833    2891    2949
SYSTST= 014000       819#
TABLE   001232       909#    1273*   1274*   1275
TEMP    020104      3251     3259    3284*   3412*   3413*   3595#
TEMP1   001144       869#    2466*   2482*   2547*   2563*   2628*   2644*   2709*   2725*   2785*   2799*   2803*   2843*
                    2857*    2861*   2901*   2915*   2919*   2959*   2973*   2977*   3640*   3652    3662*   3664*   3669
                    3679*    3681*
TEMP2   001146       870#    3639*   3641*   3642*   3643*   3644    3652*   3656*   3669*   3673*
TEMP3   001150       871#    3251*   3284    3653*   3657*   3660*   3670*   3674*   3677*
TEMP4   001152       872#
TEMP5   001154       873#
THRU    003262      1260     1283#
TISDU   001332       947#    1068    1235*
```

```
TIVDU   001330            946#  1067  1234*
TKCSR   001104            847#  3080  3130  3437
TKDBR   001106            848#  3082  3132  3140  3439
TLAST = 013740           1311  2990#
TPCSR   001110            849#  3113  3141
TPDBR   001112            850#  3115* 3140*
TRPOK   015760           3321#
TRPREG  020652           1324  1339  1354  1369  1384  3684#
TSTNO   001126            859#  1015* 1322* 1337* 1352* 1367* 1382* 1397* 1406* 1439* 1472* 1505* 1528*
                         1551* 1574* 1597* 1620* 1643* 1666* 1689* 1714* 1739* 1762* 1785* 1808* 1831*
                         1847* 1883* 1912* 1946* 1958* 1970* 1982* 1993* 2005* 2018* 2030* 2042* 2054*
                         2065* 2093* 2108* 2124* 2376* 2406* 2445* 2526* 2607* 2688* 2764* 2822* 2880*
                         2938*
TST1    003446           1310  1316  1322#  3055  3056
TST10   004524           1473  1505#
TST11   004630           1506  1528#
TST12   004734           1529  1551#
TST13   005040           1552  1574#
TST14   005144           1575  1597#
TST15   005250           1598  1620#
TST16   005354           1621  1643#
TST17   005460           1644  1666#
TST18   005564           1667  1689#
TST19   005670           1690  1714#
TST2    003534           1323  1337#
TST20   005774           1715  1739#
TST21   006100           1740  1762#
TST22   006204           1763  1785#
TST23   006310           1786  1808#
TST24   006420           1809  1831#
TST25   006476           1832  1847#
TST26   006664           1848  1883#
TST27   007016           1884  1912#
TST28   007156           1913  1946#
TST29   007214           1947  1958#
TST3    003622           1338  1352#
TST30   007252           1959  1970#
TST31   007310           1971  1982#
TST32   007346           1983  1993#
TST33   007404           1994  2005#
TST34   007452           2006  2018#
TST35   007510           2019  2030#
TST36   007546           2031  2042#
TST37   007604           2043  2054#
TST38   007642           2055  2065#
TST39   007750           2066  2093#
TST4    003710           1353  1367#
TST40   010024           2094  2108#
TST41   010072           2109  2124#
TST42   011006           2125  2376#
TST43   011134           2377  2406#
TST44   011262           2407  2445#
TST45   011604           2446  2526#
TST46   012126           2527  2607#
TST47   012450           2608  2688#
TST48   012772           2689  2764#
```

```
TST49   013234          2765    2822#
TST5    003776          1368    1382#
TST50   013476          2823    2880#
TST51   013740          2881    2938#   2990
TST52 = ****** U        2939
TST6    004064          1383    1397#
TST7    004114          1398    1406#
TST8    004244          1407    1439#
TST9    004374          1440    1472#
TTST    014614          1289*   1290*   1300*   1301*   1303*   1304*   3078#
TXCSR   020724          1078*   1244    1371*   1420*   1453*   1486*   1519*   1542*   1565*   1588*   1599*   1600    1604*
                        1605    1610*   1611*   1612    1622*   1623    1627*   1628    1633*   1634*   1635    1645*   1646
                        1650*   1651    1656*   1657*   1658    1668*   1669    1673*   1674    1679*   1680*   1681    1691*
                        1692    1696*   1697    1702*   1703*   1704    1716*   1717    1721*   1722    1727*   1728*   1729
                        1741*   1742    1746*   1747    1752*   1753*   1754    1764*   1765    1769*   1770    1775*   1776*
                        1777    1787*   1788    1792*   1793    1798*   1799*   1800    1811*   1815    1833*   1834    1838*
                        1839    1849*   1864*   1866    1872*   1873    1885*   1887    1890*   1894    1898*   1899*   1900*
                        1904    1918*   1920    1923*   1927    1931*   1932*   1933*   1937    1948*   1960*   1972*   1984*
                        1985    1995*   1996    2007*   2020*   2032*   2044*   2056*   2068*   2095*   2096*   2097    2098
                        2110*   2127*   2378*   2380*   2383*   2408*   2410*   2413*   2447*   2449*   2452*   2459*   2460*
                        2462*   2463*   2528*   2530*   2533*   2540*   2541*   2543*   2544*   2609*   2611*   2614*   2621*
                        2622*   2624*   2625*   2690*   2692*   2695*   2702*   2703*   2705*   2706*   2766*   2768*   2771*
                        2777*   2778*   2780*   2781*   2824*   2826*   2829*   2835*   2836*   2838*   2839*   2882*   2884*
                        2887*   2893*   2894*   2896*   2897*   2940*   2942*   2945*   2951*   2952*   2954*   2955*   3625*
                        3638*   3644*   3645*   3646*   3707#
TXDBUF  020730          1080*   1246    1386*   1399    3629*   3709#
TXDONE= 000200           809#   1985
TXINTE= 000100           810#   1691    1692    1696    1697    1702    1704
TYPDAT  016140          3351    3358    3361#
TYPE  = 104402           974#   1020    1261    1276    1317    2996    2999    3004    3126    3136    3148    3152    3243
                        3280    3355    3359    3417    3443    3445    3453
TYPMSG  016110          3349    3352#
UP      003224          1273#   1278
USER  = 000000           816#
VOID  = 000001           783#
WRDCNT  015672          3253*   3282*   3291#
ZERO    014256          3010#
$CNTG   016542          3443    3459#
$E    = 000065           676#   1323    1324#   1338    1339#   1353    1354#   1368    1369#   1383    1384#   1398    1399#
                        1407    1408#   1440    1441#   1473    1474#   1506    1507#   1529    1530#   1552    1553#   1575
                        1576#   1598    1599#   1621    1622#   1644    1645#   1667    1668#   1690    1691#   1715    1716#
                        1740    1741#   1763    1764#   1786    1787#   1809    1810#   1832    1833#   1848    1849#   1884
                        1885#   1913    1914#   1947    1948#   1959    1960#   1971    1972#   1983    1984#   1994    1995#
                        2006    2007#   2019    2020#   2031    2032#   2043    2044#   2055    2056#   2066    2067#   2094
                        2095#   2109    2110#   2125    2126#   2377    2378#   2407    2408#   2446    2447#   2527    2528#
                        2608    2609#   2689    2690#   2765    2766#   2823    2824#   2881    2882#   2939    2940#
$MNEW   016557          3447    3462#
$MSWR   016547          3445    3460#
$N    = 000063           676#   1322    1324#   1337    1339#   1352    1354#   1367    1369#   1382    1384#   1397    1399#
                        1406    1408#   1439    1441#   1472    1474#   1505    1507#   1528    1530#   1551    1553#   1574
                        1576#   1597    1599#   1620    1622#   1643    1645#   1666    1668#   1689    1691#   1714    1716#
                        1739    1741#   1762    1764#   1785    1787#   1808    1810#   1831    1833#   1847    1849#   1883
                        1885#   1912    1914#   1946    1948#   1958    1960#   1970    1972#   1982    1984#   1993    1995#
                        2005    2007#   2018    2020#   2030    2032#   2042    2044#   2054    2056#   2065    2067#   2093
                        2095#   2108    2110#   2124    2126#   2376    2378#   2406    2408#   2445    2447#   2526    2528#
                        2607    2609#   2688    2690#   2764    2766#   2822    2824#   2880    2882#   2938    2940#   2990#
```

CROSS REFERENCE TABLE -- USER SYMBOLS


```
$Y      = 000015          962#    970     972#    974#    976#    978#    980#    982#    984#    986#    988#    990#    992#
                          994#    996#
$67       002142         1047    1084#
.       = 021170          821#    824#    834#    841#    927#    928#    929#    930#    931#    932#    933#    937#    938#
                          939#    940#    941#    942#    943#    944#    945#    946#    947#    948#    949#    950#    951#
                          952#    953#    954#    955#    956#    957#    958#    959#    960#   1400    1821    1825    1857
                         1862    1870    1876    1888    1895    1905    1921    1928    1938    1986    2012    2077    2084
                         2101    2115    2133    2141    2157    2162    2179    2184    2206    2212    2229    2245    2261
                         2266    2286    2303    2319    2336    2352    2368    3464#   3594#   3595#   3596#
.BEGIN    002630         1082    1086    1211#
.CKSWR    016414          993    3433#
.CNTLU    016470          995    3444#
.CNVRT    015460          989    3245#
.CONVR    015454          987    3243#
.EOP      014202         2939    2996#
.ERRTA    020660         3344    3688#
.HLT      016000          827    3329#
.INSTE    015114          979    3146#
.INSTG    015120         3145    3148#
.INSTR    014776          977    3122#
.INST1    015016         3126#   3137    3153
.MSG      015020         3124*   3127#   3439*   3440*   3441
.PARAM    015146          981    3160#
.PFAIL    016250          825    1008    3388#   3409
.RES05    015422          985    3233#
.SAV05    015362          983    3219#
.SCOPE    014532          971    3060#
.SCOP1    014716          973    3100#
.SETFL    015700          991    3301#   3312
.START    001420          837    1006#   1016    3008
.TRPSR    015746          829    3318#
.TRPTA    001366          967#   3323
.TYPE     014736          975    3108#
```

```
HLT      737#  1328  1331  1343  1346  1358  1361  1373  1376  1388  1391  1401  1411  1416  1427
        1432  1444  1449  1460  1465  1477  1482  1493  1498  1510  1515  1522  1533  1538  1545
        1556  1561  1568  1579  1584  1591  1602  1607  1614  1625  1630  1637  1648  1653  1660
        1671  1676  1683  1694  1699  1706  1719  1724  1731  1744  1749  1756  1767  1772  1779
        1790  1795  1802  1822  1826  1836  1841  1858  1863  1871  1877  1889  1896  1906  1922
        1929  1939  1951  1963  1975  1987  1998  2013  2023  2035  2047  2059  2078  2085  2102
        2116  2142  2158  2163  2180  2185  2207  2213  2230  2246  2262  2267  2287  2304  2320
        2337  2353  2369  2389  2394  2399  2419  2424  2429  2475  2479  2486  2490  2495  2499
        2505  2509  2556  2560  2567  2571  2576  2580  2586  2590  2637  2641  2648  2652  2657
        2661  2667  2671  2718  2722  2729  2733  2738  2742  2748  2752  2789  2794  2810  2847
        2852  2868  2905  2910  2926  2963  2968  2984
PRGEND   676#  2989
PRGFRT   676#   677
PUSSYF   676#
RSETUP   676#  2378  2408  2447  2528  2609  2690  2766  2824  2882  2940
TSETUP   676#
$BEGIN   676#  1207
$BINAR   676#
$BUFFE   676#  3591
$CABLE   676#  2144  2166  2192  2216  2232  2248  2273  2289  2306  2323  2339  2355
$CATCH   676#   820
$CLRVE   676#  1022
$CONVR   676#  3240
$DNA     676#
$EOP     676#  2989
$GETFL   676#  1118  1191  1195  1199  1203  1294
$GETPA   676#  1097  1108  1128  1154  1163  1307
$GETSY   676#  1173
$HEADE   676#   677
$HLT     676#  3326
$INSTR   676#  3119
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        2044  2056  2068  2096  2110  2127  2378  2380  2408  2410  2447  2449  2528  2530  2609
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CZDUA-E MACY11 30A(1052)  21-NOV-78  15:18  PAGE 87
CZDUAE.P11    26-JUL-78 14:27          CROSS REFERENCE TABLE -- MACRO NAMES                                    SEQ 0082

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          1970  1982    1993    2005    2018    2030    2042    2054    2065    2093    2108    2124    2376    2406    2445
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 RUN-TIME RATIO: 100/25=3.9
 CORE USED:  19K  (37 PAGES)
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