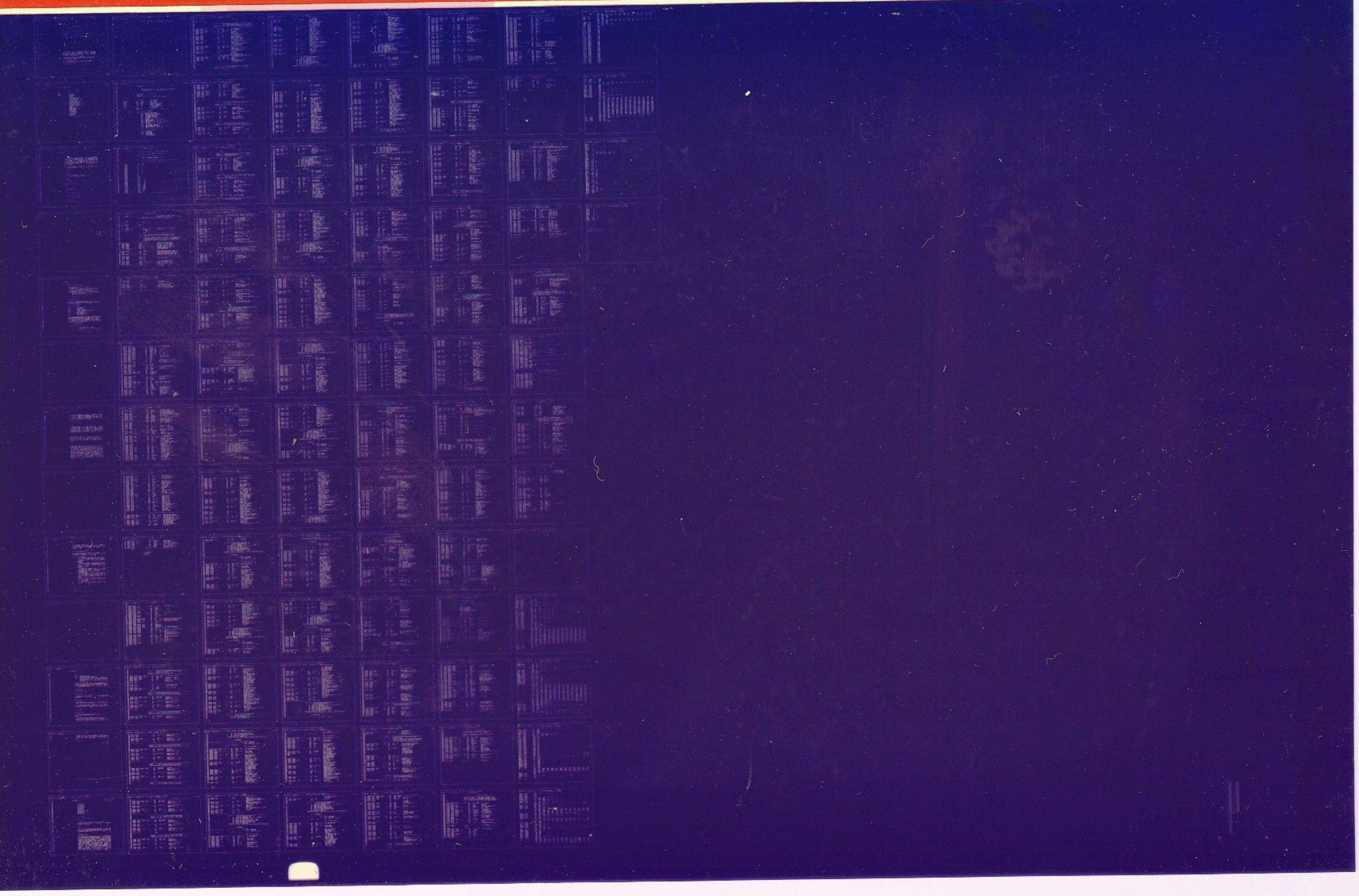
DJ11

DJ11 LGC TEST
CZDJAF0

AH-8504F-MC

FICHE 1 OF 1

SEP 1979
digital
MADE IN USA



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IDENTIFICATION

PRODUCT CODE: AC-8502F-MC

PRODUCT NAME: CZDJAF0 DJ11 LGC TEST

PROGRAM DATE: FEB 1979

MAINTAINER: DIAGNOSTIC ENGINEERING

CONTENTS

1. ABSTRACT

THIS PROGRAM TESTS THE LOGIC OF THE DJ11 ASYNCRONOUS MULTIPLEXER IN MAINTENANCE MODE. IT CHECKS THAT ALL THE CONTROL REGISTERS FUNCTION PROPERLY, THAT INTERRUPTS OCCURE AT THE RIGHT LEVEL, AND THAT DATA CAN BE TRANSMITTED AND RECEIVED CORRECTLY. THIS PROGRAM DOES NOT TEST THAT THE INPUT AND OUTPUT LEAD CONNECTIONS ARE FUNCTIONAL. (SEE MAINDEC-11-DZDJB, PROGRAMS 2 AND 3 FOR ON-LINE TESTING). THE PROGRAM SHOULD BE RUN FOR AT LEAST 2 PASSES WITH ALL SWITCHES DOWN.

NOTE: THE PROGRAM WILL AUTOSIZE THE SILO ALARM LEVEL OF THE DJ11 AND WILL RUN AT ANY ALARM LEVEL SET. AND WILL RUN AT ANY ALARM LEVEL SET.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP-11 STANDARD COMPUTER WITH CONSOLE TELETYPE
UP TO 16 DJ11 ASYNCRONOUS MULTIPLEXERS.

2.2 STORAGE

THIS PROGRAM USES ALL OF 8K, EXCEPT ABS LOADER.

2.3 PRELIMINARY PROGRAMS

NONE

3. LOADING PROCEDURE

USE STANDARD PROCEDURE FOR ABS TAPES.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

SEE 5.1 (ALL DOWN FOR WORST CASE TESTING)

4.2 STARTING ADDRESS

THE PROGRAM SHOULD ALWAYS BE STARTED AT 200. IT MAY BE

```
   138                                  RESTARTED AT 1000 AFTER ALL PARAMETERS HAVE BEEN SELECTED.
```

4.3 PROGRAM AND OPERATOR ACTION

1) LOAD PROGRAM INTO MEMORY USING ABS LOADER.
2) LOAD ADDRESS 200.
3) IF HARDWARE SWITCH REGISTER IS AVAILABLE, SET SWITCHES (SEE SEC. 5.1), ALL DOWN FOR WORST CASE, PRESS START.
4) IF SWITCH-LESS PROCESSOR SIMPLY PRESS START.
5) ENTER PARAMETERS (SEE SEC. 5.3) AS THEY ARE REQUESTED.
6) THE PROGRAM WILL LOOP AND BELL WILL RING ONCE EVERY PASS. EOP'' IS ALSO PRINTED ON EACH PASS.
7) A MINIMUM OF TWO PASSES SHOULD ALWAYS BE RUN.

5. OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

AT SA 200, ALL SWITCHES DOWN IS WORST CASE TESTING. EACH SUBTEST WILL BE LOOPED UPON UNTIL COMPLETION OF 16 PASSES OF THAT SUBTEST. THE BELL WILL RING UPON COMPLETION OF A PASS OF THE ENTIRE PROGRAM.

THE SWITCH SETTINGS ARE:

```
SW<15> = 1 ..... HALT ON ERROR
SW<14> = 1 ..... SCOPE LOOP
SW<13> = 1 ..... INHIBIT PRINTOUT
SW<12> = 1 ..... PRINT SILO ALARM LEVEL (IN OCTAL)
SW<11> = 1 ..... INHIBIT ITERATIONS OF SUBTEST
SW<10> = 1 ..... BELL ON ERROR
         0 ..... BELL ON PASS COMPLETE
SW<09> = 1 ..... LOOP ON ERROR
SW<08> = 1 ..... LOOP ON TEST IN SW<7:0>
```

THIS PROGRAM HAS BEEN MODIFIED TO RUN ON A PROCESSOR WITH OR WITHOUT A HARDWARE SWITCH REGISTER. WHEN FIRST EXECUTED THE PROGRAM TESTS THE EXISTENCE OF A HARDWARE SWITCH REGISTER. IF NOT FOUND A SOFTWARE SWITCH REGISTER LOCATION (SWREG=LOC. 176) IS DEFAULTED TO. IF THIS IS THE CASE, UPON EXECUTION THE CONTENTS OF THE SWREG ARE DUMPED IN OCTAL ON THE CONSOLE TTY AND ANY CHANGES ARE REQUESTED

(I.E.) SWR=XXXXXX NEW=

POSSIBLE RESPONSES ARE:

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

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195                                     COMMITTED KEYING IN SWREG VALUE.
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BUILT INTO THE PROGRAM IS THE ABILITY TO DYNAMICALLY CHANGE THE CONTENTS OF SWREG DURING PROGRAM EXECUTION. BY STRIKING ^G (CNTL G) ON CONSOLE TTY THE OPERATOR SETS A REQUEST FLAG TO CHANGE THE CONTENTS OF SWREG, WHICH IS PROCESSED IN KEY AREAS OF THE PROGRAM CODE (IE) ERROR ROUTINES, AFTER HALTS END OF PASS, AND OTHER APPLICABLE AREAS.

5.2 SUBROUTINE ABSTRACTS

5.2.1 SCOPE

THIS SUBROUTINE CALL (VIA A TRAP INSTRUCTION) IS PLACED BETWEEN EACH SUBTEST IN THE INSTRUCTION SECTION. IT RECORDS THE STARTING ADDRESS OF EACH SUBTEST AS IT IS BEING ENTERED IN LOCATION "LAD". IF A SCOPE LOOP IS REQUESTED, THE CURRENT SUBTEST WILL BE LOOPED UPON. SW<11> ON A 1 INHIBITS ITERATION OF SUBTESTS. THE CONTENTS OF "LAD" MAY BE USED TO DETERMINE THE LAST SUBTEST SUCCESSFULLY COMPLETED.

5.2.2 HLT

THIS ROUTINE (CALLED BY AN EMT INSTRUCTION) PRINTS OUT AN ERROR MESSAGE (SEE 6.1). IF SW<9> IS ON A 1 AND A HLT IS EXECUTED, THE SUBTEST WILL BE LOOPED UPON UNTIL 16 CONSECUTIVE GOOD PASSES ARE COMPLETED. TO INHIBIT TYPEOUTS, PUT SW<13> ON A 1. TO RING THE BELL ON AN ERROR, PUT SW<10> ON A 1.

5.2.4 ALMCK

IN THE NORMAL OPERATION THE "DONE" BIT IS SET AS EACH CHARACTER IS READ INTO THE FI/FO BUFFER (SILO). BUT THIS "DONE" CONDITION CAN BE DELAYED TO CAUSE DONE ON THE 5, 9, OR 17 CHARACTER. THIS IS DONE BY CUTTING ONE OF THE JUMPERS (W1,W2,W3) ON THE M7285 CONTROL BOARD. THE PROGRAM TESTS FOR THIS "SILO ALARM LEVEL" AND IF SW12 IS SET (1) IT WILL PRINT OUT THE LEVEL AT WHICH EACH DJ11 WILL SET "DONE." THE SUBROUTINE ALSO ADJUSTS THE CHARACTER COUNTERS TO ENSURE THAT THE MAXIMUM NUMBER OF CHARACTERS TO BE TRANSFERED IS A MULTIPLE OF THE SILO ALARM LEVEL. THIS ENSURES THAT ALL DATA WILL BE READ OUT OF THE SILO. DONE WILL NOT SET IF THE NUMBER OF CHARACTERS IN THE FI/FO BUFFER IS LESS THAN THE SILO ALARM LEVEL. (NOTE CHARACTER PRESENT IS SET ON EACH CHARACTER IN THE BUFFER, REGARDLESS OF THE SILO ALARM LEVEL.)

5.2.5 TRAPCATCHER

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252
253                                 A ''.+2'' - ''HALT'' SEQUENCE IS REPEATED FROM 0 - 56 TO  DETECT
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ANY UNEXPECTED TRAPS AND A ''.+2'' - ''IOT'' SEQUENCE IS REPEATED FROM 60 - 776 TO DETECT ANY UNEXPECTED INTERRUPTS. THUS ANY UNEXPECTED TRAPS WILL HALT AT THE VECTOR + 2. ANY UNEXPECTED INTERRUPTS WILL RESULT IN AN ERROR 'HLT'' IN ''IOTRAP''.

5.3 PROGRAM AND OPERATOR ACTION

THE FOLLOWING REQUESTS ARE MADE TO THE OPERATOR AT THE BEGINNING OF THE PROGRAM. A DETAILED DESCRIPTION OF WHAT IS REQUIRED FOR EACH PARAMETER IS GIVEN BELLOW.

1) ''FIRST DJ11 ADDRESS: ''
THE CSR ADDRESS OF THE FIRST DJ11 YOU WISH TO TEST. MUST BE BETWEEN 160000(8) AND 177777(8). THE DEFAULT (CARRIAGE RETURN) IS TO 160010(8). ''P(REVIOUS)'' SELECTS THE ADDRESS PREVIOUSLY SELECTED.

2) ''VECTOR ADDRESS: ''
THE RECEIVER INTERRUPT VECTOR ADDRESS OF THE FIRST DJ11 YOU WISH TO TEST. MUST BE BETWEEN 300(8) AND 1000(8). THE DEFAULT (CARRIAGE RETURN) IS TO 300(8). ''P(REVIOUS)'' SELECTS THE ADDRESS PREVIOUSLY SELECTED.

3) ''NO. OF DJ11'S: ''
THE NUMBER OF DJ11 UNITS YOU WISH TO TEST AT ONE TIME. MUST BE BETWEEN 1 AND 16. THE DEFAULT (CARRIAGE RETURN) IS TO 1. ''P(REVIOUS)'' SELECTS THE NUMBER OF UNITS PREVIOUSLY SELECTED.

4) ''STANDARD CONFIGURATION? ''
''Y(ES)'' OR DEFAULT (CARRIAGE RETURN) SELECTS 8 LEVEL CODE, NO PARITY. ''N(O)'' CAUSES REQUESTS FOR CODE LEVEL AND PARITY ON ALL REQUESTED LINES IN GROUPS OF FOUR. ''P(REVIOUS)'' SELECTS THE CODE LEVELS AND PARITIES PREVIOUSLY SELECTED.

5) ''CHAR LENGTH: ''
THE CODE LEVEL FOR THE LINE GROUP SPECIFIED. MUST BE 5, 6, 7, OR 8. THE DEFAULT (CARRIAGE RETURN) IS TO 8 LEVEL CODE.

6) ''PARITY (NO, ODD, EVEN): ''
THE TYPE OF PARITY SELECTED FOR THE LINE GROUP SPECIFIED. THE DEFAULT (CARRIAGE RETURN) IS TO NO PARITY.

6. ERRORS

6.1 ERROR PRINTOUT

THE FORMAT IS AS FOLLOWS:

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  310
  311                                   ADR  DJ:DR  (R1)  (R2)  (R3)  (R4)
```

WHERE:

ADR = ADDRESS OF ERROR HLT
DJADR = CSR ADDRESS OF DJ11 UNDER TEST
(RN) = CONTENTS OF GENERAL REGISTER 'N''. FROM NONE TO FOUR OF THESE MAY BE TYPED DEPENDING ON THE NUMBER FOLLOWING THE HLT; E.G., HLT+3 WOULD TYPE (R1) THRU (R3); HLT (BY ITSELF) WOULD STOP AFTER TYPING ADR AND DJADR.

TO FIND THE FAILING TEST, LOOK AT THE LISTING ABOVE THE ADDRESS TYPED. IN MOST CASES THE COMMENT BESIDE THE HLT TELLS WHAT WAS BEING CHECKED AND WHAT WAS EXPECTED. ALSO, A LIST OF THE PROBABLE FAILING LOGIC IS GIVEN IN THE COMMENTS AT THE BEGINNING OF THE TEST.

6.2 ERROR RECOVERY

RESTART AT 200 OR 1000.

6.3 ERROR COUNTER

AN ERROR COUNT IS KEPT IN 'ERRORS''. IT CAN BE CLEARED FROM THE CONSOLE, BY RESTARTING AT 200, OR BY RELOADING THE PROGRAM.

7. RESTRICTIONS

IF MORE THAN ONE DJ11 IS TESTED AT A TIME, THE DEVICE ADDRESSES AND THE VECTOR ADDRESSES MUST ALL BE CONTIGUOUS.

IF THIS PROGRAM IS RUN WITH A MONITOR, I.E. ACT11 OR DDP, THE DEVICE ADDRESSES MUST FOLLOW THE FLOATING ADDRESS CONVENTION. DJ11'S WILL BE FIRST, STARTING AT 160010,.

8. MISCELLANEOUS

8.1 EXECUTION TIME

DUE TO THE VERIOUS BAUD RATES AVAILABLE AND THE ABILITY TO
7) '' WHAT ARE THE BR PRIORITIES? FOR:''
'' DEVICE 1=''
'' DEVICE 2='' ETC.
THIS WILL GO TO THE NUMBER OF DEVICES SPECIFIED
IN QUESTION 3 ABOVE.PRIORITIES ALLOWED ARE 0 THROUGH 7.
CHECK UP TO 16 DJ11'S AT ONCE. THE EXECUTION TIME CAN BE ANYWHERE FROM 15 SECONDS TO THREE AND A HALF HOURS. THE

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FOLLOWING TYPICAL TIMES ARE FOR ONE DJ11 WITH ALL LINES AT THE SAME SPEED, 8 LEVEL CODE, 2 STOP BITS, AND NO PARITY ON A PDP-11/20 WITHOUT TRACE TRAPPING. FOR MULTIPLE DJ11'S, MULTIPLY THESE TIMES BY THE NUMBER OF UNITS SELECTED FOR TEST.

BAUD RUN TIME

```
                    ---- --------
                    75 00:26:00
                    110 00:18:00
                    134.5 00:15:00
                    150 00:13:00
                    300 00:06:30
                    600 00:03:15
                    1200 00:01:45
                    1800 00:01:20
                    2400 00:00:55
                    4800 00:00:30
                    9600 00:00:15


8.2         STACK POINTER

            STACK IS INITALLY SET TO 1200


8.3         PASS COUNT

            A 32 BIT (2 WORDS) PASS COUNT IS KEPT IN PCNT.  IT CAN BE
            CLEARED FROM THE CONSOLE, BY RESTARTING AT 200, OR BY
            RELOADING THE PROGRAM.


8.4         POWER FAIL

            EACH TEST CAN BE POWER FAILED WITH NO ERRORS.  TO USE, START
            THE TEST AS USUAL AND POWER DOWN THEN UP AT ANY TIME.  THE
            ROUTINE SHOULD TYPE 'POWER'' AND RESTART THE PROGRAM WITH NO
            OTHER ERROR TYPEOUTS.


9.          PROGRAM DESCRIPTION

            THIS PROGRAM TESTS THE LOGIC OF UP TO 16 DJ11 ASYNCHRONOUS
            DATA MULTIPLEXERS IN MAINTENANCE MODE.  IT CHECKS THAT ALL
            THE CONTROL REGISTERS FUNCTION PROPERLY, THAT INTERRUPTS
            OCCURE AT THE RIGHT PRIORITY LEVEL, AND THAT DATA CAN BE
            TRANSMITTED AND RECEIVED CORRECTLY.  THE PROGRAM HAS MANY
            SUBTESTS (THE CODE BETWEEN 2 SCOPE STATEMENTS) WHICH ARE RUN
            16 TIMES BEFORE CONTINUING TO THE NEXT.  SW<11> ON A 1
            CAUSES EACH SUBTEST TO BE RUN ONLY ONCE.  SW<9> ON A 1
            ENABLES LOOP ON ERROR.  THE ADDRESS ''ICNT'' CONTAINS THE
            ITERATION COUNT IN THE LEFT BYTE AND THE TEST NUMBER IN THE
            RIGHT BYTE.  ALL THE SUBTESTS SHOULD BE RUN SEQUENTIALLY BY
            STARTING AT 200 NOT BY STARTING AT THE BEGINNING OF THE
            SUBTEST.  TO LOOP ON A PARTICULAR SUBTEST, PUT THE TEST
            NUMBER (SEE LISTING) IN THE RIGHT BYTE OF THE SWITCH
            REGISTER AND SW<8> ON A 1.  THIS TEST WILL BE LOOPED UPON
            UNTIL SW<8> IS PUT ON A 0 OR THE RIGHT BYTE IS CHANGED.  IF
```

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431                                     THE TEST IS NON-EXISTANT, THE PROGRAM WILL BE RUN AS USUAL.
432                                     IF MORE THAN ONE DJ11 IS SELECTED, ALL THE SUBTESTS ARE
```

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                                ZZ- CZDJA-F-D DJ11 LOGIC TESTS                                  PAGE 9
                                DESCRIPTION


                                        PERFORMED ON ONE UNIT AT A TIME.  THE BELL WILL NOT RING AND
                                        EOP  PRINT, UNTIL A PASS HAS BEEN MADE ON EACH OF THE DJ11'S
                                        SELECTED FOR TEST.
                                %

                                .TITLE ZZ-CZDJA-F-0  DJ11 LOGIC TESTS
                                .ENABLE ABS
                                .ENABLE AMA
                                ;COPYRIGHT 1972,1979 DIGITAL EQUIPMENT CORP., MAYNARD, MASS.


                                ;     SWITCH                    USE
                                ;     ------                    ---------------------
100000                          SW15=    100000          ;HALT ON ERROR
040000                          SW14=    40000           ;LOOP ON TEST
020000                          SW13=    20000           ;INHIBIT ERROR TYPEOUTS
010000                          SW12=    10000           ;PRINT SILO ALARM LEVEL
004000                          SW11=    4000            ;INHIBIT ITERATIONS
002000                          SW10=    2000            ;0 - BELL ON PASS COMPLETE
                                                         ;1 - BELL ON ERROR
001000                          SW9=     1000            ;LOOP ON ERROR
000400                          SW8=     400             ;LOOP ON TEST IN SW<7:0>
                                .REM!

                                DJ11 REGISTER BIT ASSIGNMENTS:

                                CONTROL STATUS REGISTER (CSR) XXXXX0
                                        BIT0    RECEIVER ENABLE (READ/WRITE)
                                        BIT1    HALF DUPLEX SELECT (READ/WRITE)
                                        BIT2    MAINTENANCE (READ/WRITE)
                                        BIT3    CLEAR MOS (WRITE ONLY)
                                        BIT4    CLEAR MOS FLAG (READ ONLY)
                                        BIT5    NOT USED
                                        BIT6    RECEIVER INTERUPT ENABLE (READ/WRITE)
                                        BIT7    DONE (READ ONLY)
                                        BIT8    MASTER TRANSMITTER SCAN ENABLE (READ/WRITE)
                                        BIT9    NOT USED
                                        BIT10   READ/WRITE BREAK REGISTER (READ/WRITE)
                                        BIT11   NOT USED
                                        BIT12   STATUS ENABLE (READ/WRITE)
                                        BIT13   FI/FO OVERRUN (READ ONLY)
                                        BIT14   MASTER TRANSMITTER INTERUPT ENABLE (READ/WRITE)
                                        BIT15   TRANSMITTER READY (READ ONLY)

                                RECEIVER BUFFER REGISTER (RBUF) XXXXX2 (READ ONLY)

                                        BIT0-7  RECEIVED CHARACTER
                                        BIT8-11 LINE NUMBER
                                        BIT12   PARITY ERROR
                                        BIT13   FRAMING ERROR
                                        BIT14   UART OVERRUN ERROR
                                        BIT15   CHARACTER PRESENT
```

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                                TRANSMITTER CONTROL REGISTER (TCR) XXXXX4 (READ/WRITE)

                                        BIT0-15 STOP THE SCANNER ON CORRESPONDING LINE

                                TRANSMITTER BUFFER (TBUF) XXXXX6

                                        BIT0-7  TRANSMITTED CHARACTER (WRITE ONLY)
                                        BIT8-11 LINE NUMBER (READ ONLY)

                                BREAK CONTROL STATUS REGISTER (BCSR) XXXXX4 (BIT10 OF CSR SET) (READ/WRITE)

                                        BIT0-15 TRNSMIT A BREAK ON CORRESPONDING LINE!

104400                          SCOPE=  TRAP
104000                          HLT=    EMT
000004                          TYPE=   IOT
177776                          PS=     177776
000000                          R0=     %0
000001                          R1=     %1
000002                          R2=     %2
000003                          R3=     %3
000004                          R4=     %4
000005                          R5=     %5
000005                          TTY=    %5
000006                          SP=     %6
000007                          PC=     %7
000007                          BELL=   7
000001                          BIT0=       1
000002                          BIT1=       2
000004                          BIT2=       4
000010                          BIT3=      10
000020                          BIT4=      20
000040                          BIT5=      40
000100                          BIT6=     100
000200                          BIT7=     200
000400                          BIT8=     400
001000                          BIT9=    1000
002000                          BIT10=   2000
004000                          BIT11=   4000
010000                          BIT12=  10000
020000                          BIT13=  20000
040000                          BIT14=  40000
100000                          BIT15= 100000
000340                          LEVEL7 = 340
000000                          OPEN =  0
000020                          DJMXNO=16.              ;MAX  ALLOWED NUMBER OF DJ11'S
001200                          STACK   =1200
```

```
                000000                          . =     0                               ;TRAP CATCHER IN LOCATIONS 0 THRU 776
000000  000000  000000                          0,0                             ;LOCATIONS 0 AND 2 CONTAIN ''HALT'' INSTRUCTIONS
                                                ;LOCATIONS 4 THRU 56 CONTAIN ''.+2'' AND ''HALT'' IN EVERY VECTOR
                                                ;LOCATIONS 60 THRU 776 CONTAIN ''.+2'' AND ''IOT'' IN EVERY VECTOR


                000046                          . =     46
000046  014450                                  $ENDAD

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

                000200                          . =     200
000200  000137  001402                          JMP     BEGIN                   ;200 ALWAYS IS THE STARTING ADDRESS
                001000                          . =     1000                    ;RESTART ADDRESS
001000  000137  002344                          JMP     QABR

                001200                          . =     1200
                                                ;       ADDRESS TABLES
                                                ;
                                                ;''LENGTH'' TABLE IS SET SO THE FIRST FOUR BYTES (2 WORDS) CONTAIN
                                                ;       THE CHARACTER LENGTH FOR THE 4 LINE GROUPS OF THE FIRST DJ11, ETC.
                                                ;
                                                ;''PARITY'' TABLE HAS 4 WORDS, ONE FOR EACH LINE GROUP. THE FIRST WORD CONTAINS
                                                ;       THE ODD PARITY FLAGS FOR LINES 0-3 OF ALL DJ11'S. THE NEXT WORD
                                                ;       HAS PARITY FLAGS FOR LINES 4-7, ETC. EACH BIT IN THE WORD REPRESENTS
                                                ;       EACH DJ11. BIT 0 IN EACH OF THE FOUR WORDS IS FOR DJ/0 TO BIT
                                                ;       15 FOR DJ/15.

001200  000100                                  LENGTH: .BLKB 100               ;TABLE OF CHAR. LENGTHS (MASK)
001300  000000                                  PARITY: 0                       ;ODD PARITY FLAGS FOR LINES 0-3
001302  000000                                  PARIT2: 0                       ;ODD PARITY FLAGS FOR LINES 4-7
001304  000000                                  PARIT3: 0                       ;ODD PARITY FLAGS FOR LINES 10-13
001306  000000                                  PARIT4: 0                       ;ODD PARITY FLAGS FOR LINES 14-17
001310  000000                                  ICNT:   0                       ;ITERATION COUNT-LH, TEST NO.-RH
001312  000000                                  ERRORS: 0                       ;ERROR COUNT REGISTER
001314  000000  000000                          PCNT:   0,0                     ;PASS COUNT REGISTER

001320  160010                                  CSR:    160010                  ;CONTROL STATUS REGISTER(DJ UNDER TEST)
001322  160012                                  RBUF:   160012                  ;RECEIVER BUFFER REGISTER(DJ UNDER TEST)
001324                                          TCR:                            ;TRANSMITTER CONTROL REGISTER(DJ UNDER TEST)
001324  160014                                  BCSR:   160014                  ;BREAK STATUS REGISTER(DJ UNDER TEST)
001326  160016                                  TBUF:   160016                  ;TRANSMITTER BUFFER REGISTER(DJ UNDER TEST)

001330  000300                                  RCVVEC: 300                     ;RECEIVER INTERUPT VECTOR ADDRESS(DJ UNDER TEST)
001332  000302                                  RCVLVL: 302
001334  000304                                  XMTVEC: 304                     ;TRANSMITTER INTERUPT VECTOR ADDRESS(DJ UNDER TEST)
001336  000306                                  XMTLVL: 306

001340  160010                                  DEVADR: 160010                  ;FIRST DEVICE ADDRESS(SELECTED)
001342  000300                                  VECADR: 300                     ;FIRST VECTOR ADDRESS(SELECTED)
001344  000001                                  UNITS:  1                       ;NUMBER OF UNITS TO BE TESTED
001346  000000                                  TIMER:  0                       ;USED TO SAVE RELATIVE TIMES
001350  000000                                  ALMFLG: 0                       ;TEST FLAG FOR SILO ALARM LEVEL
001352  000000                                  TIMERA: 0                       ;TIME COUNTERS
```

```
 593  001354  000000                TIMERB: 0
 594  001356  000000                COUNT:  0                ;CHAR COUNTER
 595  001360  000000                SUM:    0                ;SUMATION OF ALARM LEVEL CHAR'S
 596
 597  001362  000000                DJUUT:  0                ;UNIT NUMBER OF DJ11 UNDER TEST
 598  001364  000000                DJLEN:  0                ;CHAR MASK TABLE POINTER
 599  001366  000000                DJPAR:  0                ;UNIT FLAG (FOR ODD PARITY FLAG)
 600  001370  160010                DEFADR: 160010           ;DEFAULT FIRST DEVICE ADDRESS
 601  001372  000300                DEFVEC: 300              ;DEFAULT FIRST VECTOR ADDRESS
 602
 603  001374  177570                SWR:    177570
 604  001376  177570                DISPLAY:177570
 605
 606
 607  001400  177777                FTIME:  -1
 608
 609
```

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                                                                G 2
610
611  001402  012706  001200          BEGIN:  MOV     #STACK, SP      ;SET UP STACK POINTER
612  001406  004737  017524                  JSR     PC,     SUSWRR  ;CHECK FOR SWITCH REGISTER
613  001412  012700  000020                  MOV     #20,R0
614  001416  012720  016364                  MOV     #IOTRAP,(R0)+   ;IOT VECTOR (20)
615  001422  012720  000340                  MOV     #340,   (R0)+
616  001426  012720  016224                  MOV     #PDOWN$,(R0)+   ;POWER FAIL VECTOR (24)
617  001432  012720  000340                  MOV     #340,   (R0)+
618  001436  012720  015254                  MOV     #EMT$,  (R0)+   ;EMT VECTOR (30)
619  001442  012720  000340                  MOV     #340,   (R0)+
620  001446  012720  015112                  MOV     #TRAP$, (R0)+   ;TRAP VECTOR (34)
621  001452  012720  000340                  MOV     #340,   (R0)+
622  001456  005037  001312                  CLR     ERRORS          ;CLEAR ERROR COUNTER
623  001462  005037  001314                  CLR     PCNT            ;CLEAR PASS COUNTER
624  001466  005037  001316                  CLR     PCNT+2
625  001472  005037  001350                  CLR     ALMFLG
626  001476  005737  000042                  TST     @#42            ;CHECK FOR ACT11 OR DDP PRESENT
627  001502  001404                          BEQ     GETADR          ;BRANCH IF NONE
628  001504  004737  017304                  JSR     PC,     AUTO    ;GO TO SUBROUTINE TO 'MAP' DJ11 ON THE SYS
629  001510  000137  002344                  JMP     QABR            ;SKIP OPERATOR ACTION
630
631  001514  000004  017013          GETADR: TYPE,   MTITLE
632  001520  000004  016524                  TYPE,   RETURN
633  001524  000004  016532                  TYPE,   MSGADR          ;TYPE 'FIRST DJ11 ADDRESS'
634  001530  004537  015476                  JSR     R5,     READIN  ;READ INPUT FROM TTY AND SAVE
635  001534  001340                          .WORD   DEVADR          ; IN DEVADR
636  001536  001366                          BNE     GETADR          ;BRANCH IF BAD INPUT
637  001540  005737  001340                  TST     DEVADR
638  001544  001003                          BNE     1$
639  001546  013737  000370  001340          MOV     DEFADR,DEVADR
640  001554  042737  000007  001340  1$:     BIC     #7,DEVADR
641  001562  022737  160000  001340          CMP     #160000,DEVADR
642  001570  101351                          BHI     GETADR
643
644  001572  000004  016562          GETVEC: TYPE,   MSGVEC          ;TYPE 'VECTOR ADDRESS:'
645  001576  004537  015476                  JSR     R5,     READIN  ;READ INPUT FROM TTY AND SAVE
646  001602  001342                          .WORD   VECADR          ;IN VECADR
647  001604  001372                          BNE     GETVEC          ;BRANCH IF BAD INPUT
648  001606  005737  001342                  TST     VECADR          ;CHECK FOR CR
649  001612  001003                          BNE     1$
650  001614  012737  000300  001342          MOV     #300,   VECADR  ;SET TO FIRST FLOATING VECTOR
651  001622  042737  000007  001342  1$:     BIC     #7,     VECADR  ;CLEAR TO MODULO 10
652  001630  022737  000300  001342          CMP     #300,   VECADR  ;CHECK FOR LOW LIMIT
653  001636  003355                          BGT     GETVEC
654  001640  022737  001000  001342          CMP     #1000,  VECADR  ;CHECK FOR UPPER LIMIT
655  001646  003751                          BLE     GETVEC
656  001650  000004  016606          GETNUM: TYPE,   MSGNUM          ;TYPE'NUMBER OR UNITS:'
657  001654  004737  015644                  JSR     PC,READ$        ;READ INPUT FROM THE TTY
658                                  ; CHECK STRING FOR VALID DIGITS,TERMINATOR,AND 'P'
659  001660  012702  015772                  MOV     #INPUT,R2       ;POINTS TO INPUT STRING
660  001664  112201                          MOVB    (R2)+,R1        ;LOAD 1ST CHAR
661  001666  001434                          BEQ     1$              ;BRANCH IF IMMEDIATE TERMNATOR
662  001670  122701  000120                  CMPB    #'P,R1          ;CHECK FOR A P
663  001674  001443                          BEQ     CONFIG          ;CONFIGURE MODE IF SO
664  001676  120127  000071                  CMPB    R1,#71          ;MUST BE A VALID ASCII NUMBER
665  001702  101362                          BHI     GETNUM          ;ELSE RETRY
```

```
   666  001704  162701  000060                SUB     #60,R1          ;STRIP ASCII CODE
   667  001710  003757                        BLE     GETNUM          ;SHOULDN'T BE ZERO OR NEG
   668                                  ;1ST CHAR IS A VALID DIGIT, 1 THRU 9 - CHECK REST OF STRING
   669  001712  105722                        TSTB    (R2)+           ;2ND CHAR A TERMINATOR?
   670  001714  001423                        BEQ     3$              ;YES - R1 HAS THE FINAL # OF UNITS
   671  001716  105712                        TSTB    (R2)            ;NO - NXT CHAR MUST BE THE TERMINATOR
   672  001720  001353                        BNE     GETNUM          ;ELSE RETRY.
   673  001722  124227  000071                CMPB    -(R2),#71       ;CHECK 2ND CHAR FOR A VALID NUMBER
   674  001726  101350                        BHI     GETNUM
   675  001730  111203                        MOVB    (R2),R3         ;MAKE IT MORE ACCESSIBLE
   676  001732  162703  000060                SUB     #60,R3          ;STRIP ASCII CODE
   677  001736  100744                        BMI     GETNUM          ;SHOULDN'T BE NEGATIVE
   678                                  ;BOTH LOW AND HIGH ORDER DIGITS ARE OK - CONVERT DECIMAL VALUE.
   679  001740  010146                        MOV     R1,-(SP)        ;SAVE IT FOR LATER
   680  001742  006301                        ASL     R1              ;MULT HI ORDER BY 8
   681  001744  006301                        ASL     R1
   682  001746  006301                        ASL     R1
   683  001750  006316                        ASL     (SP)            ;MULTIPLY  IT BY 2
   684  001752  062601                        ADD     (SP)+,R1        ;RESULT IS (HI ORD)*10.
   685  001754  060301                        ADD     R3,R1           ;NOW ADD IN THE LOW ORDER
   686  001756  000402                        BR      3$
   687  001760  012701  000001        1$:     MOV     #1,R1           ;LOAD DEFAULT VALUE HERE
   688                                  ;R1 HAS THE CONVERTED VALUE - COMPARE AGAINST MAX ALLOWED.
   689  001764  020127  000020        3$:     CMP     R1,#D.MXNO      ;TOO BIG?
   690  001770  101327                        BHI     GETNUM          ;YES - RETRY.
   691  001772  010137  001344                MOV     R1,UNITS        ;VALUE OK - STORE RESULT
   692  001776  012737  000100  001362        MOV     #100,DJUUT      ;'PRIME'' UNIT UNDER TEST NUMBER
   693                                  ;
   694  002004  000004  016631        CONFIG: TYPE,   MSGCON          ;TYPE ''STANDARD CONFIG?''
   695  002010  004737  015644                JSR     PC,     READ$   ;READ INPUT FROM TTY
   696  002014  122737  000120  015772        CMPB    #'P,    INPUT   ;CHECK FOR 'P''
   697  002022  001002                        BNE     AAA             ; GO THRU IF NOT PREVIOUS
   698  002024  000137  002344                JMP     QABR            ; BRANCH IF  PREVIOUS
   699  002030  012700  000044        AAA:    MOV     #44,    R0      ;SET UP COUNTER
   700  002034  012701  001200                MOV     #LENGTH,R1      ;POINT TO CHAR LEN TABLE
   701  002040  005021                1$:     CLR     (R1)+           ;PUT CHAR MASK FOR 8 IN CHAR TABLE
   702                                                                 ;AND CLR PARITY TABLE
   703  002042  005300                        DEC     R0              ;COUNT DOWN
   704  002044  001375                        BNE     1$              ;BRANCH IF NOT DONE
   705  002046  105737  015772                TSTB    INPUT           ;CHECK FOR CR
   706  002052  001002                        BNE     SSS             ; GO THRU IF NOT DEFAULT
   707  002054  000137  002344                JMP     QABR            ; BRANCH IF DEFAULT
   708  002060  122737  000131  015772 SSS:    CMPB    #131,   INPUT   ;CHECK FOR 'Y''
   709  002066  001002                        BNE     DDD             ; GO THRU IF NOT DEFAULT
   710  002070  000137  002344                JMP     QABR            ; BRANCH IF DEFAULT
   711  002074  122737  000116  015772 DDD:    CMPB    #116,   INPUT   ;CHECK FOR 'N''
   712  002102  001340                        BNE     CONFIG          ;BRANCH IF ILLEGAL ENTRY
   713  002104  005000                        CLR     R0              ;CLR UNIT COUNTER
   714  002106  005001                        CLR     R1              ;CLR LINE COUNTER
   715  002110  012702  001200                MOV     #LENGTH,R2      ;SET UP POINTER TO CHAR MASK TABLE
   716  002114  012703  001300                MOV     #PARITY,R3      ;SET UP POINTER TO PARITY TABLE
   717  002120  012704  000001                MOV     #1,R4           ;SET UP MARKER
   718  002124  000004  016665        TYPLIN: TYPE,   MSGLIN          ;TYPE ''LINES ''
   719  002130  010105                        MOV     R1,TTY          ;TYPE R1 IN OCTAL
   720  002132  004737  016052                JSR     PC,PRINTS       ;AND SUPRESS LEADING ZERO'S
   721  002136  000004  016676                TYPE,   MSGDAS          ;TYPE A DASH (-)
```

```
002142  062701  000003                  ADD     #3,     R1      ;LAST LINE IN GROUP OF 4
002146  010105                          MOV     R1,TTY          ;TYPE R1 IN OCTAL
002150  004737  016052                  JSR     PC,PRINTS       ;AND SUPRESS LEADING ZERO'S
002154  005201                          INC     R1              ;FIRST LINE NEXT GROUP
002156  000004  016702          GETLEN: TYPE,   MSGLEN          ;TYPE ''CHAR LENGTH:  ''
002162  005037  015770                  CLR     INHRE
002166  004737  015644                  JSR     PC,     READ$   ;READ FROM THE TTY
002172  105737  015772                  TSTB    INPUT           ;CHECK FOR CR (DEFAULT)
002176  001421                          BEQ     GETPAR          ;BRANCH IF DEFAULT
002200  105737  015773                  TSTB    INPUT+1         ;CHECK FOR BAD DATA
002204  001364                          BNE     GETLEN          ;BRANCH IF BAD
002206  162737  000060  015772          SUB     #60,    INPUT   ;CONVERT FROM ASCII
002214  112712  177777                  MOVB    #-1,    (R2)    ;SET UP MASK
002220  106312                  2$:     ASLB    (R2)            ;CLEAR MASK BIT BY BIT
002222  103355                          BCC     GETLEN          ;BAD INPUT, > 8
002224  105337  015772                  DECB    INPUT           ;COUNT
002230  001373                          BNE     2$              ;BRANCH IF NOT DONE
002232  132712  000037                  BITB    #37,    (R2)    ;CHECK FOR 5 CHAR
002236  001347                          BNE     GETLEN          ;BAD INPUT, < 5
002240  005202                          INC     R2              ;INC TO NEXT LINE GROUP
002242  000004  016723          GETPAR: TYPE,   MSGPAR          ;TYPE ''PARITY (NO, ODD, EVEN):
002246  005037  015770                  CLR     INHRE
002252  004737  015644                  JSR     PC,READ$        ;READ INPUT FROM TYY
002256  005737  015772                  TST     INPUT           ;CHECK FOR CR
002262  001415                          BEQ     3$              ;BRANCH IF DEFAULT
002264  122737  000116  015772          CMPB    #116,INPUT      ;CHECK FOR 'N''
002272  001411                          BEQ     3$              ;BRANCH IF 'NO''
002274  122737  000105  015772          CMPB    #105,INPUT      ;CHECK FOR 'E''
002302  001405                          BEQ     3$              ;BRANCH IF 'EVEN''
002304  122737  000117  015772          CMPB    #117,INPUT      ;CHECK FOR 'O''
002312  001353                          BNE     GETPAR          ;BRANCH IF NONE
002314  050413                          BIS     R4,     (R3)    ;SET THE ODD PARITY FLAG
002316  005723                  3$:     TST     (R3)+           ;POINT TO THE NEXT PARITY WORD
002320  032701  000017                  BIT     #17,R1          ;CHECK FOR NEXT UNIT
002324  001277                          BNE     TYPLIN          ;BRANCH IF NOT
002326  012703  001300                  MOV     #PARITY,R3      ;RESET PARITY TABLE POINTER
002332  006304                          ASL     R4              ;FLAG TO NEXT UNIT
002334  005200                          INC     R0              ;COUNT UNITS
002336  020037  001344                  CMP     R0,UNITS        ;CHECK FOR LAST
002342  001270                          BNE     TYPLIN          ;BRANCH IF MORE

                                        ; ROUTINE TO GET BUS  PRIORITIES FOR INDIVIDUAL DJ11S

002344  000004  017051          QABR:   TYPE,   MSBR            ; TYPE QUESTION- BR PRIORITES???
002350  012737  000061  017210          MOV     #61,    DEVNUM  ; LOAD UP INITIAL DEVICE #
002356  012737  000061  017212          MOV     #61,    UNITS1  ; LOAD FIRST UNIT FOR BR QUESTION
002364  010446                          MOV     R4,-(SP)        ; SAVE CONTENTS OF R4
002366  012704  017232                  MOV     #PRTBLE+2,R4    ; SKIPPING FIRST TABLE LOCATION
                                                                ; TO ALLOW ROUTINE BRSET TO WORK
002372  063737  001344  017212          ADD     UNITS,UNITS1    ; LOAD TOTAL UNITS IN UNITS1
002400  000004  017174          DEVNEW: TYPE,   VICE            ; TYPE OUT WORD 'DEVICE''
002404  000004  017210                  TYPE,   DEVNUM          ; TYPE DEVICE NUMBER
002410  000004  000075                  TYPE,   '=              ; TYPE AN EQUAL SIGN
002414  004737  015644                  JSR     PC,READ$        ; GO READ$ IN NUMBER(ASCII)
002420  023727  015772  000060          CMP     INPUT,#60       ; CMP DECIMAL 7 AND BR INPUT VALUE
002426  100415                          BMI     NOGOOD          ; REPORT ERROR
```

SEQ 0022

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778  002430  022737  000067  015772          CMP     #67, INPUT      ; CHECK IF A VALID ENTRY
779  002436  100411                          BMI     NOGOOD          ; REPORT ERROR
780  002440  013724  015772                  MOV     INPUT,(R4)+     ; STORE VALUE OF PRIO
781  002444  005237  017210                  INC     DEVNUM          ; TO NEXT DEVICE # (IN ASCII)
782  002450  023737  017212  017210          CMP     UNITS1,DEVNUM   ; ARE YOU TESTING LAST DEVICE???
783  002456  001350                          BNE     DEVNEW          ; BACK IF MORE DEVICES
784  002460  000403                          BR      AROUND          ; THRU IF ALL DEVICES FINISHED
785  002462  000004  017117          NOGOOD: TYPE,   MSBAD           ; TYPE ERROR IN INPUT VALUE
786  002466  000744                          BR      DEVNEW          ; BACK TO ASK AGAIN
787  002470  012604                  AROUND: MOV (SP)+,      R4      ; RESTORE R4
```

```
                                                    ;ISSUE RESET
002472  000005          RESTAR: RESET
002474  012706  001200          MOV     #STACK, SP      ;SET UP STACK POINTER
002500  005737  001400          TST     FTIME
002504  001410                  BEQ     CLRVEC
002506  022737  000176  001374  CMP     #SWREG, SWR
002514  001004                  BNE     CLRVEC
002516  004737  017604          JSR     PC,     CNTLU
002522  005037  001400          CLR     FTIME
002526  012700  000300  CLRVEC: MOV     #300,R0         ;BEGINNING OF FLOATING VECTORS
002532  005720          1$:     TST     (R0)+
002534  010060  177776          MOV     R0,-2(R0)       ;''+2''
002540  012720  000004          MOV     #IOT,   (R0)+   ;''IOT''
002544  022700  001000          CMP     #1000,R0
002550  001370                  BNE     1$
002552  062737  000010  001320  ADD     #10.,   CSR     ;UPDATE DEVICE ADDRESS TO NEXT UNIT
002560  062737  000010  001330  ADD     #10.,   RCVVEC  ;UPDATE DEVICE VECTOR ADDRESS
002566  062737  000004  001364  ADD     #4.,    DJLEN   ;MOVE CHAR TABLE POINTER
002574  006337  001366          ASL     DJPAR           ;UPDATE PARITY FLAG MARKER
002600  023737  001362  001344  CMP     DJUUT,UNITS
002606  002416                  BLT     2$
002610  005037  001362          CLR     DJUUT
002614  013737  001340  001320  MOV     DEVADR,CSR
002622  013737  001342  001330  MOV     VECADR,RCVVEC
002630  012737  001200  001364  MOV     #LENGTH,DJLEN   ;INIT CHAR TABLE POINTER
002636  012737  000001  001366  MOV     #1,DJPAR        ;INIT PARITY FLAG MARKER
002644  005237  001362  2$:     INC     DJUUT
002650  013701  001320          MOV     CSR,    R1      ;SET UP ALL THE REGISTER ADDRESSES
002654  062701  000002          ADD     #2.,    R1      ;ADD 2
002660  010137  001322          MOV     R1,     RBUF    ;SET UP RECEIVER BUFFER
002664  062701  000002          ADD     #2.,    R1      ;ADD 2
002670  010137  001324          MOV     R1,     TCR     ;SET UP TRANSMITTER CONTROL REG
                                                        ; AND BREAK STATUS REG
002674  062701  000002          ADD     #2.,    R1      ;ADD 2
002700  010137  001326          MOV     R1,     TBUF    ;SET UP TRANSMITTER BUFFER
002704  013701  001330          MOV     RCVVEC, R1      ;POINTER FOR VECTOR SETUP
002710  005721                  TST     (R1)+           ;INC R1
002712  010137  001332          MOV     R1,     RCVLVL  ;SET INT LVL
002716  005721                  TST     (R1)+           ;INC R1
002720  010137  001334          MOV     R1,     XMTVEC  ;TRANSMITTER VECTOR
002724  005721                  TST     (R1)+           ;INC R1
002726  010137  001336          MOV     R1,     XMTLVL  ;XMT INT LVL ADR
002732  005037  001310          CLR     ICNT
002736  005037  015250          CLR     LAD
002742  104400                  SCOPE
```

```
                                ;*****************************************************************
                                ; TEST 1:        TEST ABILITY TO REFERENCE CSR WITHOUT TRAPPING
                                ;                AND ABILITY TO CLR CSR.
                                ;PROBABLE FAULTY LOGIC:  M105; M7285 (D2-6) E29
                                ;*****************************************************************

002744  012737  003002  000004  TST1:   MOV     #1$,    @#4     ;SET UP TIME-OUT TRAP VECTOR
002752  012737  000340  000006          MOV     #LEVEL7,@#6
002760  005777  176334                  TST     @CSR            ;REFERENCE CSR  (READ)
002764  005077  176330                  CLR     @CSR            ;CLEAR CSR      (WRITE)
002770  005577  176324                  ADC     @CSR            ;CHECK CSR      (READ AND WRITE)
002774  001405                          BEQ     2$              ;BRANCH IF OK
002776  104000                          HLT                     ;CSR NOT CLEARED

003000  000403                          BR      2$              ;SKIP ISR

003002  012601                  1$:     MOV     (SP)+,R1        ;SAVE RTI ADR FOR TYPING
003004  104001                          HLT+1                   ;CAN'T REFERENCE CSR!

003006  005726                          TST     (SP)+           ;FINISH CLEARING STACK
003010  012737  000006  000004  2$:     MOV     #6,@#4
003016  005037  000006                  CLR     @#6
003022  104400                          SCOPE

                                ;*****************************************************************
                                ;TEST 2:        TEST THAT CSR BIT1 CAN BE SET AND CLEARED
                                ;PROBABLE FAULTY LOGIC:  M7285 (D2-2) E25,E7, (D2-4) E47,E64
                                ;*****************************************************************

003024  012777  000002  176266  TST2:   MOV     #BIT1,@CSR      ;SET BIT1
003032  032777  000002  176260          BIT     #BIT1,@CSR      ;CHECK THAT BIT1 IS SET
003040  001001                          BNE     .+4             ;BRANCH IF OK
003042  104000                          HLT                     ;CSR BIT1 FAILED TO SET

003044  032777  177775  176246          BIT     #177775,@CSR    ;CHECK THAT NO OTHER BIT SET
003052  001401                          BEQ     .+4             ;BRANCH IF OK
003054  104000                          HLT                     ;EXTRA BIT SET IN CSR

003056  005077  176236                  CLR     @CSR            ;CLEAR BIT1
003062  032777  000002  176230          BIT     #BIT1,@CSR      ;CHECK THAT BIT1 IS CLEARED
003070  001401                          BEQ     .+4             ;BRANCH IF OK
003072  104000                          HLT                     ;CSR BIT1 FAILED TO CLEAR

003074  104400                          SCOPE

                                ;*****************************************************************
                                ;TEST 3:        TEST THAT CSR BIT2 CAN BE SET AND CLEARED
                                ;PROBABLE FAULTY LOGIC:  M7285 (D2-2) E25,E7, (D2-4) E47,E64
                                ;*****************************************************************

003076  012777  000004  176214  TST3:   MOV     #BIT2,@CSR      ;SET BIT2
003104  032777  000004  176206          BIT     #BIT2,@CSR      ;CHECK THAT BIT2 IS SET
003112  001001                          BNE     .+4             ;BRANCH IF OK
003114  104000                          HLT                     ;CSR BIT2 FAILED TO SET
```

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   891  003116  032777  177773  176174          BIT     #177773,@CSR    ;CHECK THAT NO OTHER BIT SET
   892  003124  001401                          BEQ     .+4             ;BRANCH IF OK
   893  003126  104000                          HLT                     ;EXTRA BIT SET IN CSR
   894
   895  003130  005077  176164                  CLR     @CSR            ;CLEAR BIT2
   896  003134  032777  000004  176156          BIT     #BIT2,@CSR      ;CHECK THAT BIT2 IS CLEARED
   897  003142  001401                          BEQ     .+4             ;BRANCH IF OK
   898  003144  104000                          HLT                     ;CSR BIT2 FAILED TO CLEAR
   899
   900  003146  104400                          SCOPE
   901
   902                                  ;******************************************************************************
   903                                  ;TEST 4:        TEST THAT CSR BIT6 CAN BE SET AND CLEARED
   904                                  ;PROBABLE FAULTY LOGIC:  M7285 (D2-2) E4,E18, (D2-4) E47,E64
   905                                  ;******************************************************************************
   906
   907  003150  012777  000100  176142  TST4:   MOV     #BIT6,@CSR      ;SET BIT6
   908  003156  032777  000100  176134          BIT     #BIT6,@CSR      ;CHECK THAT BIT6 IS SET
   909  003164  001001                          BNE     .+4             ;BRANCH IF OK
   910  003166  104000                          HLT                     ;CSR BIT6 FAILED TO SET
   911
   912  003170  032777  177677  176122          BIT     #177677,@CSR    ;CHECK THAT NO OTHER BIT SET
   913  003176  001401                          BEQ     .+4             ;BRANCH IF OK
   914  003200  104000                          HLT                     ;EXTRA BIT SET IN CSR
   915
   916  003202  005077  176112                  CLR     @CSR            ;CLEAR BIT6
   917  003206  032777  000100  176104          BIT     #BIT6,@CSR      ;CHECK THAT BIT6 IS CLEARED
   918  003214  001401                          BEQ     .+4             ;BRANCH IF OK
   919  003216  104000                          HLT                     ;CSR BIT6 FAILED TO CLEAR
   920
   921  003220  104400                          SCOPE
   922
   923                                  ;******************************************************************************
   924                                  ;TEST 5:        TEST THAT CSR BIT8 CAN BE SET AND CLEARED
   925                                  ;PROBABLE FAULTY LOGIC:  M7285 (D2-2) E6,E18, (D2-4) E47,E31
   926                                  ;******************************************************************************
   927
   928  003222  012777  000400  176070  TST5:   MOV     #BIT8,@CSR      ;SET BIT8
   929  003230  032777  000400  176062          BIT     #BIT8,@CSR      ;CHECK THAT BIT8 IS SET
   930  003236  001001                          BNE     .+4             ;BRANCH IF OK
   931  003240  104000                          HLT                     ;CSR BIT8 FAILED TO SET
   932
   933  003242  032777  177377  176050          BIT     #177377,@CSR    ;CHECK THAT NO OTHER BIT SET
   934  003250  001401                          BEQ     .+4             ;BRANCH IF OK
   935  003252  104000                          HLT                     ;EXTRA BIT SET IN CSR
   936
   937  003254  005077  176040                  CLR     @CSR            ;CLEAR BIT8
   938  003260  032777  000400  176032          BIT     #BIT8,@CSR      ;CHECK THAT BIT8 IS CLEARED
   939  003266  001401                          BEQ     .+4             ;BRANCH IF OK
   940  003270  104000                          HLT                     ;CSR BIT8 FAILED TO CLEAR
   941
   942  003272  104400                          SCOPE
   943
   944
   945                                  ;******************************************************************************
   946                                  ;TEST 6:        TEST THAT CSR BIT10 CAN BE SET AND CLEARED
                                        ;PROBABLE FAULTY LOGIC:  M7285 (D2-2) E30,E24, (D2-4) E47,E31
```

```
                                ;*****************************************************************************
                                ;*****************************************************************************
003274  012777  002000  176016 TST6:   MOV     #BIT10,@CSR     ;SET BIT10
003302  032777  002000  176010         BIT     #BIT10,@CSR     ;CHECK THAT BIT10 IS SET
003310  001001                        BNE     .+4             ;BRANCH IF OK
003312  104000                        HLT                     ;CSR BIT10 FAILED TO SET

003314  032777  175777  175776         BIT     #175777,@CSR    ;CHECK THAT NO OTHER BIT SET
003322  001401                        BEQ     .+4             ;BRANCH IF OK
003324  104000                        HLT                     ;EXTRA BIT SET IN CSR

003326  005077  175766                CLR     @CSR            ;CLEAR BIT10
003332  032777  002000  175760         BIT     #BIT10,@CSR     ;CHECK THAT BIT10 IS CLEARED
003340  001401                        BEQ     .+4             ;BRANCH IF OK
003342  104000                        HLT                     ;CSR BIT10 FAILED TO CLEAR

003344  104400                        SCOPE

                                ;*****************************************************************************
                                ;TEST 7:        TEST THAT CSR BIT12 CAN BE SET AND CLEARED
                                ;PROBABLE FAULTY LOGIC:  M7285 (D2-2) E5,E1, (D2-4) E47,E31
                                ;*****************************************************************************

003346  012777  010000  175744 TST7:   MOV     #BIT12,@CSR     ;SET BIT12
003354  032777  010000  175736         BIT     #BIT12,@CSR     ;CHECK THAT BIT12 IS SET
003362  001001                        BNE     .+4             ;BRANCH IF OK
003364  104000                        HLT                     ;CSR BIT12 FAILED TO SET

003366  032777  167777  175724         BIT     #167777,@CSR    ;CHECK THAT NO OTHER BIT SET
003374  001401                        BEQ     .+4             ;BRANCH IF OK
003376  104000                        HLT                     ;EXTRA BIT SET IN CSR

003400  005077  175714                CLR     @CSR            ;CLEAR BIT12
003404  032777  010000  175706         BIT     #BIT12,@CSR     ;CHECK THAT BIT12 IS CLEARED
003412  001401                        BEQ     .+4             ;BRANCH IF OK
003414  104000                        HLT                     ;CSR BIT12 FAILED TO CLEAR

003416  104400                        SCOPE

                                ;*****************************************************************************
                                ;TEST 10:       TEST THAT CSR BIT14 CAN BE SET AND CLEARED
                                ;PROBABLE FAULTY LOGIC:  M7285 (D2-2) E3,E1, (D2-4) E47,E31
                                ;*****************************************************************************

003420  012777  040000  175672 TST10:  MOV     #BIT14,@CSR     ;SET BIT14
003426  032777  040000  175664         BIT     #BIT14,@CSR     ;CHECK THAT BIT14 IS SET
003434  001001                        BNE     .+4             ;BRANCH IF OK
003436  104000                        HLT                     ;CSR BIT14 FAILED TO SET

003440  032777  137777  175652         BIT     #137777,@CSR    ;CHECK THAT NO OTHER BIT SET
003446  001401                        BEQ     .+4             ;BRANCH IF OK
003450  104000                        HLT                     ;EXTRA BIT SET IN CSR

003452  005077  175642                CLR     @CSR            ;CLEAR BIT14
003456  032777  040000  175634         BIT     #BIT14,@CSR     ;CHECK THAT BIT14 IS CLEARED
003464  001401                        BEQ     .+4             ;BRANCH IF OK
```

```
1003  003466  104000                          HLT                     ;CSR BIT14 FAILED TO CLEAR
1004
1005  003470  104400                          SCOPE
1006
1007                                  ;*************************************************************************
1008                                  ;TEST 11:       TEST THAT RECEIVER ENABLE (BIT0 OF THE CSR) CAN BE SET
1009                                  ;                 AND CLEARED, AND THAT CLEAR MOS (BIT3) IS WRITE ONLY.
1010                                  ;PROBABLE FAULTY LOGIC:  M7285 (D2-2) E26,E36,E7,E24, (D2-8) E17,E14,E15
1011                                  ;*************************************************************************
1012
1013  003472  012777  000004  175620  TST11:  MOV     #BIT2,  @CSR    ;SET MAINTENANCE MODE (BIT2)
1014  003500  005005                          CLR     R5              ;SET UP COUNTER
1015  003502  052777  000010  175610          BIS     #BIT3,  @CSR    ;SET CLEAR MOS (BIT3)
1016  003510  017701  175604          1$:     MOV     @CSR,   R1      ;SAVE CSR
1017  003514  032701  000010                  BIT     #BIT3,  R1      ;CHECK CLEAR MOS (BIT3)
1018  003520  001401                          BEQ     .+4             ;BRANCH IF OK
1019  003522  104001                          HLT+1                   ;CLEAR MOS (BIT3) SET (WRITE-ONLY)
1020                                                                  ;R1 = CONTENTS OF CSR
1021  003524  032701  000020                  BIT     #BIT4,  R1      ;CHECK CLEAR MOS FLAG
1022  003530  001403                          BEQ     2$              ;BRANCH IF CLEARED
1023  003532  105305                          DECB    R5              ;WAIT FOR MOS TO CLEAR
1024  003534  001365                          BNE     1$              ;BRANCH IF MORE TIME
1025  003536  104001                          HLT+1                   ;CLEAR MOS FLAG (BIT4) FAILED TO CLEAR
1026                                                                  ;R1 = CONTENTS OF CSR
1027  003540  022701  000004          2$:     CMP     #BIT2,  R1      ;CHECK THAT ONLY MAINTENANCE BIT SET
1028  003544  001401                          BEQ     .+4             ;BRANCH IF OK
1029  003546  104001                          HLT+1                   ;CLEAR MOS CLEARED MAINTENANCE
1030                                                                  ; OR SET OTHER CSR BITS
1031                                                                  ;R1 = CONTENTS OF CSR
1032  003550  052777  000001  175542          BIS     #BIT0,  @CSR    ;SET RECEIVER ENABLE
1033  003556  017701  175536                  MOV     @CSR,   R1      ;SAVE CSR
1034  003562  032777  000001  175530          BIT     #BIT0,  @CSR    ;CHECK THAT RECEIVER ENABLE SET
1035  003570  001001                          BNE     .+4             ;BRANCH IF OK
1036  003572  104001                          HLT+1                   ;RECEIVER ENABLE FAILED TO SET
1037                                                                  ;R1 = CONTENTS OF CSR
1038  003574  022777  000005  175516          CMP     #5,     @CSR    ;CHECK REST OF CSR
1039  003602  001401                          BEQ     .+4             ;BRANCH IF OK
1040  003604  104001                          HLT+1                   ;CSR ERROR
1041                                                                  ;R1 = CONTENTS OF CSR
1042                                  ;NOTE:  IF THE TTY MODULE IS BEING USED AND DONE (BIT7) IS SET,
1043                                  ;       THE ERROR COULD BE DUE TO MAINTENANCE OR CLEAR MOS NOT WORKING.
1044  003606  042777  000001  175504          BIC     #BIT0,  @CSR    ;CLEAR RECEIVER ENABLE
1045  003614  017701  175500                  MOV     @CSR,   R1      ;SAVE CSR
1046  003620  022777  000004  175472          CMP     #BIT2,  @CSR    ;CHECK CSR
1047  003626  001401                          BEQ     .+4             ;BRANCH IF OK
1048  003630  104001                          HLT+1                   ;RECEIVER ENABLE DIDN'T CLEAR
1049                                                                  ; OR OTHER CSR BIT SET
1050                                                                  ;R1 = CONTENTS OF CSR
1051
1052  003632  104400                          SCOPE
1053
1054                                  ;*************************************************************************
1055                                  ; TEST 12:      TEST THAT CSR RESPONDS PROPERLY TO BYTE COMMANDS
1056                                  ;PROBABLE FAULTY LOGIC:  M7285 (D2-4) E47
1057                                  ;*************************************************************************
1058
```

```
1059  003634  012777  052506  175456  TST12:  MOV     #052506,@CSR    ;SET TEST NUMBER IN CSR
1060  003642  105077  175452                  CLRB    @CSR            ;CLR EVEN BYTE
1061  003646  017701  175446                  MOV     @CSR,   R1      ;SAVE CSR
1062  003652  022701  052400                  CMP     #052400,R1      ;CHECK CSR
1063  003656  001401                          BEQ     .+4             ;BRANCH IF OK
1064  003660  104001                          HLT+1                   ;EVEN BYTE CLR FAILED ON CSR
1065                                                                   ;R1 = CONTENTS OF CSR
1066  003662  012777  052506  175430          MOV     #052506,@CSR    ;SET TEST NUMBER IN CSR
1067  003670  005237  001320                  INC     CSR             ;INC TO ODD BYTE
1068  003674  105077  175420                  CLRB    @CSR            ;CLR ODD BYTE
1069  003700  005337  001320                  DEC     CSR             ;RESTORE TO EVEN
1070  003704  017701  175410                  MOV     @CSR,   R1      ;SAVE CSR
1071  003710  022701  000106                  CMP     #000106,R1      ;CHECK CSR
1072  003714  001401                          BEQ     .+4             ;BRANCH IF OK
1073  003716  104001                          HLT+1                   ;ODD BYTE CLR FAILED ON CSR
1074                                                                   ;R1 = CONTENTS OF CSR
1075
1076  003720  104400                          SCOPE
1077
1078                                  ;*****************************************************************************
1079                                  ;TEST 13:       TEST THAT THE BIS AND BIC INSTRUCTIONS SET AND CLEAR R/W
1080                                  ;               BITS OF CSR
1081                                  ;PROBABLE FAULTY LOGIC:  M7285 (D2-4) E47
1082                                  ;*****************************************************************************
1083
1084  003722  005077  175372  TST13:  CLR     @CSR            ;CLEAR THE CSR
1085  003726  017701  175366          MOV     @CSR,   R1      ;CHECK AND SAVE CSR
1086  003732  001401                  BEQ     .+4             ;BRANCH IF CLEARED OK
1087  003734  104001                  HLT+1                   ;RESET FAILED TO CLR CSR
1088
1089  003736  052777  052506  175354  BIS     #052506,        @CSR    ;SET ALL R/W BITS OF CSR
1090  003744  022777  052506  175346  CMP     #052506,        @CSR    ;CHECK THAT THEY GOT SET
1091  003752  001401                  BEQ     .+4             ;BRANCH IF OK
1092  003754  104000                  HLT                     ;REG FAILED CMP
1093
1094  003756  042777  052506  175334  BIC     #052506,        @CSR    ;CLEAR CSR
1095  003764  017701  175330          MOV     @CSR,   R1      ;CHECK AND SAVE CSR
1096  003770  001401                  BEQ     .+4             ;BRANCH IF CLEARED OK
1097  003772  104001                  HLT+1                   ;CLR FAILED TO CLR CSR
1098
1099  003774  104400                  SCOPE
1100
1101                                  ;*****************************************************************************
1102                                  ;TEST 14:       TEST BITS OF TCR FOR READ/WRITE CAPABILITY
1103                                  ;PROBABLE FAULTY LOGIC:  M7285 (D2-2) ALL, (D2-3) E8,E20,E21,E43,E41
1104                                  ;*****************************************************************************
1105
1106  003776  012777  177777  175320  TST14:  MOV     #177777,@TCR    ;SET ALL BITS OF TCR
1107  004004  017701  175314                  MOV     @TCR,   R1      ;CHECK AND SAVE TCR
1108  004010  022701  177777                  CMP     #177777,R1      ;CHECK THAT ALL THE BITS ARE SET
1109  004014  001401                          BEQ     .+4             ;BRANCH IF OK
1110  004016  104001                          HLT+1                   ;BIT(S) OF TCR FAILED TO SET
1111
1112  004020  005077  175300                  CLR     @TCR            ;CLEAR TCR
1113  004024  017701  175274                  MOV     @TCR,   R1      ;CHECK THAT IT CLEARED AND SAVE
1114  004030  001401                          BEQ     .+4             ;BRANCH IF CLR
```

```
1115  004032  104001                          HLT+1                   ;BIT(S) OF TCR FAILED TO CLEAR
1116
1117  004034  104400                          SCOPE
1118
1119                                  ;*************************************************************************
1120                                  ; TEST 15:      TEST THAT TCR RESPONDS PROPERLY TO BYTE COMMANDS
1121                                  ;PROBABLE FAULTY LOGIC:  M7285 (D2-3) E41
1122                                  ;*************************************************************************
1123
1124  004036  012777  177777  175260  TST15:  MOV     #177777,@TCR    ;SET TEST NUMBER IN TCR
1125  004044  105077  175254                  CLRB    @TCR            ;CLR EVEN BYTE
1126  004050  017701  175250                  MOV     @TCR,   R1      ;SAVE TCR
1127  004054  022701  177400                  CMP     #177400,R1      ;CHECK TCR
1128  004060  001401                          BEQ     .+4             ;BRANCH IF OK
1129  004062  104001                          HLT+1                   ;EVEN BYTE CLR FAILED ON TCR
1130                                                                  ;R1 = CONTENTS OF TCR
1131  004064  012777  177777  175232          MOV     #177777,@TCR    ;SET TEST NUMBER IN TCR
1132  004072  005237  001324                  INC     TCR             ;INC TO ODD BYTE
1133  004076  105077  175222                  CLRB    @TCR            ;CLR ODD BYTE
1134  004102  005337  001324                  DEC     TCR             ;RESTORE TO EVEN
1135  004106  017701  175212                  MOV     @TCR,   R1      ;SAVE TCR
1136  004112  022701  000377                  CMP     #000377,R1      ;CHECK TCR
1137  004116  001401                          BEQ     .+4             ;BRANCH IF OK
1138  004120  104001                          HLT+1                   ;ODD BYTE CLR FAILED ON TCR
1139                                                                  ;R1 = CONTENTS OF TCR
1140
1141  004122  104400                          SCOPE
1142
1143                                  ;*************************************************************************
1144                                  ;TEST 16:       TEST THAT THE BIS AND BIC INSTRUCTIONS SET AND CLEAR R/W
1145                                  ;               BITS OF TCR
1146                                  ;PROBABLE FAULTY LOGIC:  M7285 (D2-3) E41
1147                                  ;*************************************************************************
1148
1149  004124  005077  175174          TST16:  CLR     @TCR            ;CLEAR THE TCR
1150  004130  017701  175170                  MOV     @TCR,   R1      ;CHECK AND SAVE TCR
1151  004134  001401                          BEQ     .+4             ;BRANCH IF CLEARED OK
1152  004136  104001                          HLT+1                   ;RESET FAILED TO CLR TCR
1153
1154  004140  052777  177777  175156          BIS     #177777,        @TCR    ;SET ALL R/W BITS OF TCR
1155  004146  022777  177777  175150          CMP     #177777,        @TCR    ;CHECK THAT THEY GOT SET
1156  004154  001401                          BEQ     .+4             ;BRANCH IF OK
1157  004156  104000                          HLT                     ;REG FAILED CMP
1158
1159  004160  042777  177777  175136          BIC     #177777,        @TCR    ;CLEAR TCR
1160  004166  017701  175132                  MOV     @TCR,   R1      ;CHECK AND SAVE TCR
1161  004172  001401                          BEQ     .+4             ;BRANCH IF CLEARED OK
1162  004174  104001                          HLT+1                   ;CLR FAILED TO CLR TCR
1163
1164  004176  104400                          SCOPE
1165  004200  012737  000001  001346          MOV     #1,     TIMER   ;INITIALIZE TIMER
1166  004206  012737  004214  015250          MOV     #.+6,   LAD     ;RESET LOOP ADDRESS
1167
1168                                  ;*************************************************************************
1169                                  ;TEST 17:       TEST THAT TRANSMIT READY (BIT15 OF CSR) SETS AND CLEARS
1170                                  ;                 WHEN TCRO IS SET AND CLEARED.
```

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1171                                    ;                ALSO CHECK THAT THE RIGHT LINE NO. (0) APPEARS IN TBUFF.
1172                                    ;PROBABLE FAULTY LOGIC:  M7285 (D2-5) ALL, (D2-6) E23, E32, E33, E49, (D2-2) E3, E1
1173                                    ;*****************************************************************************
1174
1175  004214  012777  000400  175076  TST17:  MOV     #400,   @CSR    ;SET XMTR SCAN ENABLE
1176  004222  052777  000001  175074           BIS     #BIT0,  @TCR    ;SET XMTR CONTROL BIT, LINE 0
1177  004230  005000                           CLR     R0              ;SET UP WAIT COUNTER
1178  004232  017701  175062          1$:     MOV     @CSR,   R1      ;CHECK AND SAVE XMTR READY
1179  004236  100404                           BMI     2$              ;BRANCH IF SET OK
1180  004240  005200                           INC     R0              ;WAIT A WHILE
1181  004242  001373                           BNE     1$
1182  004244  104001                           HLT+1                   ;XMTR READY FAILED TO SET
1183
1184  004246  000416                           BR      3$              ;SKIP LINE # CHECK ON ERROR
1185
1186  004250  050037  001346          2$:     BIS     R0,     TIMEP   ;SET UP TIMER
1187  004254  017701  175046                   MOV     @TBUF,  R1      ;SAVE LINE NUMBER
1188  004260  105001                           CLRB    R1
1189  004262  000301                           SWAB    R1
1190  004264  022701  000000                   CMP     #0,     R1      ;CHECK THAT THE XMTR STOPPED ON LINE 0
1191  004270  001401                           BEQ     .+4             ;BRANCH IF OK
1192  004272  104001                           HLT+1                   ;WRONG LINE NUMBER APPEARED IN TBUF
1193
1194  004274  017702  175020                   MOV     @CSR,   R2      ;CHECK AND SAVE XMTR READY
1195  004300  100401                           BMI     .+4             ;BRANCH IF OK
1196  004302  104002                           HLT+2                   ;READING THE TBUF CLEARED XMTR READY
1197
1198  004304  042777  000001  175012  3$:     BIC     #BIT0,  @TCR    ;CLR XMTR CONTROL BIT, LINE 0
1199  004312  017701  175002                   MOV     @CSR,   R1      ;CHECK AND SAVE XMTR READY
1200  004316  100001                           BPL     .+4             ;BRANCH IF OK
1201  004320  104001                           HLT+1                   ;XMTR READY FAILED TO CLEAR WHEN
1202                                                                    ;   XMTR CONTROL FOR LINE 0 WAS CLEARED
1203
1204  004322  104400                   SCOPE
1205
1206
1207                                    ;*****************************************************************************
1208                                    ;TEST 20:        TEST THAT TRANSMIT READY (BIT15 OF CSR) SETS AND CLEARS
1209                                    ;                  WHEN EACH TCR BIT IS SET AND CLEARED.
1210                                    ;                ALSO CHECK THAT THE RIGHT LINE NO.  APPEARS IN TBUFF.
1211                                    ;PROBABLE FAULTY LOGIC:  M7285 (D2-5) ALL, (D2-6) E23, E32, E33, E49, (D2-2) E3, E1
1212                                    ;*****************************************************************************
1213
1214  004324  012777  000400  174766  TST20:  MOV     #400,   @CSR    ;SET XMTR SCAN ENABLE
1215  004332  005001                           CLR     R1
1216  004334  012704  000001                   MOV     #1,     R4      ;SET UP MARKER
1217  004340  050477  174760          4$:     BIS     R4,     @TCR    ;SET XMTR CONTROL BIT, EACH LINE
1218  004344  005000                           CLR     R0              ;SET UP WAIT COUNTER
1219  004346  017702  174746          1$:     MOV     @CSR,   R2      ;CHECK AND SAVE XMTR READY
1220  004352  100404                           BMI     2$              ;BRANCH IF SET OK
1221  004354  005300                           DEC     R0              ;WAIT A WHILE
1222  004356  001373                           BNE     1$
1223  004360  104002                           HLT+2                   ;XMTR READY FAILED TO SET
1224                                                                    ;R1=LINE #
1225                                                                    ;R2=CSR
1226
```

```
1227  004362  000414                        BR      3$              ;SKIP LINE # CHECK ON ERROR
1228
1229  004364  050037  001346        2$:     BIS     R0,     TIMER   ;SET UP TIMER
1230  004370  017702  174732                MOV     @TBUF,  R2      ;SAVE LINE NUMBER
1231  004374  000302                        SWAB    R2
1232  004376  020201                        CMP     R2,     R1      ;CHECK THAT THE XMTR STOPPED ON RIGHT LINE
1233  004400  001401                        BEQ     .+4             ;BRANCH IF OK
1234  004402  104002                        HLT+2                   ;WRONG LINE NUMBER APPEARED IN TBUF
1235                                                                ;R1=LINE #(SHOULD BE)
1236                                                                ;R2=LINE # (TBUF)
1237
1238
1239  004404  017703  174710                MOV     @CSR,   R3      ;CHECK AND SAVE XMTR READY
1240  004410  100401                        BMI     .+4             ;BRANCH IF OK
1241  004412  104003                        HLT+3                   ;READING THE TBUF CLEARED XMTR READY
1242
1243  004414  040477  174704        3$:     BIC     R4,     @TCR    ;CLR XMTR CONTROL BIT, EACH LINE
1244  004420  017702  174674                MOV     @CSR,   R2      ;CHECK AND SAVE XMTR READY
1245  004424  100001                        BPL     .+4             ;BRANCH IF OK
1246  004426  104002                        HLT+2                   ;XMTR READY FAILED TO CLEAR WHEN
1247                                                                ;    XMTR CONTROL FOR LINE .LINE WAS CLEARED
1248                                                                ;R1 = LINE #
1249                                                                ;R2 = CONTENTS OF CSR
1250
1251  004430  005201                        INC     R1              ;INC LINE COUNTER TO NEXT LINE
1252  004432  006304                        ASL     R4              ;SHIFT MARKER TO NEXT LINE
1253  004434  103341                        BCC     4$              ;BRANCH IF NOT LAST LINE
1254
1255  004436  104400                        SCOPE
1256
1257
1258                                ;*****************************************************************************
1259                                ;TEST 21:       TEST THAT MASTER TRANSMIT SCAN ENABLE (CSR BIT 8) ON A 0
1260                                ;                DISABLES TRANSMITTER READY (CSR BIT 15)
1261                                ;                WHEN TCR BIT, LINE 0 IS SET.
1262                                ;PROBABLE FAULTY LOGIC:  M7285 (D2-6) E49,E23,E32,E33
1263                                ;*****************************************************************************
1264
1265  004440  005077  174654        TST21:  CLR     @CSR            ;CLEAR CONTROL STATUS
1266  004444  052777  000001  174652        BIS     #BIT0,@TCR      ;SET XMTR CONTROL BIT, LINE 0
1267  004452  013700  001346                MOV     TIMER,R0        ;GET TIMER FROM PREVIOUS TEST
1268  004456  017701  174636        1$:     MOV     @CSR,R1         ;CHECK AND SAVE XMTR READY
1269  004462  100002                        BPL     2$              ;BRANCH IF NOT SET
1270  004464  104001                        HLT+1                   ;XMTR READY SET WITHOUT
1271  004466  000402                        BR      3$              ;MASTER TRANS SCAN ENABLE
1272  004470  005300                2$:     DEC     R0              ;WAIT A WHILE
1273  004472  001371                        BNE     1$              ;AND CHECK AGAIN
1274
1275  004474  052777  000400  174616  3$:     BIS     #400,@CSR       ;SET MASTER TRAN SCAN ENABLE
1276  004502  005000                        CLR     R0
1277  004504  017701  174610        4$:     MOV     @CSR,   R1      ;CHECK AND SAVE XMTR READY
1278  004510  100403                        BMI     5$
1279  004512  005200                        INC     R0
1280  004514  001373                        BNE     4$
1281  004516  104001                        HLT+1                   ;TRAN READY NEVER CAME UP
1282                                                                ;TCR BIT WAS SET FIRST
```

```
1283
1284  004520  042777  000001  174576  5$:     BIC     #BIT0,  @TCR    ;THEN MASTER TRAN SCAN ENABLE
1285  004526  017701  174566                  MOV     @CSR,   R1      ;CLEAR IT OUT
1286  004532  100001                          BPL     .+4             ;CHECK AND SAVE TRAN READY
1287  004534  104001                          HLT+1                   ;BRANCH IF OK
1288                                                                  ;TRAN READY DIDN'T CLEAR.
1289  004536  104400                          SCOPE
1290
1291
1292                                  ;*************************************************************************
1293                                  ;TEST 22:       TEST  TRANSMIT INTERRUPT LEVEL
1294
1295                                  ;               THIS TESTS ALL INTERRUPT LEVELS. THIS TEST WILL
1296                                  ;       TEST ALL DEVICES WHICH ARE SPECIFIED DURING QUESTIONING.
1297
1298                                  ;       ERROR PRINT OUT IS AS FOLLOWS::::
1299                                  ;       ADDR  DJADR  R0 R1
1300
1301                                  ;       ADDR=  ADDRESS OF ERROR HLT
1302                                  ;       DJADR= CSR ADDRESS OF DJ11 UNDER TEST
1303                                  ;       R1= BR LEVEL FOR DJ11 TO ALLOW INTR
1304                                  ;       R2= BR LEVEL WHERE ERROR OCCURED
1305
1306                                  ;PROBABLE FAULTY LOGIC:  M7821 WIRING, PROPER PRIORITY CHIP
1307                                  ;*************************************************************************
1308
1309  004540  012777  004656  174566  TST22:  MOV     #INTR1,@XMTVEC  ; SET UP XMTR INTERRUPT VECTOR
1310  004546  012777  000340  174562          MOV     #340,@XMTLVL    ; AT LEVEL 7
1311  004554  012737  000010  017214          MOV     #10,PRIOLO      ; LOAD BR7+1 INTO BR TEST LEVEL
1312  004562  012737  000005  017226  AGAIN1: MOV      #5,CT          ; LOADS COUNTER 5 ROL -BR PRIOT
1313  004570  005337  017214                  DEC     PRIOLO          ; START TEST BR7, THEN BR6,BR5...ETC.
1314  004574  013737  017214  017216          MOV     PRIOLO,NOW      ; LOAD PRE-ROL-ED DECIMAL PRIO
1315  004602  004737  014464                  JSR     PC,     BRSET   ; GO TO SUBROUTINE TO ::::::
1316                                                                  ; LOAD BR INTR LEVEL OF DJ11
1317                                                                  ; (LEVEL)= DECIMAL #(0 TO 7)
1318                                                                  ; (MASK)= OCTAL #(0 TO 340)
1319                                                                  ; (0,40,100,140,200,240,300,340)
1320                                                                  ; (NOW)= OCTAL #(0 TO 340) AS
1321                                                                  ; MASK, BUT  CURRENTLY TESTING
1322  004606  042737  000340  177776          BIC     #340,@#PS       ; CLEAR PS LEVEL
1323  004614  053737  017216  177776          BIS     NOW,@#PS        ; SET PS TO  CURRENT TEST LEVEL
1324  004622  012777  040400  174470          MOV     #040400,@CSR    ; SET TRAN MASTER INT. ENABLE
1325  004630  012777  000001  174466          MOV     #BIT0,  @TCR    ; SET TRAN CONTROL BIT, LINE 0
1326  004636  017701  174456          WAIT1:  MOV     @CSR,   R1      ; WAIT
1327  004642  100375                          BPL     WAIT1
1328
1329  004644                          NINTR1: ;
1330                                          ;IF YOU ARE HERE NO INTR OCCURED
1331                                          ;
1332  004644  023737  017216  017220          CMP     NOW,MASK        ; IS THIS AN ERROR?????
1333  004652  002407                          BLT     ERROR1          ; BRANCH IF YES
1334  004654  000417                          BR      THRU1           ; IF NO,GO ON TO NEXT BR
1335
1336  004656                          INTR1:;
1337                                  ;IF YOU ARE HERE AN INTR OCCURED
1338
```

```
1339  004656  022626                          CMP     (SP)+,(SP)+     ; CLEAN UP THE STACK
1340  004660  023737  017216  017220          CMP     NOW,MASK        ; IS THIS AN ERROR?????
1341  004666  002001                          BGE     ERROR1          ; BRANCH IF ERROR
1342  004670  000411                          BR      THRU1           ; IF NO,SEE IF ALL BR LEVELS TESTED
1343
1344  004672                          ERROR1: ; IF YOU ARE HERE , THEN SOMETHING IS WRONG
1345                                          ;                ERROR!!!!!!!!!
1346
1347  004672  010146                          MOV     R1,-(6)         ;PUSH R1 ON STACK
1348  004674  010246                          MOV     R2,-(6)         ;PUSH R2 ON STACK
1349
1350  004676  013701  017220                  MOV MASK,       R1      ; R1=BR LEVEL ALLOWED
1351                                                                  ; (BR BITS OF PSW)
1352  004702  013702  017216                  MOV NOW,        R2      ; R2=BR LEVEL OF ERROR
1353                                                                  ; (BR BITS OF PSW)
1354
1355  004706  104002                          HLT+2                   ; REPORT ERROR+ REG. 1,2
1356
1357  004710  012602                          MOV     (6)+,R2         ;POP STACK INTO R2
1358  004712  012601                          MOV     (6)+,R1         ;POP STACK INTO R1
1359
1360  004714                          THRU1:
1361  004714  005077  174404                  CLR     @TCR
1362  004720  005077  174374                  CLR     @CSR
1363  004724  005737  017216                  TST     NOW             ; TEST IF LAST BR WAS CHECKED
1364  004730  001314                          BNE     AGAIN1          ; BACK TO TEST NEXT INTR LOWER
1365                                                                  ; (NOW) = 0
1366
1367  004732  013777  001336  174374  END22:  MOV     XMTLVL,@XMTVEC  ; RELOAD AND CLEAN UP
1368  004740  012777  000004  174370          MOV     #IOT,   @XMTLVL
1369  004746  042737  000340  177776          BIC     #340,@#PS
1370
1371  004754  104400                          SCOPE
1372
1373  004756  005037  001346                  CLR     TIMER           ;INITIALIZE TIMER
1374  004762  012737  004770  015250          MOV     #.+6,   LAD     ;RESET LOOP ADDRESS
1375
1376                                  ;*******************************************************************************
1377                                  ;TEST 23:       TEST THAT LINE 0 CAN TRANSMIT AND
1378                                  ;               RECEIVE A CHARACTER. (377)
1379                                  ;       1$:  CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
1380                                  ;       3$:  CHECKS THAT NO ERRORS IN FI/FO
1381                                  ;       4$:  CHECKS THAT RIGHT LINE # (0) IN FI/FO
1382                                  ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
1383                                  ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
1384                                  ;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
1385                                  ;       8$:  CHECKS THAT DONE CLEARS
1386                                  ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
1387                                  ;*******************************************************************************
1388
1389                                  ;               INITIALIZE
1390                                  ;       DEVICE''CSR'REGISTER
1391                                  ;                                       SET:
1392  004770  004737  014600          TST23:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
1393                                                                  ;BIT3 = CLEAR MOS
1394                                                                  ;BIT8 = MASTER XMTR SCAN ENB
```

```
                                        ;WAIT FOR MOS TO CLEAR
                                        ;                                SET:
                                        ;                                ;BIT0 = RECEIVER ENABLE
                                        ;
004774  052777  000001  174322          BIS     #BIT0,  @TCR     ;SET XMTR CONTROL BIT, LINE 0
005002  017701  174312          LOP23:  MOV     @CSR,   R1       ;WAIT FOR XMTR READY
005006  100375                          BPL     LOP23
005010  012777  000377  174310          MOV     #377,   @TBUF    ;SEND A RUBOUT
005016  005000                          CLR     R0               ;CLEAR COUNTER
005020  105305                  1$:     DECB    R5               ;SHORT WAIT LOOP
005022  001376                          BNE     1$
005024  017701  174272                  MOV     @RBUF,R1         ;WAIT FOR CHAR. PRES.
005030  100405                          BMI     3$               ;BRANCH WHEN FOUND
005032  005200                          INC     R0               ;TIME COUNTER
005034  001371                          BNE     1$               ;BRANCH IF NOT TIME-OUT
005036  017702  174256                  MOV     @CSR,   R2       ;SAVE CSR
005042  104002                          HLT+2                    ;CHARACTER READY DIDN'T SET
                                                                 ;R1 = CONTENTS OF RBUF
                                                                 ;R2 = CONTENTS OF CSR
005044  050037  001346          3$:     BIS     R0,TIMER         ;SAVE THE TIMER
005050  032701  070000                  BIT     #70000, R1       ;CHECK FOR ERROR BITS
005054  001401                          BEQ     .+4              ;BRANCH IF NONE
005056  104001                          HLT+1                    ;ERROR IN RECEIVED CHAR
                                                                 ;R1 = CONTENTS OF RBUF
                                                                 ;BIT14=UART OVERRUN
                                                                 ;BIT13=FRAMING ERROR
                                                                 ;BIT12=PARITY ERROR
005060  010102                  4$:     MOV     R1,     R2       ;DUPLICATE DATA WORD
005062  042702  170377                  BIC     #170377,R2       ;MASK LINE#
005066  000302                          SWAB    R2               ;LINE # IN LOW BYTE
005070  122702  000000                  CMPB    #0,     R2       ;CHECK LINE #
005074  001401                          BEQ     .+4              ;BRANCH IF OK
005076  104001                          HLT+1                    ;WRONG LINE # RECEIVED
                                                                 ;R1 = CONTENTS OF RBUF
                                                                 ;BITS8-11 = LINE #
005100  117702  174260          5$:     MOVB    @DJLEN, R2       ;GET MASK OF CHARACTER
005104  130201                          BITB    R2,     R1       ;CHECK CHAR LENGTH.
005106  001401                          BEQ     .+4              ;BRANCH IF OK
005110  104002                          HLT+2                    ;WRONG CHARACTER LENGTH
                                                                 ;R1=DATA FROM FI/FO
                                                                 ;R2=MASK (BITS SET NOT EXPECTED)
005112  105102                  6$:     COMB    R2               ;REVERSE THE MASK
005114  120102                          CMPB    R1,     R2       ;CHECK THE ACTURAL DATA
005116  001401                          BEQ     .+4              ;BRANCH IF OK
005120  104002                          HLT+2                    ;WRONG CHAR LEN OR DATA ERROR
                                                                 ;R1=DATA FROM FI/FO (COMPLETE WORD)
                                                                 ;R2=DATA (LOW BYTE) EXPECTED
005122  017701  174174          7$:     MOV     @RBUF,  R1       ;READ FI/FO
005126  100001                          BPL     .+4              ;BRANCH IF CHAR PRESENT NOT SET
005130  104001                          HLT+1                    ;CHARACTER PRESENT STAYED SET
                                                                 ;R1 = CONTENTS OF RBUF
005132  017701  174162          8$:     MOV     @CSR,   R1       ;SAVE THE CSR
005136  022701  100405                  CMP     #100405,R1       ;CHECK THE CSR
005142  001401                          BEQ     .+4              ;BRANCH IF OK
005144  104001                          HLT+1                    ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
                                                                 ;R1 = CONTENTS OF CSR
```

```
                        005146  005077  174152          CLR     @TCR            ;CLEAR TCR
                        005152  005077  174142          CLR     @CSR            ;CLEAR CSR
                        005156  104400                  SCOPE

                                                ;*************************************************************************
                                                ;TEST 24:       TEST THAT LINE 1 CAN TRANSMIT AND
                                                ;               RECEIVE A CHARACTER. (377)
                                                ;       1$:  CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
                                                ;       3$:  CHECKS THAT NO ERRORS IN FI/FO
                                                ;       4$:  CHECKS THAT RIGHT LINE # (1) IN FI/FO
                                                ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
                                                ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
                                                ;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
                                                ;       8$:  CHECKS THAT DONE CLEARS
                                                ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
                                                ;*************************************************************************

                                                ;               INITIALIZE
                                                ;       DEVICE 'CSR' REGISTER
                                                ;                                       SET:
                        005160  004737  014600  TST24:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
                                                ;                                       ;BIT3 = CLEAR MOS
                                                ;                                       ;BIT8 = MASTER XMTR SCAN ENB
                                                ;WAIT FOR MOS TO CLEAR
                                                ;                                       SET:
                                                ;                                       ;BIT0 = RECEIVER ENABLE
                                                ;
                        005164  052777  000002  174132          BIS     #BIT1,  @TCR    ;SET XMTR CONTROL BIT, LINE 1
                        005172  017701  174122  LOP24:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
                        005176  100375          BPL     LOP24
                        005200  012777  000377  174120          MOV     #377,   @TBUF   ;SEND A RUBOUT
                        005206  005000          CLR     R0              ;CLEAR COUNTER
                        005210  105305  1$:     DECB    R5              ;SHORT WAIT LOOP
                        005212  001376          BNE     1$
                        005214  017701  174102          MOV     @RBUF,R1        ;WAIT FOR CHAR. PRES.
                        005220  100405          BMI     3$              ;BRANCH WHEN FOUND
                        005222  005200          INC     R0              ;TIME COUNTER
                        005224  001371          BNE     1$              ;BRANCH IF NOT TIME-OUT
                        005226  017702  174066          MOV     @CSR,   R2      ;SAVE CSR
                        005232  104002          HLT+2                   ;CHARACTER READY DIDN'T SET
                                                                        ;R1 = CONTENTS OF RBUF
                                                                        ;R2 = CONTENTS OF CSR
                        005234  050037  001346  3$:     BIS     R0,TIMER        ;SAVE THE TIMER
                        005240  032701  070000          BIT     #70000, R1      ;CHECK FOR ERROR BITS
                        005244  001401          BEQ     .+4             ;BRANCH IF NONE
                        005246  104001          HLT+1                   ;ERROR IN RECEIVED CHAR
                                                                        ;R1 = CONTENTS OF RBUF
                                                                        ;BIT14=UART OVERRUN
                                                                        ;BIT13=FRAMING ERROR
                                                                        ;BIT12=PARITY ERROR
                        005250  010102  4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
                        005252  042702  170377          BIC     #170377,R2      ;MASK LINE#
                        005256  000302          SWAB    R2              ;LINE # IN LOW BYTE
                        005260  122702  000001          CMPB    #1,     R2      ;CHECK LINE #
                        005264  001401          BEQ     .+4             ;BRANCH IF OK
                        005266  104001          HLT+1                   ;WRONG LINE # RECEIVED
```

```
1507
1508
1509  005270  117702  174070          5$:     MOVB    @DJLEN, R2      ;R1 = CONTENTS OF RBUF
1510  005274  130201                          BITB    R2,     R1      ;BITS8-11 = LINE #
1511  005276  001401                          BEQ     .+4             ;GET MASK OF CHARACTER
1512  005300  104002                          HLT+2                   ;CHECK CHAR LENGTH.
1513                                                                  ;BRANCH IF OK
1514                                                                  ;WRONG CHARACTER LENGTH
1515  005302  105102                  6$:     COMB    R2              ;R1=DATA FROM FI/FO
1516  005304  120102                          CMPB    R1,     R2      ;R2=MASK (BITS SET NOT EXPECTED)
1517  005306  001401                          BEQ     .+4             ;REVERSE THE MASK
1518  005310  104002                          HLT+2                   ;CHECK THE ACTURAL DATA
1519                                                                  ;BRANCH IF OK
1520                                                                  ;WRONG CHAR LEN OR DATA ERROR
1521  005312  017701  174004          7$:     MOV     @RBUF,  R1      ;R1=DATA FROM FI/FO (COMPLETE WORD)
1522  005316  100001                          BPL     .+4             ;R2=DATA (LOW BYTE) EXPECTED
1523  005320  104001                          HLT+1                   ;READ FI/FO
1524                                                                  ;BRANCH IF CHAR PRESENT NOT SET
1525  005322  017701  173772          8$:     MOV     @CSR,   R1      ;CHARACTER PRESENT STAYED SET
1526  005326  022701  100405                  CMP     #100405,R1      ;R1 = CONTENTS OF RBUF
1527  005332  001401                          BEQ     .+4             ;SAVE THE CSR
1528  005334  104001                          HLT+1                   ;CHECK THE CSR
1529                                                                  ;BRANCH IF OK
1530  005336  005077  173762                  CLR     @TCR            ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
1531  005342  005077  173752                  CLR     @CSR            ;R1 = CONTENTS OF CSR
1532  005346  10440C                          SCOPE                   ;CLEAR TCR
1533                                                                  ;CLEAR CSR
1534                                  ;*******************************************************************************
1535                                  ;TEST 25:       TEST THAT LINE 2 CAN TRANSMIT AND
1536                                  ;               RECEIVE A CHARACTER. (377)
1537                                  ;       1$:  CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
1538                                  ;       3$:  CHECKS THAT NO ERRORS IN FI/FO
1539                                  ;       4$:  CHECKS THAT RIGHT LINE # (2) IN FI/FO
1540                                  ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
1541                                  ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
1542                                  ;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
1543                                  ;       8$:  CHECKS THAT DONE CLEARS
1544                                  ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD DO3 SERIES
1545                                  ;*******************************************************************************
1546
1547                                  ;               INITIALIZE
1548                                  ;       DEVICE'CSR'REGISTER
1549                                  ;                                               SET:
1550  005350  004737  014600          TST25:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
1551                                                                  ;BIT3 = CLEAR MOS
1552                                                                  ;BIT8 = MASTER XMTR SCAN ENB
1553                                  ;WAIT FOR MOS TO CLEAR
1554                                  ;                               SET:
1555                                  ;                               ;BIT0 = RECEIVER ENABLE
1556                                  ;
1557  005354  052777  000004  173742          BIS     #BIT2,  @TCR    ;SET XMTR CONTROL BIT, LINE 2
1558  005362  017701  173732          LOP25:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
1559  005366  100375                          BPL     LOP25
1560  005370  012777  000377  173730          MOV     #377,   @TBUF   ;SEND A RUBOUT
1561  005376  005000                          CLR     R0              ;CLEAR COUNTER
1562  005400  105305                  1$.     DECB    R5              ;SHORT WAIT LOOP
```

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1563  005402  001376                    BNE     1$
1564  005404  017701  173712            MOV     @RBUF,R1        ;WAIT FOR CHAR. PRES.
1565  005410  100405                    BMI     3$              ;BRANCH WHEN FOUND
1566  005412  005200                    INC     R0              ;TIME COUNTER
1567  005414  001371                    BNE     1$              ;BRANCH IF NOT TIME-OUT
1568  005416  017702  173676            MOV     @CSR,   R2      ;SAVE CSR
1569  005422  104002                    HLT+2                   ;CHARACTER READY DIDN'T SET
1570                                                            ;R1 = CONTENTS OF RBUF
1571                                                            ;R2 = CONTENTS OF CSR
1572  005424  050037  001346    3$:     BIS     R0,TIMER        ;SAVE THE TIMER
1573  005430  032701  070000            BIT     #70000, R1      ;CHECK FOR ERROR BITS
1574  005434  001401                    BEQ     .+4             ;BRANCH IF NONE
1575  005436  104001                    HLT+1                   ;ERROR IN RECEIVED CHAR
1576                                                            ;R1 = CONTENTS OF RBUF
1577                                                            ;BIT14=UART OVERRUN
1578                                                            ;BIT13=FRAMING ERROR
1579                                                            ;BIT12=PARITY ERROR
1580  005440  010102    4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
1581  005442  042702  170377            BIC     #170377,R2      ;MASK LINE#
1582  005446  000302                    SWAB    R2              ;LINE # IN LOW BYTE
1583  005450  122702  000002            CMPB    #2,     R2      ;CHECK LINE #
1584  005454  001401                    BEQ     .+4             ;BRANCH IF OK
1585  005456  104001                    HLT+1                   ;WRONG LINE # RECEIVED
1586                                                            ;R1 = CONTENTS OF RBUF
1587                                                            ;BITS8-11 = LINE #
1588  005460  117702  173700    5$:     MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
1589  005464  130201                    BITB    R2,     R1      ;CHECK CHAR LENGTH.
1590  005466  001401                    BEQ     .+4             ;BRANCH IF OK
1591  005470  104002                    HLT+2                   ;WRONG CHARACTER LENGTH
1592                                                            ;R1=DATA FROM FI/FO
1593                                                            ;R2=MASK (BITS SET NOT EXPECTED)
1594  005472  105102    6$:     COMB    R2              ;REVERSE THE MASK
1595  005474  120102            CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
1596  005476  001401            BEQ     .+4             ;BRANCH IF OK
1597  005500  104002            HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
1598                                                    ;R1=DATA FROM FI/FO (COMPLETE WORD)
1599                                                    ;R2=DATA (LOW BYTE) EXPECTED
1600  005502  017701  173614    7$:     MOV     @RBUF,  R1      ;READ FI/FO
1601  005506  100001                    BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
1602  005510  104001                    HLT+1                   ;CHARACTER PRESENT STAYED SET
1603                                                            ;R1 = CONTENTS OF RBUF
1604  005512  017701  173602    8$:     MOV     @CSR,   R1      ;SAVE THE CSR
1605  005516  022701  100405            CMP     #100405,R1      ;CHECK THE CSR
1606  005522  001401                    BEQ     .+4             ;BRANCH IF OK
1607  005524  104001                    HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
1608                                                            ;R1 = CONTENTS OF CSR
1609  005526  005077  173572            CLR     @TCR            ;CLEAR TCR
1610  005532  005077  173562            CLR     @CSR            ;CLEAR CSR
1611  005536  104400                    SCOPE
1612
1613  ;*****************************************************************************
1614  ;TEST 26:       TEST THAT LINE 3 CAN TRANSMIT AND
1615  ;               RECEIVE A CHARACTER. (377)
1616  ;       1$:  CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
1617  ;       3$:  CHECKS THAT NO ERRORS IN FI/FO
1618  ;       4$:  CHECKS THAT RIGHT LINE # (3) IN FI/FO
```

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1619                                    ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
1620                                    ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
1621                                    ;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
1622                                    ;       8$:  CHECKS THAT DONE CLEARS
1623                                    ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
1624                                    ;*********************************************************************************
1625
1626                                    ;               INITIALIZE
1627                                    ;       DEVICE''CSR'REGISTER
1628                                    ;                                               SET:
1629  005540  004737  014600            TST26:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
1630                                                                    ;BIT3 = CLEAR MOS
1631                                                                    ;BIT8 = MASTER XMTR SCAN ENB
1632                                    ;WAIT FOR MOS TO CLEAR
1633                                    ;                               SET:
1634                                    ;                               ;BIT0 = RECEIVER ENABLE
1635                                    ;
1636  005544  052777  000010  173552            BIS     #BIT3,  @TCR    ;SET XMTR CONTROL BIT, LINE 3
1637  005552  017701  173542            LOP26:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
1638  005556  100375                            BPL     LOP26
1639  005560  012777  000377  173540            MOV     #377,   @TBUF   ;SEND A RUBOUT
1640  005566  005000                            CLR     R0              ;CLEAR COUNTER
1641  005570  105305                    1$:     DECB    R5              ;SHORT WAIT LOOP
1642  005572  001376                            BNE     1$
1643  005574  017701  173522                    MOV     @RBUF,R1        ;WAIT FOR CHAR. PRES.
1644  005600  100405                            BMI     3$              ;BRANCH WHEN FOUND
1645  005602  005200                            INC     R0              ;TIME COUNTER
1646  005604  001371                            BNE     1$              ;BRANCH IF NOT TIME-OUT
1647  005606  017702  173506                    MOV     @CSR,   R2      ;SAVE CSR
1648  005612  104002                            HLT+2                   ;CHARACTER READY DIDN'T SET
1649                                                                    ;R1 = CONTENTS OF RBUF
1650                                                                    ;R2 = CONTENTS OF CSR
1651  005614  050037  001346            3$:     BIS     R0,TIMER        ;SAVE THE TIMER
1652  005620  032701  070000                    BIT     #70000, R1      ;CHECK FOR ERROR BITS
1653  005624  001401                            BEQ     .+4             ;BRANCH IF NONE
1654  005626  104001                            HLT+1                   ;ERROR IN RECEIVED CHAR
1655                                                                    ;R1 = CONTENTS OF RBUF
1656                                                                    ;BIT14=UART OVERRUN
1657                                                                    ;BIT13=FRAMING ERROR
1658                                                                    ;BIT12=PARITY ERROR
1659  005630  010102                    4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
1660  005632  042702  170377                    BIC     #170377,R2      ;MASK LINE#
1661  005636  000302                            SWAB    R2              ;LINE # IN LOW BYTE
1662  005640  122702  000003                    CMPB    #3.,    R2      ;CHECK LINE #
1663  005644  001401                            BEQ     .+4             ;BRANCH IF OK
1664  005646  104001                            HLT+1                   ;WRONG LINE # RECEIVED
1665                                                                    ;R1 = CONTENTS OF RBUF
1666                                                                    ;BITS8-11 = LINE #
1667  005650  117702  173510            5$:     MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
1668  005654  130201                            BITB    R2,     R1      ;CHECK CHAR LENGTH.
1669  005656  001401                            BEQ     .+4             ;BRANCH IF OK
1670  005660  104002                            HLT+2                   ;WRONG CHARACTER LENGTH
1671                                                                    ;R1=DATA FROM FI/FO
1672                                                                    ;R2=MASK (BITS SET NOT EXPECTED)
1673  005662  105102                    6$:     COMB    R2              ;REVERSE THE MASK
1674  005664  120102                            CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
```

```
1675  005666  001401                        BEQ     .+4             ;BRANCH IF OK
1676  005670  104002                        HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
1677                                                                  ;R1=DATA FROM FI/FO (COMPLETE WORD)
1678                                                                  ;R2=DATA (LOW BYTE) EXPECTED
1679  005672  017701  173424        7$:     MOV     @RBUF,  R1      ;READ FI/FO
1680  005676  100001                        BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
1681  005700  104001                        HLT+1                   ;CHARACTER PRESENT STAYED SET
1682                                                                  ;R1 = CONTENTS OF RBUF
1683  005702  017701  173412        8$:     MOV     @CSR,   R1      ;SAVE THE CSR
1684  005706  022701  100405                CMP     #100405,R1      ;CHECK THE CSR
1685  005712  001401                        BEQ     .+4             ;BRANCH IF OK
1686  005714  104001                        HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
1687                                                                  ;R1 = CONTENTS OF CSR
1688  005716  005077  173402                CLR     @TCR            ;CLEAR TCR
1689  005722  005077  173372                CLR     @CSR            ;CLEAR CSR
1690  005726  104400                        SCOPE
1691  005730  005237  001364                INC     DJLEN
1692  005734  012737  005742  015250        MOV     #.+6,   LAD
1693
1694                                ;*************************************************************************
1695                                ;TEST 27:       TEST THAT LINE 4 CAN TRANSMIT AND
1696                                ;               RECEIVE A CHARACTER. (377)
1697                                ;       1$:  CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
1698                                ;       3$:  CHECKS THAT NO ERRORS IN FI/FO
1699                                ;       4$:  CHECKS THAT RIGHT LINE # (4) IN FI/FO
1700                                ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
1701                                ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
1702                                ;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
1703                                ;       8$:  CHECKS THAT DONE CLEARS
1704                                ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
1705                                ;*************************************************************************
1706
1707                                ;               INITIALIZE
1708                                ;       DEVICE''CSR''REGISTER
1709                                ;                                               SET:
1710  005742  004737  014600        TST27:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
1711                                                                  ;BIT3 = CLEAR MOS
1712                                                                  ;BIT8 = MASTER XMTR SCAN ENB
1713                                ;WAIT FOR MOS TO CLEAR
1714                                ;                               SET:
1715                                ;                               ;BIT0 = RECEIVER ENABLE
1716                                ;
1717  005746  052777  000020  173350        BIS     #BIT4,  @TCR    ;SET XMTR CONTROL BIT, LINE 4
1718  005754  017701  173340        LOP27:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
1719  005760  100375                        BPL     LOP27
1720  005762  012777  000377  173336        MOV     #377,   @TBUF   ;SEND A RUBOUT
1721  005770  005000                        CLR     R0              ;CLEAR COUNTER
1722  005772  105305                1$:     DECB    R5              ;SHORT WAIT LOOP
1723  005774  001376                        BNE     1$
1724  005776  017701  173320                MOV     @RBUF,R1        ;WAIT FOR CHAR. PRES.
1725  006002  100405                        BMI     3$              ;BRANCH WHEN FOUND
1726  006004  005200                        INC     R0              ;TIME COUNTER
1727  006006  001371                        BNE     1$              ;BRANCH IF NOT TIME-OUT
1728  006010  017702  173304                MOV     @CSR,   R2      ;SAVE CSR
1729  006014  104002                        HLT+2                   ;CHARACTER READY DIDN'T SET
1730                                                                  ;R1 = CONTENTS OF RBUF
```

```
1731
1732  006016  050037  001346          3$:     BIS     R0,TIMER        ;R2 = CONTENTS OF CSR
1733  006022  032701  070000                  BIT     #70000, R1      ;SAVE THE TIMER
1734  006026  001401                         BEQ     .+4             ;CHECK FOR ERROR BITS
1735  006030  104001                         HLT+1                   ;BRANCH IF NONE
1736                                                                  ;ERROR IN RECEIVED CHAR
1737                                                                  ;R1 = CONTENTS OF RBUF
1738                                                                  ;BIT14=UART OVERRUN
1739                                                                  ;BIT13=FRAMING ERROR
1740  006032  010102                  4$:     MOV     R1,     R2      ;BIT12=PARITY ERROR
1741  006034  042702  170377                 BIC     #170377,R2      ;DUPLICATE DATA WORD
1742  006040  000302                         SWAB    R2              ;MASK LINE#
1743  006042  122702  000004                 CMPB    #4,,    R2      ;LINE # IN LOW BYTE
1744  006046  001401                         BEQ     .+4             ;CHECK LINE #
1745  006050  104001                         HLT+1                   ;BRANCH IF OK
1746                                                                  ;WRONG LINE # RECEIVED
1747                                                                  ;R1 = CONTENTS OF RBUF
1748  006052  117702  173306          5$:     MOVB    @DJLEN, R2      ;BITS8-11 = LINE #
1749  006056  130201                         BITB    R2,     R1      ;GET MASK OF CHARACTER
1750  006060  001401                         BEQ     .+4             ;CHECK CHAR LENGTH.
1751  006062  104002                         HLT+2                   ;BRANCH IF OK
1752                                                                  ;WRONG CHARACTER LENGTH
1753                                                                  ;R1=DATA FROM FI/FO
1754  006064  105102                  6$:     COMB    R2              ;R2=MASK (BITS SET NOT EXPECTED)
1755  006066  120102                         CMPB    R1,     R2      ;REVERSE THE MASK
1756  006070  001401                         BEQ     .+4             ;CHECK THE ACTURAL DATA
1757  006072  104002                         HLT+2                   ;BRANCH IF OK
1758                                                                  ;WRONG CHAR LEN OR DATA ERROR
1759                                                                  ;R1=DATA FROM FI/FO (COMPLETE WORD)
1760  006074  017701  173222          7$:     MOV     @RBUF,  R1      ;R2=DATA (LOW BYTE) EXPECTED
1761  006100  100001                         BPL     .+4             ;READ FI/FO
1762  006102  104001                         HLT+1                   ;BRANCH IF CHAR PRESENT NOT SET
1763                                                                  ;CHARACTER PRESENT STAYED SET
1764  006104  017701  173210          8$:     MOV     @CSR,   R1      ;R1 = CONTENTS OF RBUF
1765  006110  022701  100405                 CMP     #100405,R1      ;SAVE THE CSR
1766  006114  001401                         BEQ     .+4             ;CHECK THE CSR
1767  006116  104001                         HLT+1                   ;BRANCH IF OK
1768                                                                  ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
1769  006120  005077  173200                 CLR     @TCR            ;R1 = CONTENTS OF CSR
1770  006124  005077  173170                 CLR     @CSR            ;CLEAR TCR
1771  006130  104400                         SCOPE                   ;CLEAR CSR
1772
1773                          ;*****************************************************************************
1774                          ;TEST 30:       TEST THAT LINE 5 CAN TRANSMIT AND
1775                          ;               RECEIVE A CHARACTER. (377)
1776                          ;       1$:  CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
1777                          ;       3$:  CHECKS THAT NO ERRORS IN FI/FO
1778                          ;       4$:  CHECKS THAT RIGHT LINE # (5) IN FI/FO
1779                          ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
1780                          ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
1781                          ;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
1782                          ;       8$:  CHECKS THAT DONE CLEARS
1783                          ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
1784                          ;*****************************************************************************
1785
1786                          ;               INITIALIZE
```

```
                                        ;       DEVICE''CSR''REGISTER
                                        ;
                                        TST30:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
                                                                        ;BIT3 = CLEAR MOS
                                                                        ;BIT8 = MASTER XMTR SCAN ENB
                                        ;WAIT FOR MOS TO CLEAR
                                        ;
                                        ;
                                        ;
006136  052777  000040  173160          LOP30:  BIS     #BIT5,  @TCR    ;SET XMTR CONTROL BIT, LINE 5
006144  017701  173150                  LOP30:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
006150  100375                          BPL     LOP30
006152  012777  000377  173146          MOV     #377,   @TBUF   ;SEND A RUBOUT
006160  005000                          CLR     R0              ;CLEAR COUNTER
006162  105305                          1$:     DECB    R5              ;SHORT WAIT LOOP
006164  001376                          BNE     1$
006166  017701  173130                  MOV     @RBUF,R1        ;WAIT FOR CHAR. PRES.
006172  100405                          BMI     3$              ;BRANCH WHEN FOUND
006174  005200                          INC     R0              ;TIME COUNTER
006176  001371                          BNE     1$              ;BRANCH IF NOT TIME-OUT
006200  017702  173114                  MOV     @CSR,   R2      ;SAVE CSR
006204  104002                          HLT+2                   ;CHARACTER READY DIDN'T SET
                                                                ;R1 = CONTENTS OF RBUF
                                                                ;R2 = CONTENTS OF CSR
006206  050037  001346          3$:     BIS     R0,TIMER        ;SAVE THE TIMER
006212  032701  070000                  BIT     #70000, R1      ;CHECK FOR ERROR BITS
006216  001401                          BEQ     .+4             ;BRANCH IF NONE
006220  104001                          HLT+1                   ;ERROR IN RECEIVED CHAR
                                                                ;R1 = CONTENTS OF RBUF
                                                                ;BIT14=UART OVERRUN
                                                                ;BIT13=FRAMING ERROR
                                                                ;BIT12=PARITY ERROR
006222  010102                  4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
006224  042702  170377                  BIC     #170377,R2      ;MASK LINE#
006230  000302                          SWAB    R2              ;LINE # IN LOW BYTE
006232  122702  000005                  CMPB    #5.,    R2      ;CHECK LINE #
006236  001401                          BEQ     .+4             ;BRANCH IF OK
006240  104001                          HLT+1                   ;WRONG LINE # RECEIVED
                                                                ;R1 = CONTENTS OF RBUF
                                                                ;BITS8-11 = LINE #
006242  117702  173116          5$:     MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
006246  130201                          BITB    R2,     R1      ;CHECK CHAR LENGTH.
006250  001401                          BEQ     .+4             ;BRANCH IF OK
006252  104002                          HLT+2                   ;WRONG CHARACTER LENGTH
                                                                ;R1=DATA FROM FI/FO
                                                                ;R2=MASK (BITS SET NOT EXPECTED)
006254  105102                  6$:     COMB    R2              ;REVERSE THE MASK
006256  120102                          CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
006260  001401                          BEQ     .+4             ;BRANCH IF OK
006262  104002                          HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
                                                                ;R1=DATA FROM FI/FO (COMPLETE WORD)
                                                                ;R2=DATA (LOW BYTE) EXPECTED
006264  017701  173032          7$:     MOV     @RBUF,  R1      ;READ FI/FO
006270  100001                          BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
006272  104001                          HLT+1                   ;CHARACTER PRESENT STAYED SET
                                                                ;R1 = CONTENTS OF RBUF
```

```
 1843  006274  017701  173020          8$:     MOV     @CSR,   R1      ;SAVE THE CSR
 1844  006300  022701  100405                  CMP     #100405,R1      ;CHECK THE CSR
 1845  006304  001401                          BEQ     .+4             ;BRANCH IF OK
 1846  006306  104001                          HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
 1847                                                                  ;R1 = CONTENTS OF CSR
 1848  006310  005077  173010                  CLR     @TCR            ;CLEAR TCR
 1849  006314  005077  173000                  CLR     @CSR            ;CLEAR CSR
 1850  006320  104400                          SCOPE
 1851
 1852                                  ;*************************************************************************
 1853                                  ;TEST 31:       TEST THAT LINE 6 CAN TRANSMIT AND
 1854                                  ;               RECEIVE A CHARACTER. (377)
 1855                                  ;       1$:  CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
 1856                                  ;       3$:  CHECKS THAT NO ERRORS IN FI/FO
 1857                                  ;       4$:  CHECKS THAT RIGHT LINE # (6) IN FI/FO
 1858                                  ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
 1859                                  ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
 1860                                  ;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
 1861                                  ;       8$:  CHECKS THAT DONE CLEARS
 1862                                  ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
 1863                                  ;*************************************************************************
 1864
 1865                                  ;               INITIALIZE
 1866                                  ;       DEVICE''CSR''REGISTER
 1867                                  ;                                               SET:
 1868  006322  004737  014600          TST31:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
 1869                                                                  ;BIT3 = CLEAR MOS
 1870                                                                  ;BIT8 = MASTER XMTR SCAN ENB
 1871                                  ;WAIT FOR MOS TO CLEAR
 1872                                  ;                               SET:
 1873                                  ;                               ;BIT0 = RECEIVER ENABLE
 1874                                  ;
 1875  006326  052777  000100  172770          BIS     #BIT6,  @TCR    ;SET XMTR CONTROL BIT, LINE 6
 1876  006334  017701  172760          LOP31:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
 1877  006340  100375                          BPL     LOP31
 1878  006342  012777  000377  172756          MOV     #377,   @TBUF   ;SEND A RUBOUT
 1879  006350  005000                          CLR     R0              ;CLEAR COUNTER
 1880  006352  105305                  1$:     DECB    R5              ;SHORT WAIT LOOP
 1881  006354  001376                          BNE     1$
 1882  006356  017701  172740                  MOV     @RBUF,R1        ;WAIT FOR CHAR. PRES.
 1883  006362  100405                          BMI     3$              ;BRANCH WHEN FOUND
 1884  006364  005200                          INC     R0              ;TIME COUNTER
 1885  006366  001371                          BNE     1$              ;BRANCH IF NOT TIME-OUT
 1886  006370  017702  172724                  MOV     @CSR,   R2      ;SAVE CSR
 1887  006374  104002                          HLT+2                   ;CHARACTER READY DIDN'T SET
 1888                                                                  ;R1 = CONTENTS OF RBUF
 1889                                                                  ;R2 = CONTENTS OF CSR
 1890  006376  050037  001346          3$:     BIS     R0,TIMER        ;SAVE THE TIMER
 1891  006402  032701  070000                  BIT     #70000, R1      ;CHECK FOR ERROR BITS
 1892  006406  001401                          BEQ     .+4             ;BRANCH IF NONE
 1893  006410  104001                          HLT+1                   ;ERROR IN RECEIVED CHAR
 1894                                                                  ;R1 = CONTENTS OF RBUF
 1895                                                                  ;BIT14=UART OVERRUN
 1896                                                                  ;BIT13=FRAMING ERROR
 1897                                                                  ;BIT12=PARITY ERROR
 1898  006412  010102                  4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
```

```
1899  006414  042702  170377            BIC     #170377,R2      ;MASK LINE#
1900  006420  000302                    SWAB    R2              ;LINE # IN LOW BYTE
1901  006422  122702  000006            CMPB    #6.,    R2      ;CHECK LINE #
1902  006426  001401                    BEQ     .+4             ;BRANCH IF OK
1903  006430  104001                    HLT+1                   ;WRONG LINE # RECEIVED
1904                                                            ;R1 = CONTENTS OF RBUF
1905                                                            ;BITS8-11 = LINE #
1906  006432  117702  172726    5$:     MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
1907  006436  130201                    BITB    R2,     R1      ;CHECK CHAR LENGTH.
1908  006440  001401                    BEQ     .+4             ;BRANCH IF OK
1909  006442  104002                    HLT+2                   ;WRONG CHARACTER LENGTH
1910                                                            ;R1=DATA FROM FI/FO
1911                                                            ;R2=MASK (BITS SET NOT EXPECTED)
1912  006444  105102    6$:     COMB    R2                      ;REVERSE THE MASK
1913  006446  120102                    CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
1914  006450  001401                    BEQ     .+4             ;BRANCH IF OK
1915  006452  104002                    HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
1916                                                            ;R1=DATA FROM FI/FO (COMPLETE WORD)
1917                                                            ;R2=DATA (LOW BYTE) EXPECTED
1918  006454  017701  172642    7$:     MOV     @RBUF,  R1      ;READ FI/FO
1919  006460  100001                    BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
1920  006462  104001                    HLT+1                   ;CHARACTER PRESENT STAYED SET
1921                                                            ;R1 = CONTENTS OF RBUF
1922  006464  017701  172630    8$:     MOV     @CSR,   R1      ;SAVE THE CSR
1923  006470  022701  100405            CMP     #100405,R1      ;CHECK THE CSR
1924  006474  001401                    BEQ     .+4             ;BRANCH IF OK
1925  006476  104001                    HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
1926                                                            ;R1 = CONTENTS OF CSR
1927  006500  005077  172620            CLR     @TCR            ;CLEAR TCR
1928  006504  005077  172610            CLR     @CSR            ;CLEAR CSR
1929  006510  104400                    SCOPE
1930
1931                              ;*************************************************************************
1932                              ;TEST 32:       TEST THAT LINE 7 CAN TRANSMIT AND
1933                              ;               RECEIVE A CHARACTER. (377)
1934                              ;       1$:  CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
1935                              ;       3$:  CHECKS THAT NO ERRORS IN FI/FO
1936                              ;       4$:  CHECKS THAT RIGHT LINE # (7) IN FI/FO
1937                              ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
1938                              ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
1939                              ;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
1940                              ;       8$:  CHECKS THAT DONE CLEARS
1941                              ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL: M7279 ALL: UART CARD D03 SERIES
1942                              ;*************************************************************************
1943
1944                              ;               INITIALIZE
1945                              ;       DEVICE''CSR'REGISTER
1946                              ;                                               SET:
1947  006512  004737  014600    TST32:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
1948                                                            ;BIT3 = CLEAR MOS
1949                                                            ;BIT8 = MASTER XMTR SCAN ENB
1950                              ;WAIT FOR MOS TO CLEAR
1951                              ;                               SET:
1952                              ;                               ;BIT0 = RECEIVER ENABLE
1953                              ;
1954  006516  052777  000200  172600    BIS     #BIT7,  @TCR    ;SET XMTR CONTROL BIT, LINE 7
```

```
1955  006524  017701  172570          LOP32:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
1956  006530  100375                          BPL     LOP32
1957  006532  012777  000377  172566          MOV     #377,   @TBUF   ;SEND A RUBOUT
1958  006540  005000                          CLR     R0              ;CLEAR COUNTER
1959  006542  105305                  1$:     DECB    R5              ;SHORT WAIT LOOP
1960  006544  001376                          BNE     1$
1961  006546  017701  172550                  MOV     @RBUF,R1        ;WAIT FOR CHAR. PRES.
1962  006552  100405                          BMI     3$              ;BRANCH WHEN FOUND
1963  006554  005200                          INC     R0              ;TIME COUNTER
1964  006556  001371                          BNE     1$              ;BRANCH IF NOT TIME-OUT
1965  006560  017702  172534                  MOV     @CSR,   R2      ;SAVE CSR
1966  006564  104002                          HLT+2                   ;CHARACTER READY DIDN'T SET
1967                                                                  ;R1 = CONTENTS OF RBUF
1968                                                                  ;R2 = CONTENTS OF CSR
1969  006566  050037  001346          3$:     BIS     R0,TIMER        ;SAVE THE TIMER
1970  006572  032701  070000                  BIT     #70000, R1      ;CHECK FOR ERROR BITS
1971  006576  001401                          BEQ     .+4             ;BRANCH IF NONE
1972  006600  104001                          HLT+1                   ;ERROR IN RECEIVED CHAR
1973                                                                  ;R1 = CONTENTS OF RBUF
1974                                                                  ;BIT14=UART OVERRUN
1975                                                                  ;BIT13=FRAMING ERROR
1976                                                                  ;BIT12=PARITY ERROR
1977  006602  010102                  4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
1978  006604  042702  170377                  BIC     #170377,R2      ;MASK LINE#
1979  006610  000302                          SWAB    R2              ;LINE # IN LOW BYTE
1980  006612  122702  000007                  CMPB    #7.,    R2      ;CHECK LINE #
1981  006616  001401                          BEQ     .+4             ;BRANCH IF OK
1982  006620  104001                          HLT+1                   ;WRONG LINE # RECEIVED
1983                                                                  ;R1 = CONTENTS OF RBUF
1984                                                                  ;BITS8-11 = LINE #
1985  006622  117702  172536          5$:     MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
1986  006626  130201                          BITB    R2,     R1      ;CHECK CHAR LENGTH.
1987  006630  001401                          BEQ     .+4             ;BRANCH IF OK
1988  006632  104002                          HLT+2                   ;WRONG CHARACTER LENGTH
1989                                                                  ;R1=DATA FROM FI/FO
1990                                                                  ;R2=MASK (BITS SET NOT EXPECTED)
1991  006634  105102                  6$:     COMB    R2              ;REVERSE THE MASK
1992  006636  120102                          CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
1993  006640  001401                          BEQ     .+4             ;BRANCH IF OK
1994  006642  104002                          HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
1995                                                                  ;R1=DATA FROM FI/FO (COMPLETE WORD)
1996                                                                  ;R2=DATA (LOW BYTE) EXPECTED
1997  006644  017701  172452          7$:     MOV     @RBUF,  R1      ;READ FI/FO
1998  006650  100001                          BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
1999  006652  104001                          HLT+1                   ;CHARACTER PRESENT STAYED SET
2000                                                                  ;R1 = CONTENTS OF RBUF
2001  006654  017701  172440          8$.     MOV     @CSR,   R1      ;SAVE THE CSR
2002  006660  022701  100405                  CMP     #100405,R1      ;CHECK THE CSR
2003  006664  001401                          BEQ     .+4             ;BRANCH IF OK
2004  006666  104001                          HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
2005                                                                  ;R1 = CONTENTS OF CSR
2006  006670  005077  172430                  CLR     @TCR            ;CLEAR TCR
2007  006[illegible]  005077  172420          CLR     @CSR            ;CLEAR CSR
2008  00[illegible]   104400                  SCOPE
2009  006702  005237  001364                  INC     DJLEN
2010  006706  012737  006714  015250          MOV     #.+6,   LAD
```

```
                        ;*****************************************************************************
                        ;TEST 33:       TEST THAT LINE 8 CAN TRANSMIT AND
                        ;               RECEIVE A CHARACTER. (377)
                        ;       1$:  CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
                        ;       3$:  CHECKS THAT NO ERRORS IN FI/FO
                        ;       4$:  CHECKS THAT RIGHT LINE # (8) IN FI/FO
                        ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
                        ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
                        ;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
                        ;       8$:  CHECKS THAT DONE CLEARS
                        ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
                        ;*****************************************************************************

                        ;               INITIALIZE
                        ;       DEVICE'CSR'REGISTER
                        ;                                               SET:
006714  004737  014600  TST33:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
                                                        ;BIT3 = CLEAR MOS
                                                        ;BIT8 = MASTER XMTR SCAN ENB
                        ;WAIT FOR MOS TO CLEAR
                        ;                               SET:
                        ;                               ;BIT0 = RECEIVER ENABLE
                        ;
006720  052777  000400  172376          BIS     #BIT8,  @TCR    ;SET XMTR CONTROL BIT, LINE 8
006726  017701  172366  LOP33:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
006732  100375                  BPL     LOP33
006734  012777  000377  172364          MOV     #377,   @TBUF   ;SEND A RUBOUT
006742  005000                  CLR     R0              ;CLEAR COUNTER
006744  105305          1$:     DECB    R5              ;SHORT WAIT LOOP
006746  001376                  BNE     1$
006750  017701  172346          MOV     @RBUF,R1        ;WAIT FOR CHAR. PRES.
006754  100405                  BMI     3$              ;BRANCH WHEN FOUND
006756  005200                  INC     R0              ;TIME COUNTER
006760  001371                  BNE     1$              ;BRANCH IF NOT TIME-OUT
006762  017702  172332          MOV     @CSR,   R2      ;SAVE CSR
006766  104002                  HLT+2                   ;CHARACTER READY DIDN'T SET
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;R2 = CONTENTS OF CSR
006770  050037  001346  3$:     BIS     R0,TIMER        ;SAVE THE TIMER
006774  032701  070000          BIT     #70000, R1      ;CHECK FOR ERROR BITS
007000  001401                  BEQ     .+4             ;BRANCH IF NONE
007002  104001                  HLT+1                   ;ERROR IN RECEIVED CHAR
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BIT14=UART OVERRUN
                                                        ;BIT13=FRAMING ERROR
                                                        ;BIT12=PARITY ERROR
007004  010102  4$:     MOV     R1,     R2              ;DUPLICATE DATA WORD
007006  042702  170377          BIC     #170377,R2      ;MASK LINE#
007012  000302                  SWAB    R2              ;LINE # IN LOW BYTE
007014  122702  000010          CMPB    #8.,    R2      ;CHECK LINE #
007020  001401                  BEQ     .+4             ;BRANCH IF OK
007022  104001                  HLT+1                   ;WRONG LINE # RECEIVED
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BITS8-11 = LINE #
007024  117702  172334  5$:     MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
```

```
2067  007030  130201                  BITB    R2,     R1      ;CHECK CHAR LENGTH.
2068  007032  001401                  BEQ     .+4             ;BRANCH IF OK
2069  007034  104002                  HLT+2                   ;WRONG CHARACTER LENGTH
2070                                                          ;R1=DATA FROM FI/FO
2071                                                          ;R2=MASK (BITS SET NOT EXPECTED)
2072  007036  105102          6$:     COMB    R2              ;REVERSE THE MASK
2073  007040  120102                  CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
2074  007042  001401                  BEQ     .+4             ;BRANCH IF OK
2075  007044  104002                  HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
2076                                                          ;R1=DATA FROM FI/FO (COMPLETE WORD)
2077                                                          ;R2=DATA (LOW BYTE) EXPECTED
2078  007046  017701  172250  7$:     MOV     @RBUF,  R1      ;READ FI/FO
2079  007052  100001                  BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
2080  007054  104001                  HLT+1                   ;CHARACTER PRESENT STAYED SET
2081                                                          ;R1 = CONTENTS OF RBUF
2082  007056  017701  172236  8$:     MOV     @CSR,   R1      ;SAVE THE CSR
2083  007062  022701  100405          CMP     #100405,R1      ;CHECK THE CSR
2084  007066  001401                  BEQ     .+4             ;BRANCH IF OK
2085  007070  104001                  HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
2086                                                          ;R1 = CONTENTS OF CSR
2087  007072  005077  172226          CLR     @TCR            ;CLEAR TCR
2088  007076  005077  172216          CLR     @CSR            ;CLEAR CSR
2089  007102  104400                  SCOPE
2090
2091                            ;*****************************************************************************
2092                            ;TEST 34:       TEST THAT LINE 9 CAN TRANSMIT AND
2093                            ;               RECEIVE A CHARACTER. (377)
2094                            ;       1$:  CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
2095                            ;       3$:  CHECKS THAT NO ERRORS IN FI/FO
2096                            ;       4$:  CHECKS THAT RIGHT LINE # (9) IN FI/FO
2097                            ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
2098                            ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
2099                            ;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
2100                            ;       8$:  CHECKS THAT DONE CLEARS
2101                            ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
2102                            ;*****************************************************************************
2103
2104                            ;               INITIALIZE
2105                            ;       DEVICE 'CSR' REGISTER
2106                            ;                                               SET:
2107  007104  004737  014600  TST34:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
2108                                                          ;BIT3 = CLEAR MOS
2109                                                          ;BIT8 = MASTER XMTR SCAN ENB
2110                            ;WAIT FOR MOS TO CLEAR
2111                            ;                               SET:
2112                            ;                               ;BIT0 = RECEIVER ENABLE
2113                            ;
2114  007110  052777  001000  172206          BIS     #BIT9,  @TCR    ;SET XMTR CONTROL BIT, LINE 9
2115  007116  017701  172176  LOP34:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
2116  007122  100375                  BPL     LOP34
2117  007124  012777  000377  172174          MOV     #377,   @TBUF   ;SEND A RUBOUT
2118  007132  005000                  CLR     R0              ;CLEAR COUNTER
2119  007134  105305          1$:     DECB    R5              ;SHORT WAIT LOOP
2120  007136  001376                  BNE     1$
2121  007140  017701  172156          MOV     @RBUF,R1        ;WAIT FOR CHAR. PRES.
2122  007144  100405                  BMI     3$              ;BRANCH WHEN FOUND
```

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2123  007146  005200                    INC     R0              ;TIME COUNTER
2124  007150  001371                    BNE     1$              ;BRANCH IF NOT TIME-OUT
2125  007152  017702  172142            MOV     @CSR,   R2      ;SAVE CSR
2126  007156  104002                    HLT+2                   ;CHARACTER READY DIDN'T SET
2127                                                            ;R1 = CONTENTS OF RBUF
2128                                                            ;R2 = CONTENTS OF CSR
2129  007160  050037  001346    3$:     BIS     R0,TIMER        ;SAVE THE TIMER
2130  007164  032701  070000            BIT     #70000, R1      ;CHECK FOR ERROR BITS
2131  007170  001401                    BEQ     .+4             ;BRANCH IF NONE
2132  007172  104001                    HLT+1                   ;ERROR IN RECEIVED CHAR
2133                                                            ;R1 = CONTENTS OF RBUF
2134                                                            ;BIT14=UART OVERRUN
2135                                                            ;BIT13=FRAMING ERROR
2136                                                            ;BIT12=PARITY ERROR
2137  007174  010102    4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
2138  007176  042702  170377            BIC     #170377,R2      ;MASK LINE#
2139  007202  000302                    SWAB    R2              ;LINE # IN LOW BYTE
2140  007204  122702  000011            CMPB    #9.,    R2      ;CHECK LINE #
2141  007210  001401                    BEQ     .+4             ;BRANCH IF OK
2142  007212  104001                    HLT+1                   ;WRONG LINE # RECEIVED
2143                                                            ;R1 = CONTENTS OF RBUF
2144                                                            ;BITS8-11 = LINE #
2145  007214  117702  172144    5$:     MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
2146  007220  130201                    BITB    R2,     R1      ;CHECK CHAR LENGTH.
2147  007222  001401                    BEQ     .+4             ;BRANCH IF OK
2148  007224  104002                    HLT+2                   ;WRONG CHARACTER LENGTH
2149                                                            ;R1=DATA FROM FI/FO
2150                                                            ;R2=MASK (BITS SET NOT EXPECTED)
2151  007226  105102    6$:     COMB    R2              ;REVERSE THE MASK
2152  007230  120102                    CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
2153  007232  001401                    BEQ     .+4             ;BRANCH IF OK
2154  007234  104002                    HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
2155                                                            ;R1=DATA FROM FI/FO (COMPLETE WORD)
2156                                                            ;R2=DATA (LOW BYTE) EXPECTED
2157  007236  017701  172060    7$:     MOV     @RBUF,  R1      ;READ FI/FO
2158  007242  100001                    BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
2159  007244  104001                    HLT+1                   ;CHARACTER PRESENT STAYED SET
2160                                                            ;R1 = CONTENTS OF RBUF
2161  007246  017701  172046    8$:     MOV     @CSR,   R1      ;SAVE THE CSR
2162  007252  022701  100405            CMP     #100405,R1      ;CHECK THE CSR
2163  007256  001401                    BEQ     .+4             ;BRANCH IF OK
2164  007260  104001                    HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
2165                                                            ;R1 = CONTENTS OF CSR
2166  007262  005077  172036            CLR     @TCR            ;CLEAR TCR
2167  007266  005077  172026            CLR     @CSR            ;CLEAR CSR
2168  007272  104400                    SCOPE
2169
2170                    ;*****************************************************************************
2171                    ;TEST 35:       TEST THAT LINE 10 CAN TRANSMIT AND
2172                    ;               RECEIVE A CHARACTER. (377)
2173                    ;       1$:  CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
2174                    ;       3$:  CHECKS THAT NO ERRORS IN FI/FO
2175                    ;       4$:  CHECKS THAT RIGHT LINE # (10) IN FI/FO
2176                    ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
2177                    ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
2178                    ;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
```

```
                        ;       8$:  CHECKS THAT DONE CLEARS
                        ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD DO3 SERIES
                        ;*****************************************************************************
                        ;
                        ;               INITIALIZE
                        ;       DEVICE 'CSR' REGISTER
                        ;                                                       SET:
007274  004737  014600  TST35:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
                                                        ;BIT3 = CLEAR MOS
                                                        ;BIT8 = MASTER XMTR SCAN ENB
                        ;WAIT FOR MOS TO CLEAR
                                                        SET:
                                                        ;BIT0 = RECEIVER ENABLE
007300  052777  002000  172016        BIS     #BIT10, @TCR    ;SET XMTR CONTROL BIT, LINE 10
007306  017701  172006  LOP35:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
007312  100375          LOP35
007314  012777  000377  172004        MOV     #377,   @TBUF   ;SEND A RUBOUT
007322  005000                        CLR     R0              ;CLEAR COUNTER
007324  105305          1$:     DECB    R5              ;SHORT WAIT LOOP
007326  001376                        BNE     1$
007330  017701  171766                MOV     @RBUF,R1        ;WAIT FOR CHAR. PRES.
007334  100405                        BMI     3$              ;BRANCH WHEN FOUND
007336  005200                        INC     R0              ;TIME COUNTER
007340  001371                        BNE     1$              ;BRANCH IF NOT TIME-OUT
007342  017702  171752                MOV     @CSR,   R2      ;SAVE CSR
007346  104002                        HLT+2                   ;CHARACTER READY DIDN'T SET
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;R2 = CONTENTS OF CSR
007350  050037  001346  3$:     BIS     R0,TIMER        ;SAVE THE TIMER
007354  032701  070000                BIT     #70000, R1      ;CHECK FOR ERROR BITS
007360  001401                        BEQ     .+4             ;BRANCH IF NONE
007362  104001                        HLT+1                   ;ERROR IN RECEIVED CHAR
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BIT14=UART OVERRUN
                                                        ;BIT13=FRAMING ERROR
                                                        ;BIT12=PARITY ERROR
007364  010102          4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
007366  042702  170377                BIC     #170377,R2      ;MASK LINE#
007372  000302                        SWAB    R2              ;LINE # IN LOW BYTE
007374  122702  000012                CMPB    #10.,   R2      ;CHECK LINE #
007400  001401                        BEQ     .+4             ;BRANCH IF OK
007402  104001                        HLT+1                   ;WRONG LINE # RECEIVED
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BITS8-11 = LINE #
007404  117702  171754  5$:     MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
007410  130201                        BITB    R2,     R1      ;CHECK CHAR LENGTH.
007412  001401                        BEQ     .+4             ;BRANCH IF OK
007414  104002                        HLT+2                   ;WRONG CHARACTER LENGTH
                                                        ;R1=DATA FROM FI/FO
                                                        ;R2=MASK (BITS SET NOT EXPECTED)
007416  105102          6$:     COMB    R2              ;REVERSE THE MASK
007420  120102                        CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
007422  001401                        BEQ     .+4             ;BRANCH IF OK
007424  104002                        HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
                                                        ;R1=DATA FROM FI/FO (COMPLETE WORD)
```

```
                                                        ;R2=DATA (LOW BYTE) EXPECTED
007426  017701  171670          7$:     MOV     @RBUF,  R1      ;READ FI/FO
007432  100001                          BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
007434  104001                          HLT+1                   ;CHARACTER PRESENT STAYED SET
                                                        ;R1 = CONTENTS OF RBUF
007436  017701  171656          8$:     MOV     @CSR,   R1      ;SAVE THE CSR
007442  022701  100405                  CMP     #100405,R1      ;CHECK THE CSR
007446  001401                          BEQ     .+4             ;BRANCH IF OK
007450  104001                          HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
                                                        ;R1 = CONTENTS OF CSR
007452  005077  171646                  CLR     @TCR            ;CLEAR TCR
007456  005077  171636                  CLR     @CSR            ;CLEAR CSR
007462  104400                          SCOPE

;*************************************************************************
;TEST 36:       TEST THAT LINE 11 CAN TRANSMIT AND
;               RECEIVE A CHARACTER. (377)
;       1$:  CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
;       3$:  CHECKS THAT NO ERRORS IN FI/FO
;       4$:  CHECKS THAT RIGHT LINE # (11) IN FI/FO
;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
;       8$:  CHECKS THAT DONE CLEARS
;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
;*************************************************************************

;               INITIALIZE
;       DEVICE'CSR'REGISTER
;
                                                        SET:
007464  004737  014600          TST36:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
                                                        ;BIT3 = CLEAR MOS
                                                        ;BIT8 = MASTER XMTR SCAN ENB
;WAIT FOR MOS TO CLEAR
;
                                                        SET:
;
                                                        ;BIT0 = RECEIVER ENABLE
;
007470  052777  004000  171626          BIS     #BIT11, @TCR    ;SET XMTR CONTROL BIT, LINE 11
007476  017701  171616          LOP36:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
007502  100375                          BPL     LOP36
007504  012777  000377  171614          MOV     #377,   @TBUF   ;SEND A RUBOUT
007512  005000                          CLR     R0              ;CLEAR COUNTER
007514  105305                  1$:     DECB    R5              ;SHORT WAIT LOOP
007516  001376                          BNE     1$
007520  017701  171576                  MOV     @RBUF,R1        ;WAIT FOR CHAR. PRES.
007524  100405                          BMI     3$              ;BRANCH WHEN FOUND
007526  005200                          INC     R0              ;TIME COUNTER
007530  001371                          BNE     1$              ;BRANCH IF NOT TIME-OUT
007532  017702  171562                  MOV     @CSR,   R2      ;SAVE CSR
007536  104002                          HLT+2                   ;CHARACTER READY DIDN'T SET
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;R2 = CONTENTS OF CSR
007540  050037  001346          3$:     BIS     R0,TIMER        ;SAVE THE TIMER
007544  032701  070000                  BIT     #70000, R1      ;CHECK FOR ERROR BITS
007550  001401                          BEQ     .+4             ;BRANCH IF NONE
007552  104001                          HLT+1                   ;ERROR IN RECEIVED CHAR
```

```
2291                                                    ;R1 = CONTENTS OF RBUF
2292                                                    ;BIT14=UART OVERRUN
2293                                                    ;BIT13=FRAMING ERROR
2294                                                    ;BIT12=PARITY ERROR
2295  007554  010102              4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
2296  007556  042702  170377            BIC     #170377,R2      ;MASK LINE#
2297  007562  000302                    SWAB    R2              ;LINE # IN LOW BYTE
2298  007564  122702  000013            CMPB    #11.,   R2      ;CHECK LINE #
2299  007570  001401                    BEQ     .+4             ;BRANCH IF OK
2300  007572  104001                    HLT+1                   ;WRONG LINE # RECEIVED
2301                                                    ;R1 = CONTENTS OF RBUF
2302                                                    ;BITS8-11 = LINE #
2303  007574  117702  171564      5$:     MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
2304  007600  130201                    BITB    R2,     R1      ;CHECK CHAR LENGTH.
2305  007602  001401                    BEQ     .+4             ;BRANCH IF OK
2306  007604  104002                    HLT+2                   ;WRONG CHARACTER LENGTH
2307                                                    ;R1=DATA FROM FI/FO
2308                                                    ;R2=MASK (BITS SET NOT EXPECTED)
2309  007606  105102              6$:     COMB    R2              ;REVERSE THE MASK
2310  007610  120102                    CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
2311  007612  001401                    BEQ     .+4             ;BRANCH IF OK
2312  007614  104002                    HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
2313                                                    ;R1=DATA FROM FI/FO (COMPLETE WORD)
2314                                                    ;R2=DATA (LOW BYTE) EXPECTED
2315  007616  017701  171500      7$:     MOV     @RBUF,  R1      ;READ FI/FO
2316  007622  100001                    BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
2317  007624  104001                    HLT+1                   ;CHARACTER PRESENT STAYED SET
2318                                                    ;R1 = CONTENTS OF RBUF
2319  007626  017701  171466      8$:     MOV     @CSR,   R1      ;SAVE THE CSR
2320  007632  022701  100405            CMP     #100405,R1      ;CHECK THE CSR
2321  007636  001401                    BEQ     .+4             ;BRANCH IF OK
2322  007640  104001                    HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
2323                                                    ;R1 = CONTENTS OF CSR
2324  007642  005077  171456            CLR     @TCR            ;CLEAR TCR
2325  007646  005077  171446            CLR     @CSR            ;CLEAR CSR
2326  007652  104400                    SCOPE
2327  007654  005237  001364            INC     DJLEN
2328  007660  012737  007666  015250    MOV     #.+6,   LAD
2329
2330                                    ;*************************************************************************
2331                                    ;TEST 37:       TEST THAT LINE 12 CAN TRANSMIT AND
2332                                    ;               RECEIVE A CHARACTER. (377)
2333                                    ;       1$:  CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
2334                                    ;       3$:  CHECKS THAT NO ERRORS IN FI/FO
2335                                    ;       4$:  CHECKS THAT RIGHT LINE # (12) IN FI/FO
2336                                    ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
2337                                    ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
2338                                    ;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
2339                                    ;       8$:  CHECKS THAT DONE CLEARS
2340                                    ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
2341                                    ;*************************************************************************
2342
2343                                    ;               INITIALIZE
2344                                    ;       DEVICE'CSR'REGISTER
2345                                    ;                                       SET:
2346  007666  004737  014600    TST37:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
```

```
                                                                ;BIT3 = CLEAR MOS
                                                                ;BIT8 = MASTER XMTR SCAN ENB
                                ;WAIT FOR MOS TO CLEAR
                                ;
                                ;                               SET:
                                ;                               ;BIT0 = RECEIVER ENABLE
                                ;
007672  052777  010000  171424          BIS     #BIT12, @TCR    ;SET XMTR CONTROL BIT, LINE 12
007700  017701  171414          LOP37:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
007704  100375                  BPL     LOP37
007706  012777  000377  171412          MOV     #377,   @TBUF   ;SEND A RUBOUT
007714  005000                  CLR     R0                      ;CLEAR COUNTER
007716  105305                  1$:     DECB    R5              ;SHORT WAIT LOOP
007720  001376                  BNE     1$
007722  017701  171374                  MOV     @RBUF,R1        ;WAIT FOR CHAR. PRES.
007726  100405                  BMI     3$                      ;BRANCH WHEN FOUND
007730  005200                  INC     R0                      ;TIME COUNTER
007732  001371                  BNE     1$                      ;BRANCH IF NOT TIME-OUT
007734  017702  171360                  MOV     @CSR,   R2      ;SAVE CSR
007740  104002                  HLT+2                           ;CHARACTER READY DIDN'T SET
                                                                ;R1 = CONTENTS OF RBUF
                                                                ;R2 = CONTENTS OF CSR
007742  050037  001346          3$:     BIS     R0,TIMER        ;SAVE THE TIMER
007746  032701  070000                  BIT     #70000, R1      ;CHECK FOR ERROR BITS
007752  001401                  BEQ     .+4                     ;BRANCH IF NONE
007754  104001                  HLT+1                           ;ERROR IN RECEIVED CHAR
                                                                ;R1 = CONTENTS OF RBUF
                                                                ;BIT14=UART OVERRUN
                                                                ;BIT13=FRAMING ERROR
                                                                ;BIT12=PARITY ERROR
007756  010102                  4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
007760  042702  170377                  BIC     #170377,R2      ;MASK LINE#
007764  000302                  SWAB    R2                      ;LINE # IN LOW BYTE
007766  122702  000014                  CMPB    #12.,   R2      ;CHECK LINE #
007772  001401                  BEQ     .+4                     ;BRANCH IF OK
007774  104001                  HLT+1                           ;WRONG LINE # RECEIVED
                                                                ;R1 = CONTENTS OF RBUF
                                                                ;BITS8-11 = LINE #
007776  117702  171362          5$:     MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
010002  130201                  BITB    R2,     R1              ;CHECK CHAR LENGTH.
010004  001401                  BEQ     .+4                     ;BRANCH IF OK
010006  104002                  HLT+2                           ;WRONG CHARACTER LENGTH
                                                                ;R1=DATA FROM FI/FO
                                                                ;R2=MASK (BITS SET NOT EXPECTED)
010010  105102                  6$:     COMB    R2              ;REVERSE THE MASK
010012  120102                  CMPB    R1,     R2              ;CHECK THE ACTURAL DATA
010014  001401                  BEQ     .+4                     ;BRANCH IF OK
010016  104002                  HLT+2                           ;WRONG CHAR LEN OR DATA ERROR
                                                                ;R1=DATA FROM FI/FO (COMPLETE WORD)
                                                                ;R2=DATA (LOW BYTE) EXPECTED
010020  017701  171276          7$:     MOV     @RBUF,  R1      ;READ FI/FO
010024  100001                  BPL     .+4                     ;BRANCH IF CHAR PRESENT NOT SET
010026  104001                  HLT+1                           ;CHARACTER PRESENT STAYED SET
                                                                ;R1 = CONTENTS OF RBUF
010030  017701  171264          8$:     MOV     @CSR,   R1      ;SAVE THE CSR
010034  022701  100405                  CMP     #100405,R1      ;CHECK THE CSR
010040  001401                  BEQ     .+4                     ;BRANCH IF OK
```

```
                        HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
                                                ;R1 = CONTENTS OF CSR
                        CLR     @TCR            ;CLEAR TCR
                        CLR     @CSR            ;CLEAR CSR
                        SCOPE

                ;*****************************************************************************
                ;TEST 40:       TEST THAT LINE 13 CAN TRANSMIT AND
                ;               RECEIVE A CHARACTER. (377)
                ;       1$:  CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
                ;       3$:  CHECKS THAT NO ERRORS IN FI/FO
                ;       4$:  CHECKS THAT RIGHT LINE # (13) IN FI/FO
                ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
                ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
                ;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
                ;       8$:  CHECKS THAT DONE CLEARS
                ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
                ;*****************************************************************************

                ;               INITIALIZE
                ;       DEVICE'CSR'REGISTER
                ;                                       SET:
010056  004737  014600  TST40:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
                                                        ;BIT3 = CLEAR MOS
                                                        ;BIT8 = MASTER XMTR SCAN ENB
                ;WAIT FOR MOS TO CLEAR
                ;                                       SET:
                ;                                       ;BIT0 = RECEIVER ENABLE
                ;
010062  052777  020000  171234          BIS     #BIT13, @TCR    ;SET XMTR CONTROL BIT, LINE 13
010070  017701  171224  LOP40:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
010074  100375                 BPL     LOP40
010076  012777  000377  171222          MOV     #377,   @TBUF   ;SEND A RUBOUT
010104  005000                  CLR     R0              ;CLEAR COUNTER
010106  105305          1$:     DECB    R5              ;SHORT WAIT LOOP
010110  001376                  BNE     1$
010112  017701  171204          MOV     @RBUF,R1        ;WAIT FOR CHAR. PRES.
010116  100405                  BMI     3$              ;BRANCH WHEN FOUND
010120  005200                  INC     R0              ;TIME COUNTER
010122  001371                  BNE     1$              ;BRANCH IF NOT TIME-OUT
010124  017702  171170          MOV     @CSR,   R2      ;SAVE CSR
010130  104002                  HLT+2                   ;CHARACTER READY DIDN'T SET
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;R2 = CONTENTS OF CSR
010132  050037  001346  3$:     BIS     R0,TIMER        ;SAVE THE TIMER
010136  032701  070000          BIT     #70000, R1      ;CHECK FOR ERROR BITS
010142  001401                  BEQ     .+4             ;BRANCH IF NONE
010144  104001                  HLT+1                   ;ERROR IN RECEIVED CHAR
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BIT14=UART OVERRUN
                                                        ;BIT13=FRAMING ERROR
                                                        ;BIT12=PARITY ERROR
010146  010102          4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
010150  042702  170377          BIC     #170377,R2      ;MASK LINE#
010154  000302                  SWAB    R2              ;LINE # IN LOW BYTE
010156  122702  000015          CMPB    #13.,   R2      ;CHECK LINE #
```

```
                        BEQ     .+4             ;BRANCH IF OK
                        HLT+1                   ;WRONG LINE # RECEIVED
                                                ;R1 = CONTENTS OF RBUF
                                                ;BITS8-11 = LINE #
                5$:     MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
                        BITB    R2,     R1      ;CHECK CHAR LENGTH.
                        BEQ     .+4             ;BRANCH IF OK
                        HLT+2                   ;WRONG CHARACTER LENGTH
                                                ;R1=DATA FROM FI/FO
                                                ;R2=MASK (BITS SET NOT EXPECTED)
                6$:     COMB    R2              ;REVERSE THE MASK
                        CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
                        BEQ     .+4             ;BRANCH IF OK
                        HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
                                                ;R1=DATA FROM FI/FO (COMPLETE WORD)
                                                ;R2=DATA (LOW BYTE) EXPECTED
                7$:     MOV     @RBUF,  R1      ;READ FI/FO
                        BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
                        HLT+1                   ;CHARACTER PRESENT STAYED SET
                                                ;R1 = CONTENTS OF RBUF
                8$:     MOV     @CSR,   R1      ;SAVE THE CSR
                        CMP     #100405,R1      ;CHECK THE CSR
                        BEQ     .+4             ;BRANCH IF OK
                        HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
                                                ;R1 = CONTENTS OF CSR
                        CLR     @TCR            ;CLEAR TCR
                        CLR     @CSR            ;CLEAR CSR
                        SCOPE

                ;*******************************************************************************
                ;TEST 41:       TEST THAT LINE 14 CAN TRANSMIT AND
                ;               RECEIVE A CHARACTER. (377)
                ;       1$:  CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
                ;       3$:  CHECKS THAT NO ERRORS IN FI/FO
                ;       4$:  CHECKS THAT RIGHT LINE # (14) IN FI/FO
                ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
                ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
                ;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
                ;       8$:  CHECKS THAT DONE CLEARS
                ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
                ;*******************************************************************************

                ;               INITIALIZE
                ;       DEVICE''CSR'REGISTER
                ;                                       SET:
                TST41:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
                                                ;BIT3 = CLEAR MOS
                                                ;BIT8 = MASTER XMTR SCAN ENB
                ;WAIT FOR MOS TO CLEAR
                ;                                       SET:
                ;                                       ;BIT0 = RECEIVER ENABLE
                ;
                        BIS     #BIT14, @TCR    ;SET XMTR CONTROL BIT, LINE 14
                LOP41:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
                        BPL     LOP41
                        MOV     #377,   @TBUF   ;SEND A RUBOUT
```

```
2515  010274  005000                    CLR     R0              ;CLEAR COUNTER
2516  010276  105305            1$:     DECB    R5              ;SHORT WAIT LOOP
2517  010300  001376                    BNE     1$
2518  010302  017701  171014            MOV     @RBUF,R1        ;WAIT FOR CHAR. PRES.
2519  010306  100405                    BMI     3$              ;BRANCH WHEN FOUND
2520  010310  005200                    INC     R0              ;TIME COUNTER
2521  010312  001371                    BNE     1$              ;BRANCH IF NOT TIME-OUT
2522  010314  017702  171000            MOV     @CSR,   R2      ;SAVE CSR
2523  010320  104002                    HLT+2                   ;CHARACTER READY DIDN'T SET
2524                                                            ;R1 = CONTENTS OF RBUF
2525                                                            ;R2 = CONTENTS OF CSR
2526  010322  050037  001346    3$:     BIS     R0,TIMER        ;SAVE THE TIMER
2527  010326  032701  070000            BIT     #70000, R1      ;CHECK FOR ERROR BITS
2528  010332  001401                    BEQ     .+4             ;BRANCH IF NONE
2529  010334  104001                    HLT+1                   ;ERROR IN RECEIVED CHAR
2530                                                            ;R1 = CONTENTS OF RBUF
2531                                                            ;BIT14=UART OVERRUN
2532                                                            ;BIT13=FRAMING ERROR
2533                                                            ;BIT12=PARITY ERROR
2534  010336  010102            4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
2535  010340  042702  170377            BIC     #170377,R2      ;MASK LINE#
2536  010344  000302                    SWAB    R2              ;LINE # IN LOW BYTE
2537  010346  122702  000016            CMPB    #14.,   R2      ;CHECK LINE #
2538  010352  001401                    BEQ     .+4             ;BRANCH IF OK
2539  010354  104001                    HLT+1                   ;WRONG LINE # RECEIVED
2540                                                            ;R1 = CONTENTS OF RBUF
2541                                                            ;BITS8-11 = LINE #
2542  010356  117702  171002    5$:     MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
2543  010362  130201                    BITB    R2,     R1      ;CHECK CHAR LENGTH.
2544  010364  001401                    BEQ     .+4             ;BRANCH IF OK
2545  010366  104002                    HLT+2                   ;WRONG CHARACTER LENGTH
2546                                                            ;R1=DATA FROM FI/FO
2547                                                            ;R2=MASK (BITS SET NOT EXPECTED)
2548  010370  105102            6$:     COMB    R2              ;REVERSE THE MASK
2549  010372  120102                    CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
2550  010374  001401                    BEQ     .+4             ;BRANCH IF OK
2551  010376  104002                    HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
2552                                                            ;R1=DATA FROM FI/FO (COMPLETE WORD)
2553                                                            ;R2=DATA (LOW BYTE) EXPECTED
2554  010400  017701  170716    7$:     MOV     @RBUF,  R1      ;READ FI/FO
2555  010404  100001                    BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
2556  010406  104001                    HLT+1                   ;CHARACTER PRESENT STAYED SET
2557                                                            ;R1 = CONTENTS OF RBUF
2558  010410  017701  170704    8$:     MOV     @CSR,   R1      ;SAVE THE CSR
2559  010414  022701  100405            CMP     #100405,R1      ;CHECK THE CSR
2560  010420  001401                    BEQ     .+4             ;BRANCH IF OK
2561  010422  104001                    HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
2562                                                            ;R1 = CONTENTS OF CSR
2563  010424  005077  170674            CLR     @TCR            ;CLEAR TCR
2564  010430  005077  170664            CLR     @CSR            ;CLEAR CSR
2565  010434  104400                    SCOPE
2566
2567                              ;*************************************************************************
2568                              ;TEST 42:       TEST THAT LINE 15 CAN TRANSMIT AND
2569                              ;               RECEIVE A CHARACTER. (377)
2570                              ;       1$:  CHECKS THAT CHAR PRESENT IS IN FI/FO IN REASONABLE TIME.
```

```
                        ;       3$:  CHECKS THAT NO ERRORS IN FI/FO
                        ;       4$:  CHECKS THAT RIGHT LINE # (15) IN FI/FO
                        ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
                        ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
                        ;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
                        ;       8$:  CHECKS THAT DONE CLEARS
                        ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
                        ;*****************************************************************************

                        ;               INITIALIZE
                        ;       DEVICE 'CSR' REGISTER
                        ;                                               SET:
010436  004737  014600  TST42:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
                                                        ;BIT3 = CLEAR MOS
                                                        ;BIT8 = MASTER XMTR SCAN ENB
                        ;WAIT FOR MOS TO CLEAR
                        ;                               SET:
                        ;                               ;BIT0 = RECEIVER ENABLE
                        ;
010442  052777  100000  170654          BIS     #BIT15, @TCR    ;SET XMTR CONTROL BIT, LINE 15
010450  017701  170644  LOP42:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
010454  100375                  BPL     LOP42
010456  012777  000377  170642          MOV     #377,   @TBUF   ;SEND A RUBOUT
010464  005000                  CLR     R0              ;CLEAR COUNTER
010466  105305          1$:     DECB    R5              ;SHORT WAIT LOOP
010470  001376                  BNE     1$
010472  017701  170624          MOV     @RBUF,R1        ;WAIT FOR CHAR. PRES.
010476  100405                  BMI     3$              ;BRANCH WHEN FOUND
010500  005200                  INC     R0              ;TIME COUNTER
010502  001371                  BNE     1$              ;BRANCH IF NOT TIME-OUT
010504  017702  170610          MOV     @CSR,   R2      ;SAVE CSR
010510  104002                  HLT+2                   ;CHARACTER READY DIDN'T SET
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;R2 = CONTENTS OF CSR
010512  050037  001346  3$:     BIS     R0,TIMER        ;SAVE THE TIMER
010516  032701  070000          BIT     #70000, R1      ;CHECK FOR ERROR BITS
010522  001401                  BEQ     .+4             ;BRANCH IF NONE
010524  104001                  HLT+1                   ;ERROR IN RECEIVED CHAR
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BIT14=UART OVERRUN
                                                        ;BIT13=FRAMING ERROR
                                                        ;BIT12=PARITY ERROR
010526  010102  4$:     MOV     R1,     R2              ;DUPLICATE DATA WORD
010530  042702  170377          BIC     #170377,R2      ;MASK LINE#
010534  000302                  SWAB    R2              ;LINE # IN LOW BYTE
010536  122702  000017          CMPB    #15.,   R2      ;CHECK LINE #
010542  001401                  BEQ     .+4             ;BRANCH IF OK
010544  104001                  HLT+1                   ;WRONG LINE # RECEIVED
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BITS8-11 = LINE #
010546  117702  170612  5$:     MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
010552  130201                  BITB    R2,     R1      ;CHECK CHAR LENGTH.
010554  001401                  BEQ     .+4             ;BRANCH IF OK
010556  104002                  HLT+2                   ;WRONG CHARACTER LENGTH
                                                        ;R1=DATA FROM FI/FO
                                                        ;R2=MASK (BITS SET NOT EXPECTED)
```

```
2627  010560  105102                  6$:     COMB    R2              ;REVERSE THE MASK
2628  010562  120102                          CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
2629  010564  001401                          BEQ     .+4             ;BRANCH IF OK
2630  010566  104002                          HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
2631                                                                  ;R1=DATA FROM FI/FO (COMPLETE WORD)
2632                                                                  ;R2=DATA (LOW BYTE) EXPECTED
2633  010570  017701  170526          7$:     MOV     @RBUF,  R1      ;READ FI/FO
2634  010574  100001                          BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
2635  010576  104001                          HLT+1                   ;CHARACTER PRESENT STAYED SET
2636                                                                  ;R1 = CONTENTS OF RBUF
2637  010600  017701  170514          8$:     MOV     @CSR,   R1      ;SAVE THE CSR
2638  010604  022701  100405                  CMP     #100405,R1      ;CHECK THE CSR
2639  010610  001401                          BEQ     .+4             ;BRANCH IF OK
2640  010612  104001                          HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
2641                                                                  ;R1 = CONTENTS OF CSR
2642  010614  005077  170504                  CLR     @TCR            ;CLEAR TCR
2643  010620  005077  170474                  CLR     @CSR            ;CLEAR CSR
2644  010624  104400                          SCOPE
2645  010626  162737  000003  001364         SUB     #3,     DJLEN
2646  010634  005237  001346                  INC     TIMER           ;WORSE CASE TIME, ONE CHARACTER
2647  010640  013700  001346                  MOV     TIMER,  R0      ;DUP TIMER
2648  010644  006200                          ASR     R0              ;/2
2649  010646  006200                          ASR     R0              ;/4
2650  010650  005200                          INC     R0              ;+1
2651  010652  006137  001346                  ROL     TIMER           ;TIMER * 2
2652  010656  060037  001346                  ADD     R0,     TIMER   ;2.25 TIMES ONE CHARACTER TIME
2653  010662  012737  010670  015250         MOV     #.+6,   LAD     ;RESET LOOP ADDRESS
2654
2655                                  ;******************************************************************************
2656                                  ;TEST 43:       TEST THAT CHARACTER PRESENT (BIT15) OF RBUF
2657                                  ;               IS CLEARED (BY CLEAR MOS).
2658                                  ;PROBABLE FAULTY LOGIC:  M7285 (D2-8) E17,E14,E15; M7279; M7280
2659                                  ;******************************************************************************
2660
2661                                  ;       INITIALIZE
2662                                  ;
2663  010670  004737  014600          TST43:  JSR     PC,@#INITD
2664                                  ;SET:
2665                                  ;       BIT2 = MAINTENANCE
2666                                  ;       BIT3 = CLEAR MOS
2667                                  ;       BIT8 = TRANS SCAN ENABLE
2668                                  ;       WAIT FOR BIT4 = MOS CLEAR
2669                                  ;SET:
2670                                  ;       BIT0 = RECEIVER ENABLE
2671  010674  012777  000001  170422          MOV     #BIT0,  @TCR    ;TRANS CONTROL, LINE0
2672  010702  012704  000040                  MOV     #40,R4          ;SET UP COUNTER TO OUTPUT 32 CHAR'S
2673  010706  017701  170406          1$:     MOV     @CSR,R1         ;WAIT FOR TRANS READY
2674  010712  100375                          BPL     1$
2675  010714  010477  170406                  MOV     R4,@TBUF        ;TRANSMIT COUNT
2676  010720  005304                          DEC     R4              ;COUNT DOWN
2677  010722  001371                          BNE     1$
2678
2679  010724  105777  170370          2$:     TSTB    @CSR            ;MAKE SURE DONE IS SET
2680  010730  100375                          BPL     2$
2681
2682  010732  052777  000010  170360         BIS     #BIT3,@CSR      ;CLEAR MOS
```

```
2683  010740  032777  000020  170352  3$:     BIT     #BIT4,@CSR      ;WAIT FOR CLRMOS TO FINISH
2684  010746  001374                          BNE     3$
2685
2686  010750  017701  170346                  MOV     @RBUF,R1        ;CHECK RBUF AND SAVE
2687  010754  100001                          BPL     .+4
2688  010756  104001                          HLT+1
2689  010760  017701  170334                  MOV     @CSR,R1         ;SAVE CSR
2690  010764  022701  100405                  CMP     #100405,R1      ;CHECK CSR
2691  010770  001401                          BEQ     .+4             ;BRANCH IF OK
2692  010772  104001                          HLT+1                   ;CSR ERROR. POSSIBILITES:
2693                                                                  ;(1) DONE DIDN'T CLEAR
2694
2695                                                                  ;(2) TRANSMITTER UART DIDN'T CLR.
2696                                                                  ;R1=CONTENTS OF CSR
2697
2698  010774  013700  001346                  MOV     TIMER,  R0      ;SET UP TIMER
2699  011000  105305          4$:             DECB    R5              ;SHORT WAIT LOOP
2700  011002  001376                          BNE     4$
2701
2702  011004  017701  170310                  MOV     @CSR,R1         ;SAVE CSR
2703  011010  105701                          TSTB    R1              ;CHECK FOR DONE
2704  011012  100001                          BPL     .+4             ;BRANCH IF OK
2705  011014  104001                          HLT+1                   ;DONE CAME UP!
2706                                                                  ;MOS MUST NOT HAVE CLEARED
2707  011016  005300                          DEC     R0              ;TIMER COUNT
2708  011020  001367                          BNE     4$
2709
2710  011022  022701  100405                  CMP     #100405,R1      ;CHECK CSR
2711  011026  001401                          BEQ     .+4             ;BRANCH IF OK
2712  011030  104001                          HLT+1                   ;CSR ERROR
2713
2714  011032  017701  170264                  MOV     @RBUF,R1        ;CHECK RBUF
2715  011036  100001                          BPL     .+4             ;BRANCH IF OK
2716  011040  104001                          HLT+1                   ;RBUF NOT EMPTY!
2717
2718  011042  005077  170256                  CLR     @TCR
2719  011046  005077  170246                  CLR     @CSR
2720
2721  011052  104400                          SCOPE
2722
2723
2724                          ;*****************************************************************************
2725                          ;TEST 44:       TEST THAT TRANSMITTER READY CLEARS WHEN TBUF IS LOADED
2726                          ;       NOTE:   DUE TO THE DOUBLE BUFFERING BY THE UART, TWO CHARACTERS
2727                          ;                 MUST BE LOADED TO INSURE SEEING TRANSMITTER READY CLEAR
2728                          ;PROBABLE FAULTY LOGIC:  M7285 (D2-6) E39, E23, E49
2729                          ;*****************************************************************************
2730
2731                          ;               INITIALIZE
2732                          ;       DEVICE''CSR'REGISTER
2733                          ;                                       SET:
2734  011054  004737  014600  TST44:  JSR     PC,@#INITD              ;BIT2 = MAINTENANCE
2735                                                                  ;BIT3 = CLEAR MOS
2736                                                                  ;BIT8 = MASTER XMTR SCAN ENB
2737                          ;WAIT FOR MOS TO CLEAR
2738                          ;                                       SET:
```

```
2739                                    ;
2740                                    ;
2741  011060  052777  000001  170236        BIS     #BIT0,  @TCR    ;BIT0 = RECEIVER ENABLE
2742  011066  017701  170226          1$:   MOV     @CSR,   R1      ;TRANS CONTROL, LINE 0
2743  011072  100375                       BPL     1$              ;WAIT FOR XMTR READY
2744  011074  012777  000001  170224        MOV     #1,     @TBUF   ;TRANSMIT A 1
2745  011102  017701  170212          2$:   MOV     @CSR,   R1      ;WAIT FOR XMTR READY
2746  011106  100375                       BPL     2$              ;TRANSMIT A 2
2747  011110  012777  000002  170210        MOV     #2,     @TBUF   ;CHECK FOR XMTR READY
2748  011116  017701  170176              MOV     @CSR,   R1      ;BRANCH IF XMTR READY CLEARED
2749  011122  100001                       BPL     .+4             ;TRANSMITTER READY FAILED TO CLEAR
2750  011124  104001                       HLT+1                   ;R1 = CONTENTS OF CSR
2751                                                                ;SET UP TIMER
2752  011126  013700  001346              MOV     TIMER,  R0      ;SHORT WAIT LOOP
2753  011132  105305                 3$:   DECB    R5              ;SAVE CSR FOR THE RECORD
2754  011134  001376                       BNE     3$              ;NOP FOR TIMING
2755  011136  017701  170156              MOV     @CSR,   R1      ;TIMER COUNT
2756  011142  000400                       BR      .+2             ;BRANCH IF MORE TIME
2757  011144  005300                       DEC     R0
2758  011146  001371                       BNE     3$
2759
2760  011150  042701  000200              BIC     #BIT7,R1        ;DONE MAY OR MAY NOT BE SET SO DONT TEST FOR IT
2761  011154  022701  100405              CMP     #100405,R1      ;TEST REST OF THE CSR
2762  011160  001401                       BEQ     .+4
2763  011162  104001                       HLT+1                   ;A CSR ERROR
2764                                                                ;R1 = CONTENTS OF CSR
2765
2766  011164  017701  170132              MOV     @RBUF,  R1      ;CHECK RBUF FOR CHAR PRESENT
2767  011170  100401                       BMI     .+4             ;BRANCH IF CHAR PRESENT
2768  011172  104001                       HLT+1                   ;CHAR PRESENT MISSING
2769                                                                ;R1 = CONTENTS OF RBUF
2770  011174  022701  100001              CMP     #100001,R1      ;CHECK THE DATA
2771  011200  001401                       BEQ     .+4             ;BRANCH IF OK
2772  011202  104001                       HLT+1                   ;RECEIVER ERROR
2773                                                                ;R1 = CNTENTS OF RBUF
2774  011204  017701  170112              MOV     @RBUF,  R1      ;CHECK RBUF FOR SECOND CHAR
2775  011210  100401                       BMI     .+4             ;BRANCH IF CHAR PRESENT
2776  011212  104001                       HLT+1                   ;CHAR PRESENT MISSING
2777                                                                ;R1 = CONTENTS OF RBUF
2778  011214  022701  100002              CMP     #100002,R1      ;CHECK THE DATA
2779  011220  001401                       BEQ     .+4             ;BRANCH IF OK
2780  011222  104001                       HLT+1                   ;RECEIVER ERROR
2781                                                                ;R1 = CNTENTS OF RBUF
2782  011224  017701  170072              MOV     @RBUF,  R1      ;CHECK FOR NO MORE CHARACTERS
2783  011230  100001                       BPL     .+4             ;BRANCH IF CHAR PRESENT CLEARED
2784  011232  104001                       HLT+1                   ;CHAR PRESENT NOT CLEAR!
2785                                                                ;R1 = CONTENTS OF RBUF
2786  011234  017701  170060              MOV     @CSR,   R1      ;SAVE CSR
2787  011240  022701  100405              CMP     #100405,R1      ;CHECK CSR
2788  011244  001401                       BEQ     .+4             ;BRANCH IF OK
2789  011246  104001                       HLT+1                   ;CSR ERROR
2790                                                                ;R1 = CONTENTS OF CSR
2791  011250  005077  170050              CLR     @TCR            ;CLEAR TCR
2792  011254  005077  170040              CLR     @CSR            ;CLEAR CSR
2793  011260  104400                       SCOPE
2794
```

```
                                ;*****************************************************************************
                                ;TEST 45:       TEST THE SILO ALARM LEVEL AT WHICH DONE WILL SET.
                                ;               TEST THAT RECEIVER ENABLE ON A 0 INHIBITS
                                ;               CHARACTER PRESENT.
                                ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) E32, E15; M7279 (D11-3) E19,E23
                                ;*****************************************************************************
                                ;               INITIALIZE
                                ;       DEVICE''CSR''REGISTER
                                ;                                               SET:
011262  004737  014600          TST45:  JSR     PC,@#INITD      ;BIT2 = MAINTENANCE
                                                                ;BIT3 = CLEAR MOS
                                                                ;BIT8 = MASTER XMTR SCAN ENB
                                ;WAIT FOR MOS TO CLEAR
                                ;                               SET:
                                ;                               ;BIT0 = RECEIVER ENABLE
011266  052777  000001  170030          BIS     #BIT0,  @TCR    ;TRANS CONTROL, LINE 0
011274  005737  001350                TST     ALMFLG          ;HAS THE ALARM LEVEL BEEN TESTED?
011300  001005                        BNE     11$             ;YES
011302  004737  014644                JSR     PC,ALMCK        ;NO, GO DO IT
011306  012737  000001  001350        MOV     #1,ALMFLG       ;SET THE FLAG
011314  012777  000414  167776  11$:  MOV     #414,   @CSR    ;BIT2 = MAINTENANCE
                                                                ;BIT3 = CLEAR MOS
                                                                ;BIT8 = MASTER TRAN SCAN ENB
011322  032777  000020  167770  10$:  BIT     #BIT4,  @CSR    ;WAIT FOR MOS TO CLEAR
011330  001374                        BNE     10$
                                ;OUTPUT THE # OF CHARACTERS NECESSARY FOR THE SILO ALARM
                                ;LEVEL TO ALOW DONE TO SET.
011332  013702  001356                MOV     COUNT,R2        ;SET CHAR COUNT
011336  017701  167756          1$:   MOV     @CSR,   R1      ;WAIT FOR XMTR READY
011342  100375                        BPL     1$
011344  012777  000252  167754        MOV     #252,   @TBUF   ;SEND AN "*"
011352  005302                        DEC     R2
011354  001370                        BNE     1$
011356  013700  001346                MOV     TIMER,  R0      ;SET UP TIMER
011362  105305                  2$:   DECB    R5              ;SHORT WAIT LOOP
011364  001376                        BNE     2$
011366  017701  167726                MOV     @CSR,   R1      ;SAVE CSR FOR TYPING
011372  105701                        TSTB    R1              ;CHECK FOR DONE
011374  100002                        BPL     3$              ;BRANCH IF NOT SET
011376  104001                        HLT+1                   ;DONE SET WHEN RCV ENB CLR
                                                                ;R1=CONTENTS OF CSR
011400  000402                        BR      4$
011402  005300                  3$:   DEC     R0              ;TIMER COUNT
011404  001366                        BNE     2$              ;BRANCH IF MORE TIMER
011406  017701  167710          4$:   MOV     @RBUF,  R1      ;CHECK AND SAVE FI/FO
011412  100001                        BPL     .+4             ;BRANCH IF OK
011414  104001                        HLT+1                   ;CHARACTER PRESENT IN FI/FO
                                                                ;R1=DATA FROM FI/FO
011416  005277  167676                INC     @CSR            ;SET RECEIVER ENABLE
011422  017701  167674          5$:   MOV     @RBUF,  R1      ;CHECK FOR CHARACTER PRESENT
011426  100403                        BMI     6$              ;BRANCH IF OK
011430  105300                        DECB    R0              ;SHORT TIMER
011432  001373                        BNE     5$
011434  104001                        HLT+1                   ;CHARACTER PRESENT MISSING
```

```
                                                        ;R1 = CONTENTS OF RBUF
011436  005077  167662          6$:     CLR     @TCR    ;CLR TRANS CONTROL REG

011442  104400                  SCOPE

                        ;*****************************************************************************
                        ;TEST 46:       TEST THAT HALF DUPLEX (BIT1) DISABLES THE RECEIVER UARTS.
                        ;PROBABLE FAULTY LOGIC:  M7285 (D2-4) E32, E17, E22, (D2-2) E5, E1
                        ;*****************************************************************************

011444  004737  014570          TST46:  JSR     PC,     @#INITC ;INITIALIZE
                                                        ;BIT1 = HALF DUPLEX
                                                        ;BIT2 = MAINTENANCE
                                                        ;BIT3 = CLEAR MOS
                                                        ;BIT8 = MASTER TRAN SCAN ENB
                                                        ;WAIT FOR MOS TO CLEAR
                                                        ;BIT0 = RECEIVER ENABLE
011450  012777  000001  167646          MOV     #BIT0,  @TCR    ;SET XMTR CONTROL BIT, LINE0
                        ;OUTPUT THE # OF CHARACTERS NECESSARY FOR THE SILO ALARM
                        ;LEVEL TO ALOW DONE TO SET.
011456  013702  001356          MOV     COUNT,R2        ;SET CHAR COUNT
011462  017701  167632          1$:     MOV     @CSR,   R1      ;WAIT FOR XMTR READY
011466  100375                  BPL     1$
011470  012777  000252  167630          MOV     #252,   @TBUF   ;SEND AN "*"
011476  005302                  DEC     R2
011500  001370                  BNE     1$
011502  013700  001346          MOV     TIMER,  R0      ;SET UP TIMER
011506  105305                  2$:     DECB    R5              ;SHORT WAIT LOOP
011510  001376                  BNE     2$
011512  017701  167602          MOV     @CSR,   R1      ;SAVE CSR
011516  105701                  TSTB    R1              ;CHECK FOR DONE
011520  100002                  BPL     3$              ;BRANCH IF NOT SET
011522  104001                  HLT+1                   ;DONE SET WHEN HALF DUPLEX (BIT1) SET
                                                        ;R1=CONTENTS OF CSR
011524  000402                  BR      4$
011526  005300                  3$:     DEC     R0              ;TIMER COUNT
011530  001366                  BNE     2$              ;BRANCH IF MORE TIMER

011532  017701  167564          4$:     MOV     @RBUF,  R1      ;CHECK AND SAVE FI/FO
011536  100001                  BPL     .+4             ;BRANCH IF OK
011540  104001                  HLT+1                   ;CHARACTER PRESENT IN FI/FO
                                                        ;R1=DATA FROM FI/FO
011542  042777  000002  167550          BIC     #BIT1,  @CSR    ;CLEAR HALF DUPLEX BIT
011550  000240                  NOP
011552  000240                  NOP
011554  000240                  NOP
011556  000240                  NOP
011560  017701  167536          5$:     MOV     @RBUF,  R1      ;CHECK FOR CHAR PRESENT
011564  100001                  BPL     .+4             ;BRANCH IF CHAR NOT PRESENT
011566  104001                  HLT+1                   ;CHAR PRESENT AFTER H/D CLEARED
                                                        ;R1 = CONTENTS OF RBUF
011570  005077  167530          CLR     @TCR            ;CLR TRANS CONTROL REG

011574  104400                  SCOPE

                        ;*****************************************************************************
```

```
2907                                    ;TEST 47:       TEST  RECEIVER INTERRUPT LEVEL
2908                                    ;       ERROR PRINT OUT IS AS FOLLOWS::::
2909                                    ;       ADDR  DJADR  R0 R1
2910                                    ;
2911                                    ;       ADDR=  ADDRESS OF ERROR HLT
2912                                    ;       DJADR= CSR ADDRESS OF DJ11 UNDER TEST
2913                                    ;       R1= BR LEVEL FOR DJ11 TO ALLOW INTR
2914                                    ;       R2= BR LEVEL WHERE ERROR OCCURED
2915
2916                                    ;PROBABLE FAULTY LOGIC:  M7821 WIRING, PROPER PRIORITY CHIP
2917                                    ;*************************************************************************
2918
2919  011576  012777  011736  167524  TST47:  MOV     #INTR2,@RCVVEC  ; SET UP RCVR INTERRUPT VECTOR
2920  011604  012777  000340  167520           MOV     #340,@RCVLVL    ; AT LEVEL 7
2921  011612  012737  000010  017214           MOV     #10,PRIOLO      ; LOAD BR7+1 INTO BR TEST LEVEL
2922  011620  012737  000005  017226  AGAIN2: MOV     #5,CT           ; LOADS COUNTER FOR 5 ROL -BR
2923  011626  005337  017214                   DEC     PRIOLO          ; START TEST BR7, THEN BR6,BR5...ETC.
2924  011632  013737  017214  017216           MOV     PRIOLO,NOW      ; LOAD PRE-ROL-ED DECIMAL PRIO
2925  011640  004737  014464                   JSR     PC,     BRSET   ; GO TO SUBROUTINE TO ::::::
2926                                                                    ; LOAD BR INTR LEVEL OF DJ11
2927                                                                    ; (LEVEL)= DECIMAL #(0 TO 7)
2928                                                                    ; (MASK)= OCTAL #(0 TO 340)
2929                                                                    ; (0,40,100,140,200,240,300,340)
2930                                                                    ; (NOW)= OCTAL #(0 TO 340) AS
2931                                                                    ; MASK, BUT  CURRENTLY TESTING
2932  011644  042737  000340  177776           BIC     #340,@#PS       ; CLEAR PS LEVEL
2933  011652  053737  017216  177776           BIS     NOW,@#PS        ; SET PS TO  CURRENT TEST LEVEL
2934  011660  004737  014560                   JSR     PC,     @#INITB ; SET:
2935                                                                    ; BIT2 = MAINTENANCE
2936                                                                    ; BIT3 = CLEAR MOS
2937                                                                    ; BIT6 = RECEIVER INTERUPT ENABLE
2938                                                                    ; BIT8 = MASTER TRANS SCAN ENABLE
2939                                                                    ; WAIT FOR MOS TO CLEAR
2940                                                                    ; BIT0 = RECEIVER ENABLE
2941  011664  012777  000001  167432           MOV     #BIT0,  @TCR    ; SET TRAN CONTROL BIT, LINE 0
2942                                    ;OUTPUT THE # OF CHARACTERS NECESSARY FOR THE SILO ALARM
2943                                    ;LEVEL TO ALOW DONE TO SET.
2944  011672  013702  001356                   MOV     COUNT,R2        ; SET CHAR COUNT
2945  011676  017701  167416           1$:     MOV     @CSR,   R1      ; WAIT FOR TRAN RDY
2946  011702  100375                           BPL     1$
2947  011704  012777  000025  167414           MOV     #25,    @TBUF   ;SEND #25
2948  011712  005302                           DEC     R2
2949  011714  001370                           BNE     1$
2950  011716  105777  167376           2$:     TSTB    @CSR            ;WAIT FOR DONE
2951  011722  100375                           BPL     2$
2952  011724                          NINTR2: ;
2953                                          ; IF YOU ARE HERE NO INTR OCCURED
2954                                          ;
2955  011724  023737  017216  017220           CMP     NOW,MASK        ; IS THIS AN ERROR?????
2956  011732  002407                           BLT     ERROR2          ; BRANCH IF YES
2957  011734  000417                           BR      THRU2           ; IF NO,GO ON NEXT BR
2958
2959  011736                          INTR2:  ;
2960                                          ;       IF YOU ARE HERE AN INTR OCCURED
2961  011736  022626                           CMP     (SP)+,(SP)+     ; CLEAN UP THE STACK
2962  011740  023737  017216  017220           CMP     NOW,MASK        ; IS THIS AN ERROR?????
```

```
2963  011746  002001                        BGE     ERROR2          ; BRANCH IF ERROR
2964  011750  000411                        BR      THRU2           ; IF NO,SEE IF ALL BR LEVELS TESTED
2965
2966  011752                        ERROR2: ; IF YOU ARE HERE , THEN SOMETHING IS WRONG
2967                                        ;               ERROR!!!!!!!!!
2968
2969  011752  010146                        MOV     R1,-(6)         ;PUSH R1 ON STACK
2970  011754  010246                        MOV     R2,-(6)         ;PUSH R2 ON STACK
2971
2972  011756  013701  017220                MOV MASK,       R1      ; R1=BR LEVEL ALLOWED
2973                                                                ; (BR BITS OF PSW)
2974  011762  013702  017216                MOV NOW,        R2      ; R2=BR LEVEL OF ERROR
2975                                                                ; (BR BITS OF PSW)
2976
2977  011766  104002                        HLT+2                   ; REPORT ERROR+ REG. 0,1
2978
2979
2980  011770  012602                        MOV     (6)+,R2         ;POP STACK INTO R2
2981  011772  012601                        MOV     (6)+,R1         ;POP STACK INTO R1
2982
2983  011774                        THRU2:
2984
2985  011774  017701  167322                MOV     @RBUF,  R1      ; READ THE CHARACTER
2986  012000  100401                        BMI     .+4             ; BRANCH IF CHAR PRESENT
2987  012002  104001                        HLT+1                   ; CHAR PRESENT MISSING
2988                                                                ; R1= CONTENTS OF RBUF
2989  012004  022701  100025                CMP     #100025,R1      ; CHECK THE DATA
2990  012010  001401                        BEQ     .+4             ; BRANCH IF OK
2991  012012  104001                        HLT+1                   ; RECEIVED DATA ERROR
2992                                                                ; R1= CONTENTS OF RBUF
2993
2994  012014  005077  167304                CLR     @TCR
2995  012020  005077  167274                CLR     @CSR
2996  012024  005737  017216                TST     NOW             ; TEST IF LAST BR WAS CHECKED
2997  012030  001273                        BNE     AGAIN2          ; BACK TO TEST NEXT INTR LOWER
2998                                                                ; (NOW) = 0
2999  012032  013777  001332  167270        MOV     RCVLVL,@RCVVEC  ; RELOAD AND CLEAN UP
3000  012040  012777  000004  167270        MOV     #IOT,   @XMTLVL
3001  012046  042737  000340  177776        BIC     #340,@#PS
3002
3003
3004
3005  012054  104400                        SCOPE
3006
3007
3008                                ;*****************************************************************
3009                                ;TEST 50:       TEST FI/FO OVERRUN
3010                                ;               THE FI/FO BUFFER SHOULD HOLD 64 CHARACTERS.
3011                                ;PROBABLE FAULTY LOGIC:  M7285 (D1-7) E32, E17, E22 (D2-2) E5, E1
3012                                ;*****************************************************************
3013
3014                                ;               INITIALIZE
3015                                ;       DEVICE''CSR'REGISTER
3016                                ;                                               SET:
3017  012056  004737  014600        TST50:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
3018                                                                ;BIT3 = CLEAR MOS
```

```
3019                                                    ;BIT8 = MASTER XMTR SCAN ENB
3020                                    ;WAIT FOR MOS TO CLEAR
3021                                    ;                       SET:
3022                                    ;                       ;BIT0 = RECEIVER ENABLE
3023                                    ;
3024  012062  012777  177777  167234          MOV     #177777,@TCR    ;TRANS CONTROL BIT, ALL LINES
3025  012070  012700  000100                  MOV     #100,   R0      ;SET UP COUNTER - 64. CHAR FI/FO BUFF
3026  012074  017701  167220          1$:     MOV     @CSR,   R1      ;SAVE AND WAIT FOR TRANS READY
3027  012100  100375                          BPL     1$
3028  012102  000377  167220                  SWAB    @TBUF           ;TRANSMIT LINE # ON LINE
3029  012106  032701  020000                  BIT     #BIT13, R1      ;CHECK FI/FO OVERRUN
3030  012112  001401                          BEQ     .+4             ;BRANCH IF OK
3031  012114  104001                          HLT+1                   ;FI/FO OVERRUN TOO SOON
3032                                                                  ;R1=CONTENTS OF CSR
3033  012116  005300                          DEC     R0              ;COUNT DOWN
3034  012120  001365                          BNE     1$
3035
3036  012122  013700  001346                  MOV     TIMER,  R0      ;SET UP TIMER
3037  012126  017701  167166          2$:     MOV     @CSR,   R1      ;WAIT FOR XMTR READY
3038  012132  100375                          BPL     2$
3039  012134  105305          3$:     DECB    R5              ;SHORT WAIT LOOP
3040  012136  001376                          BNE     3$
3041  012140  017701  167154                  MOV     @CSR,   R1      ;SAVE CSR FOR THE RECORD
3042  012144  100401                          BMI     .+4             ;BRANCH IF TRANS READY
3043  012146  104001                          HLT+1                   ;TRANS READY MISTERIOUSLY DISAPPEARED
3044                                                                  ;R1=CONTENTS OF CSR
3045  012150  005300                          DEC     R0              ;TIME 3 CHARACTER LENGTHS
3046  012152  001370                          BNE     3$              ;BRANCH IF MORE TIME
3047
3048                                    ;FI/FO SHOULD NOW BE FULL
3049
3050  012154  105701                          TSTB    R1              ;CHECK THAT DONE IS SET
3051  012156  100401                          BMI     .+4             ;BRANCH IF OK
3052  012160  104001                          HLT+1                   ;DONE DIDN'T COME UP!
3053                                                                  ;R1 = CONTENTS OF CSR
3054  012162  022701  100605                  CMP     #100605,R1      ;CHECK THAT FI/FO NOT OVERRUN
3055  012166  001401                          BEQ     .+4             ;BRANCH IF OK
3056  012170  104001                          HLT+1                   ;FI/FO OVERRUN SET
3057                                                                  ;OR SOME OTHER CSR ERROR
3058                                                                  ;R1=CONTENTS OF CSR
3059
3060                                    ;*****************************************************************************
3061                                    ;TEST 50A:      TEST THAT FI/FO OVERRUN COMES UP WHEN 65TH CHARACTER
3062                                    ;                 IS RECEIVED WITHOUT READING FI/FO
3063                                    ;*****************************************************************************
3064
3065  012172  000377  167130  T50A:     SWAB    @TBUF           ;SEND 65TH CHARACTER
3066  012176  013700  001346                  MOV     TIMER,  R0      ;SET UP TIMER
3067  012202  105305          11$:     DECB    R5              ;SHORT WAIT LOOP
3068  012204  001376                          BNE     11$
3069  012206  017701  167106                  MOV     @CSR,R1         ;SAVE CSR
3070  012212  032701  020000                  BIT     #BIT13,R1       ;CHECK FI/FO OVERRUN
3071  012216  001003                          BNE     12$             ;BRANCH WHEN SET
3072  012220  005300                          DEC     R0              ;TIMER
3073  012222  001367                          BNE     11$             ;BRANCH IF MORE TIME
3074  012224  104001                          HLT+1                   ;FI/FO OVERRUN DIDN'T COMEUP
```

```
3075
3076  012226  022701  120605          12$:    CMP     #120605,R1      ;R1 = CONTENTS OF CSR
3077  012232  001401                          BEQ     .+4             ;CHECK TOTAL CSR
3078  012234  104001                          HLT+1                   ;BRANCH IF OK
3079                                                                  ;SOMETHING IN CSR FOULED UP
3080                                                                  ;R1=CONTENTS OF CSR
3081                                  ;*********************************************************************
3082                                  ;TEST 50B:      TEST THAT READING THE RECEIVER BUFFER CAUSES FI/FO
3083                                  ;                 OVERRUN TO CLEAR.
3084                                  ;       NOTE:   BECAUSE OF TIMING OF THE FI/FO, FI/FO OVERRUN CAN COME
3085                                  ;                 BACK UP AFTER READING ONE CHARACTER, SO A SECOND MUST
3086                                  ;                 BE READ TO INSURE THAT FI/FO OVERRUN IS CLEAR.
3087                                  ;*********************************************************************
3088
3089  012236  012700  000002          T50B:   MOV     #2,     R0      ;SET UP COUNTER - 2 CHARACTERS
3090  012242  017701  167054          21$:    MOV     @RBUF,  R1      ;CHECK AND SAVE FIRST CHAR IN FI/FO
3091  012246  100401                          BMI     .+4             ;BRANCH IF CHAR PRESENT
3092  012250  104001                          HLT+1                   ;CHARACTER PRESENT GONE!
3093
3094  012252  032701  070000                  BIT     #070000,R1      ;CHECK RECEIVER ERRORS
3095  012256  001401                          BEQ     .+4             ;BRANCH IF OK
3096  012260  104001                          HLT+1                   ;RECEIVER  ERROR
3097                                                                  ;R1=CONTENTS OF RBUF
3098                                                                  ;BIT14=UART OVERRUN
3099                                                                  ;BIT13=FRAMMING ERROR
3100                                                                  ;BIT12=PARITY ERROR
3101
3102  012262  010102                          MOV     R1,     R2      ;PUT LINE # IN R2
3103  012264  000302                          SWAB    R2
3104  012266  042702  177760                 BIC     #177760,R2
3105  012272  120102                          CMPB    R1,     R2      ;CHECK DATA (=LINE#)
3106  012274  001401                          BEQ     .+4             ;BRANCH IF OK
3107  012276  104001                          HLT+1                   ;WRONG DATA RECEIVED
3108                                                                  ;R1=FI/FO DATA
3109                                                                  ;(DATA SHOULD=LINE#)
3110  012300  005300                  22$:    DEC     R0              ;COUNT CHARACTERS
3111  012302  001403                          BEQ     24$             ;BRANCH WHEN DONE
3112  012304  105305                  23$:    DECB    R5              ;SHORT WAIT LOOP - GIVE FI/FO TIME
3113  012306  001376                          BNE     23$
3114  012310  000754                          BR      21$             ;GO READ ANOTHER
3115
3116  012312  017701  167002          24$:    MOV     @CSR,   R1      ;SAVE CSR
3117  012316  022701  100605                  CMP     #100605,R1      ;CHECK THAT FI/FO OVERRUN CLEARED
3118  012322  001401                          BEQ     .+4             ;BRANCH IF OK
3119  012324  104001                          HLT+1                   ;FI/FO OVERRUN DIDN'T CLR
3120                                                                  ;OR SOMEOTHER CSR PROBLEM
3121                                                                  ;R1=CONTENTS OF CSR
3122
3123
3124                                  ;*********************************************************************
3125                                  ;TEST 50C:      TEST THAT FI/FO OVERRUN INTERRUPT
3126                                  ;               DOESN'T OCCUR WHEN THE PROCESSOR IS AT LEVEL 5
3127                                  ;*********************************************************************
3128
3129  012326  042737  000340  177776  T50C:   BIC     #340,   @#PS    ;CLEAR PSW
3130  012334  052737  000240  177776          BIS     #240,   @#PS    ;SET PROCESSOR TO LEVEL 5
```

```
3131  012342  012777  012432  166760          MOV     #32$,   @RCVVEC ;SET UP RECEIVER INTERRUPT VEC
3132  012350  012777  000340  166754          MOV     #340,   @RCVLVL
3133  012356  052777  010000  166734          BIS     #BIT12, @CSR    ;SET STATUS ENABLE
3134  012364  017701  166730                  MOV     @CSR,   R1      ;SAVE CSR
3135  012370  022701  110605                  CMP     #110605,R1      ;CHECK CSR
3136  012374  001401                          BEQ     .+4
3137  012376  104001                          HLT+1                   ;CSR ERROR
3138                                                                  ;R1=CONTENTS OF CSR
3139  012400  000377  166722                  SWAB    @TBUF           ;SEND LINE #
3140  012404  005777  166710          30$:    TST     @CSR            ;WAIT FOR TRANSMITTER READY
3141  012410  100375                          BPL     30$
3142  012412  000377  166710                  SWAB    @TBUF           ;SEND LINE #
3143  012416  017701  166676          31$:    MOV     @CSR,   R1      ;SAVE CSR
3144  012422  032701  020000                  BIT     #BIT13, R1      ;WAIT FOR FI/FO OVERRUN
3145  012426  001773                          BEQ     31$
3146  012430  000410                          BR      33$             ;SKIP ISR
3147
3148  012432  017701  166662          32$:    MOV     @CSR,   R1      ;SAVE CSR
3149  012436  104001                          HLT+1                   ;INTERRUPT OCCURRED AT LEVEL 5
3150  012440  005777  166656                  TST     @RBUF           ;"POP" ONE CHARACTER
3151  012444  012716  012456                  MOV     #34$,   (SP)    ;RESET RETURN ADDRESS
3152  012450  000002                          RTI                     ;RETURN
3153
3154  012452  012700  000002          33$:    MOV     #2,     R0      ;SET UP COUNTER - 2 CHARACTERS
3155  012456  017701  166640          34$:    MOV     @RBUF,  R1      ;READ ONE CHARACTER
3156  012462  100401                          BMI     .+4             ;BRANCH IF CHARACTER PRESENT
3157  012464  104001                          HLT+1
3158
3159
3160  012466  032701  070000                  BIT     #70000, R1      ;CHECK ERRORS
3161  012472  001401                          BEQ     .+4
3162  012474  104001                          HLT+1
3163
3164  012476  010102                          MOV     R1,     R2      ;DUP DATA
3165  012500  000302                          SWAB    R2
3166  012502  042702  177760                  BIC     #177760,R2      ;CLR ALL BUT LINE #
3167  012506  120102                          CMPB    R1,     R2      ;CHECK DATA
3168  012510  001401                          BEQ     .+4
3169  012512  104001                          HLT+1
3170
3171  012514  005300                          DEC     R0              ;COUNT CHARACTERS
3172  012516  003403                          BLE     36$             ;BRANCH IF DONE
3173  012520  105305          35$:    DECB    R5                      ;SHORT WAIT LOOP
3174  012522  001376                          BNE     35$
3175  012524  000754                          BR      34$             ;GO READ ANOTHER CHARACTER
3176
3177  012526  017701  166566          36$:    MOV     @CSR,   R1      ;SAVE CSR
3178  012532  022701  110605                  CMP     #110605,R1      ;CHECK THAT FI/FO OVERRUN CLEARED
3179  012536  001401                          BEQ     .+4             ;BRANCH IF OK
3180  012540  104001                          HLT+1                   ;FI/FO OVERRUN DIDN'T CLR
3181                                                                  ;OR SOMEOTHER CSR PROBLEM
3182                                                                  ;R1=CONTENTS OF CSR
3183
3184                  ;*************************************************************************
3185                  ;TEST 50D:      TEST THAT FI/FO OVERRUN INTERRUPT
3186                  ;               OCCURS WHEN PROCESSOR IS AT LEVEL 4
```

```
                                ;*******************************************************************************
                                ;*******************************************************************************
012542  042737  000340  177776  T50D:   BIC     #340,   @#PS    ;CLEAR PROCESSOR LEVEL
012550  052737  000200  177776          BIS     #200,   @#PS    ;SET PROCESSOR TO LEVEL 4
012556  012777  012642  166544          MOV     #42$,   @RCVVEC ;SET UP RECEIVER INTERRUPT VEC
012564  017701  166530                  MOV     @CSR,   R1      ;SAVE CSR
012570  022701  110605                  CMP     #110605,R1      ;CHECK CSR
012574  001401                          BEQ     .+4
012576  104001                          HLT+1

012600  000377  166522                  SWAB    @TBUF           ;SEND LINE #
012604  005777  166510          40$:    TST     @CSR            ;WAIT FOR TRANSMITTER READY
012610  100375                          BPL     40$
012612  000377  166510                  SWAB    @TBUF           ;SEND LINE #
012616  017701  166476          41$:    MOV     @CSR,   R1      ;SAVE CSR
012622  032701  020000                  BIT     #BIT13, R1      ;WAIT FOR FI/FO OVERRUN
012626  001773                          BEQ     41$
012630  104001                          HLT+1                   ;INTERUPT DIDN'T OCCURE WHEN OVERRUN SET
                                                                ;R1 = CONTENTS OF CSR
012632  052777  000010  166460          BIS     #BIT3,  @CSR    ;CLEAR MOS
012640  000470                          BR      45$             ;SKIP TO THE END

012642  017701  166452          42$:    MOV     @CSR,   R1      ;SAVE CSR
012646  022701  130605                  CMP     #130605,R1      ;CHECK CSR
012652  001401                          BEQ     .+4             ;BRANCH IF OK
012654  104001                          HLT+1                   ;CSR ERROR
                                                                ;R1 = CONTENTS OF CSR
012656  012700  000101                  MOV     #101,   R0      ;SET UP COUNTER - 65 CHARACTERS
012662  017701  166434          43$:    MOV     @RBUF,  R1      ;READ ONE CHARACTER
012666  100401                          BMI     .+4             ;BRANCH IF CHARACTER PRESENT
012670  104001                          HLT+1

012672  032701  070000                  BIT     #70000, R1      ;CHECK ERRORS
012676  001401                          BEQ     .+4
012700  104001                          HLT+1

012702  010102                          MOV     R1,     R2      ;DUP DATA
012704  000302                          SWAB    R2
012706  042702  177760                  BIC     #177760,R2      ;CLR ALL BUT LINE #
012712  120102                          CMPB    R1,     R2      ;CHECK DATA
012714  001401                          BEQ     .+4
012716  104001                          HLT+1

012720  017701  166374                  MOV     @CSR,   R1      ;SAVE CSR
012724  005300                          DEC     R0
012726  001420                          BEQ     46$             ;GET OUT IF ALL CHAR'S READ
012730  022700  000100                  CMP     #100,   R0      ;CHECK FOR FIRST CHAR READ
012734  001752                          BEQ     43$             ;SKIP CSR CHECK ON FIRST CHAR
012736  020037  001356                  CMP     R0,COUNT        ;IF CHAR'S LEFT IN SILO IS LESS THEN
                                                                ;ALARM LEVEL, DONE WILL GO AWAY.
012742  002405                          BLT     44$
012744  022701  110605                  CMP     #110605,R1      ;CHECK CSR
012750  001401                          BEQ     .+4
012752  104001                          HLT+1

012754  000742                          BR      43$
```

```
3243
3244  012756  022701  110405          44$:    CMP     #110405,R1      ;CHECK CSR
3245  012762  001401                          BEQ     .+4             ;BRANCH IF OK
3246  012764  104001                          HLT+1                   ;DONE DIDN'T GO AWAY
3247                                                                  ;OR OTHER CSR ERROR
3248  012766  000735                          BR      43$
3249
3250  012770  017701  166326          46$:    MOV     @RBUF, R1       ;READ A CHARACTER
3251  012774  100001                          BPL     .+4             ;BRANCH IF NO CHAR. PRES
3252  012776  104001                          HLT+1                   ;CHAR. PRESENT
3253
3254  013000  013777  001332  166322          MOV     RCVLVL, @RCVVEC
3255  013006  012777  000004  166316          MOV     #IOT,   @RCVLVL
3256  013014  012716  013022                  MOV     #45$,   (SP)    ;RESET RETURN ADDRESS ON STACK
3257  013020  000002                          RTI                     ;RESTORE PSW
3258  013022  005077  166276          45$:    CLR     @TCR
3259  013026  005077  166266                  CLR     @CSR
3260  013032  042737  000340  177776          BIC     #340,   @#PS    ;LOWER PROCESSOR STATUS
3261
3262  013040  104400                          SCOPE
3263
3264
3265                                  ;*************************************************************************
3266                                  ;TEST 51:       TEST THAT UART OVERRUN IS DETECTED ON ALL LINES
3267                                  ;PROBABLE FAULTY LOGIC:  M7285 (D2-2) E3, E1; M7279; M7280
3268                                  ;*************************************************************************
3269
3270  013042  012777  000414  166250  TST51:  MOV     #414,   @CSR    ;BIT2 = MAINTENANCE
3271                                                                  ;BIT3 = CLEAR MOS
3272                                                                  ;BIT8 = TRANS SCAN ENABLE
3273  013050  032777  000020  166242  10$:    BIT     #BIT4,  @CSR    ;WAIT FOR MOS TO CLEAR
3274  013056  001374                          BNE     10$
3275  013060  005001                          CLR     R1              ;SET UP LINE COUNTER
3276  013062  012777  000001  166234          MOV     #1,     @TCR    ;TRANS CONTROL, LINE 0
3277  013070  017702  166224          LOP51:  MOV     @CSR,   R2      ;WAIT FOR TRANS READY
3278  013074  100375                          BPL     LOP51
3279  013076  012777  000001  166222          MOV     #1,     @TBUF   ;SEND #1
3280  013104  017702  166210          2$:     MOV     @CSR,   R2      ;WAIT FOR TRANS READY
3281  013110  100375                          BPL     2$
3282  013112  012777  000002  166206          MOV     #2,     @TBUF   ;SEND #2
3283  013120  013700  001346                  MOV     TIMER,  R0      ;SET  UP TIMER
3284  013124  105305                  3$:     DECB    R5              ;SHORT TIME LOOP
3285  013126  001376                          BNE     3$
3286  013130  017702  166164                  MOV     @CSR,   R2      ;SAVE CSR FOR THE RECORD
3287  013134  000400                          BR      .+2             ;NOP FOR TIMING
3288  013136  005300                          DEC     R0              ;TIMER COUNT
3289  013140  001371                          BNE     3$
3290  013142  005277  166152                  INC     @CSR            ;SET RECEIVER ENABLE
3291  013146  017702  166146                  MOV     @CSR,   R2      ;SAVE CSR
3292  013152  032702  000001                  BIT     #BIT0,  R2      ;CHECK RECEIVER ENABLE
3293  013156  001001                          BNE     .+4             ;BRANCH IF OK
3294  013160  104002                          HLT+2                   ;RECEIVER ENABLE FAILED TO SET
3295                                                                  ;R1 = LINE #
3296                                                                  ;R2 = CONTENTS OF CSR
3297  013162  013700  001346                  MOV     TIMER,R0        ;SET UP TIMER
3298  013166  105305                  4$:     DECB    R5              ;WAIT SHORT TIME LOOP
```

```
3299  013170  001376                        BNE     4$
3300  013172  017702  166124                MOV     @RBUF,R2        ;CHECK FOR CHAR PRES
3301  013176  100403                        BMI     5$              ;OK
3302  013200  005300                        DEC     R0              ;TIMER COUNT
3303  013202  001371                        BNE     4$
3304  013204  104002                        HLT+2                   ;NO CHARACTER PRESENT
3305                                                                  ;R1 = LINE #
3306                                                                  ;R2 = CONTENTS OF RBUF
3307  013206  032702  040000          5$:   BIT     #BIT14,R2       ;CHECK FOR UART OVERRRUN
3308  013212  001001                        BNE     .+4             ;BRANCH IF OK
3309  013214  104002                        HLT+2                   ;UART OVERRUN MISSING
3310                                                                  ;R1 = LINE #
3311                                                                  ;R2 = CONTENTS OF RBUF
3312  013216  122702  000002                CMPB    #2,     R2      ;CHECK THE DATA
3313  013222  001401                        BEQ     .+4             ;BRANCH IF OK
3314  013224  104002                        HLT+2                   ;DATA ERROR - 3RD CHAR OVERRUNS 2ND
3315                                                                  ;R1 = LINE #
3316                                                                  ;R2 = CONTENTS OF RBUF
3317  013226  010203                        MOV     R2,     R3      ;DUP DATA
3318  013230  000303                        SWAB    R3
3319  013232  042703  177700                BIC     #177700,R3      ;MASK ALL BIT LINE #, ERROR BITS
3320  013236  020103                        CMP     R1,     R3      ;CHECK LINE #, ERRORS
3321  013240  001401                        BEQ     .+4             ;BRANCH IF OK
3322  013242  104002                        HLT+2                   ;LINE # OR OTHER RBUF ERROR
3323                                                                  ;R1 = LINE #
3324                                                                  ;R2 = CONTENTS OF RBUF
3325  013244  017702  166052          7$:   MOV     @RBUF,  R2      ;CHECK FOR MORE DATA
3326  013250  100002                        BPL     8$              ;BRANCH IF OK
3327  013252  104002                        HLT+2                   ;EXTRA DATA IN FI/FO!
3328                                                                  ;R1 = LINE #
3329                                                                  ;R2 = CONTENTS OF RBUF
3330  013254  000773                        BR      7$
3331
3332  013256  005377  166036          8$:   DEC     @CSR            ;CLEAR RECEIVER ENABLE
3333  013262  017702  166032                MOV     @CSR,   R2      ;SAVE CSR
3334  013266  022702  100404                CMP     #100404,R2      ;CHECK CSR
3335  013272  001401                        BEQ     .+4             ;BRANCH IF OK
3336  013274  104002                        HLT+2                   ;CSR ERROR
3337                                                                  ;R1 = LINE NUMBER
3338                                                                  ;R2 = CONTENTS OF CSR
3339  013276  005201                        INC     R1              ;COUNT LINES
3340  013300  006377  166020                ASL     @TCR            ;GO TO NEXT LINE
3341  013304  103271                        BCC     LOP51           ;BRANCH BACK IF MORE LINES
3342
3343  013306  005077  166006                CLR     @CSR
3344
3345  013312  104400                        SCOPE
3346
3347
3348                                ;*****************************************************************************
3349                                ;TEST 52:       TEST BITS OF BCSR FOR READ/WRITE CAPABILITY
3350                                ;PROBABLE FAULTY LOGIC:  M7285 (D2-2) E5, E1, (D2-3) E16, E2, E19, E35
3351                                ;*****************************************************************************
3352
3353  013314  012777  002010  165776 TST52: MOV     #002010,@CSR    ;SET CSR
3354  013322  012777  177777  165774        MOV     #177777,@BCSR   ;SET ALL BITS OF BCSR
```

```
3355  013330  017701  165770          MOV     @BCSR,  R1      ;CHECK AND SAVE BCSR
3356  013334  022701  177777          CMP     #177777,R1      ;CHECK THAT ALL THE BITS ARE SET
3357  013340  001401                  BEQ     .+4             ;BRANCH IF OK
3358  013342  104001                  HLT+1                   ;BIT(S) OF BCSR FAILED TO SET
3359
3360  013344  005077  165754          CLR     @BCSR           ;CLEAR BCSR
3361  013350  017701  165750          MOV     @BCSR,  R1      ;CHECK THAT IT CLEARED AND SAVE
3362  013354  001401                  BEQ     .+4             ;BRANCH IF CLR
3363  013356  104001                  HLT+1                   ;BIT(S) OF BCSR FAILED TO CLEAR
3364
3365  013360  104400                  SCOPE
3366
3367                          ;*************************************************************************
3368                          ;TEST 53:       TEST THAT LINE0 CAN TRANSMIT AND RECEIVE A BREAK
3369                          ;        ALSO CHECKS FRAMING ERROR(RBUF BIT13)
3370                          ;       ALSO CHECKS PARITY ERROR(RBUF BIT12)
3371                          ;       IF ODD PARITY IS SELECTED
3372                          ;PROBABLE FAULTY LOGIC:  M7285 (D2-2) E5, E1, (D2-3) E16, E2, E19, E35
3373                          ;*************************************************************************
3374
3375  013362  004737  014550  TST53:  JSR     PC,     @#INITA ;INITIALIZE
3376                                                          ;BIT2 = MAINTENANCE
3377                                                          ;BIT3 = CLEAR MOS
3378                                                          ;BIT10= R/W BCSR
3379                                                          ;WAIT FOR MOS TO CLEAR
3380                                                          ;BIT0 = RECEIVER ENABLE
3381  013366  012777  000001  165730          MOV     #1,     @BCSR   ;SEND BREAKS, LINE 0
3382  013374  013700  001346                  MOV     TIMER,  R0      ;SET UP TIMER
3383  013400  105305          1$:     DECB    R5              ;SHORT WAIT LOOP
3384  013402  001376                  BNE     1$
3385  013404  017701  165712          MOV     @RBUF,  R1      ;SAVE CHAR PRES
3386  013410  100403                  BMI     2$              ;BRANCH WHEN FOUND
3387  013412  005200                  INC     R0              ;WAIT A WHILE
3388  013414  001371                  BNE     1$
3389  013416  104001                  HLT+1                   ;CHAR PRES NEVER CAME UP
3390                                                          ;R1=CONTENTS OF RBUF
3391
3392  013420  032701  020000          2$:     BIT     #020000,R1      ;CHECK FOR FRAMING ERROR
3393  013424  001001                  BNE     .+4             ;BRANCH IF OK
3394  013426  104001                  HLT+1                   ;FRAMING ERROR NOT UP
3395                                                          ;R1=CONTENTS OF RBUF
3396  013430  133737  001366  001300          BITB    DJPAR,  PARITY  ;CHECK ODD PARITY FLAG
3397  013436  001404                  BEQ     3$              ;BRANCH IF NOT
3398  013440  032701  010000          BIT     #010000,R1      ;CHECK PARITY ERROR
3399  013444  001005                  BNE     4$              ;
3400  013446  104001                  HLT+1                   ;ODD PARITY SHOULD CAUSE PARITY ERROR
3401                                                          ;R1=CONTENTS OF RBUF
3402
3403  013450  032701  010000          3$:     BIT     #010000,R1      ;CHECK PARITY ERROR
3404  013454  001401                  BEQ     .+4             ;BRANCH IF OK
3405  013456  104001                  HLT+1                   ;EVEN PARITY OR NO PARITY
3406                                                          ;SHOULDN'T CAUSE PARITY ERROR
3407                                                          ;R1=CONTENTS OF RBUF
3408  013460  032701  040000          4$:     BIT     #040000,R1      ;CHECK UART OVERRUN
3409  013464  001401                  BEQ     .+4             ;BRANCH IF OK
3410  013466  104001                  HLT+1                   ;UART OVERRUN SET!!
```

```
3411
3412  013470  032701  007400              BIT     #007400,R1      ;R1=CONTENTS OF RBUF
3413  013474  001401                      BEQ     .+4             ;CHECK LINE #
3414  013476  104001                      HLT+1                   ;BRANCH IF OK
3415                                                              ;WRONG LINE# IN FI/FO
3416  013500  105701                      TSTB    R1              ;R1=CONTENTS OF RBUF
3417  013502  001401                      BEQ     .+4             ;CHECK DATA
3418  013504  104001                      HLT+1                   ;BRANCH IF OK
3419                                                              ;WRONG DATA RECEIVED
3420                                                              ;R1=CONTENTS OF RBUF
3421  013506  017701  165610              MOV     @RBUF,  R1      ;READ FI/FO AGAIN
3422  013512  100001                      BPL     .+4             ;BRANCH IF OK
3423  013514  104001                      HLT+1                   ;EXTRA CHAR IN FI/FO
3424                                                              ;R1 = CONTENTS OF RBUF
3425  013516  005077  165602              CLR     @BCSR           ;CLEAR BREAK CONTROL REG
3426  013522  105305          5$:         DECB    R5              ;SHORT WAIT LOOP-REGISTER A MARK
3427  013524  001376                      BNE     5$
3428
3429  013526  104400                      SCOPE
3430
3431
3432                          ;*************************************************************************
3433                          ;TEST 54:       TEST THAT EACH LINE CAN TRANSMIT AND RECEIVE A BREAK
3434                          ;               ALSO CHECKS FRAMING ERROR(RBUF BIT13)
3435                          ;               ALSO CHECKS PARITY ERROR(RBUF BIT12)
3436                          ;                 IF ODD PARITY IS SELECTED
3437                          ;PROBABLE FAULTY LOGIC:  M7285 (D2-2) E5, E1, (D2-3) E16, E2, E19, E35
3438                          ;*************************************************************************
3439
3440  013530  004737  014550  TST54:  JSR     PC,     @#INITA ;INITIALIZE
3441                                                          ;BIT2 = MAINTENANCE
3442                                                          ;BIT3 = CLEAR MOS
3443                                                          ;BIT10= R/W BCSR
3444                                                          ;WAIT FOR MOS TO CLEAR
3445                                                          ;BIT0 = RECEIVER ENABLE
3446  013534  005001                  CLR     R1              ;SET UP LINE COUNTER
3447  013536  012704  000001          MOV     #1,     R4      ;SET UP LINE MARKER
3448  013542  013700  001346  LOP54:  MOV     TIMER,  R0      ;SET UP TIMER
3449  013546  050477  165552          BIS     R4,     @BCSR   ;SET BREAK CONTROL BIT, LINE # IN R1
3450  013552  105305          1$:     DECB    R5              ;SHORT WAIT LOOP
3451  013554  001376                  BNE     1$
3452  013556  017702  165540          MOV     @RBUF,  R2      ;READ RBUF FOR CHAR PRES
3453  013562  100403                  BMI     2$              ;BRANCH WHEN FOUND
3454  013564  005200                  INC     R0              ;WAIT A WHILE
3455  013566  001371                  BNE     1$
3456  013570  104002                  HLT+2                   ;CHAR PRES NEVER CAME UP
3457                                                          ;R1 = LINE #
3458                                                          ;R2 = CONTENTS OF RBUF
3459
3460  013572  032702  020000  2$:     BIT     #020000,R2      ;CHECK FOR FRAMING ERROR
3461  013576  001001                  BNE     .+4             ;BRANCH IF OK
3462  013600  104002                  HLT+2                   ;FRAMING ERROR NOT UP
3463                                                          ;R1 = LINE #
3464                                                          ;R2 = CONTENTS OF RBUF
3465
3466  013602  010103                  MOV     R1,     R3      ;GET LINE #
```

```
3467  013604  006203                        ASR     R3              ;/4 TO GET RID OF BITS 1 & 0
3468  013606  006203                        ASR     R3
3469  013610  006303                        ASL     R3              ;SHIFT BACK FOR EVEN ADDR OF PARITY TABLE
3470  013612  133763  001366  001300        BITB    DJPAR,PARITY(3) ;CHECK ODD PARITY FLAG
3471  013620  001404                        BEQ     3$              ;BRANCH IF NOT
3472  013622  032702  010000                BIT     #010000,R2      ;CHECK PARITY ERROR
3473  013626  001005                        BNE     4$              ;
3474  013630  104002                        HLT+2                   ;ODD PARITY SHOULD CAUSE PARITY ERROR
3475                                                                ;R1 = LINE #
3476                                                                ;R2 = CONTENTS OF RBUF
3477
3478  013632  032702  010000          3$:   BIT     #010000,R2      ;CHECK PARITY ERROR
3479  013636  001401                        BEQ     4$              ;BRANCH IF OK
3480  013640  104002                        HLT+2                   ;EVEN PARITY OR NO PARITY
3481                                                                ;SHOULDN'T CAUSE PARITY ERROR
3482                                                                ;R1 = LINE #
3483                                                                ;R2 = CONTENTS OF RBUF
3484  013642  032702  040000          4$:   BIT     #040000.R2      ;CHECK UART OVERRUN
3485  013646  001401                        BEQ     .+4             ;BRANCH IF OK
3486  013650  104002                        HLT+2                   ;UART OVERRUN SET!!
3487                                                                ;R1 = LINE #
3488                                                                ;R2 = CONTENTS OF RBUF
3489  013652  010203                        MOV     R2,     R3      ;DUP DATA
3490  013654  000303                        SWAB    R3              ;LINE # IN LOW BYTE
3491  013656  042703  177760                BIC     #177760,R3      ;MASK ALL BUT LINE #
3492  013662  020103                        CMP     R1,     R3      ;CHECK FOR RIGHT LINE #
3493  013664  001401                        BEQ     .+4             ;BRANCH IF OK
3494  013666  104002                        HLT+2                   ;WRONG LINE# IN FI/FO
3495                                                                ;R1 = LINE #
3496                                                                ;R2 = CONTENTS OF RBUF
3497
3498
3499  013670  105702                        TSTB    R2              ;CHECK DATA
3500  013672  001401                        BEQ     .+4             ;BRANCH IF OK
3501  013674  104002                        HLT+2                   ;WRONG DATA RECEIVED
3502                                                                ;R1 = LINE #
3503                                                                ;R2 = CONTENTS OF RBUF
3504  013676  017702  165420                MOV     @RBUF,  R2      ;READ FI/FO AGAIN
3505  013702  100001                        BPL     .+4             ;BRANCH IF OK
3506  013704  104002                        HLT+2                   ;EXTRA CHAR IN FI/FO
3507                                                                ;R1 = LINE #
3508                                                                ;R2 = CONTENTS OF RBUF
3509  013706  005077  165412                CLR     @BCSR           ;CLEAR BREAK CONTROL REG
3510  013712  005201                        INC     R1              ;COUNT LINES
3511  013714  006304                        ASL     R4              ;UPDATE LINE MARKER
3512  013716  103311                        BCC     LOP54           ;BRANCH IF MORE LINES
3513
3514  013720  005077  165374                CLR     @CSR            ;CLEAR CSR
3515  013724  104400                        SCOPE
3516
3517  013726  012737  000002  015252        MOV     #2,     TIMES
3518
3519
3520                          ;*****************************************************************************
3521                          ;TEST 55:       TEST THAT RESET CLEARS ALL BUFFERS
3522                          ;       NOTE:   THE FI/FO BUFFER IS NOT COMPLETELY CLEARED
                             ;               BY RESET; ONLY CHARACTER PRESENT IS CLEARED.
```

```
3523                                    ;PROBABLE FAULTY LOGIC:  M7285 (D2-8) E13
3524                                    ;*************************************************************************
3525
3526  013734  052737  000340  177776    TST55:  BIS     #340,@#PS       ;SET PROCESSOR TO LEVEL 7
3527  013742  012777  177777  165354            MOV     #177777,@TCR    ;SET ALL TCR BITS
3528  013750  012777  052507  165342            MOV     #052507,@CSR    ;SET ALL R/W BITS OF CSR
3529  013756  012777  177777  165340            MOV     #177777,@BCSR   ;SET ALL BREAK CONTROL BITS (SEND BREAKS)
3530                                    ;NOTE:  ALL LINES SHOULD BE SENDING BREAKS, BUT NONE SHOULD BERECEIVING
3531                                    ;         BECAUSE THE HALF DUPLEX BIT IS SET
3532  013764  012777  177777  165334            MOV     #177777,@TBUF   ;LOADING TRANS BUFF WHEN BREAK BIT SET
3533                                                                    ;  SHOULD DO NOTHING
3534  013772  000005                            RESET                   ;CLEAR THE WORLD
3535  013774  013737  001320  014004            MOV     CSR,1$          ;CHECK CSR AND SAVE
3536  014002  013701                            MOV     @(PC)+,R1
3537  014004  000000                    1$:     000000
3538  014006  001401                            BEQ     .+4
3539  014010  104001                            HLT+1
3540
3541  014012  017701  165306                    MOV     @TCR,R1         ;CHECK TCR AND SAVE
3542  014016  001401                            BEQ     .+4
3543  014020  104001                            HLT+1
3544
3545  014022  017701  165276                    MOV     @BCSR,R1        ;CHECK BCSR AND SAVE
3546  014026  001401                            BEQ     .+4
3547  014030  104001                            HLT+1
3548
3549  014032  017701  165264                    MOV     @RBUF,R1        ;CHECK RBUF AND SAVE
3550  014036  100001                            BPL     .+4
3551  014040  104001                            HLT+1
3552
3553  014042  017701  165260                    MOV     @TBUF,R1        ;CHECK TBUF AND SAVE
3554  014046  001401                            BEQ     .+4
3555  014050  104001                            HLT+1
3556
3557  014052  104400                            SCOPE
3558
3559
3560                                    ;*************************************************************************
3561                                    ;TEST 56:       SEND A BINARY COUNT PATTERN ON EACH LINE
3562                                    ;PROBABLE FAULTY LOGIC:  COULD BE ALMOST ANYWHERE!
3563                                    ;*************************************************************************
3564
3565  014054  005001                    TST56:  CLR     R1              ;SET UP LINE COUNTER
3566  014056  012703  100000                    MOV     #100000,R3      ;SET UP RCV DATA
3567  014062  012777  014260  165240            MOV     #ISR56,@RCVVEC  ;SET UP RECEIVER INTERRUPT VECTOR
3568  014070  012777  000240  165234            MOV     #240,   @RCVLVL
3569  014076  042737  000340  177776            BIC     #340,   @#PS    ;CLEAR PROCESSOR PRIORITY
3570  014104  052737  000200  177776            BIS     #200,   @#PS    ;SET PRIORITY TO 4
3571  014112  012700  000001                    MOV     #1,     R0      ;SET UP LINE MARKER
3572  014116  012777  010514  165174            MOV     #010514,@CSR    ;BIT2 = MAINTENANCE
3573                                                                    ;BIT3 = CLR MOS
3574                                                                    ;BIT6 = RECEIVER INTERRUPT ENB
3575                                                                    ;BIT8 = TRANS SCAN ENABLE
3576                                                                    ;BIT12= STATUS ENABLE
3577  014124  032777  000020  165166    10$:    BIT     #BIT4,  @CSR    ;WAIT FOR MOS TO CLEAR
3578  014132  001374                            BNE     10$
```

```
3579  014134  052777  000001  165156          BIS     #1,@CSR         ;SET THE RCV EN BIT
3580  014142  005004                  1$:     CLR     R4              ;SET FOR OUTPUT DATA
3581  014144  010077  165154                  MOV     R0,     @TCR    ;TRANS CONTROL, ONE LINE AT A TIME
3582  014150  005777  165144          2$:     TST     @CSR            ;WAIT FOR TRANS READY
3583  014154  100375                          BPL     2$
3584  014156  010477  165144                  MOV     R4,     @TBUF   ;SEND DATA
3585  014162  105204                          INCB    R4              ;BINARY COUNT
3586  014164  123704  001360                  CMPB    SUM,R4          ;MAKE SURE THE CORECT NUMBER IS OUTPUTED
3587  014170  001367                          BNE     2$
3588  014172  147704  165166          3$:     BICB    @DJLEN,R4       ;SET FOR MAX. RECIEVER COUNT
3589  014176  120403                          CMPB    R4,R3           ;WAIT FOR RECEIVER DONE
3590  014200  001374                          BNE     3$
3591  014202  017702  165112                  MOV     @CSR,   R2      ;SAVE CSR
3592  014206  022702  110505                  CMP     #110505,R2      ;CHECK CSR
3593  014212  001401                          BEQ     .+4             ;BRANCH IF OK
3594  014214  104002                          HLT+2                   ;CSR ERROR
3595                                                                  ;R1=LINE #
3596                                                                  ;R2=CONTENTS OF CSR
3597  014216  017702  165100                  MOV     @RBUF,  R2      ;CHECK CHARACTER PRESENT
3598  014222  100001                          BPL     .+4             ;BRANCH IF OK
3599  014224  104002                          HLT+2                   ;CHARACTER PRESENT SET!!
3600                                                                  ;R1=LINE #
3601                                                                  ;R2=CONTENTS OF CSR
3602  014226  105003                          CLRB    R3              ;RESET EXPECTED DATA
3603  014230  062703  000400                  ADD     #400,   R3      ;UPDATE LINE # IN EXPECTED DATA
3604  014234  005201                          INC     R1              ;UPDATE LINE #
3605  014236  032701  000003                  BIT     #3,     R1      ;CHECK FOR FOURTH LINE
3606  014242  001002                          BNE     4$              ;BRANCH IF NOT
3607  014244  005237  001364                  INC     DJLEN           ;MOVE CHARACTER LENGTH POINTER
3608  014250  000241                  4$:     CLC
3609  014252  006300                          ASL     R0              ;UPDATE LINE MARKER
3610  014254  103332                          BCC     1$              ;BRANCH IF MORE
3611  014256  000416                          BR      END56           ;SKIP ISR
3612
3613  014260  017702  165036          ISR56:  MOV     @RBUF,  R2      ;READ FIRST DATA
3614  014264  100401                          BMI     11$             ;BRANCH IF CHARACTER PRESENT
3615  014266  104003                          HLT+3                   ;INTERRUPT BUT NO CHAR PRESENT
3616                                                                  ;R1=LINE #
3617                                                                  ;R2=CONTENTS OF RBUF
3618                                                                  ;R3=EXPECTED DATA
3619  014270  147703  165070          11$:    BICB    @DJLEN,R3       ;MASK CHAR. LENGTH
3620  014274  020203                          CMP     R2,     R3      ;CHECK THE DATA
3621  014276  001401                          BEQ     .+4             ;BRANCH IF OK
3622  014300  104003                          HLT+3                   ;DATA ERROR
3623                                                                  ;R1=LINE #
3624                                                                  ;R2=CONTENTS OF RBUF
3625                                                                  ;R3=EXPECTED DATA
3626  014302  105203                          INCB    R3              ;UPDATE EXPECTED DATA
3627  014304  017702  165012                  MOV     @RBUF,  R2      ;READ MORE DATA
3628  014310  100767                          BMI     11$             ;BRANCH IF MORE
3629  014312  000002                  12$:    RTI                     ;RETURN
3630
3631  014314  162737  000004  001364  END56:  SUB     #4,     DJLEN   ;RESET CHAR LENGTH POINTER
3632  014322  013777  001332  165000          MOV     RCVLVL, @RCVVEC ;RESTORE RECEIVER INT. VEC
3633  014330  012777  000004  164774          MOV     #IOT,   @RCVLVL
3634  014336  005077  164762                  CLR     @TCR            ;CLEAR TCR
```

```
3635  014342  005077  164752          CLR     @CSR            ;CLEAR CSR
3636  014346  104400                  SCOPE
3637
3638  014350  012737  000020  015252  MOV     #20,    TIMES
3639  014356  023737  001362  001344  CMP     DJUUT,UNITS     ;CHECK FOR LAST UNIT
3640  014364  002004                  BGE     DONE            ;BRANCH IF LAST UNIT
3641  014366  005037  001350          CLR     ALMFLG          ;CLEAR FLAG FOR NEXT UNIT
3642  014372  000137  002472          JMP     RESTAR          ;JUMP IF NOT
3643
3644  014376                  DONE:
3645  014376  004737  017454          JSR     PC,     KBDINT
3646  014402  062737  000001  001316  ADD     #1,PCNT+2       ;ADD 1 TO THE PASS COUNT
3647  014410  005537  001314          ADC     PCNT            ;MAKE IT DOUBLE PREC.
3648  014414  000004  016516          TYPE    ,MEOP           ;END OF PASS INDICATOR
3649  014420  032777  002000  164746  BIT     #SW10,@SWR      ;RING THE BELL?
3650  014426  001004                  BNE     4$              ;NO!
3651  014430  000004  000007          TYPE    ,BELL           ;RING THE BELL
3652  014434  000004  000177          TYPE    ,177            ;TYPE A FILLER FOR 11/05
3653  014440  013700  000042  4$:     MOV     @#42,R0         ;GET MONITOR ADDRESS
3654  014444  001405                  BEQ     3$              ;IF NONE
3655  014446  000005                  RESET                   ;RESET AND
3656          014450                  $ENDAD = .
3657  014450  004710                  JSR     7,(0)           ;GO TO MONITOR
3658  014452  000240                  NOP                     ;SAVE ROOM
3659  014454  000240                  NOP                     ;FOR
3660  014456  000240                  NOP                     ;ACT11
3661  014460  000137  002472  3$:     JMP     RESTAR          ;RETURN
3662
3663
3664                          ;
3665                          ;       THIS SUBROUTINE WILL CALCULATE THE BR PRIORITIES.
3666                          ;
3667  014464                  BRSET:
3668  014464  010046                  MOV     R0,     -(SP)           ; SAVE R0
3669  014466  010146                  MOV     R1,     -(SP)           ; SAVE R1
3670  014470  013700  001362          MOV     DJUUT,  R0              ; LOAD UP UUT DEVICE #
3671  014474  006100                  ROL     R0                      ; MULT X 2 TO SAVE OFFSET
3672  014476  012701  017230          MOV     #PRTBLE,        R1      ; LOAD IN BASE OF TABLE
3673  014502  060100                  ADD     R1,     R0              ; STORE LOCATION OF BR  IN R0
3674  014504  011037  017220          MOV     (R0),   MASK            ; SAVE BR FROM QUESTION
3675  014510  162737  000060  017220  SUB     #60,    MASK            ; MASK= DECIMAL #(0 TO 7)
3676                                                                  ; CREATED FROM ASCII
3677  014516  013737  017220  017222  MOV     MASK,   LEVEL           ; STORE FOR ERROR PRINTOUT
3678  014524  006137  017220  1$:     ROL     MASK                    ; ROTATE 5 TIMES TO
3679  014530  006137  017216          ROL     NOW                     ; CREATE BR LEVELS AS BELOW
3680  014534  005337  017226          DEC     CT                      ; COUNT TO 5
3681  014540  001371                  BNE     1$                      ; BACK TILL 5 ROL DONE
3682
3683
3684                                  ;  NOW= 340,THEN 300,THEN 240,THEN 200 ETC.
3685  014542  012601                  ;  (340,300,240,200,140,100,40,0)
3686  014544  012600          MOV     (SP)+,  R1              ; RELOAD R1
3687                          MOV     (SP)+,  R0              ; RELOAD R0
3688  014546  000207
3689                          RTS PC                          ; BACK TO MAIN CODE/ QUESTIONING
3690                                                          ; MASK AND NOW ARE LOADED.
```

```
3691                                    ;
3692                                    ;   INITIALIZATION ROUTINE
3693                                    ;
3694                                    ;       DEVICE CSR REGISTER
3695                                    ;
3696                                    ;ON FAILURE:    REGISTER 0 CONTAINS ERROR ADDRESS
3697                                    ;
3698                                    ;SET:
3699                                    ;BIT01 = HALF DUPLEX
3700                                    ;BIT02 = MAINTENANCE
3701                                    ;BIT03 = CLEAR MOS
3702                                    ;BIT06 = RECEIVER INTERRUPT ENABLE
3703                                    ;BIT08 = MASTER XMTR SCAN ENB
3704                                    ;BIT10 = R/W BCSR
3705                                    ;
3706                                    ;WAIT FOR MOS TO CLEAR
3707                                    ;SET:
3708                                    ;BIT00 = RECEIVER ENABLE
3709                                    ;
3710                                    ;                                       SET
3711  014550  012777  002014  164542  INITA:  MOV     #2014,@CSR      ;BIT(S)2,3,10 THEN 0
3712  014556  000413                          BR      INITR
3713
3714  014560  012777  000514  164532  INITB:  MOV     #514,@CSR       ;BIT(S)2,3,6,8 THEN 0
3715  014566  000407                          BR      INITR
3716
3717  014570  012777  000416  164522  INITC:  MOV     #416,@CSR       ;BIT(S)1,2,3,8 THEN 0
3718  014576  000403                          BR      INITR
3719
3720  014600  012777  000414  164512  INITD:  MOV     #414,@CSR       ;BIT(S)2,3,8 THEN 0
3721
3722  014606  005000                  INITR:  CLR     R0
3723
3724  014610  005200                  1$:     INC     R0              ;ANTIHANG
3725  014612  001004                          BNE     2$              ;ROUTINE
3726
3727  014614  011600                          MOV     (SP),R0         ;RECORD SUBROUTINE CALL RETURN
3728  014616  162700  000002                  SUB     #2,R0           ;FORM CALL ADDRESS FOR DISPLAY
3729
3730  014622  104000                          HLT                     ;BIT#4 OF DEVICE CSR FAILED TO CLEAR
3731
3732  014624  032777  000020  164466  2$:     BIT     #BIT4,@CSR      ;TEST HAS MOS CLEARED
3733  014632  001366                          BNE     1$              ;NO BRANCHES
3734                                                                  ;SET:
3735  014634  052777  000001  164456          BIS     #1,     @CSR    ;BIT00 RECEIVE ENABLE
3736  014642  000207                          RTS     PC              ;CONTINUE
3737                                  ;
3738
```

```
3739
3740  014644  013701  001320          ALMCK:  MOV     CSR,R1          ;GET CSR ADDR INTO R1
3741  014650  012761  000001  000004          MOV     #1,4(R1)        ;SET LINE 0 IN THE TCR
3742  014656  052711  000004                  BIS     #BIT2, (R1)     ;SET THE MAINT BIT
3743  014662  005037  001356                  CLR     COUNT
3744  014666  005037  001360                  CLR     SUM
3745  014672  005037  001352                  CLR     TIMERA
3746  014676  012737  000200  001354  2$:     MOV     #200,TIMERB     ;SET UP TIME CONSTANTS
3747  014704  005711                          TST     (R1)            ;WAIT FOR TRANSFER READY BIT
3748  014706  100373                          BPL     2$
3749  014710  112761  000377  000006          MOVB    #377,6(R1)      ;OUTPUT A CHAR TO TBUF
3750  014716  005237  001356                  INC     COUNT           ;COUNT EACH CHAR
3751  014722  105711                  1$:     TSTB    (R1)            ;CHECK FOR DONE IN THE CSR
3752  014724  100405                          BMI     3$              ;IF SET GET  OUT OF THE LOOP
3753  014726  004537  015056                  JSR     R5,TIME         ;GIVE DONE TIME TO SET
3754  014732  000773                          BR      1$              ;RETURN TO TEST FOR DONE AGAIN
3755  014734  000760                          BR      2$              ;RETURN TO OUTPUT ANOTHER CHAR
3756  014736  000742                          BR      ALMCK           ;ERROR RETURN TRY AGAIN
3757  014740  042711  000001          3$:     BIC     #BIT0,(R1)      ;TURN OFF RCV ENABLE
3758  014744  022737  000001  001356          CMP     #1,COUNT        ;IF SILO LEVEL SET FOR 1 THEN GET OUT
3759  014752  001414                          BEQ     4$
3760  014754  063737  001356  001360  7$:     ADD     COUNT,SUM       ;CONTINUE TO A COUNT OF 256
3761  014762  023727  001360  000377          CMP     SUM,#377
3762  014770  002771                          BLT     7$
3763  014772  001403                          BEQ     10$             ;IF EQUAL USE IT
3764  014774  163737  001356  001360          SUB     COUNT,SUM       ;IF GREATER SUBTRACT 1 COUNT SO IT'S LESS
3765  015002  000403                  10$:    BR      11$             ;ALL SET GET OUT
3766  015004  012737  000377  001360  4$:     MOV     #377,SUM        ;PUT SUM TO MAX VALUE
3767  015012  004737  017454          11$:    JSR     PC,KBDINT       ;GET THE SWITCH REGISTER
3768  015016  032777  010000  164350          BIT     #SW12,@SWR      ;PRINT ALARM LEVEL?
3769  015024  001413                          BEQ     13$             ;NO
3770  015026  000004  016756                  TYPE,   MALARM
3771  015032  010105                          MOV     R1,TTY          ;YES, PRINT CSR FIRST
3772  015034  004737  016042                  JSR     PC,PRINTR
3773  015040  000004  016676                  TYPE,   MSGDAS
3774  015044  013705  001356                  MOV     COUNT,TTY       ;PRINT ALARM LEVEL
3775  015050  004737  016042                  JSR     PC,PRINTR
3776  015054  000207                  13$:    RTS     PC
3777
3778
3779
3780  015056  105237  001352          TIME:   INCB    TIMERA          ;INCREMENT THROUGH ONE WORD
3781  015062  001012                          BNE     1$              ;GO TEST FOR DONE AGAIN
3782  015064  005337  001354                  DEC     TIMERB          ;MAKE TIMERB LARGER IF FAST PROCESSOR
3783  015070  001007                          BNE     1$
3784  015072  023727  001356  000022          CMP     COUNT,#22       ;HAVE OUTPUTTED 18 TIMES
3785  015100  001002                          BNE     2$              ;NO, GO OUTPUT ANOTHER CHAR
3786  015102  104001                          HLT+1                   ;YES,DONE DID NOT SET AFTER 18 OUTPUTS
3787                                                                  ;R1 = CSR
3788  015104  005725                          TST     (R5)+           ;SET R5 FOR ERROR RETURN
3789  015106  005725                  2$:     TST     (R5)+           ;SET R5 FOR NEXT OUTPUT RETURN
3790  015110  000205                  1$:     RTS     R5              ;RETURN FROM ABOVE OR RETEST DONE
```

```
 3791                                   ;       $SCOPE          SCOPE LOOP HANDLER
 3792
 3793                                   ;THIS ROUTINE HANDLES THE ITERATIONS, LOOPING, ERROR
 3794                                   ;LOOPING, AND THE DISPLAYING OF THE TEST NUMBER.
 3795
 3796                                   ;''SCOPE'' IS PLACED BETWEEN EACH SUBTEST IN THE TEST AND
 3797                                   ;RECORDS THE STARTING ADDRESS OF THE SUBTEST IN 'LAD:'
 3798
 3799  015112  004737  017454           TRAP$:  JSR     PC,     KBDINT
 3800  015116  032777  000400  164250           BIT     #SW8,@SWR       ;LOOP ON SPEC. TEST?
 3801  015124  001404                   1$      BEQ     1$              ;NO LOOP ON SPEC. TEST
 3802  015126  127737  164242  001310           CMPB    @SWR,ICNT       ;ON RIGHT TEST?   *SW7-0*
 3803  015134  001434                           BEQ     OVER$           ;NOT RIGHT TEST
 3804  015136  032777  040000  164230  1$:      BIT     #SW14,@SWR      ;LOOP ON TEST?
 3805  015144  001026                           BNE     KIT$            ;LOOP ON TEST IS SET
 3806  015146  032777  004000  164220           BIT     #SW11,@SWR      ;KILL ITERATIONS
 3807  015154  001012                           BNE     SVLAD$          ;YES - KILL ITERATIONS
 3808  015156  105737  001311                   TSTB    ICNT+1          ;FIRST ONE?
 3809  015162  001404                           BEQ     2$              ;BRANCH IF FIRST
 3810  015164  123737  015252  001311           CMPB    TIMES,ICNT+1    ;DONE?
 3811  015172  001013                           BNE     KIT$            ;BRANCH IF NOT
 3812  015174  112737  000001  001311  2$:      MOVB    #1,ICNT+1       ;FIRST ITERATION
 3813  015202  105237  001310           SVLAD$: INCB    ICNT            ;COUNT TEST NUMBERS
 3814  015206  011637  015250                   MOV     (6),LAD         ;SAVE LOOP ADDRESS
 3815  015212  013737  001310  001376           MOV     ICNT,@#DISPLAY  ;DISPLAY TEST NO. AND ITERATION COUNT
 3816  015220  000002                           RTI                     ;RETURN
 3817
 3818  015222  105237  001311           KIT$:   INCB    ICNT+1          ;INC THE ITERATION COUNT
 3819  015226  013737  001310  001376   OVER$:  MOV     ICNT,@#DISPLAY  ;SET UP DISPLAY
 3820  015234  005737  015250                   TST     LAD             ;FIRST ONE?
 3821  015240  001760                           BEQ     SVLAD$          ;YES
 3822  015242  013716  015250                   MOV     LAD,(6)         ;FUDGE RETURN ADDRESS
 3823  015246  000002                           RTI                     ;FIXES PS
 3824
 3825  015250  000000           LAD:    0               ;LOOP ADDRESS
 3826  015252  000020           TIMES:  20              ;RUN 20 TIMES
```

```
3827
3828                                    ;       $HLT            ERROR TYPEOUT HANDLER
3829
3830                                    ;THIS ROUTINE PRINTS OUT ERROR MESSAGES STARTING WITH THE
3831                                    ;ADDRESS OF THE 'HLT'. IT ALSO COUNTS THE NUMBER OF ERRORS
3832                                    ;AND HAS THE CAPABILITY OF LOOPING ON ERROR, BELL ON ERROR,
3833                                    ;'HALT' ON ERROR, AND INHIBIT TYPEOUTS. AN OPTIONAL ARGUEMENT
3834                                    ;(HLT+3) WILL BE PLACED IN 'HLTCT$:' FOR ADITIONAL TYPEOUTS.
3835
3836  015254  004737  017454          EMT$:   JSR     PC,     KBDINT
3837  015260  032777  002000  164106          BIT     #SW10,@SWR      ;BELL ON ERROR?
3838  015266  001402                          BEQ     1$              ;NO - SKIP
3839  015270  000004  000007                  TYPE    ,BELL           ;RING BELL
3840  015274  005237  001312          1$:     INC     ERRORS          ;COUNT THE NUMBER OF ERRORS
3841  015300  032777  020000  164066          BIT     #SW13,@SWR      ;SKIP TYPEOUT IF SET
3842  015306  001026                          BNE     2$              ;SKIP TYPEOUTS
3843  015310  000004  015314                  TYPE    ,.+2            ;.ASCIZ <15><12>
3844  015320  011637  015424                  MOV     (6),HLTADR      ;PUT ADDRESS OF INSTRUCTION ON STACK
3845  015324  162737  000002  015424          SUB     #2,HLTADR       ;FUDGE ADDRESS
3846  015332  117737  000066  015422          MOVB    @HLTADR,HLTCT$  ;GET HLT ARGUEMENT
3847  015340  013705  015424                  MOV     HLTADR,TTY      ;TYPE HLTADR IN OCTAL
3848  015344  004737  016042                  JSR     PC,PRINTR       ;TYPE LEADING ZERO'S
3849  015350  000004  015354                  TYPE    ,.+2            ;.ASCIZ " "
3850  015360  004737  015426                  JSR     PC,ERROR$       ;GO TO USER ERROR ROUTINE
3851  015364  005777  164004          2$:     TST     @SWR            ;HALT ON ERROR
3852  015370  100001                          BPL     .+4             ;SKIP IF CONTINUE
3853  015372  000000                          HALT                    ;HALT ON ERROR!
3854  015374  004737  017454                  JSR     PC,KBDINT
3855  015400  032777  001000  163766          BIT     #SW9,@SWR       ;CHECK FOR INHIBIT LOOP ON ERROR
3856  015406  001001                          BNE     .+4             ;SKIP IF LOOP ON ERROR
3857  015410  000002                          RTI                     ;RETURN
3858  015412  105037  001311                  CLRB    ICNT+1          ;CLEAR ITERATION COUNT
3859  015416  000137  015222                  JMP     KIT$            ;LOOP ON TEST UNTIL NO ERRORS
3860
3861  015422  000000                  HLTCT$: 0                       ;HLT ARGUEMENT
3862  015424  000000                  HLTADR: 0                       ;LAST HLT INSTRUCTION EXECUTED
3863
3864  015426                          ERROR$:
3865  015426  013705  001320                  MOV     CSR,TTY         ;TYPE CSR IN OCTAL
3866  015432  004737  016042                  JSR     PC,PRINTR       ;TYPE LEADING ZERO'S
3867  015436  042737  007700  015464          BIC     #7700,2$
3868  015444  105337  015422          1$:     DECB    HLTCT$
3869  015450  100411                          BMI     3$
3870  015452  062737  000100  015464          ADD     #100,2$
3871  015460  000004  016527                  TYPE,   SPACE
3872  015464  010005                  2$:     MOV     %0,TTY          ;TYPE REGISTER X IN OCTAL
3873  015466  004737  016042                  JSR     %7,PRINTR
3874  015472  000764                          BR      1$
3875  015474  000207                  3$:     RTS     PC
```

```
3876
3877                                    ;SUBROUTINE TO SAVE INPUT AS OCTAL NUMBER
3878
3879  015476  012737  000001  015770  READIN: MOV     #1,INHRE
3880  015504  004737  015644                  JSR     PC,     READ$   ;GO READ TTY UNTIL CR
3881  015510  005037  015770                  CLR     INHRE
3882  015514  010146                          MOV     R1,-(6)         ;PUSH R1 ON STACK
3883  015516  010246                          MOV     R2,-(6)         ;PUSH R2 ON STACK
3884  015520  010346                          MOV     R3,-(6)         ;PUSH R3 ON STACK
3885  015522  012501                          MOV     (R5)+,  R1
3886  015524  012737  000020  017664          MOV     #20,CNT
3887  015532  012702  015772                  MOV     #INPUT,R2
3888  015536  122712  000120                  CMPB    #120,(R2)       ;CHECK FOR 'P'
3889  015542  001425                          BEQ     3$
3890  015544  005011                          CLR     (R1)
3891  015546  112203                  1$:     MOVB    (R2)+,R3
3892  015550  120327  000015                  CMPB    R3,#15
3893  015554  001420                          BEQ     3$
3894  015556  162703  000060                  SUB     #60,R3
3895  015562  032703  177770                  BIT     #177770,R3
3896  015566  001013                          BNE     3$              ;BRANCH IF BAD DATA
3897  015570  006311                          ASL     (R1)
3898  015572  103410                          BCS     2$
3899  015574  006311                          ASL     (R1)
3900  015576  103406                          BCS     2$
3901  015600  006311                          ASL     (R1)
3902  015602  103404                          BCS     2$
3903  015604  050311                          BIS     R3,(R1)
3904  015606  005337  017664                  DEC     CNT
3905  015612  000755                          BR      1$
3906  015614  000244                  2$:     CLZ                     ;MAKE SURE Z-BIT IS CLR
3907  015616  013737  177776  015642  3$:     MOV     @#PS,   PSTEMP  ;SAVE CONDITION CODES
3908  015624  012603                          MOV     (6)+,R3         ;POP STACK INTO R3
3909  015626  012602                          MOV     (6)+,R2         ;POP STACK INTO R2
3910  015630  012601                          MOV     (6)+,R1         ;POP STACK INTO R1
3911  015632  013737  015642  177776          MOV     PSTEMP, @#PS    ;RESTORE CONDITION CODES
3912  015640  000205                          RTS     R5
3913
3914  015642  000000          PSTEMP: 0               ;TEMPORARY STORAGE FOR PS
3915
3916  015644  010346          READ$:  MOV     R3,-(6)         ;SAVE R3
3917  015646  012703  015772  1$:     MOV     #INPUT,R3       ;GET ADDRESS
3918  015652  022703  016012  2$:     CMP     #INPUT+20,R3    ;BUFFER FULL?
3919  015656  001415                          BEQ     4$              ;YES - TYPE '?'
3920  015660  105737  177560                  TSTB    @#177560        ;WAIT FOR
3921  015664  100375                          BPL     .-4             ;A CHARACTER
3922  015666  113713  177562                  MOVB    @#177562,(3)    ;GET CHARACTER
3923  015672  142713  000200                  BICB    #200,(3)        ;GET RID OF JUNK
3924  015676  122713  000177                  CMPB    #177,(3)        ;IS IT A RUBOUT
3925  015702  001403                          BEQ     4$              ;SKIP IF NOT
3926  015704  122713  000025                  CMPB    #25,(3)
3927  015710  001006                          BNE     3$
3928  015712                  4$:
3929  015712  000004  015716                  TYPE    ,.+2            ;.ASCIZ '?'<15><12>'= '
3930  015724  000750                          BR      1$              ;ZAP THE BUFFER AND LOOP
3931  015726  111337  016514          3$:     MOVB    (3),.TYPE       ;SET UP FOR TYPING
```

TTY INPUT ROUTINE

SEQ 0080

```
 3932  015732  000004  016514                TYPE    ,.TYPE          ;ECHO IT
 3933  015736  122723  000015                CMPB    #15,(3)+        ;CHECK FOR RETURN
 3934  015742  001343                        BNE     2$              ;LOOP IF NOT RETURN
 3935  015744  005737  015770                TST     INHRE
 3936  015750  001401                        BEQ     5$
 3937  015752  000402                        BR      6$
 3938  015754  105063  177777        5$:     CLRB    -1(3)           ;ZAP RETURN (THE 15)
 3939  015760  000004  000012        6$:     TYPE    ,12             ;TYPE A LINE FEED
 3940  015764  012603                        MOV     (6)+,R3         ;RESTORE R3
 3941  015766  000207                        RTS     PC              ;RETURN
 3942
 3943  015770  000000                INHRE:  0
 3944  015772  000020                INPUT:  .BLKW   20              ;TTY INPUT AREA
```

```
                                        ;       $OCTAL          OCTAL TYPEOUT ROUTINE
                                        ;
                                        ;THIS ROUTINE IS USED TO TYPE AN OCTAL NUMBER ON THE TTY. IT WILL TYPE
                                        ;ALL 6 CHARACTERS, SUPPRESS LEADING ZEROES, TYPE AN 18 BIT ADDRESS, OR TYPE
                                        ;THE 16 BITS. IT IS CALLED VIA THE DUMP, SDUMP, DUMP18, OR BITYPE MACRO'S.
                                        ;
016032  012737  170101  016200  BITYP$: MOV     #170101,.PR     ;SET BIT FLAG ANS 16. CHARACTER COUNT
016040  000411                        BR      .PTIT           ;NOW TYPE IT IN BIT FORM
016042  112737  000001  016200  PRINTR: MOVB    #1,.PR          ;SET ZERO FILL SWITCH
016050  000402                        BR      .+6             ;SKIP
016052  005037  016200          PRINTS: CLR     .PR             ;SUPRESS LEADING ZERO'S
016056  112737  177772  016201        MOVB    #-6,.PR+1       ;SET COUNT
016064  010446                .PTIT:  MOV     R4,-(6)         ;SAVE R4
016066  012704  016202                MOV     #.PR+2,R4       ;SET POINTER TO FIRST ASCII CHAR.
016072  105014                        CLRB    (4)             ;CLEAR FIRST BYTE
016074  000411                        BR      .PRF            ;ROTATE FIRST BIT
016076  105014                .PRL:   CLRB    (4)             ;CLEAR BYTE OF CHARACTER
016100  032737  000100  016200        BIT     #100,.PR        ;BIT TYPING MODE?
016106  001004                        BNE     .PRF            ;YES - SKIP 2 ROTATES
016110  006105                        ROL     TTY             ;ROTATE BIT INTO C
016112  106114                        ROLB    (4)             ;PACK IT
016114  006105                        ROL     TTY             ;ROTATE BIT INTO C
016116  106114                        ROLB    (4)             ;PACK IT
016120  006105                .PRF:   ROL     TTY             ;ROTATE BIT INTO C
016122  106114                        ROLB    (4)             ;PACK IT
016124  105714                        TSTB    (4)             ;IS IT ZERO?
016126  001402                        BEQ     .+6             ;SKIP INC
016130  105237  016200                INCB    .PR             ;SET FILL SWITCH
016134  105737  016200                TSTB    .PR             ;CHECK FILL SWITCH
016140  001402                        BEQ     .+6             ;SKIP BITSET
016142  152724  000060                BISB    #'0,(4)+        ;MAKE INTO ASCII CHAR
016146  105237  016201                INCB    .PR+1           ;INC COUNT
016152  001351                        BNE     .PRL            ;REPEAT
016154  022704  016202                CMP     #.PR+2,R4       ;EMPTY BUFFER?
016160  001002                        BNE     .+6             ;SKIP IF NOT
016162  112724  000060                MOVB    #'0,(4)+        ;LOAD 1 ZERO
016166  105014                        CLRB    (4)             ;NULL TERMINATOR
016170  000004  016202                TYPE    ,.PR+2          ;TYPE IT
016174  012604                        MOV     (6)+,R4         ;RESTORE R4
016176  000207                        RTS     PC              ;RETURN
016200  000012          .PR:    .BLKW   12              ;COUNT, SWITCH, AND OUTPUT BUFFER
```

```
3986  016224  012777  016352  000126  PDOWN$: MOV     #ILLUP,@PUVEC$  ;SET FOR FAST UP
3987  016232  012777  000340  000122          MOV     #340,@PUVEC$+2  ;PRIO:7
3988  016240  010046                          MOV     R0,-(6)         ;PUSH R0 ON STACK
3989  016242  010146                          MOV     R1,-(6)         ;PUSH R1 ON STACK
3990  016244  010246                          MOV     R2,-(6)         ;PUSH R2 ON STACK
3991  016246  010346                          MOV     R3,-(6)         ;PUSH R3 ON STACK
3992  016250  010446                          MOV     R4,-(6)         ;PUSH R4 ON STACK
3993  016252  010546                          MOV     R5,-(6)         ;PUSH R5 ON STACK
3994  016254  010637  016356                  MOV     SP,.SAVR6       ;SAVE SP
3995  016260  012777  016270  000072          MOV     #PUP$,@PUVEC$   ;SET UP VECTOR
3996  016266  000000                          HALT                    ;WAIT FOR PF
3997
3998  016270  013706  016356          PUP$:   MOV     .SAVR6,SP       ;GET SP
3999  016274  005001                          CLR     R1              ;WAIT LOOP FOR THE TTY
4000  016276  005201                  1$:     INC     R1              ;WAIT FOR THE INC
4001  016300  001376                          BNE     1$              ;OF  WORD
4002  016302  012605                          MOV     (6)+,R5         ;POP STACK INTO R5
4003  016304  012604                          MOV     (6)+,R4         ;POP STACK INTO R4
4004  016306  012603                          MOV     (6)+,R3         ;POP STACK INTO R3
4005  016310  012602                          MOV     (6)+,R2         ;POP STACK INTO R2
4006  016312  012601                          MOV     (6)+,R1         ;POP STACK INTO R1
4007  016314  012600                          MOV     (6)+,R0         ;POP STACK INTO R0
4008  016316  012737  016224  000024          MOV     #PDOWN$,@#24    ;SET UP THE POWER DOWN VECTOR
4009  016324  012737  000340  000026          MOV     #340,@#26       ;PRIO:7
4010  016332  000004  016336                  TYPE    ,..+2           ;.ASCIZ <15><12>'POWER'
4011  016346  000137  002472                  JMP     RESTAR          ;JMP TO USER ADDRESS
4012
4013  016352  000000          ILLUP:  HALT                    ;THE POWER UP SEQUENCE WAS STARTED
4014  016354  000776                  BR      .-2             ; BEFORE THE POWER DOWN WAS COMPLETE
4015
4016  016356  000000          .SAVR6: 0                       ;PUT THE SP HERE
4017  016360  000024  000026  PUVEC$: 24,26                   ;POWER UP VECTOR
```

```
                        ;*****************************************************************************
                        ;IOT HANDLER.  REENTERENT ROUTINE TO EITHER TYPE MESSAGES OR
                        ;       INDICATE A FAULSE INTERUPT OR TRAP.
                        ;*****************************************************************************

016364  022716  001000  IOTRAP: CMP     #1000,  (SP)    ;CHECK RETURN ADDRESS FOR FAULSE TRAP
016370  002407                  BLT     IOT$            ;BRANCH IF ''TYPE'' COMMAND INTENDED
016372  162716  000004          SUB     #4,     (SP)    ;GET VECTOR ADDRESS FROM RETURN ADDRESS
016376  012601                  MOV     (SP)+,  R1      ;PUT IN  R1 FOR TYPING
016400  005726                  TST     (SP)+           ;POP STACK
016402  011602                  MOV     (SP),   R2      ;SAVE RETURN ADDRESS FOR TYPING
016404  104002                  HLT+2                   ;UNEXPECTED INTERUPT OR TRAP
                                                        ;R1 = VECTOR ADDRESS
                                                        ;R2 = RETURN PC
016406  000002                  RTI                     ;CONTINUE THE PROGRAM

                        ;MCALL  $TYPE
                        ;       $TYPE           MESSAGE TYPEOUT ROUTINE

                        ;THIS ROUTINE IS USE TO TYPE ASCII MESSAGES ON THE TTY. THE
                        ;CALL CAN BE IN ONE OF 3 FORMS: 1) ''TYPE ,ADR'' - TYPES THE
                        ;MESSAGE STARTING IN LOCATION ''ADR:'', 2) ''TYPE ,CHAR'' - TYPES
                        ;THE ASCII ''CHAR'', AND 3) 'PRINT <<15><12>'MESSAGE'> - TYPES
                        ;THE MESSAGE WHICH IS INLINE ASCII.

016410  010546          IOT$:   MOV     TTY,-(6)        ;SAVE TTY
016412  017605  000002          MOV     @2(6),TTY       ;GET ADDRESS TO BE TYPED
016416  032705  177400          BIT     #177400,TTY     ;IS IT A TYPEM?
016422  001004                  BNE     1$              ;NO
016424  010537  016514          MOV     TTY,.TYPE       ;GET THE CHARACTER
016430  012705  016514          MOV     #.TYPE,TTY      ;FUDGE THE ADDRESS
016434  105715          1$:     TSTB    (TTY)           ;TERMINATOR?
016436  001406                  BEQ     2$              ;GET OUT IF SO
016440  112537  177566          MOVB    (TTY)+,@#177566 ;LOAD AND TYPE THE CHARACTER
016444  105737  177564          TSTB    @#177564        ;IS THE PRINTER READY
016450  100375                  BPL     .-4             ;WAIT UNTIL IT IS
016452  000770                  BR      1$              ;GET THE NEXT CHARACTER
016454  017646  000002  2$:     MOV     @2(6),-(6)      ;GET ADDRESS TO BE TYPED
016460  062766  000002  000004  ADD     #2,4(6)         ;ADD 2 TO THE ADDRESS
016466  022666  000002          CMP     (6)+,2(6)       ;IS IT .+2?
016472  001006                  BNE     3$              ;NO
016474  062705  000002          ADD     #2,TTY          ;ADD 2 TO THE ADDRESS
016500  042705  000001          BIC     #1,TTY          ;BACK UP TO AN EVEN BYTE
016504  010566  000002          MOV     TTY,2(6)        ;RESTORE ADDRESS
016510  012605          3$:     MOV     (6)+,TTY        ;RESTORE TTY
016512  000002                  RTI                     ;RETURN
016514  000000          .TYPE:  0                       ;CHARACTER TYPE LOCATION

016516  005015  047505  000120  MEOP:   .ASCIZ <15><12> ''EOP''
016524  005015     000          RETURN: .ASCIZ  <15><12>
016527     040  000040          SPACE:  .ASCIZ  '' ''
016532  005015  044506  051522  MSGADR: .ASCIZ  <15><12>''FIRST DJ11 ADDRESS:  ''
016540  020124  045104  030461
016546  040440  042104  042522
016554  051523  020072  000040
016562  005015  042526  052103  MSGVEC: .ASCIZ  <15><12>''VECTOR ADDRESS:  ''
```

```
 4074  016570  051117  040440  042104
 4075  016576  042522  051523  020072
 4076  016604  000040
 4077  016606  005015  047516  020056  MSGNUM: .ASCIZ  <15><12>'NO. OF DJ11'S:  '
 4078  016614  043117  042040  030512
 4079  016622  023461  035123  020040
 4080  016630     000
 4081  016631     015  051412  040524  MSGCON: .ASCIZ  <15><12>''STANDARD CONFIGURATION?  '
 4082  016636  042116  051101  020104
 4083  016644  047503  043116  043511
 4084  016652  051125  052101  047511
 4085  016660  037516  020040     000
 4086  016665     015  046012  047111  MSGLIN: .ASCIZ  <15><12>''LINES '
 4087  016672  051505  000040
 4088  016676  026440  000040          MSGDAS: .ASCIZ  ' - '
 4089  016702  005015  044103  051101  MSGLEN: .ASCIZ  <15><12>''CHAR LENGTH:  '
 4090  016710  046040  047105  052107
 4091  016716  035110  020040     000
 4092  016723     015  050012  051101  MSGPAR: .ASCIZ  <15><12>''PARITY(NO, ODD, EVEN):  '
 4093  016730  052111  024131  047516
 4094  016736  020054  042117  026104
 4095  016744  042440  042526  024516
 4096  016752  020072  000040
 4097  016756  005015  044523  047514  MALARM: .ASCIZ <15><12>''SILO ALARM LEVEL FOR CSR''<15><12>
 4098  016764  040440  040514  046522
 4099  016772  046040  053105  046105
 4100  017000  043040  051117  041440
 4101  017006  051123  005015     000
 4102  017013     015  041412  042132  MTITLE: .ASCIZ <15><12> ''CZDJA-F  DJ11 LOGIC TESTS''<15><12>
 4103  017020  040512  043055  020040
 4104  017026  045104  030461  046040
 4105  017034  043517  041511  052040
 4106  017042  051505  051524  005015
 4107  017050     000
 4108                                  ;
 4109                                  ; MESSAGES FOR INTERRPUT TESTING
 4110                                  ; ADDED  DURING  REVISION F OF CZDJAF
 4111
 4112  017051     015  053412  040510  MSBR.   .ASCIZ <15><12>/WHAT ARE THE BR PRIORITIES ?? FOR::/
 4113  017056  020124  051101  020105
 4114  017064  044124  020105  051102
 4115  017072  050040  044522  051117
 4116  017100  052111  042511  020123
 4117  017106  037477  043040  051117
 4118  017114  035072     000
 4119  017117     015  020012  044124  MSBAD:  .ASCIZ <15><12>/ THAT BR IS A GOOD FOR NOTHING. TRY AGAIN?/
 4120  017124  052101  041040  020122
 4121  017132  051511  040440  043440
 4122  017140  047517  020104  047506
 4123  017146  020122  047516  044124
 4124  017154  047111  027107  052040
 4125  017162  054522  040440  040507
 4126  017170  047111  000077
 4127  017174  005015  042504  044526  VICE:   .ASCIZ<15><12>/DEVICE   /
 4128  017202  042503  020040  000040
 4129                                  ;
```

```
                                ;       STORAGE FOR INTERRUPT TESTING
                                .EVEN
017210  000061                  DEVNUM: 000061                  ; DEFAULT FIRST DEVICE #=1
017212  000061                  UNITS1: 000061                  ; STORE FOR UNITS+1, DFAULT=1
017214  000001                  PRIOLO: .WORD 1                 ; FOR DECIMAL PRIORITIES #
017216  000001                  NOW:    .WORD 1                 ; OCTAL # OF BR
                                                                ; OF CURRENT TESTING
017220  000001                  MASK:   .WORD 1                 ; OCTAL # OF ALLOWED BR
017222  000001                  LEVEL:  .WORD 1                 ; DECIMAL  BR PRIO
017224  000001                  UUTDJ:  .WORD 1                 ; DEVICE    # FOR ROTATE LEFT OF BR
017226  000001                  CT:     .WORD 1                 ; STORE COUNTER FOR ROLS
017230  000026                  PRTBLE: .BLKW 26                ; TABLE OF INPUT BR
                                .EVEN

                                ;SUBROUTINE TO AUTOMATICLY DETERMINE THE NUMBER OF DJ11'S ON THE SYSTEM
                                ;       AND WHERE THEIR INTERUPT VECTORS ARE.
                                ;THIS ROUTINE IS ONLY USED IF LOC 42 IS NOT ZERO, AS WHEN THE PROGRAM IS
                                ;       BEING RUN UNDER ACT11 OR DDP MONITOR CONTROL.
                                ;NOTE:  SOME OF THE LOGIC MUST BE FUNCTIONAL OR THIS ROUTINE WILL BOMB!

017304  012700  160000          AUTO:   MOV     #160000,R0      ;START AT NO RESPONSE BASE DJ11 -10(8)
017310  012702  000001                  MOV     #1,     R2      ;COUNTER OF NON RESPONSE OR DJ11 OR DONE
017314  012737  000002  000006          MOV     #RTI,   @#6     ;RTI WHEN TIME-OUT
017322  005001                  5$:     CLR     R1              ;SET UP COUNTER
017324  000261                  1$:     SEC                     ;SET CARRY
017326  005710                          TST     (R0)            ;CHECK FOR ANY DJ11'S
017330  103404                          BCS     2$              ;BRANCH IF IT TIMED OUT
017332  062700  000010                  ADD     #10,    R0      ;POINT TO NEXT DJ11 ADDRESS
017336  005201                          INC     R1              ;COUNT DJ11'S
017340  000771                          BR      1$              ;LOOK FOR MORE

017342  005302                  2$:     DEC     R2              ;COUNT DOWN DEVICES
017344  100405                          BMI     7$              ;BRANCH IF DONE
017346  062700  000010                  ADD     #10,    R0      ;POINT TO FIRST DJ11
017352  010037  001340                  MOV     R0,     DEVADR  ;SAVE FIRST DJ11 ADDRESS
017356  000761                          BR      5$              ;GO COUNT DJ11'S

017360  005037  000006          7$:     CLR     @#6             ;RESTORE TIME-OUT CATCHER
017364  010137  001344                  MOV     R1,     UNITS   ;SAVE COUNT
017370  001003                          BNE     3$              ;BRANCH IF NOT ZERO
017372  104000                          HLT                     ;REPORT THAT NO DJ11'S WERE FOUND
017374  000137  014376                  JMP     DONE            ;EXIT THIS PROGRAM

                                ;ROUTINE TO DETERMINE VECTOR ADDRESSES

017400  013746  000020          3$:     MOV     @#20,   -(SP)   ;SAVE IOT VECTOR ON THE STACK
017404  012737  017440  000020          MOV     #4$,    @#20    ;RESET IOT VECTOR
017412  013701  001340                  MOV     DEVADR, R1      ;GET FIRST DJ ADR
017416  012721  040400                  MOV     #40400, (R1)+   ;SET CSR
                                                                ;BIT8 = TRANS SCAN ENABLE
                                                                ;BIT14 = TRANS INTERUPT ENABLE
017422  005721                          TST     (R1)+           ;INC POINTER
017424  012721  000001                  MOV     #1,     (R1)+   ;SET TCR, LINE 0
017430  000001                          WAIT                    ;WAIT FOR AN INTERUPT
017432  012637  000020                  MOV     (SP)+,  @#20    ;RESTORE IOT VECTOR
```

```
 4186  017436  000207                          RTS     PC
 4187
 4188  017440  162716  000010          4$:     SUB     #10,    (SP)    ;REPOSITION ADDRESS TO RVC VEC
 4189  017444  011637  001342                  MOV     (SP),   VECADR  ;SAVE FIRST VECTOR
 4190  017450  022626                          CMP     (SP)+,  (SP)+   ;RESET STACK FROM IOT
 4191  017452  000002                          RTI                     ;RETURN FROM INTERUPT - RESTORE STATUS
 4192
 4193
 4194  017454  022737  000176  001374  KBDINT: CMP     #SWREG,SWR
 4195  017462  001016                          BNE     1$
 4196  017464  005037  017522                  CLR     TMP1
 4197  017470  113737  177562  017522          MOVB    177562,TMP1
 4198  017476  142737  000200  017522          BICB    #200,TMP1
 4199  017504  122737  000007  017522          CMPB    #7,TMP1
 4200  017512  001002                          BNE     1$
 4201  017514  004737  017604                  JSR     PC,CNTLU
 4202  017520  000207                  1$:     RTS     PC
 4203
 4204  017522  000000                  TMP1:   0
 4205
 4206
 4207  017524  013746  000006          SUSWRR: MOV     6,-(SP)
 4208  017530  013746  000004                  MOV     4,-(SP)
 4209  017534  012737  017554  000004          MOV     #1$,4
 4210  017542  022777  177777  161624          CMP     #-1,@SWR
 4211  017550  001402                          BEQ     2$
 4212  017552  000407                          BR      3$
 4213  017554  022626                  1$:     CMP     (SP)+,(SP)+
 4214  017556  012737  000176  001374  2$:     MOV     #SWREG,SWR
 4215  017564  012737  000174  001376          MOV     #DISPREG,DISPLAY
 4216  017572  012637  000004          3$:     MOV     (SP)+,4
 4217  017576  012637  000006                  MOV     (SP)+,6
 4218  017602  000207                          RTS     PC
 4219
 4220
 4221  017604  022737  000176  001374  CNTLU:  CMP     #SWREG,SWR
 4222  017612  001023                          BNE     1$
 4223  017614  004004  017676                  TYPE    ,SWREQ
 4224  017620  013705  000176                  MOV     SWREG,TTY       ;TYPE SWREG IN OCTAL
 4225  017624  004737  016042                  JSR     PC,PRINTR       ;TYPE LEADING ZERO'S
 4226  017630  000004  017666                  TYPE    ,NEWIS
 4227  017634  004537  015476                  JSR     R5,READIN
 4228  017640  017522                          .WORD   TMP1
 4229  017642  001360                          BNE     CNTLU
 4230  017644  022737  000020  017664          CMP     #20,CNT
 4231  017652  001403                          BEQ     1$
 4232  017654  013777  017522  161512          MOV     TMP1,@SWR
 4233  017662  000207                  1$:     RTS     PC
 4234
 4235  017664  000000                  CNT:    0
 4236
 4237  017666  020040  042516  036527  NEWIS:  .ASCIZ  '' NEW= ''
 4238  017674  000040
 4239  017676  005015  053523  036522  SWREQ:  .ASCIZ  <15><12>''SWR= ''
 4240  017704  000040
 4241
```

```
 4242          000001                    .END
```

```
AAA      002030              697    699#
AGAIN1   004562             1312#  1364
AGAIN2   011620             2922#  2997
ALMCK    014644             2814   3740#  3756
ALMFLG   001350              591#   625*  2812   2815*  3641*
AROUND   002470              784    787#
AUTO     017304              628   4151#
BCSR     001324              579#  3354*  3355   3360*  3361   3381*  3425*  3449*  3509*  3529*  3545
BEGIN    001402              551    611#
BELL   = 000007              516#  3651   3839
BITYP$   016032             3951#
BIT0   = 000001              517#  1032   1034   1044   1176   1198   1266   1284   1325   1399   2671   2741   2811
                            2868  2941   3292   3757
BIT1   = 000002              518#   865    866    875   1478   2893
BIT10  = 002000              527#   949    950    959   2193
BIT11  = 004000              528#  2272
BIT12  = 010000              529#   970    971    980   2353   3133
BIT13  = 020000              530#  2432   3029   3070   3144   3202
BIT14  = 040000              531#   991    992   1001   2511   3307
BIT15  = 100000              532#  2590
BIT2   = 000004              519#   886    887    896   1013   1027   1046   1557   3742
BIT3   = 000010              520#  1015   1017   1636   2682   3206
BIT4   = 000020              521#  1021   1717   2683   2819   3273   3577   3732
BIT5   = 000040              522#  1796
BIT6   = 000100              523#   907    908    917   1875
BIT7   = 000200              524#  1954   2760
BIT8   = 000400              525#   928    929    938   2035
BIT9   = 001000              526#  2114
BRSET    014464             1315   2925   3667#
CLRVEC   002526              792    794    797#
CNT      017664             3886*  3904*  4230   4235#
CNTLU    017604              795   4201   4221#  4229
CONFIG   002004              663    694#   712
COUNT    001356              594#  2823   2871   2944   3235   3743*  3750*  3758   3760   3764   3774   3784
CSR      001320              576#   803*   810*   815    844    845*   846*   865*   866    870    874*   875    886*
                             887    891    895*   896    907*   908    912    916*   917    928*   929    933    937*
                             938    949*   950    954    958*   959    970*   971    975    979*   980    991*   992
                             996   1000*  1001   1013*  1015*  1016   1032*  1033   1034   1038   1044*  1045   1046
                            1059*  1060*  1061   1066*  1067*  1068*  1069*  1070   1084*  1085   1089*  1090   1094*
                            1095   1175*  1178   1194   1199   1214*  1219   1239   1244   1265*  1268   1275*  1277
                            1285   1324*  1326   1362*  1400   1410   1446   1452*  1479   1489   1525   1531*  1558
                            1568   1604   1610*  1637   1647   1683   1689*  1718   1728   1764   1770*  1797   1807
                            1843   1849*  1876   1886   1922   1928*  1955   1965   2001   2007*  2036   2046   2082
                            2088*  2115   2125   2161   2167*  2194   2204   2240   2246*  2273   2283   2319   2325*
                            2354   2364   2400   2406*  2433   2443   2479   2485*  2512   2522   2558   2564*  2591
                            2601   2637   2643*  2673   2679   2682*  2683   2689   2702   2719*  2742   2745   2748
                            2755   2786   2792*  2816*  2819   2824   2832   2845*  2872   2880   2893*  2945   2950
                            2995*  3026   3037   3041   3069   3116   3133*  3134   3140   3143   3148   3177   3192
                            3198   3201   3206*  3209   3230   3259*  3270*  3273   3277   3280   3286   3290*  3291
                            3332*  3333   3343*  3353*  3514*  3528*  3535   3572*  3577   3579*  3582   3591   3635*
                            3711*  3714*  3717*  3720*  3732   3735*  3740   3865
CT       017226             1312*  2922*  3680*  4141#
DDD      002074              709    711#
DEFADR   001370              600#   639
DEFVEC   001372              601#
DEVADR   001340              587#   635    637    639*   640*   641    810   4165*  4178
```

L 7

```
DEVNEW  002400          772#    783     786
DEVNUM  017210          766*    773     781*    782     4133#
DISPLA  001376          604#    3815*   3819*   4215*
DISPRE  000174          547#    4215
DJLEN   001364          598#    805*    812*    1430    1509    1588    1667    1691*   1748    1827    1906    1985    2009*
                        2066    2145    2224    2303    2327*   2384    2463    2542    2621    2645*   3588    3607*   3619
                        3631*
DJMXNO= 000020          535#    689
DJPAR   001366          599#    806*    813*    3396    3470
DJUUT   001362          597#    692*    807     809*    814*    3639    3670
DONE    014376          3640    3644#   4172
EMT$    015254          618     3836#
END22   004732          1367#
END56   014314          3611    3631#
ERRORS  001312          573#    622*    3840*   3861
ERROR$  015426          3850    3864#
ERROR1  004672          1333    1341    1344#
ERROR2  011752          2956    2963    2966#
FTIME   001400          607#    791     796*
GETADR  001514          627     631#    636     642
GETLEN  002156          726#    732     736     740
GETNUM  001650          656#    665     667     672     674     677     690
GETPAR  002242          730     742#    752
GETVEC  001572          644#    647     653     655
HLT   = 104000          504#    848     853     868     872     877     889     893     898     910     914     919     931
                        935     940     952     956     961     973     977     982     994     998     1003    1019    1025
                        1029    1036    1040    1048    1064    1073    1087    1092    1097    1110    1115    1129    1138
                        1152    1157    1162    1182    1192    1196    1201    1223    1234    1241    1246    1270    1281
                        1287    1355    1411    1417    1427    1433    1439    1444    1449    1490    1496    1506    1512
                        1518    1523    1528    1569    1575    1585    1591    1597    1602    1607    1648    1654    1664
                        1670    1676    1681    1686    1729    1735    1745    1751    1757    1762    1767    1808    1814
                        1824    1830    1836    1841    1846    1887    1893    1903    1909    1915    1920    1925    1966
                        1972    1982    1988    1994    1999    2004    2047    2053    2063    2069    2075    2080    2085
                        2126    2132    2142    2148    2154    2159    2164    2205    2211    2221    2227    2233    2238
                        2243    2284    2290    2300    2306    2312    2317    2322    2365    2371    2381    2387    2393
                        2398    2403    2444    2450    2460    2466    2472    2477    2482    2523    2529    2539    2545
                        2551    2556    2561    2602    2608    2618    2624    2630    2635    2640    2688    2692    2705
                        2712    2716    2750    2763    2768    2772    2776    2780    2784    2789    2835    2843    2850
                        2883    2891    2900    2977    2987    2991    3031    3043    3052    3056    3074    3078    3092
                        3096    3107    3119    3137    3149    3157    3162    3169    3180    3195    3204    3212    3217
                        3221    3228    3240    3246    3252    3294    3304    3309    3314    3322    3327    3336    3358
                        3363    3389    3394    3400    3405    3410    3414    3418    3423    3456    3462    3474    3480
                        3486    3494    3501    3506    3539    3543    3547    3551    3555    3594    3599    3615    3622
                        3730    3786    4029    4171
HLTADR  015424          3844*   3845*   3846    3847    3862#
HLTCT$  015422          3846*   3861#   3868*
ICNT    001310          572#    830*    3802    3808    3810    3812*   3813*   3815    3818*   3819    3825    3858*
ILLUP   016352          3986    4013#
INHRE   015770          727*    743*    3879*   3881*   3935    3943#
INITA   014550          3375    3440    3711#
INITB   014560          2934    3714#
INITC   014570          2861    3717#
INITD   014600          1392    1471    1550    1629    1710    1789    1868    1947    2028    2107    2186    2265    2346
                        2425    2504    2583    2663    2734    2805    3017    3720#
INITR   014606          3712    3715    3718    3722#
INPUT   015772          659     696     705     708     711     729     731     733*    737*    745     747     749     751
```

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                        776     778     780    3887    3917    3918    3944#
INTR1   004656         1309    1336#
INTR2   011736         2919    2959#
IOTRAP  016364          614    4023#
IOT$    016410         4024    4043#
ISR56   014260         3567    3613#
KBDINT  017454         3645    3767    3799    3836    3854    4194#
KIT$    015222         3805    3811    3818#   3859
LAD     015250          831*   1166*   1374*   1692*   2010*   2328*   2653*   3814*   3820    3822    3825#
LENGTH  001200          567#    700     715     812
LEVEL   017222         3677*   4139#
LEVEL7= 000340          533#    843
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LOP24   005172         1479#   1480
LOP25   005362         1558#   1559
LOP26   005552         1637#   1638
LOP27   005754         1718#   1719
LOP30   006144         1797#   1798
LOP31   006334         1876#   1877
LOP32   006524         1955#   1956
LOP33   006726         2036#   2037
LOP34   007116         2115#   2116
LOP35   007306         2194#   2195
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LOP37   007700         2354#   2355
LOP40   010070         2433#   2434
LOP41   010260         2512#   2513
LOP42   010450         2591#   2592
LOP51   013070         3277#   3278    3341
LOP54   013542         3448#   3512
MALARM  016756         3770    4097#
MASK    017220         1332    1340    1350    2955    2962    2972    3674*   3675*   3677    3678*   4138#
MEOP    016516         3648    4066#
MSBAD   017117          785    4119#
MSBR    017051          765    4112#
MSGADR  016532          633    4069#
MSGCON  016631          694    4081#
MSGDAS  016676          721    3773    4088#
MSGLEN  016702          726    4089#
MSGLIN  016665          718    4086#
MSGNUM  016606          656    4077#
MSGPAR  016723          742    4092#
MSGVEC  016562          644    4073#
MTITLE  017013          631    4102#
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                       1118#   1142#   1165#   1167    1206#   1257#   1291#   1373#   1375    1454#   1533#   1612#   1691#
                       1693    1772#   1851#   1930#   2009#   2011    2090#   2169#   2248#   2327#   2329    2408#   2487#
                       2566#   2645#   2654    2723#   2795#   2855#   2906#   3007#   3264#   3347#   3366#   3431#   3517#
                       3518    3559#   3638#
NEWIS   017666         4226    4237#
NINTR1  004644         1329#
NINTR2  011724         2952#
NOGOOD  002462          777     779     785#
NOW     017216         1314*   1323    1332    1340    1352    1363    2924*   2933    2955    2962    2974    2996    3679*
                       4136#
OPEN    = 000000        534#
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PARIT2  001302   569#
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PARIT4  001306   571#
PCNT    001314   574#   623*  624*  3646* 3647* 3663
PDOWN$  016224   616   3986#  4008
PRINTR  016042  3772   3775  3848  3866  3873  3953#  4225
PRINTS  016052   720    724  3955#
PRIOLO  017214  1311*  1313*  1314  2921* 2923* 2924  4135#
PRTBLE  017230   769   3672  4142#
PS    = 177776   506#  1322* 1323* 1369* 2932* 2933* 3001* 3129* 3130* 3189* 3190* 3260* 3526*
                3569* 3570* 3907  3911*
PSTEMP  015642  3907* 3911  3914#
PUP$    016270  3995  3998#
PUVEC$  016360  3986* 3987* 3995* 4017#
QABR    002344   553   629   698   707   710   765#
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                1839  1882  1918  1961  1997  2042  2078  2121  2157  2200  2236  2279  2315
                2360  2396  2439  2475  2518  2554  2597  2633  2686  2714  2766  2774  2782
                2841  2846  2889  2898  2985  3090  3150  3155  3215  3250  3300  3325  3385
                3421  3452  3504  3549  3597  3613  3627
RCVLVL  001332   583#  825*  2920* 2999  3132* 3254  3255* 3568* 3632  3633*
RCVVEC  001330   582#  804*  811*  823   2919* 2999* 3131* 3191* 3254* 3567* 3632*
READIN  015476   634   645  3879#  4227
READ$   015644   657   695   728   744   775  3880  3916#
RESTAR  002472   789#  3642  3661  4011
RETURN  016524   632  4067#
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                1117  1141  1164  1204  1255  1289  1371  1453  1532  1611  1690  1771  1850
                1929  2008  2089  2168  2247  2326  2407  2486  2565  2644  2721  2793  2854
                2904  3005  3262  3345  3365  3429  3515  3557  3636
                3871  4063#
SPACE   016527
SSS     002060   706   708#
STACK = 001200   536#  611   790
SUM     001360   595#  3586  3744* 3760* 3761  3764* 3766*
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SVLAD$  015202  3807  3813#  3821
SWR     001374   603#  793   3649  3768  3800  3802  3804  3806  3837  3841  3851  3855  4194
                4210  4214* 4221  4232*
SWREG   000176   548#  793   4194  4214  4221  4224
SWREQ   017676  4223  4239#
SW10  = 002000   455#  3649  3836  3837
SW11  = 004000   454#  3806
SW12  = 010000   453#  3768
SW13  = 020000   452#  3841
SW14  = 040000   451#  3804
SW15  = 100000   450#
SW8   = 000400   458#  3799  3800
SW9   = 001000   457#  3855
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                2117* 2196* 2275* 2356* 2435* 2514* 2593* 2675* 2744* 2747* 2826* 2874* 2947*
                3028* 3065* 3139* 3142* 3197* 3200* 3279* 3282* 3532* 3553  3584*
TCR     001324   578#   819*  1106* 1107  1112* 1113  1124* 1125* 1126  1131* 1132* 1133* 1134*
                1135  1149* 1150  1154* 1155  1159* 1160  1176* 1198* 1217* 1243* 1266* 1284*
                1325* 1361* 1399* 1451* 1478* 1530* 1557* 1609* 1636* 1688* 1717* 1769* 1796*
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		1848*	1875*	1927*	1954*	2006*	2035*	2087*	2114*	2166*	2193*	2245*	2272*	2324*
		2353*	2405*	2432*	2484*	2511*	2563*	2590*	2642*	2671*	2718*	2741*	2791*	2811*
		2852*	2868*	2902*	2941*	2994*	3024*	3258*	3276*	3340*	3527*	3541	3581*	3634*
THRU1	004714	1334	1342	1360#										
THRU2	011774	2957	2964	2983#										
TIME	015056	3753	3780#											
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		1969*	2050*	2129*	2208*	2287*	2368*	2447*	2526*	2605*	2646*	2647	2651*	2652*
		2698	2752	2829	2877	3036	3066	3283	3297	3382	3448			
TIMERA	001352	592#	3745*	3780*										
TIMERB	001354	593#	3746*	3782*										
TIMES	015252	3517*	3638*	3810	3826#									
TMP1	017522	4196*	4197*	4198*	4199	4204#	4228	4232						
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TST11	003472	1013#												
TST12	003634	1059#												
TST13	003722	1084#												
TST14	003776	1106#												
TST15	004036	1124#												
TST16	004124	1149#												
TST17	004214	1175#												
TST2	003024	865#												
TST20	004324	1214#												
TST21	004440	1265#												
TST22	004540	1309#												
TST23	004770	1392#												
TST24	005160	1471#												
TST25	005350	1550#												
TST26	005540	1629#												
TST27	005742	1710#												
TST3	003076	886#												
TST30	006132	1789#												
TST31	006322	1868#												
TST32	006512	1947#												
TST33	006714	2028#												
TST34	007104	2107#												
TST35	007274	2186#												
TST36	007464	2265#												
TST37	007666	2346#												
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TST40	010056	2425#												
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TST44	011054	2734#												
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TST46	011444	2861#												
TST47	011576	2919#												
TST5	003222	928#												
TST50	012056	3017#												
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TST54	013530	3440#												

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TST56   014054              3565#
TST6    003274               949#
TST7    003346               970#
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                             773    774   785  3648  3651  3652  3770  3773  3839  3843  3849  3871  3929
                            3932   3939  3982  4010  4223  4226
TYPLIN  002124               718#   756   761
T50A    012172              3065#
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T50C    012326              3129#
T50D    012542              3189#
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UNITS1  017212               767*   771*  782  4134#
UUTDJ   017224              4140#
VECADR  001342               588#   646   648   650*  651*  652   654   811  4189*
VICE    017174               772   4127#
WAIT1   004636              1326#  1327
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XMTVEC  001334               584#   827*  1309* 1367*
$ENDAD= 014450               544   3656#
.     = 017706               537#   541   543#  546#  550#  552#  555#  567#  867   871   876   888   892
                             897    909   913   918   930   934   939   951   955   960   972   976   981
                             993    997  1002  1018  1028  1035  1039  1047  1063  1072  1086  1091  1096
                            1109   1114  1128  1137  1151  1156  1161  1166  1191  1195  1200  1233  1240
                            1245   1286  1374  1416  1426  1432  1438  1443  1448  1495  1505  1511  1517
                            1522   1527  1574  1584  1590  1596  1601  1606  1653  1663  1669  1675  1680
                            1685   1692  1734  1744  1750  1756  1761  1766  1813  1823  1829  1835  1840
                            1845   1892  1902  1908  1914  1919  1924  1971  1981  1987  1993  1998  2003
                            2010   2052  2062  2068  2074  2079  2084  2131  2141  2147  2153  2158  2163
                            2210   2220  2226  2232  2237  2242  2289  2299  2305  2311  2316  2321  2328
                            2370   2380  2386  2392  2397  2402  2449  2459  2465  2471  2476  2481  2528
                            2538   2544  2550  2555  2560  2607  2617  2623  2629  2634  2639  2653  2687
                            2691   2704  2711  2715  2749  2756  2762  2767  2771  2775  2779  2783  2788
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                            3118   3136  3156  3161  3168  3179  3194  3211  3216  3220  3227  3239  3245
                            3251   3287  3293  3308  3313  3321  3335  3357  3362  3393  3404  3409  3413
                            3417   3422  3461  3485  3493  3500  3505  3538  3542  3546  3550  3554  3593
                            3598   3621  3656  3663  3825  3843  3844#  3849  3850#  3852  3856  3861  3862
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.BIT  = 177777               441#   450   451   452   453   454   455   456   457   458   459  3649  3799
                            3836   3841  3855
.PR     016200              3951*  3953*  3955*  3956*  3958  3962  3972*  3973  3976*  3978  3982  3985#
.PRF    016120              3960   3963   3968#
.PRL    016076              3961#  3977
.PTIT   016064              3952   3957#
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BUFHDR	1#														
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DUMP18	1#														
FILBLK	1#														
LNKBLK	1#														
ODT11	1#														
ODT11X	1#														
POP	1#	533#	1357	2980	3908	4002									
PRINT	1#	533#	3843	3849	3928	4010									
PUSH	1#	533#	1347	2969	3882	3988									
SCOPE.	1#														
SCOP.	1#														
SDUMP	1#	533#	719	723											
TRACE	1#														
TRNBLK	1#														
TYPEM	1#														
WRITE	1#														
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	2487	2566													
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$EQUAT	1#	503													
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$FIFOV	835#	3007													
$HD	835#	2855													
$HLT	1#	3828													
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$KBIN	1#	4193													
$KRAT	1#														
$LOADR	1#														
$LVL	835#	1291													
$MTSE	835#	1257													
$OCTAL	1#	3945													
$POWER	1#	3986													
$RAND	1#														
$RAND4	1#														
$RCVDA	835#	2795													
$RCVE	835#	1006													
$READ	1#	3916													
$REGBC	835#	859	880	901	922	943	964	985							
$REGST	835#	1100	3347												
$RESET	835#	3518													
$RINT	835#	2906													
$RONLY	835#														
$RUOR	835#														

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$SETUP       1#
$SRAT        1#
$SWDOC       1#    447
$SWRDF       1#    602
$SWRRR       1#   4206
$TRAP        1#
$TYPE        1#   4035
$URAT        1#
$XRDY      835#   1206
$XRDYC     835#   2723
$XRDYO     835#   1167
$XUOR      835#   3264
.SCOP        1#
.SCOPE       1#


. ABS.  017706     000

 ERRORS DETECTED:  0

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 RUN-TIME: 11 16 .9 SECONDS
 RUN-TIME RATIO: 159/29=5.4
 CORE USED:  32K  (63 PAGES)
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