DJ11

LOGIC TEST

MD-11-DZDJA-D

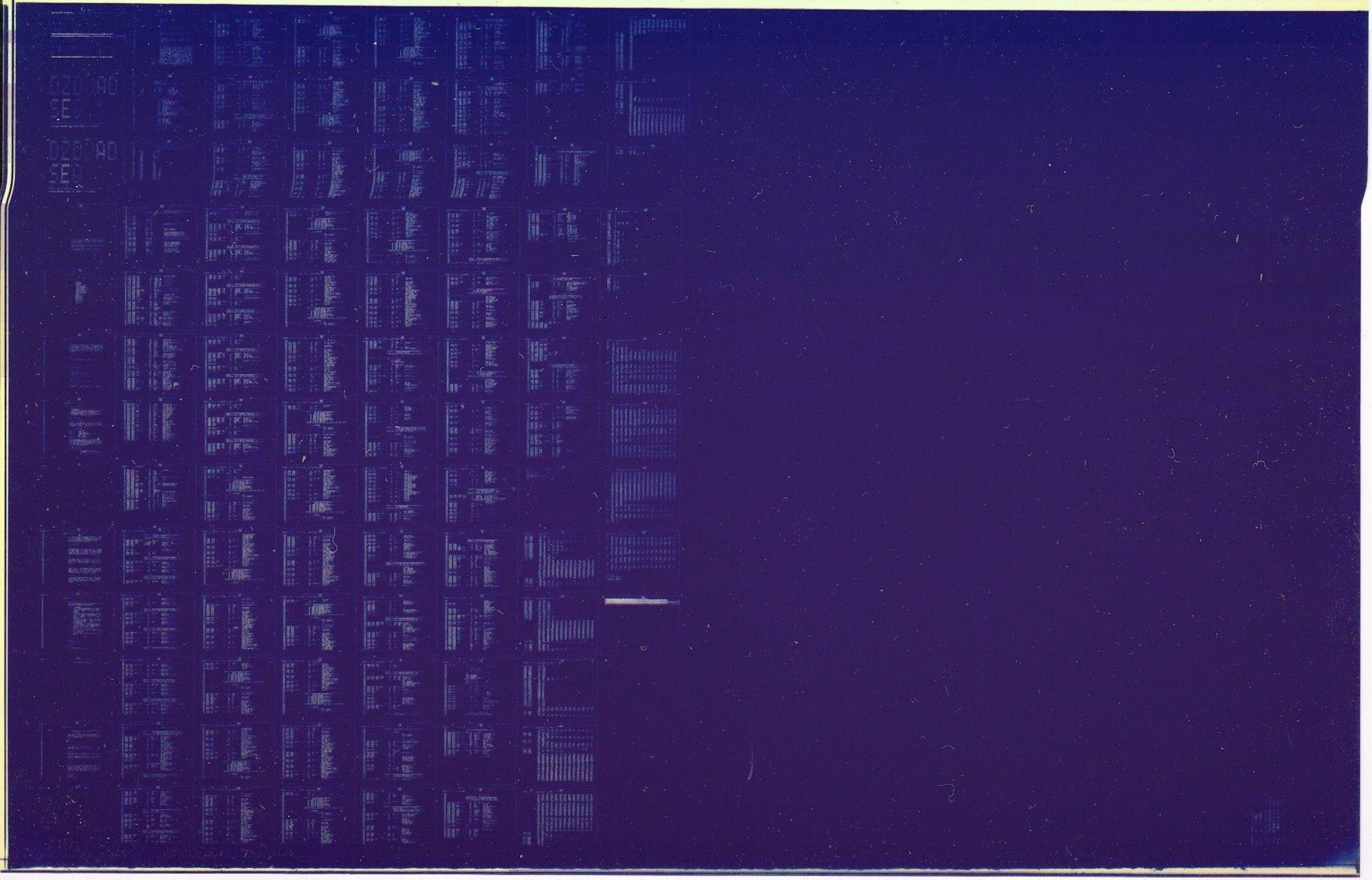
EP-DZDJA-D-DL-A

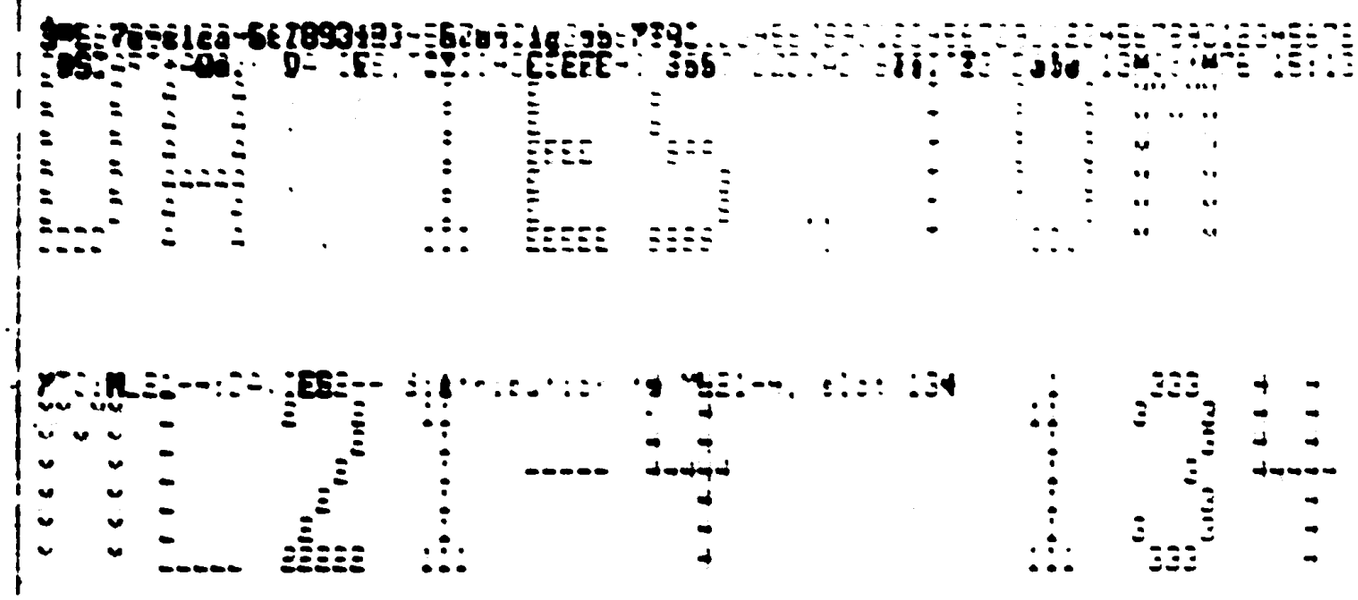
FICHE 1 OF 1

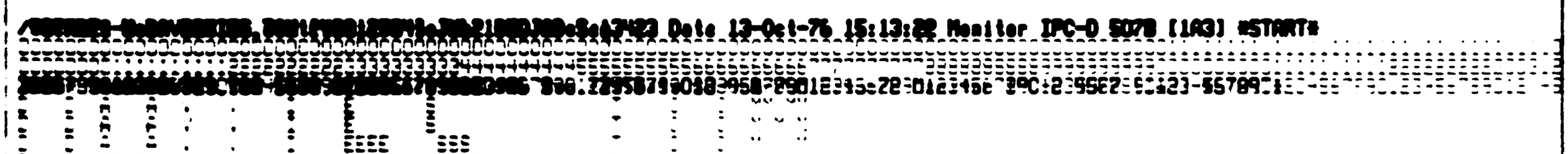
NOV 1976

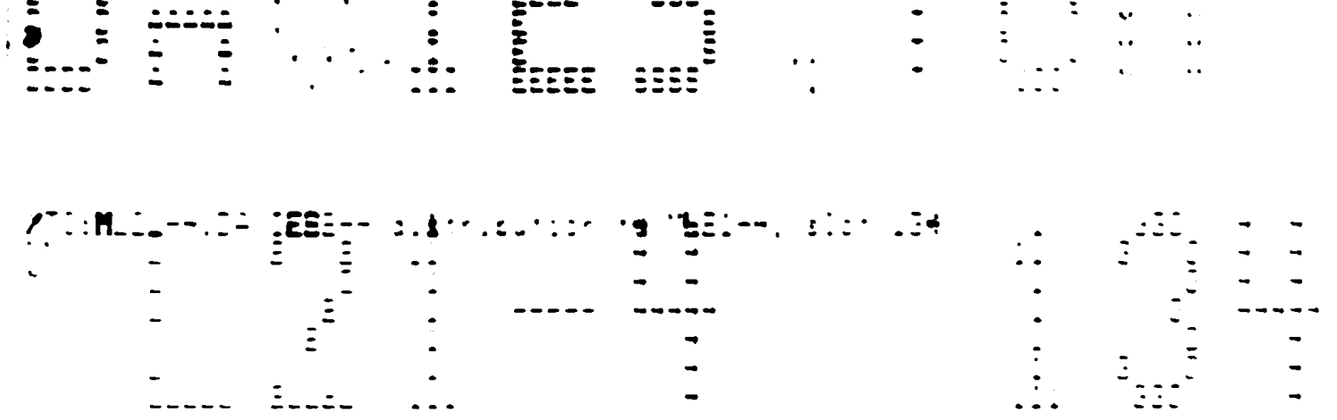
digital

MADE IN USA









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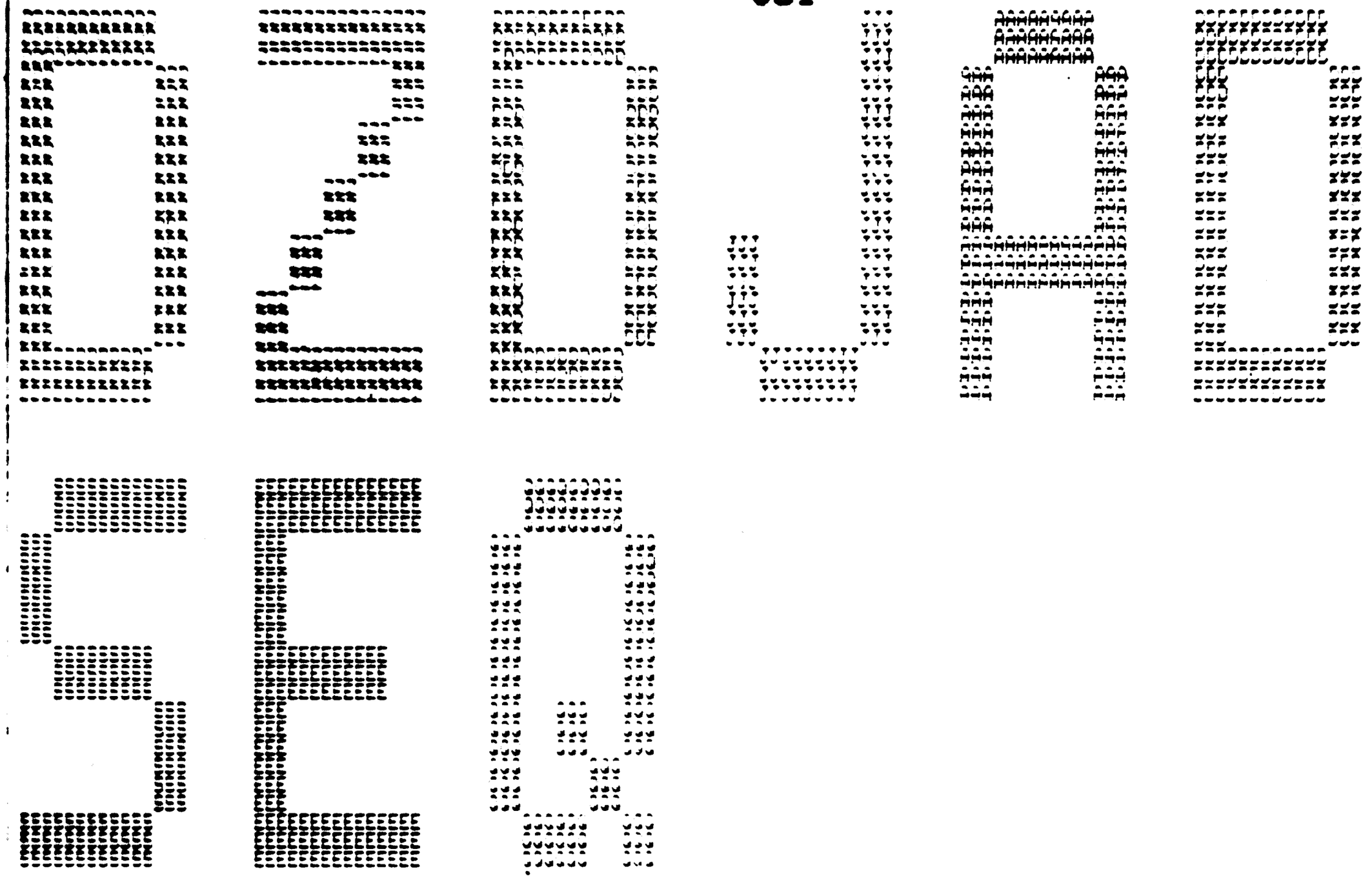
C01



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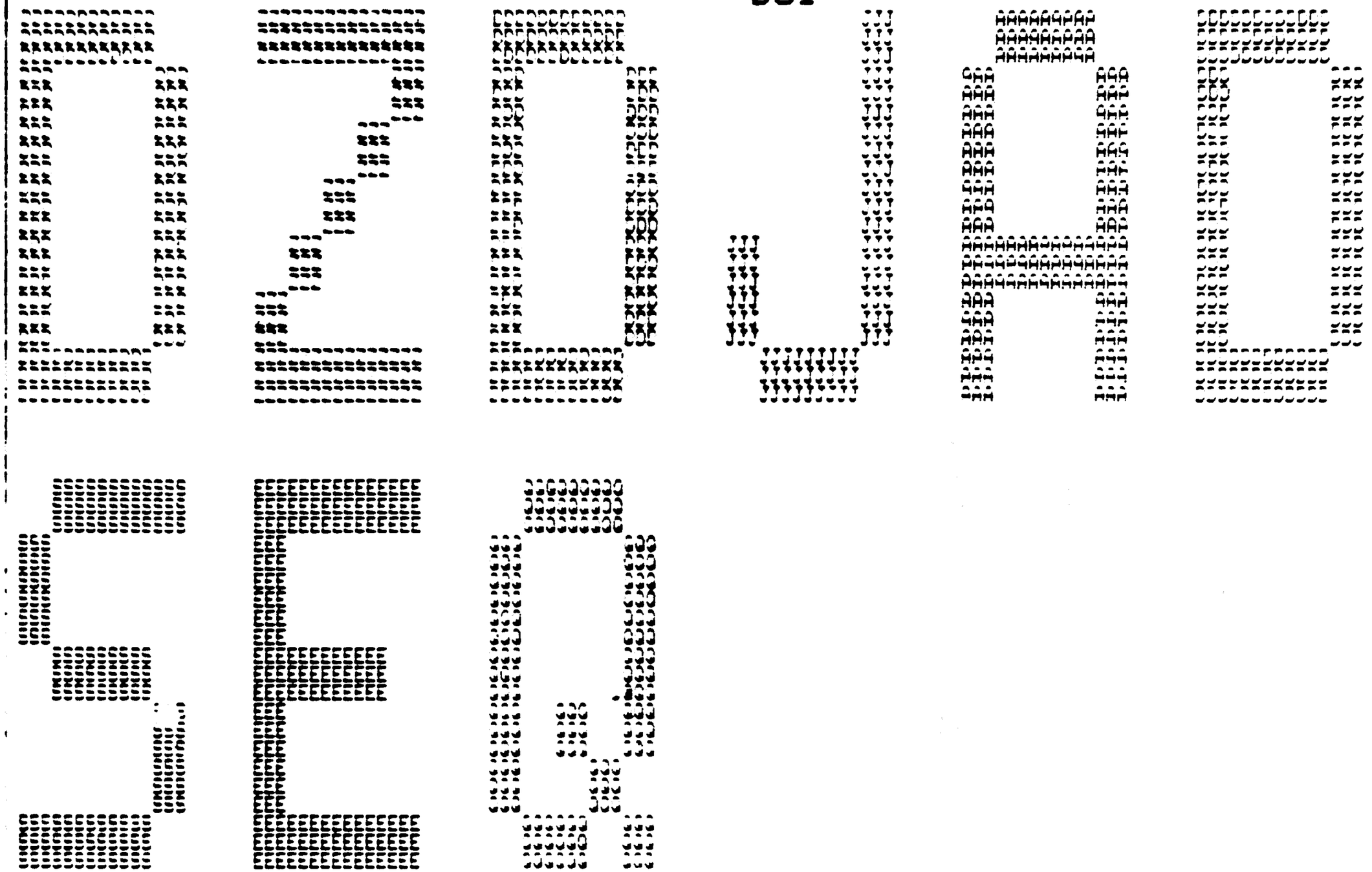

.REM *

IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZDJA-D-D
PRODUCT NAME: DJ11 LOGIC TESTS
PROGRAM DATE: MAY 1976
MAINTAINER: DIAGNOSTIC GROUP

TABLE OF CONTENTS

CONTENTS

DESCRIPTION

1. ABSTRACT

THIS PROGRAM TESTS THE LOGIC OF THE DJ11 ASYNCHRONOUS MULTIPLEXER IN MAINTENANCE MODE. IT CHECKS THAT ALL CONTROL REGISTERS FUNCTION PROPERLY, THAT INTERRUPTS OCCUR 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-D2DJB PROGRAMS 2 AND 3 FOR ON-LINE TESTING. THE PROGRAM SHOULD BE RUN FOR AT LEAST 2 PASSES WITH ALL SWITCHES DOWN.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP-11 STANDARD COMPUTER WITH CONSOLE TELETYPE
UP TO 16 DJ11 ASYNCHRONOUS 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 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.
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. ALTERNATE PASS WILL RUN WITH THE 7-BIT SET.

THE SWITCH SETTINGS ARE:

```
SW<15> = 1 ..... HALT ON ERROR
SW<14> = 1 ..... SCOPE LOOP
SW<13> = 1 ..... INHIBIT PRINTOUT
SW<12> = 1 ..... INHIBIT TRACE TRAPPING
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<09> = 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=000176) 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

```
192                                     COMMITTED KEYING IN SWREG VALUE.
```

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(13) ON A 1.

5.2.4 TRTRAP

IF SW(12) IS ON A 0, THE T-BIT WILL BE SET ON ALTERNATE PASSES. WHEN THE T-BIT IS SET, THE PROCESSOR TRAPS AFTER EACH INSTRUCTION. THE FIRST INSTRUCTION EXECUTED UPON TRAPPING IS AN "RTI" OR "RTT" WHICH RETURNS TO THE INTERRUPTED SEQUENCE OF INSTRUCTIONS. THIS SEQUENCE IS CONTINUED UNTIL THE END OF THE PROGRAM IS REACHED.

5.2.5 TRAPCATCHER

A ".+2" - "HALT" SEQUENCE IS REPEATED FROM 0 - 56 TO DETECT 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".

DESCRIPTION

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 "P(REVIOUS)" SELECTS THE NUMBER OF UNITS PREV SLY SELECTED.

4) "STANDARD CONFIGURATION? "
"Y(ES)" OR DEFAULT (CAR AGE 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:

ADR DJADR (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" (LOC 1202). 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 CHECK UP TO 8 DJ11'S AT ONCE, THE EXICUTION TIME CAN BE ANYWHERE FROM 15 SECONDS TO THREE AND A HALF HOURS. THE 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

```
   363                                  150 00:13:00
   364                                  300 00:05:30
```

DESCRIPTION

[illegible]

8.2 STACK POINTER

STACK IS INITIALLY SET TO 1200

8.3 PASS COUNT

A 32 BIT (2 WORDS) PASS COUNT IS KEPT IN "PASSES". [illegible] BE CLEARED FROM THE CONSOLE. BY RESTARTING AT 200, OR BY RELOADING THE PROGRAM.

8.4 POWER FAIL

[illegible] CAN BE POWER FAILED WITH NO ERRORS. [illegible] AND RESTART THE PROGRAM. [illegible] ERROR TYPE 10.

9. PROGRAM DESCRIPTION

[illegible]

```
.TITLE MAINDEC-11-D2DJA-D       DJ11 LOGIC TESTS
.ENABLE ABS
.ENABLE AMA
;COPYRIGHT 1976, DIGITAL EQUIPMENT CORP., MAYNARD, MASS.
;PROGRAM BY KEN CHAPMAN

;       SWITCH                  USE
;       ------          --------------------
;SW15=  100000          ;HALT ON ERROR
;SW14=  040000          ;LOOP ON TEST
;SW13=  020000          ;INHIBIT ERROR TYPEOUTS
;SW12=  010000          ;INHIBIT ERROR TRAP
;SW11=  004000          ;INHIBIT ITERATIONS
;SW10=  002000          ;BELL ON PASS COMPLETE
;SW09=  001000          ;BELL ON ERROR
;SW08=  000400          ;LOOP ON ERROR
;SW07=  000200          ;LOOP ON TEST IN SW 7:0

DJ11 REGISTER BIT ASSIGNMENTS:

CONTROL STATUS REGISTER (CSR) XXXXX0
        BIT0    RECEIVER ENABLE (READ/WRITE)
        BIT1    MODEM CONTROL 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   FIFO 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

TRANSMITTER CONTROL REGISTER (TCR) XXXX04 (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 (BIT2 OF CSR SET) (READ/WRITE)

BIT0-15 TRNSMIT A BREAK ON CORRESPONDING LINE!

```
                        .       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


                        .       46
000046  016516          $ENDAD

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

                        .       200
000200  000137  001384  BEGIN:  JMP     @#BEGIN         ;200 ALWAYS IS THE STARTING ADDRESS
000204  000137  002300  RESTAR: JMP     @#RESTAR        ;RESTART ADDRESS

                        .       1200
001200  000000          ICNT:    0                      ;ITERATION COUNT-LH, TEST NO.-RH
001202  000000          ERRORS:  0                      ;ERROR COUNT REGISTER
001204  000000  000000  PCNT:    0,0                    ;PASS COUNT REGISTER

001210  160010          CSR:     160010                 ;CONTROL STATUS REGISTER(DJ UNDER TEST)
001212  160012          RBUF:    160012                 ;RECEIVER BUFFER REGISTER(DJ UNDER TEST)
                        *CR:                            ;TRANSMITTER CONTROL REGISTER(DJ UNDER TEST)
001214  160014          BRKSR:   160014                 ;BREAK STATUS REGISTER(DJ UNDER TEST)
001216  160016          *BUF:    160016                 ;TRANSMITTER BUFFER REGISTER(DJ UNDER TEST)

001220  000300          RCVVEC:  300                    ;RECEIVER INTERUPT VECTOR ADDRESS(DJ UNDER TEST
001222  000000          RCVLVL:  0
001224  000304          XMTVEC:  304                    ;TRANSMITTER INTERUPT VECTOR ADDRESS(DJ UNDER TEST
001226  000000          XMTLVL:  0

001230  160010          DEVADR:  160010                 ;FIRST DEVICE ADDRESS(SELECTED)
001232  000300          VECADR:  300                    ;FIRST VECTOR ADDRESS(SELECTED)
001234  000001          UNITS:   1                      ;NUMBER OF UNITS TO BE TESTED
001236  000040          LENGTH:  .BLKB   40             ;TABLE OF CHARACTER LENGTHS (MASK)
001240  000004          PARITY:  .BLKB   4              ;TABLE OF ODD PARITY FLAGS
001244  000000          TIMER:   0                      ;USED TO SAVE RELATIVE TIMES

001300  000000          DJUNIT:  0                      ;UNIT NUMBER OF DJ11 UNDER TEST
001302  000000          CH_LEN:  0                      ;CHAR MASK TABLE POINTER
001304  000000          PTYPAR:  0                      ;UNIT FLAG (FOR ODD PARITY FLAG)
001306  160010          DEFADR:  160010                 ;DEFAULT FIRST DEVICE ADDRESS
001310  000300          DEFVEC:  300                    ;DEFAULT FIRST VECTOR ADDRESS

001312  177570          SAR:     177570
001314  177570          DISP_AT: 177570


001322  177777          FTIME:   -1
```

```
001200                  BEGIN:  MOV     #ICNT,  SP      ;SET UP STACK POINTER
001206 004537 016216            JSR     PC,     SUSWRR  ;CHECK FOR SWITCH REGISTER
001212 012700 000014            MOV     #14,R0
001216 012720 015534            MOV     #YESRT, (R0)+   ;TRACE TRAP VECTOR (14)
001222 012720 000340            MOV     #340,   (R0)+
001226 012720 017104            MOV     #IOTRAP,(R0)+   ;IOT VECTOR (20)
001232 012720 000340            MOV     #340,   (R0)+
001236 012720 016446            MOV     #PDOWN$,(R0)+   ;POWER FAIL VECTOR (24)
001242 012720 000340            MOV     #340,   (R0)+
001246 012720 015774            MOV     #EMT$,  (R0)+   ;EMT VECTOR (30)
001252 012720 000340            MOV     #340,   (R0)+
001256 012720 015632            MOV     #TRAP$, (R0)+   ;TRAP VECTOR (34)
001262 012720 000340            MOV     #340,   (R0)+
001266 012737 001446 000010     MOV     #1$,@#10
001274 006700                   SXT     R0              ;CHECK FOR PDP-11/40 OR 45
001276 012737 000006 015534     MOV     #RTT,@#YESRT
001304 012737 000006 000006     MOV     #RTT,@#6
001312 012737 000400 177774     MOV     #400,@#177774   ;SET UP STACK LIMIT TO 1000
001320 005037 000006            CLR     @#6
001324 012737 000012 000010 1$: MOV     #12,@#10
001332 005037 001202            CLR     ERRORS          ;CLEAR ERROR COUNTER
001336 005037 001204            CLR     PCNT            ;CLEAR PASS COUNTER
001342 005037 001206            CLR     PCNT+2
001346 005737 000042            TST     @#42            ;CHECK FOR ACT11 OR DDP PRESENT
001352 001404                   BEQ     GETADR          ;BRANCH IF NONE
001354 004737 017470            JSR     PC,     AUTO    ;GO TO SUBROUTINE TO "MAP" DJ11 ON THE SYS
001360 000137 002302            JMP     RESTAR          ;SKIP OPERATOR ACTION

001364 000004 017244    GETADR: TYPE,   MSGADR          ;TYPE "FIRST DJ11 ADDRESS"
001370 004537 016216            JSR     R5,     READIN  ;READ INPUT FROM TTY AND SAVE
001374 001230                   .WORD   DEVADR          ; IN DEVADR
001376 001372                   BNE     GETADR          ;BRANCH IF BAD INPUT
001400 005737 001230            TST     DEVADR
001404 001003                   BNE     1$
001406 013737 001312 001230     MOV     DEFADR,DEVADR
001414 042737 000007 001230 1$: BIC     #7,DEVADR
001422 022737 160000 001230     CMP     #160000,DEVADR
001430 101355                   BHI     GETADR

001432 000004 017274    GETVEC: TYPE,   MSGVEC          ;TYPE "VECTOR ADDRESS:"
001436 004537 016216            JSR     R5,     READIN  ;READ INPUT FROM TTY AND SAVE
001442 001232                   .WORD   VECADR          ;IN VECADR
001444 001372                   BNE     GETVEC          ;BRANCH IF BAD INPUT
001446 005737 001232            TST     VECADR          ;CHECK FOR CR
001452 001003                   BNE     1$
001454 012737 000300 001232     MOV     #300,   VECADR  ;SET TO FIRST FLOATING VECTOR
001462 042737 000007 001232 1$: BIC     #7,     VECADR  ;CLEAR TO MODULO 10
001470 022737 000300 001232     CMP     #300,   VECADR  ;CHECK FOR LOW LIMIT
001476 003355                   BGT     GETVEC
001500 022737 001000 001232     CMP     #1000,  VECADR  ;CHECK FOR UPPER LIMIT
001506 002375                   BLE     GETVEC
001510 000004 017320    GETNUM: TYPE,   MSGNUM  ;TYPE"NUMBER OR UNITS:"
001514 004737 016364            JSR     PC,READS$       ;READ INPUT FROM THE TTY
                        ; CHECK STRING FOR VALID DIGITS,TERMINATOR,AND 'P'
001520 012702 016512            MOV     #INPUT,R2       ;POINTS TO INPUT STRING
```

```
001646  112201                          MOVB    (R2)+,R1        ;LOAD 1ST CHAR
001650  001434                          BEQ     1$              ;BRANCH IF IMMEDIATE TERMINATOR
001652  122701  000120                  CMPB    #'P,R1          ;CHECK FOR A P
001656  001443                          BEQ     CONFIG          ;CONFIGURE MODE IF SO
001660  120127  000071                  CMPB    R1,#71          ;MUST BE A VALID ASCII NUMBER
001664  101362                          BHI     GETNUM          ;ELSE RETRY
001666  162701  000060                  SUB     #60,R1          ;STRIP ASCII CODE
001672  003754                          BLE     GETNUM          ;SHOULDN'T BE ZERO OR NEG
                                ;1ST CHAR IS A VALID DIGIT, 1 THRU 9 - CHECK REST OF STRING
001674  105732                          TSTB    (R2)+           ;2ND CHAR A TERMINATOR?
001676  001403                          BEQ     3$              ;YES - R1 HAS THE FINAL # OF UNITS
001700  105712                          TSTB    (R2)            ;NO - NXT CHAR MUST BE THE TERMINATOR
001702  001356                          BNE     GETNUM          ;ELSE RETRY.
001704  122732  000071                  CMPB    -(R2),#71       ;CHECK 2ND CHAR FOR A VALID NUMBER
001710  101360                          BHI     GETNUM
001712  116203                          MOVB    (R2),R3         ;MAKE IT MORE ACCESSIBLE
001714  162703  000060                  SUB     #60,R3          ;STRIP ASCII CODE
001720  100744                          BMI     GETNUM          ;SHOULDN'T BE NEGATIVE
                                ;BOTH LOW AND HIGH ORDER DIGITS ARE OK - CONVERT DECIMAL VALUE.
001722  010146                          MOV     R1,-(SP)        ;SAVE IT FOR LATER
001724  006301                          ASL     R1              ;MULT HI ORDER BY 8
001726  006301                          ASL     R1
001730  006301                          ASL     R1
001732  006316                          ASL     (SP)            ;MULTIPLY IT BY 2
001734  062601                          ADD     (SP)+,R1        ;RESULT IS (HI ORD)*10.
001736  060301                          ADD     R3,R1           ;NOW ADD IN THE LOW ORDER
001740  000432                          BR      3$
001742  012701  000001                  MOV     #1,R1           ;LOAD DEFAULT VALUE HERE
                                ;R1 HAS THE CONVERTED VALUE - COMPARE AGAINST MAX ALLOWED.
001746  020127  000020                  CMP     R1,#DJMXNO      ;TOO BIG?
001752  101327                          BHI     GETNUM          ;YES - RETRY.
001754  010137  001234                  MOV     R1,UNITS        ;VALUE OK - STORE RESULT
001760  012737  000100  001304          MOV     #100.,DJOUT     ;"PRIME" UNIT UNDER TEST NUMBER

001766  001304  017343          CONFIG: TYPE.   MSGCON          ;TYPE "STANDARD CONFIG"
001772  004737  016364                  JSR     PC,     READ$   ;READ INPUT FROM TTY
001776  122737  000120  016512          CMPB    #'P,    INPUT   ;CHECK FOR "P"
002004  001536                          BEQ     RESTAR          ;BRANCH IF PREVIOUS
002006  012700  000022                  MOV     #22.,   R0      ;SET UP COUNTER
002012  012701  001236                  MOV     #LENGTH,R1      ;POINT TO CHAR LEN TABLE
002016  005021                  1$:     CLR     (R1)+           ;PUT CHAR MASK FOR 9 IN CHAR TABLE
                                                                ;AND CLR PARITY TABLE
002020  005300                          DEC     R0              ;COUNT DOWN
002022  001375                          BNE     1$              ;BRANCH IF NOT DONE
002024  105737  016512                  TSTB    INPUT           ;CHECK FOR CR
002030  001524                          BEQ     RESTAR          ;BRANCH IF DEFAULT
002032  122737  000131  016512          CMPB    #131,   INPUT   ;CHECK FOR "Y"
002040  001520                          BEQ     RESTAR          ;BRANCH IF DEFAULT
002042  122737  000116  016512          CMPB    #116,   INPUT   ;CHECK FOR "N"
002050  001346                          BNE     CONFIG          ;BRANCH IF ILLEGAL ENTRY
002052  005000                          CLR     R0              ;CLR UNIT COUNTER
002054  005001                          CLR     R1              ;CLR LINE COUNTER
002056  012702  001236                  MOV     #LENGTH,R2      ;SET UP POINTER TO CHAR MASK TABLE
002062  012703  001276                  MOV     #PARITY,R3      ;SET UP POINTER TO PARITY TABLE
002066  012704  000001                  MOV     #1,R4           ;SET UP MARKER
002072  000004  017377          TYPLIN: TYPE.   MSGLIN          ;TYPE "LINES "
```

```
                                                MOV     R1,TTY          ;TYPE R1 IN OCTAL
                                                JSR     PC,PRINTS       ;AND SUPRESS LEADING ZERO'S
                                                TYPE,   MSGDAS          ;TYPE A DASH (-)
                                                ADD     #3.     R1      ;LAST LINE IN GROUP OF 4
                                                MOV     R1,TTY          ;TYPE R1 IN OCTAL
                                                JSR     PC,PRINTS       ;AND SUPRESS LEADING ZERO'S
                                                INC     R1              ;FIRST LINE NEXT GROUP
                                        GETLEN: TYPE,   MSGLEN          ;TYPE "CHAR LENGTH:  "
                                                JSR     PC,     READ$   ;READ FROM THE TTY
                                                TST3    INPUT           ;CHECK FOR CR (DEFAULT)
                                                BEQ     GETPAR          ;BRANCH IF DEFAULT
                                                TSTB    INPUT+1         ;CHECK FOR BAD DATA
                                                BNE     GETLEN          ;BRANCH IF BAD
                                                SUB     #60.    INPUT   ;CONVERT FROM ASCII
                                                MOVB    #-1.    (R2     ;SET UP MASK
                                        2$:     ASLB    (R2)            ;CLEAR MASK BIT BY BIT
                                                BCS     GETLEN          ;BAD INPUT, > 8
                                                DECB    INPUT           ;COUNT
                                                BNE     2$              ;BRANCH IF NOT DONE
                                                BIT3    #37.    (R2)    ;CHECK FOR 5 CHAR
                                                BNE     GETLEN          ;BAD INPUT, < 5
                                                INC     R2              ;INC TO NEXT LINE GROUP
                                        GETPAR: TYPE,   MSGPAR          ;TYPE "PARITY (NO, ODD, EVEN):
                                                JSR     PC,READ$        ;READ INPUT FROM TTY
                                                TST     INPUT           ;CHECK FOR CR
                                                BEQ     3$              ;BRANCH IF DEFAULT
                                                CMPB    #116.INPUT      ;CHECK FOR "N"
                                                BEQ     3$              ;BRANCH IF "NO"
                                                CMPB    #105.INPUT      ;CHECK FOR "E"
                                                BEQ     3$              ;BRANCH IF "EVEN"
                                                CMPB    #117.INPUT      ;CHECK FOR "O"
                                                BNE     GETPAR          ;BRANCH IF NONE
                                                BISB    R4,     (R3)    ;SET THE ODD PARITY FLAG
                                        3$:     INC     R3              ;UP DATE PARITY TABLE POINTER
                                                BIT     #17,R1          ;CHECK FOR NEXT UNIT
                                                BNE     TYPLIN          ;BRANCH IF NOT
                                                MOV     #PARITY,R3      ;RESET PARITY TABLE POINTER
                                                ASL     R4              ;FLAG TO NEXT UNIT
                                                INC     R0              ;COUNT UNITS
                                                CMP     R0,UNITS        ;CHECK FOR LAST
                                                BNE     TYPLIN          ;BRANCH IF MORE
```

```
                    ;723
002302  000005      ;724  RESTAR: RESET                   ;ISSUE RESET
002304  012706 001230 ;725         MOV     #IOINT, SP      ;SET UP STACK POINTER
002310  005737 001322 ;726         TST     FTIME
002314  001410       ;727         BEQ     CLRVEC
002316  022737 000176 001316 ;728         CMP     #SWREG, SWR
002324  001004       ;729         BNE     CLRVEC
002326  004737 017770 ;730         JSR     PC,     CNTLU
002332  005037 001322 ;731         CLR     FTIME
002336  012700 000300 ;732  CLRVEC: MOV     #300,R0         ;BEGINNING OF FLOATING VECTORS
002342  005720       ;733  1$:     TST     (R0)+
002344  010060 177776 ;734         MOV     R0,-2(R0)       ;".+2"
002350  012720 000004 ;735         MOV     #IOT,   (R0)+   ;"IOT"
002354  022700 001000 ;736         CMP     #1000,R0
002360  001370       ;737         BNE     1$
002362  062737 000010 001210 ;738         ADD     #10,    CSR     ;UPDATE DEVICE ADDRESS TO NEXT UNIT
002370  062737 000010 001220 ;739         ADD     #10,    RCVVEC  ;UPDATE DEVICE VECTOR ADDRESS
002376  062737 000004 001306 ;740         ADD     #4,     DJLEN   ;MOVE CHAR TABLE POINTER
002404  006337 001310 ;741         ASL     DJPAR           ;UPDATE PARITY FLAG MARKER
002410  023737 001304 001234 ;742         CMP     DJUUT,UNITS
002416  002416       ;743         BLT     2$
002420  005037 001304 ;744         CLR     DJUUT
002424  013737 001230 001210 ;745         MOV     DEVADR,CSR
002432  013737 001232 001220 ;746         MOV     VECADR,RCVVEC
002440  012737 001236 001306 ;747         MOV     #LENGTH,DJLEN   ;INIT CHAR TABLE POINTER
002446  012737 000001 001310 ;748         MOV     #1,DJPAR        ;INIT PARITY FLAG MARKER
002454  005237 001304 ;749  2$:     INC     DJUUT
002460  013701 001210 ;750         MOV     CSR,    R1      ;SET UP ALL THE REGISTER ADDRESSES
002464  062701 000002 ;751         ADD     #2,     R1      ;ADD 2
002470  010137 001212 ;752         MOV     R1,     RBUF    ;SET UP RECEIVER BUFFER
002474  062701 000002 ;753         ADD     #2,     R1      ;ADD 2
002500  010137 001214 ;754         MOV     R1,     TCR     ;SET UP TRANSMITTER CONTROL REG
                    ;755                                 ; AND BREAK STATUS REG
002504  062701 000002 ;756         ADD     #2,     R1      ;ADD 2
002510  010137 001216 ;757         MOV     R1,     TBUF    ;SET UP TRANSMITTER BUFFER
002514  013701 001220 ;758         MOV     RCVVEC, R1      ;POINTER FOR VECTOR SETUP
002520  005721       ;759         TST     (R1)+           ;INC R1
002522  010137 001222 ;760         MOV     R1,     RCVLVL  ;SET INT LVL
002526  005721       ;761         TST     (R1)+           ;INC R1
002530  010137 001224 ;762         MOV     R1,     XMTVEC  ;TRANSMITTER VECTOR
002534  005721       ;763         TST     (R1)+           ;INC R1
002536  010137 001226 ;764         MOV     R1,     XMTLVL  ;XMT INT LVL ADR
002542  005037 001200 ;765         CLR     ICNT
002546  005037 015770 ;766         CLR     LAD
002552  104400       ;767         SCOPE
                    ;768
                    ;769
```

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

002554  012737  002612  000004  TST1:  MOV     #1$,    @#4     ;SET UP TIME-OUT TRAP VECTOR
002562  012737  000340  000006         MOV     #LEVEL7,@#6
002570  005777  176414                 TST     @CSR            ;REFERENCE CSR  (READ)
002574  005077  176410                 CLR     @CSR            ;CLEAR CSR      (WRITE)
002600  005577  176404                 ADC     @CSR            ;CHECK CSR      (READ AND WRITE)
002604  001405                         BEQ     2$              ;BRANCH IF OK
002606  104000                         HLT                     ;CSR NOT CLEARED

002610  000403                         BR      2$              ;SKIP ISR

002612  012601                 1$:     MOV     (SP)+,R1        ;SAVE RTI ADR FOR TYPING
002614  104001                         HLT+1                   ;CAN'T REFERENCE CSR!

002616  005726                         TST     (SP)+           ;FINISH CLEARING STACK
002620  012737  000006  000004  2$:     MOV     #6,@#4
002626  005037  000006                 CLR     @#6
002632  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
                                ;*****************************************************************

002634  012777  000002  176346  TST2:  MOV     #BIT1,@CSR      ;SET BIT1
002642  032777  000002  176340         BIT     #BIT1,@CSR      ;CHECK THAT BIT1 IS SET
002650  001001                         BNE     .+4             ;BRANCH IF OK
002652  104000                         HLT                     ;CSR BIT1 FAILED TO SET

002654  032777  177775  176326         BIT     #177775,@CSR    ;CHECK THAT NO OTHER BIT SET
002662  001401                         BEQ     .+4             ;BRANCH IF OK
002664  104000                         HLT                     ;EXTRA BIT SET IN CSR

002666  005077  176316                 CLR     @CSR            ;CLEAR BIT1
002672  032777  000002  176310         BIT     #BIT1,@CSR      ;CHECK THAT BIT1 IS CLEARED
002700  001401                         BEQ     .+4             ;BRANCH IF OK
002702  104000                         HLT                     ;CSR BIT1 FAILED TO CLEAR

002704  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
                                ;*****************************************************************

002706  012777  000004  176274  TST3:  MOV     #BIT2,@CSR      ;SET BIT2
002714  032777  000004  176266         BIT     #BIT2,@CSR      ;CHECK THAT BIT2 IS SET
002722  001001                         BNE     .+4             ;BRANCH IF OK
002724  104000                         HLT                     ;CSR BIT2 FAILED TO SET
```

```
002726  032777  177773  176254          BIT     #177773,@CSR    ;CHECK THAT NO OTHER BIT SET
002734  001401                          BEQ     .+4             ;BRANCH IF OK
002736  104000                          HLT                     ;EXTRA BIT SET IN CSR

002740  005077  176244                  CLR     @CSR            ;CLEAR BIT2
002744  032777  000004  176236          BIT     #BIT2,@CSR      ;CHECK THAT BIT2 IS CLEARED
002752  001401                          BEQ     .+4             ;BRANCH IF OK
002754  104000                          HLT                     ;CSR BIT2 FAILED TO CLEAR

002756  104400                          SCOPE

                        ;*****************************************************************
                        ;TEST 4:        TEST THAT CSR BIT6 CAN BE SET AND CLEARED
                        ;PROBABLE FAULTY LOGIC:  M7285 (D2-2) E4,E18, (D2-4) E47,E64
                        ;*****************************************************************

002760  012777  000100  176222  TST4:   MOV     #BIT6,@CSR      ;SET BIT6
002766  032777  000100  176214          BIT     #BIT6,@CSR      ;CHECK THAT BIT6 IS SET
002774  001001                          BNE     .+4             ;BRANCH IF OK
002776  104000                          HLT                     ;CSR BIT6 FAILED TO SET

003000  032777  177677  176202          BIT     #177677,@CSR    ;CHECK THAT NO OTHER BIT SET
003006  001401                          BEQ     .+4             ;BRANCH IF OK
003010  104000                          HLT                     ;EXTRA BIT SET IN CSR

003012  005077  176172                  CLR     @CSR            ;CLEAR BIT6
003016  032777  000100  176164          BIT     #BIT6,@CSR      ;CHECK THAT BIT6 IS CLEARED
003024  001401                          BEQ     .+4             ;BRANCH IF OK
003026  104000                          HLT                     ;CSR BIT6 FAILED TO CLEAR

003030  104400                          SCOPE

                        ;*****************************************************************
                        ;TEST 5:        TEST THAT CSR BIT8 CAN BE SET AND CLEARED
                        ;PROBABLE FAULTY LOGIC:  M7285 (D2-2) E6,E18, (D2-4) E47,E31
                        ;*****************************************************************

003032  012777  000400  176150  TST5:   MOV     #BIT8,@CSR      ;SET BIT8
003040  032777  000400  176142          BIT     #BIT8,@CSR      ;CHECK THAT BIT8 IS SET
003046  001001                          BNE     .+4             ;BRANCH IF OK
003050  104000                          HLT                     ;CSR BIT8 FAILED TO SET

003052  032777  177377  176130          BIT     #177377,@CSR    ;CHECK THAT NO OTHER BIT SET
003060  001401                          BEQ     .+4             ;BRANCH IF OK
003062  104000                          HLT                     ;EXTRA BIT SET IN CSR

003064  005077  176120                  CLR     @CSR            ;CLEAR BIT8
003070  032777  000400  176112          BIT     #BIT8,@CSR      ;CHECK THAT BIT8 IS CLEARED
003076  001401                          BEQ     .+4             ;BRANCH IF OK
003100  104000                          HLT                     ;CSR BIT8 FAILED TO CLEAR

003102  104400                          SCOPE

                        ;*****************************************************************
                        ;TEST 6:        TEST THAT CSR BIT10 CAN BE SET AND CLEARED
                        ;PROBABLE FAULTY LOGIC:  M7285 (D2-2) E30,E24, (D2-4) E47,E31
```

```
                                ;*****************************************************************
                                ;
003104  012777  002000  176076  TST6:   MOV     #BIT10,@CSR     ;SET BIT10
003112  032777  002000  176070          BIT     #BIT10,@CSR     ;CHECK THAT BIT10 IS SET
003120  001001                          BNE     .+4             ;BRANCH IF OK
003122  104000                          HLT                     ;CSR BIT10 FAILED TO SET
                                ;
003124  032777  175777  176056          BIT     #175777,@CSR    ;CHECK THAT NO OTHER BIT SET
003132  001401                          BEQ     .+4             ;BRANCH IF OK
003134  104000                          HLT                     ;EXTRA BIT SET IN CSR
                                ;
003136  005077  176046                  CLR     @CSR            ;CLEAR BIT10
003142  032777  002000  176040          BIT     #BIT10,@CSR     ;CHECK THAT BIT10 IS CLEARED
003150  001401                          BEQ     .+4             ;BRANCH IF OK
003152  104000                          HLT                     ;CSR BIT10 FAILED TO CLEAR
                                ;
003154  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
                                ;*****************************************************************
                                ;
003156  012777  010000  176024  TST7:   MOV     #BIT12,@CSR     ;SET BIT12
003164  032777  010000  176016          BIT     #BIT12,@CSR     ;CHECK THAT BIT12 IS SET
003172  001001                          BNE     .+4             ;BRANCH IF OK
003174  104000                          HLT                     ;CSR BIT12 FAILED TO SET
                                ;
003176  032777  167777  175004          BIT     #167777,@CSR    ;CHECK THAT NO OTHER BIT SET
003204  001401                          BEQ     .+4             ;BRANCH IF OK
003206  104000                          HLT                     ;EXTRA BIT SET IN CSR
                                ;
003210  005077  175774                  CLR     @CSR            ;CLEAR BIT12
003214  032777  010000  175766          BIT     #BIT12,@CSR     ;CHECK THAT BIT12 IS CLEARED
003222  001401                          BEQ     .+4             ;BRANCH IF OK
003224  104000                          HLT                     ;CSR BIT12 FAILED TO CLEAR
                                ;
003226  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
                                ;*****************************************************************
                                ;
003230  012777  040000  175752  TST10:  MOV     #BIT14,@CSR     ;SET BIT14
003236  032777  040000  175744          BIT     #BIT14,@CSR     ;CHECK THAT BIT14 IS SET
003244  001001                          BNE     .+4             ;BRANCH IF OK
003246  104000                          HLT                     ;CSR BIT14 FAILED TO SET
                                ;
003250  032777  137777  175732          BIT     #137777,@CSR    ;CHECK THAT NO OTHER BIT SET
003256  001401                          BEQ     .+4             ;BRANCH IF OK
003260  104000                          HLT                     ;EXTRA BIT SET IN CSR
                                ;
003262  005077  175722                  CLR     @CSR            ;CLEAR BIT14
003266  032777  040000  175714          BIT     #BIT14,@CSR     ;CHECK THAT BIT14 IS CLEARED
003274  001401                          BEQ     .+4             ;BRANCH IF OK
```

```
003276  104000                          HLT                     ;CSR BIT14 FAILED TO CLEAR

003300  104400                          SCOPE

                        ;*****************************************************************
                        ;TEST 11:       TEST THAT RECEIVER ENABLE (BIT0 OF THE CSR, CAN BE SET
                        ;                 AND CLEARED, AND THAT CLEAR MOS (BIT3) IS WRITE ONLY.
                        ;PROBABLE FAULTY LOGIC:  M7285 (D2-2) E26,E36,E7,E24, (D2-8) E17,E14,E15
                        ;*****************************************************************

003302  012777  000004  175700  TST11:  MOV     #BIT2,  @CSR    ;SET MAINTENANCE MODE (BIT2)
003310  005005                          CLR     R5              ;SET UP COUNTER
003312  052777  000010  175670          BIS     #BIT3,  @CSR    ;SET CLEAR MOS (BIT3)
003320  017701  175664          1$:     MOV     @CSR,   R1      ;SAVE CSR
003324  032701  000010                  BIT     #BIT3,  R1      ;CHECK CLEAR MOS (BIT3)
003330  001401                          BEQ     .+4             ;BRANCH IF OK
003332  104001                          HLT+1                   ;CLEAR MOS (BIT3) SET (WRITE-ONLY)
                                                                ;R1 = CONTENTS OF CSR
003334  032701  000020                  BIT     #BIT4,  R1      ;CHECK CLEAR MOS FLAG
003340  001403                          BEQ     2$              ;BRANCH IF CLEARED
003342  105305                          DECB    R5              ;WAIT FOR MOS TO CLEAR
003344  001365                          BNE     1$              ;BRANCH IF MORE TIME
003346  104001                          HLT+1                   ;CLEAR MOS FLAG (BIT4) FAILED TO CLEAR
                                                                ;R1 = CONTENTS OF CSR
003350  022701  000004          2$:     CMP     #BIT2,  R1      ;CHECK THAT ONLY MAINTENANCE BIT SET
003354  001401                          BEQ     .+4             ;BRANCH IF OK
003356  104001                          HLT+1                   ;CLEAR MOS CLEARED MAINTENANCE
                                                                ; OR SET OTHER CSR BITS
                                                                ;R1 = CONTENTS OF CSR
003360  052777  000001  175622          BIS     #BIT0,  @CSR    ;SET RECEIVER ENABLE
003366  017701  175616                  MOV     @CSR,   R1      ;SAVE CSR
003372  032777  000001  175610          BIT     #BIT0,  @CSR    ;CHECK THAT RECEIVER ENABLE SET
003400  001001                          BNE     .+4             ;BRANCH IF OK
003402  104001                          HLT+1                   ;RECEIVER ENABLE FAILED TO SET
                                                                ;R1 = CONTENTS OF CSR
003404  022777  000005  175576          CMP     #5,     @CSR    ;CHECK REST OF CSR
003412  001401                          BEQ     .+4             ;BRANCH IF OK
003414  104001                          HLT+1                   ;CSR ERROR
                                                                ;R1 = CONTENTS OF CSR
                        ;NOTE:  IF THE TTY MODULE IS BEING USED AND DONE (BIT7) IS SET,
                        ;       THE ERROR COULD BE DUE TO MAINTENANCE OR CLEAR MOS NOT WORKING.
003416  042777  000001  175564          BIC     #BIT0,  @CSR    ;CLEAR RECEIVER ENABLE
003424  017701  175560                  MOV     @CSR,   R1      ;SAVE CSR
003430  022777  000004  175552          CMP     #BIT2,  @CSR    ;CHECK CSR
003436  001401                          BEQ     .+4             ;BRANCH IF OK
003440  104001                          HLT+1                   ;RECEIVER ENABLE DIDN'T CLEAR
                                                                ; OR OTHER CSR BIT SET
                                                                ;R1 = CONTENTS OF CSR

003442  104400                          SCOPE

                        ;*****************************************************************
                        ; TEST 12:       TEST THAT CSR RESPONDS PROPERLY TO BYTE COMMANDS
                        ;PROBABLE FAULTY LOGIC:  M7285 (D2-4) E47
                        ;*****************************************************************
```

```
003444  012777  052506  175536  TST12:  MOV     #052506,@CSR    ;SET TEST NUMBER IN CSR
003452  105477  175532          CLRB    @CSR            ;CLR EVEN BYTE
003456  017701  175526          MOV     @CSR,   R1      ;SAVE CSR
003462  022701  052400          CMP     #052400,R1      ;CHECK CSR
003466  001401                  BEQ     .+4             ;BRANCH IF OK
003470  104001                  HLT+1                   ;EVEN BYTE CLR FAILED ON CSR
                                                        ;R1 = CONTENTS OF CSR
003472  012777  052505  175510          MOV     #052506,@CSR    ;SET TEST NUMBER IN CSR
003500  105237  001210          INC     CSR             ;INC TO ODD BYTE
003504  105077  175500          CLRB    @CSR            ;CLR ODD BYTE
003510  105337  001210          DEC     CSR             ;RESTORE TO EVEN
003514  017701  175470          MOV     @CSR,   R1      ;SAVE CSR
003520  022701  000106          CMP     #000106,R1      ;CHECK CSR
003524  001401                  BEQ     .+4             ;BRANCH IF OK
003526  104001                  HLT+1                   ;ODD BYTE CLR FAILED ON CSR
                                                        ;R1 = CONTENTS OF CSR

003530  104400                  SCOPE

                        ;*****************************************************************
                        ;TEST 13:       TEST THAT THE BIS AND BIC INSTRUCTIONS SET AND CLEAR R/W
                        ;               BITS OF CSR
                        ;PROBABLE FAULTY LOGIC:  M7285 (D2-4) E47
                        ;*****************************************************************

003532  005077  175452  TST13:  CLR     @CSR            ;CLEAR THE CSR
003536  017701  175446          MOV     @CSR,   R1      ;CHECK AND SAVE CSR
003542  001401                  BEQ     .+4             ;BRANCH IF CLEARED OK
003544  104001                  HLT+1                   ;RESET FAILED TO CLR CSR

003546  052777  052506  175434          BIS     #052506,        @CSR    ;SET ALL R/W BITS OF CSR
003554  022777  052506  175426          CMP     #052506,        @CSR    ;CHECK THAT THEY GOT SET
003562  001401                  BEQ     .+4             ;BRANCH IF OK
003564  104000                  HLT                     ;REG FAILED CMP

003566  042777  052506  175414          BIC     #052506,        @CSR    ;CLEAR CSR
003574  017701  175410          MOV     @CSR,   R1      ;CHECK AND SAVE CSR
003600  001401                  BEQ     .+4             ;BRANCH IF CLEARED OK
003602  104001                  HLT+1                   ;CLR FAILED TO CLR CSR

003604  104400                  SCOPE

                        ;*****************************************************************
                        ;TEST 14:       TEST BITS OF TCR FOR READ/WRITE CAPABILITY
                        ;PROBABLE FAULTY LOGIC:  M7285 (D2-2, ALL, (D2-3) E8,E20,E31,E43,E41
                        ;*****************************************************************

003606  012777  177777  175400  TST14:  MOV     #177777,@TCR    ;SET ALL BITS OF TCR
003614  017701  175374          MOV     @TCR,   R1      ;CHECK AND SAVE TCR
003620  022701  177777          CMP     #177777,R1      ;CHECK THAT ALL THE BITS ARE SET
003624  001401                  BEQ     .+4             ;BRANCH IF OK
003626  104001                  HLT+1                   ;BIT(S) OF TCR FAILED TO SET

003630  005077  175360          CLR     @TCR            ;CLEAR TCR
003634  017701  175354          MOV     @TCR,   R1      ;CHECK THAT IT CLEARED AND SAVE
003640  001401                  BEQ     .+4             ;BRANCH IF CLR
```

```
                                ;BITS OF TCR FAILED TO CLEAR

                        SCOPE

                ;*****************************************************************
                ;TEST 15:       TEST THAT TCR RESPONDS PROPERLY TO BYTE COMMANDS
                ;PROBABLE FAULTY LOGIC:  M7295 (D2-3) E41
                ;*****************************************************************

                TST15:  MOV     #177777,@TCR    ;SET TEST NUMBER IN TCR
                        MOVB    @TCR,R0         ;CLR EVEN BYTE
                        MOV     @TCR,R1         ;READ TCR
                        BIC     #177400,R1      ;CLR ODD BYTE
                        BEQ     .+4             ;BRANCH IF OK
                        HLT     1               ;EVEN BYTE CLR FAILED ON TCR
                                                ;R1 = CONTENTS OF TCR
                        MOV     #177777,@TCR    ;SET TEST NUMBER IN TCR
                        MOVB    @TCR,R0         ;CLR ODD BYTE
                        MOV     @TCR,R1         ;READ TCR
                        BIC     #000377,R1      ;CLR EVEN BYTE
                        BEQ     .+4             ;BRANCH IF OK
                        HLT     1               ;ODD BYTE CLR FAILED ON TCR
                                                ;R1 = CONTENTS OF TCR

                        SCOPE

                ;*****************************************************************
                ;TEST 16:       TEST THAT THE BIS AND BIC INSTRUCTIONS SET AND CLEAR T
                ;               BITS OF TCR
                ;PROBABLE FAULTY LOGIC:  M7295 (D2-3) E41
                ;*****************************************************************

                TST16:  CLR     @TCR            ;CLEAR THE TCR
                        MOV     @TCR,R0         ;CHECK AND SAVE TCR
                        BEQ     .+4             ;BRANCH IF CLEARED OK
                        HLT     1               ;RESET FAILED TO CLR TCR

                        BIS     #177777,@TCR    ;SET ALL R0 BITS OF TCR
                        MOV     @TCR,R0         ;CHECK THAT THE BITS ARE SET
                        BEQ     .+4             ;BRANCH IF OK
                        HLT                     ;BIS FAILED CMP

                        BIC     #177777,@TCR    ;CLEAR TCR
                        MOV     @TCR,R0         ;CHECK AND SAVE TCR
                        BEQ     .+4             ;BRANCH IF CLEARED OK
                        HLT     1               ;CLR FAILED TO CLR TCR

                        SCOPE
                        MOV     #1,     TIMER   ;INITIALIZE TIMER
                        MOV     #.+6,   LOC     ;RESET LOOP ADDRESS

                ;*****************************************************************
                ;TEST 17:       TEST THAT TRANSMIT READY BITS OF CSR  SETS AND CLEARS
                ;                 WHEN TCRE IS SET AND CLEARED.
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                                ;                ALSO CHECK THAT THE RIGHT LINE NO. (0) APPEARS IN RBUFF.
                                ;PROBABLE FAULTY LOGIC:  MT295 (D2-5  ALL, (D2-6) E23, E32, E33, E49, (D2-8) E3, E1
                                ;*****************************************************************

                        175142  TST17:  MOV     #400,   @CSR    ;SET XMTR SCAN ENABLE
                                        BIS     #BIT6,  @TCR    ;SET XMTR CONTROL BIT, LINE 0
                                        MOV     #100,   R0      ;SET UP WAIT COUNTER
                        175142  1$:     MOV     @CSR,   R1      ;CHECK AND SAVE XMTR READY
                                        BMI     2$              ;BRANCH IF SET OK
                                        SOB     R0,     1$      ;WAIT A WHILE
                                        HLT+1                   ;XMTR READY FAILED TO SET

                        000416          BR      3$              ;SKIP LINE # CHECK ON ERROR

                        000000  2$:     MOV     #,      TIMES   ;SET UP TIMER
                                        BIC     #BUF,   R1      ;ISOLATE LINE NUMBER
                                        BCS     .+4             ;BRANCH IF OK
                                        BEQ     .+4             ;BRANCH IF OK
                                        HLT+1                   ;WRONG LINE NUMBER APPEARED IN RBUF

                        175100          MOV     @CSR,   R2      ;CHECK AND SAVE XMTR READY
                                        BMI     .+4             ;BRANCH IF OK
                                        HLT+2                   ;READING THE RBUF CLEARED XMTR READY

                        000000  3$:     BIC     #BIT6,  @TCR    ;CLR XMTR CONTROL BIT, LINE 0
                                        MOV     #100,   R0      ;SET UP WAIT COUNTER AND SAVE XMTR READY
                                        MOV     @CSR,   R1      ;BRANCH IF SET OK
                                        BMI     .+4             ;XMTR READY FAILED TO SET
                                        SOB     R0,     .-4     ;XMTR READY FOR LINE 0 NOT CLEARED
                                        HLT+1

                        104400          SCOPE

                                ;*****************************************************************
                                ;TEST 20:       TEST THAT TRANSMIT READY BITS OF CSR  SETS AND CLEARS
                                ;               WHEN EACH TCR BIT IS SET AND CLEARED.
                                ;               ALSO CHECK THAT THE RIGHT LINE NO.  APPEARS IN RBUFF.
                                ;PROBABLE FAULTY LOGIC:  MT295 (D2-5) ALL, (D2-6) E23, E32, E33, E49, (D2-8) E3, E1
                                ;*****************************************************************

                        000400  TST20:  MOV     #400,   @CSR    ;SET XMTR SCAN ENABLE
                                        MOV     R0,     R1
                                        MOV     #1,     R4      ;SET UP MARKER
                        175040  4$:     BIS     R4,     @TCR    ;SET XMTR CONTROL BIT, EACH LINE
                                        MOV     #100,   R0      ;SET UP WAIT COUNTER
                        175026  1$:     MOV     @CSR,   R2      ;CHECK AND SAVE XMTR READY
                                        BMI     2$              ;BRANCH IF SET OK
                                        SOB     R0,     1$      ;WAIT A WHILE
                                        HLT+2                   ;XMTR READY FAILED TO SET
                                                                ;R1=LINE #
                                                                ;R2=CSR
```

```
 000172  000414                        BR      3$              ;SKIP LINE # CHECK ON ERROR

 [illegible]  [illegible]  [illegible]  3$:    [illegible]     R0      TIMER   ;SET UP TIMER
 [illegible]  [illegible]  [illegible]          [illegible]     #TBUF,  R2      ;SAVE LINE NUMBER
 [illegible]  [illegible]                       SWAB    R2
 [illegible]  [illegible]                       CMP     R2,     R1      ;CHECK THAT THE XMTR STOPPED ON RIGHT LINE
 [illegible]  [illegible]                       BEQ     .+4             ;BRANCH IF OK
 [illegible]  [illegible]                       HLT+2                   ;WRONG LINE NUMBER APPEARED IN TBUF
                                                                        ;R1=LINE #(SHOULD BE)
                                                                        ;R2=LINE # (TBUF)

 [illegible]  [illegible]  [illegible]          MOV     #CSR,   R2      ;CHECK AND SAVE XMTR READY
 [illegible]  [illegible]                       BMI     .+4             ;BRANCH IF OK
 [illegible]  [illegible]                       HLT+3                   ;READING THE TBUF CLEARED XMTR READY

 [illegible]  [illegible]  [illegible]  3$:     BIC     R4,     #TCR    ;CLR XMTR CONTROL BIT, EACH LINE
 [illegible]  [illegible]  [illegible]          MOV     #CSR,   R2      ;CHECK AND SAVE XMTR READY
 [illegible]  [illegible]                       BMI     .+4             ;BRANCH IF OK
 [illegible]  [illegible]                       HLT+2                   ;XMTR READY FAILED TO CLEAR WHEN
                                                                        ;    XMTR CONTROL FOR LINE -1 WAS CLEARED
                                                                        ;R1 = LINE #
                                                                        ;R2 = CONTENTS OF CSR

 [illegible]  [illegible]                       INC     R1              ;INC LINE COUNTER TO NEXT LINE
 [illegible]  [illegible]                       ASLB    R4              ;SHIFT MARKER TO NEXT LINE
 [illegible]  [illegible]                       BCC     3$              ;BRANCH IF NOT LAST LINE

 [illegible]  [illegible]                       SCOPE


                                        ;*****************************************************************
                                        ;TEST 21:      TEST THAT MASTER TRANSMIT SCAN ENABLE (CSR BIT 8) IN A C
                                        ;              DISABLES TRANSMITTER READY (CSR BIT 15)
                                        ;              WHEN TCR BIT (LINE 0) IS SET.
                                        ;PROBABLE FAULTY LOGIC:  M[illegible]  D[illegible]  E49,E23,E32,E33
                                        ;*****************************************************************

 [illegible]  [illegible]  [illegible]  TST21:  CLR     #CSR            ;CLEAR CONTROL STATUS
 [illegible]  [illegible]  [illegible]  [illegible]  MOVBS   #BIT0,#TCR  ;SET XMTR CONTROL BIT, LINE 0
 [illegible]  [illegible]  [illegible]          MOV     #TIMER,R0       ;GET TIMER FROM PREVIOUS TEST
 [illegible]  [illegible]  [illegible]  1$:     MOV     #CSR,R1         ;CHECK AND SAVE XMTR READY
 [illegible]  [illegible]                       BPL     2$              ;BRANCH IF NOT SET
 [illegible]  [illegible]                       HLT+1                   ;XMTR READY SET WITHOUT
 [illegible]  [illegible]                       BR      2$              ;MASTER TRANS SCAN ENABLE
 [illegible]  [illegible]                2$:    DEC     R0              ;WAIT A WHILE
 [illegible]  [illegible]  001371               BNE     1$              ;AND CHECK AGAIN

 [illegible]  [illegible]  [illegible]  [illegible]  3$:     BIS     #400,#CSR       ;SET MASTER TRAN SCAN ENABLE
 [illegible]  [illegible]                       CLR     R0
 [illegible]  [illegible]  [illegible]          MOV     #CSR,   R1      ;CHECK AND SAVE XMTR READY
 [illegible]  [illegible]                       BMI     5$
 [illegible]  [illegible]                       INC     R0
 [illegible]  [illegible]                       BNE     4$
 [illegible]  [illegible]                       HLT+1                   ;TRAN READY NEVER CAME UP
                                                                        ;TCR BIT WAS SET FIRST
```

```
                                                        ;THEN MASTER TRAN SCAN ENABLE
004330  174656  5$:     BIC     #BIT0,  @TCR    ;CLEAR IT OUT
004334  105761  174646          MOV     @CSR,   R1      ;CHECK AND SAVE TRAN READY
004340  100001                  BPL     .+4             ;BRANCH IF OK
004342  104401                  HLT+1                   ;TRAN READY DIDN'T CLEAR.

004344  104402                  SCOPE


                        ;*****************************************************************
                        ;TEST 22:       TEST THAT INTERRUPT DOES NOT OCCUR AT LEVEL 7
                        ;PROBABLE FAULTY LOGIC:  M7821 WIRING, PROPER PRIORITY CHIP
                        ;*****************************************************************

004346  012737  004444  174646  TST22:  MOV     #ISR22,@XMT.EC  ;SET UP XMTR INTERRUPT VECTOR
004354  012737  000340  174642          MOV     #340,@XMTLVL    ;AT LEVEL 7
004362  042737  000340  177776          BIC     #340,@#PS       ;CLEAR PS LEVEL
004370  052737  000300  177776          BIS     #300,@#PS       ;SET PS TO LEVEL 7
004376  012737  040400  174462          MOV     #040400,@CSR    ;SET TRAN MASTER INT. ENABLE
004404  012777  000001  174460          MOV     #BIT0,  @TCR    ;SET TRAN CONTROL BIT, LINE 0
004412  017701  174570          1$:     MOV     @CSR,   R1      ;WAIT
004416  100375                  BPL     1$
004420  000404                  BR      END22           ;Ok, BRANCH IF NO INTERRUPT

004422  104000          ISR22:  HLT                     ;SHOULDN'T HAVE INTERRUPTED AT LEVEL 7
004424  012716  004434          MOV     #END22,(SP)     ;MOVE NEW RTI ADR ONTO STACK
004430  000002                  RTI

004432  013777  001226  174562  END22:  MOV     XMTLVL,@XMTVEC
004440  012777  000007  174556          MOV     #IGT,   @XMTLVL
004446  005077  174542                  CLR     @TCR
004452  005077  174532                  CLR     @CSR
004456  042737  000340  177776          BIC     #340,@#PS

004464  104400                  SCOPE


                        ;*****************************************************************
                        ;TEST 23:       TEST THAT INTERRUPT DOES NOT OCCUR AT LEVEL 6
                        ;PROBABLE FAULTY LOGIC:  M7821 WIRING, PROPER PRIORITY CHIP
                        ;*****************************************************************

004466  012777  004544  174526  TST23:  MOV     #ISR23,@XMTVEC  ;SET UP XMTR INTERRUPT VECTOR
004474  012777  000340  174522          MOV     #340,@XMTLVL    ;AT LEVEL 7
004502  042737  000340  177776          BIC     #340,@#PS       ;CLEAR PS LEVEL
004510  052737  000300  177776          BIS     #300,@#PS       ;SET PS TO LEVEL 6
004516  012777  040400  174462          MOV     #040400,@CSR    ;SET TRAN MASTER INT. ENABLE
004524  012777  000001  174460          MOV     #BIT0,  @TCR    ;SET TRAN CONTROL BIT, LINE 0
004532  017701  174450          1$:     MOV     @CSR,   R1      ;WAIT
004536  100375                  BPL     1$
004540  000404                  BR      END23           ;OK, BRANCH IF NO INTERRUPT

004542  104000          ISR23:  HLT                     ;SHOULDN'T HAVE INTERRUPTED AT LEVEL 6
004544  012716  004554          MOV     #END23,(SP)     ;MOVE NEW RTI ADR ONTO STACK
004550  000002                  RTI
```

```
 1274  004554  013777  001226  174442  END23:  MOV     XMTLVL,@XMTVEC
 1275  004562  012777  000004  174436          MOV     #IOT,   @XMTLVL
 1276  004570  005077  174420                  CLR     @TCR
 1277  004574  005077  174410                  CLR     @CSR
 1278  004600  042737  000340  177776          BIC     #340,@#PS
 1279
 1280  004606  104400                          SCOPE
 1281
 1282
 1283                                  ;*****************************************************************
 1284                                  ;TEST 24:       TEST THAT INTERRUPT DOES NOT OCCUR AT LEVEL 5
 1285                                  ;PROBABLE FAULTY LOGIC:  M7821 WIRING, PROPER PRIORITY CHIP
 1286                                  ;*****************************************************************
 1287
 1288  004610  012777  004664  174406  TST24:  MOV     #ISR24,@XMTVEC  ;SET UP XMTR INTERRUPT VECTOR
 1289  004616  012777  000340  174402          MOV     #340,@XMTLVL    ;AT LEVEL 7
 1290  004624  042737  000340  177776          BIC     #340,@#PS       ;CLEAR PS LEVEL
 1291  004632  052737  000240  177776          BIS     #240,@#PS       ;SET PS TO LEVEL 5
 1292  004640  012777  040400  174342          MOV     #040400,@CSR    ;SET TRAN MASTER INT. ENABLE
 1293  004646  012777  000001  174340          MOV     #BIT0,  @TCR    ;SET TRAN CONTROL BIT, LINE 0
 1294  004654  017701  174330          1$:     MOV     @CSR,   R1      ;WAIT
 1295  004660  100375                          BPL     1$
 1296  004662  000404                          BR      END24           ;OK, BRANCH IF NO INTERRUPT
 1297
 1298  004664  104000                  ISR24:  HLT                     ;SHOULDN'T HAVE INTERRUPTED AT LEVEL 5
 1299  004666  012716  004674                  MOV     #END24,(SP)     ;MOVE NEW RTI ADR ONTO STACK
 1300  004672  000002                          RTI
 1301
 1302  004674  013777  001226  174322  END24:  MOV     XMTLVL,@XMTVEC
 1303  004702  012777  000004  174316          MOV     #IOT,   @XMTLVL
 1304  004710  005077  174300                  CLR     @TCR
 1305  004714  005077  174270                  CLR     @CSR
 1306  004720  042737  000340  177776          BIC     #340,@#PS
 1307
 1308  004726  104400                          SCOPE
 1309
 1310
 1311                                  ;*****************************************************************
 1312                                  ;TEST 25:       TEST THAT INTERRUPT OCCURS AT LEVEL 4
 1313                                  ;PROBABLE FAULTY LOGIC:  M7821 WIRING, PROPER PRIORITY CHIP
 1314                                  ;*****************************************************************
 1315
 1316  004730  012777  005006  174266  TST25:  MOV     #ISR25,@XMTVEC  ;SET UP XMTR INTERRUPT VECTOR
 1317  004736  012777  000340  174262          MOV     #340,@XMTLVL    ;AT LEVEL 7
 1318  004744  042737  000340  177776          BIC     #340,@#PS       ;CLEAR PS LEVEL
 1319  004752  052737  000200  177776          BIS     #200,@#PS       ;SET PS TO LEVEL 4
 1320  004760  012777  040400  174242          MOV     #040400,@CSR    ;SET TRAN MASTER INT. ENABLE
 1321  004766  012777  000001  174220          MOV     #BIT0,  @TCR    ;SET TRAN CONTROL BIT, LINE 0
 1322  004774  017701  174210          1$:     MOV     @CSR,   R1      ;WAIT
 1323  005000  100375                          BPL     1$
 1324  005002  104000                          HLT                     ;SHOULD HAVE INTERRUPTED AT LEVEL 4
 1325  005004  000403                          BR      END25           ;CONTINUE
 1326
 1327  005006  012716  005014          ISR25:  MOV     #END25,(SP)     ;MOVE NEW RTI ADR ONTO STACK
 1328  005012  000002                          RTI
 1329
```

```
 1330  005014  013777  001226  174202  END25:  MOV     XMTLVL,@XMTVEC
 1331  005022  012777  000004  174176          MOV     #IOT,   @XMTLVL
 1332  005030  005077  174160                  CLR     @TCR
 1333  005034  005077  174150                  CLR     @CSR
 1334  005040  042737  000340  177776          BIC     #340,@#PS

       005046  104400                          SCOPE

                                        ;*****************************************************************
                                        ;TEST 26:       TEST THAT INTERRUPT OCCURS AT LEVEL 3
                                        ;PROBABLE FAULTY LOGIC:  M7821 WIRING, PROPER PRIORITY CHIP
                                        ;*****************************************************************

       005050  012777  005126  174146  TST26:  MOV     #ISR26,@XMTVEC  ;SET UP XMTR INTERRUPT VECTOR
       005056  012777  000340  174142          MOV     #340,@XMTLVL    ;AT LEVEL 7
       005064  042737  000340  177776          BIC     #340,@#PS       ;CLEAR PS LEVEL
       005072  052737  000140  177776          BIS     #140,@#PS       ;SET PS TO LEVEL 3
       005100  012777  040400  174102          MOV     #040400,@CSR    ;SET TRAN MASTER INT. ENABLE
       005106  012777  000001  174100          MOV     #BIT0,  @TCR    ;SET TRAN CONTROL BIT, LINE 0
       005114  017701  174070          1$:     MOV     @CSR,   R1      ;WAIT
       005120  100375                          BPL     1$
       005122  104000                          HLT                     ;SHOULD HAVE INTERRUPTED AT LEVEL 3
       005124  000403                          BR      END26           ;CONTINUE

       005126  012716  005134          ISR26:  MOV     #END26,(SP)     ;MOVE NEW RTI ADR ONTO STACK
       005132  000002                          RTI

       005134  013777  001226  174062  END26:  MOV     XMTLVL,@XMTVEC
       005142  012777  000004  174056          MOV     #IOT,   @XMTLVL
       005150  005077  174040                  CLR     @TCR
       005154  005077  174030                  CLR     @CSR
       005160  042737  000340  177776          BIC     #340,@#PS

       005166  104400                          SCOPE

                                        ;*****************************************************************
                                        ;TEST 27:       TEST THAT INTERRUPT OCCURS AT LEVEL 2
                                        ;PROBABLE FAULTY LOGIC:  M7821 WIRING, PROPER PRIORITY CHIP
                                        ;*****************************************************************

       005170  012777  005246  174026  TST27:  MOV     #ISR27,@XMTVEC  ;SET UP XMTR INTERRUPT VECTOR
       005176  012777  000340  174022          MOV     #340,@XMTLVL    ;AT LEVEL 7
       005204  042737  000340  177776          BIC     #340,@#PS       ;CLEAR PS LEVEL
       005212  052737  000100  177776          BIS     #100,@#PS       ;SET PS TO LEVEL 2
       005220  012777  040400  173762          MOV     #040400,@CSR    ;SET TRAN MASTER INT. ENABLE
       005226  012777  000001  173760          MOV     #BIT0,  @TCR    ;SET TRAN CONTROL BIT, LINE 0
       005234  017701  173750          1$:     MOV     @CSR,   R1      ;WAIT
       005240  100375                          BPL     1$
       005242  104000                          HLT                     ;SHOULD HAVE INTERRUPTED AT LEVEL 2
       005244  000403                          BR      END27           ;CONTINUE

       005246  012716  005254          ISR27:  MOV     #END27,(SP)     ;MOVE NEW RTI ADR ONTO STACK
       005252  000002                          RTI
```

```
005254  013777  001226  173742  END27:  MOV     XMTLVL,@XMTVEC
005262  012777  000004  173736          MOV     #IOT,   @XMTLVL
005270  005077  173720                  CLR     @TCR
005274  005077  173710                  CLR     @CSR
005300  042737  000340  177776          BIC     #340,@#PS

005306  104400                          SCOPE



                                ;*****************************************************************
                                ;TEST 30:       TEST THAT INTERRUPT OCCURS AT LEVEL 1
                                ;PROBABLE FAULTY LOGIC:  M7821 WIRING, PROPER PRIORITY CHIP
                                ;*****************************************************************

005310  012777  005366  173706  TST30:  MOV     #ISR30,@XMTVEC  ;SET UP XMTR INTERRUPT VECTOR
005316  012777  000340  173702          MOV     #340,@XMTLVL    ;AT LEVEL 7
005324  042737  000340  177776          BIC     #340,@#PS       ;CLEAR PS LEVEL
005332  052737  000040  177776          BIS     #040,@#PS       ;SET PS TO LEVEL 1
005340  012777  040400  173642          MOV     #040400,@CSR    ;SET TRAN MASTER INT. ENABLE
005346  012777  000001  173640          MOV     #BIT0,  @TCR    ;SET TRAN CONTROL BIT, LINE 0
005354  017701  173630          1$:     MOV     @CSR,   R1      ;WAIT
005360  100375                          BPL     1$
005362  104000                          HLT                     ;SHOULD HAVE INTERRUPTED AT LEVEL 1
005364  000403                          BR      END30           ;CONTINUE

005366  012716  005374          ISR30:  MOV     #END30,(SP)     ;MOVE NEW RTI ADR ONTO STACK
005372  000002                          RTI

005374  013777  001226  173622  END30:  MOV     XMTLVL,@XMTVEC
005402  012777  000004  173616          MOV     #IOT,   @XMTLVL
005410  005077  173600                  CLR     @TCR
005414  005077  173570                  CLR     @CSR
005420  042737  000340  177776          BIC     #340,@#PS

005426  104400                          SCOPE



                                ;*****************************************************************
                                ;TEST 31:       TEST THAT INTERRUPT OCCURS AT LEVEL 0
                                ;PROBABLE FAULTY LOGIC:  M7821 WIRING, PROPER PRIORITY CHIP
                                ;*****************************************************************

005430  012777  005506  173566  TST31:  MOV     #ISR31,@XMTVEC  ;SET UP XMTR INTERRUPT VECTOR
005436  012777  000340  173562          MOV     #340,@XMTLVL    ;AT LEVEL 7
005444  042737  000340  177776          BIC     #340,@#PS       ;CLEAR PS LEVEL
005452  052737  000000  177776          BIS     #000,@#PS       ;SET PS TO LEVEL 0
005460  012777  040400  173522          MOV     #040400,@CSR    ;SET TRAN MASTER INT. ENABLE
005466  012777  000001  173520          MOV     #BIT0,  @TCR    ;SET TRAN CONTROL BIT, LINE 0
005474  017701  173510          1$:     MOV     @CSR,   R1      ;WAIT
005500  100375                          BPL     1$
005502  104000                          HLT                     ;SHOULD HAVE INTERRUPTED AT LEVEL 0
005504  000403                          BR      END31           ;CONTINUE

005506  012716  005514          ISR31:  MOV     #END31,(SP)     ;MOVE NEW RTI ADR ONTO STACK
005512  000002                          RTI
```

```
 1442  005514  013777  001226  173502  END31:  MOV     XMTLVL,@XMTVEC
 1443  005522  012777  000004  173476          MOV     #IQT,   @XMTLVL
 1444  005530  105077  173460                  CLR     @TCR
 1445  005534  005077  173456                  CLR     @CSR
 1446  005540  042737  000340  177776          BIC     #340,@#PS

 1448  005546  104403                          SCOPE

 1450  005550  005037  001302                  CLR     TIMER           ;INITIALIZE TIMER
 1451  005554  012737  005562  015770          MOV     #.+6,   LAD     ;RESET LOOP ADDRESS

                                       ;*****************************************************************
                                       ;TEST 32:       TEST THAT LINE 0 CAN TRANSMIT AND
                                       ;               RECEIVE A CHARACTER. (377)
                                       ;       1$:  CHECKS THAT DONE SETS IN REASONABLE TIME.
                                       ;       2$:  CHECKS THAT CHAR PRESENT IS IN FI/FO
                                       ;       3$:  CHECKS THAT NO ERRORS IN FI/FO
                                       ;       4$:  CHECKS THAT RIGHT LINE # (0) 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 DD3 SERIES
                                       ;*****************************************************************

                                       ;               INITIALIZE
                                       ;       DEVICE"CSR"REGISTER
                                       ;                                               SET:
 1470  005562  004737  015566          TST32:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
                                                                       ;BIT3 = CLEAR MOS
                                                                       ;BIT8 = MASTER XMTR SCAN ENB
                                       ;WAIT FOR MOS TO CLEAR
                                       ;                               SET:
                                       ;                               ;BIT0 = RECEIVER ENABLE
                                       ;
 1477  005566  052777  000001  173420          BIS     #BIT0,  @TCR    ;SET XMTR CONTROL BIT, LINE 0
 1478  005574  017701  173410          LOP32:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
 1479  005600  100375                          BPL     LOP32
 1480  005602  012777  000377  173406          MOV     #377,   @TBUF   ;SEND A RUBOUT
 1481  005610  005000                          CLR     R0              ;CLEAR COUNTER
 1482  005612  105305                  1$:     DECB    R5              ;SHORT WAIT LOOP
 1483  005614  001376                          BNE     1$
 1484  005616  105777  173386                  TSTB    @CSR            ;WAIT FOR DONE
 1485  005622  100405                          BMI     2$              ;BRANCH WHEN DONE
 1486  005624  005200                          INC     R0              ;TIME COUNTER
 1487  005626  001371                          BNE     1$              ;BRANCH IF NOT TIME-OUT
 1488  005630  017701  173354                  MOV     @CSR,   R1      ;SAVE CSR
 1489  005634  104001                          HLT+1                   ;DONE NEVER CAME UP
 1490                                                                   ;R1 = CONTENTS OF CSR
 1491  005636  050037  001302          2$:     BIS     R0,     TIMER   ;SAVE TIMER
 1492  005642  017701  173344                  MOV     @RBUF,  R1      ;READ THE FIFO
 1493  005646  100401                          BMI     .+4             ;BRANCH IF CHARACTER READY
 1494  005650  104001                          HLT+1                   ;CHARACTER READY DIDN'T SET
 1495                                                                   ;R1 = CONTENTS OF RBUF
 1496  005652  032701  070000          3$:     BIT     #70000, R1      ;CHECK FOR ERROR BITS
 1497  005656  001401                          BEQ     .+4             ;BRANCH IF NONE
```

```
1498  005660  104031                          HLT+1                   ;ERROR IN RECEIVED CHAR
1499                                                                  ;R1 = CONTENTS OF RBUF
1500                                                                  ;BIT14=UART OVERRUN
1501                                                                  ;BIT13=FRAMING ERROR
1502                                                                  ;BIT12=PARITY ERROR
1503  005662  010102                  4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
1504  005664  042702  170377                BIC     #170377,R2      ;MASK LINE#
1505  005670  000302                          SWAB    R2              ;LINE # IN LOW BYTE
1506  005672  122702  000000                CMPB    #0,     R2      ;CHECK LINE #
1507  005676  001401                          BEQ     .+4             ;BRANCH IF OK
1508  005700  104001                          HLT+1                   ;WRONG LINE # RECEIVED
1509                                                                  ;R1 = CONTENTS OF RBUF
1510                                                                  ;BITS8-11 = LINE #
1511  005702  117702  173400          5$:     MOVB    @DJDLEN, R2     ;GET MASK OF CHARACTER
1512  005706  130201                          BITB    R2,     R1      ;CHECK CHAR LENGTH.
1513  005710  001401                          BEQ     .+4             ;BRANCH IF OK
1514  005712  104002                          HLT+2                   ;WRONG CHARACTER LENGTH
1515                                                                  ;R1=DATA FROM FIFO
1516                                                                  ;R2=MASK (BITS SET NOT EXPECTED)
1517  005714  105102                  6$:     COMB    R2              ;REVERSE THE MASK
1518  005716  120102                          CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
1519  005720  001401                          BEQ     .+4             ;BRANCH IF OK
1520  005722  104002                          HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
1521                                                                  ;R1=DATA FROM FIFO (COMPLETE WORD)
1522                                                                  ;R2=DATA (LOW BYTE) EXPECTED
1523  005724  017701  173262          7$:     MOV     @RBUF,  R1      ;READ FIFO
1524  005730  100001                          BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
1525  005732  104001                          HLT+1                   ;CHARACTER PRESENT STAYED SET
1526                                                                  ;R1 = CONTENTS OF RBUF
1527  005734  017701  173250          8$:     MOV     @CSR,   R1      ;SAVE THE CSR
1528  005740  022701  100405                  CMP     #100405,R1      ;CHECK THE CSR
1529  005744  001401                          BEQ     .+4             ;BRANCH IF OK
1530  005746  104001                          HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
1531                                                                  ;R1 = CONTENTS OF CSR
1532  005750  005077  173240                  CLR     @TCR            ;CLEAR TCR
1533  005754  005077  173230                  CLR     @CSR            ;CLEAR CSR
1534  005760  104400                          SCOPE
1535
1536                                  ;*****************************************************************
1537                                  ;TEST 33:       TEST THAT LINE 1 CAN TRANSMIT AND
1538                                  ;               RECEIVE A CHARACTER. (377)
1539                                  ;       1$:  CHECKS THAT DONE SETS IN REASONABLE TIME.
1540                                  ;       2$:  CHECKS THAT CHAR PRESENT IS IN FIFO
1541                                  ;       3$:  CHECKS THAT NO ERRORS IN FIFO
1542                                  ;       4$:  CHECKS THAT RIGHT LINE # (1) IN FIFO
1543                                  ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
1544                                  ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
1545                                  ;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
1546                                  ;       8$:  CHECKS THAT DONE CLEARS
1547                                  ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD D03 SERIES
1548                                  ;*****************************************************************
1549
1550                                  ;               INITIALIZE
1551                                  ;       DEVICE"CSR"REGISTER
1552                                  ;                               SET:
1553  005762  004737  015566  TST33:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
```

```
                                                                        ;BIT3 = CLEAR MOS
                                                                        ;BIT8 = MASTER XMTR SCAN ENB
                                        ;WAIT FOR MOS TO CLEAR
                                        ;                               SET:
                                        ;                               ;BIT0 = RECEIVER ENABLE
                                        ;
1560  005766  052777  000002  173320            BIS     #BIT1, @TCR     ;SET XMTR CONTROL BIT, LINE 1
1561  005774  017701  173210          LOP33:    MOV     @CSR, R1        ;WAIT FOR XMTR READY
1562  006000  100375                           BPL     LOP33
1563  006002  012777  000377  173206           MOV     #377, @TBUF     ;SEND A RUBOUT
1564  006010  005000                           CLR     R0              ;CLEAR COUNTER
1565  006012  105305                  1$:      DECB    R5              ;SHORT WAIT LOOP
1566  006014  001376                           BNE     1$
1567  006016  105777  173166                  TSTB    @CSR            ;WAIT FOR DONE
1568  006022  100405                           BMI     2$              ;BRANCH WHEN DONE
1569  006024  005200                           INC     R0              ;TIME COUNTER
1570  006026  001371                           BNE     1$              ;BRANCH IF NOT TIME-OUT
1571  006030  017701  173154                  MOV     @CSR, R1        ;SAVE CSR
1572  006034  104001                           HLT+1                   ;DONE NEVER CAME UP
1573                                                                    ;R1 = CONTENTS OF CSR
1574  006036  050037  001302          2$:      BIS     R0, TIMER       ;SAVE TIMER
1575  006042  017701  173144                  MOV     @RBUF, R1       ;READ THE FIFO
1576  006046  100401                           BMI     .+4             ;BRANCH IF CHARACTER READY
1577  006050  104001                           HLT+1                   ;CHARACTER READY DIDN'T SET
1578                                                                    ;R1 = CONTENTS OF RBUF
1579  006052  032701  070000          3$:      BIT     #70000, R1      ;CHECK FOR ERROR BITS
1580  006056  001401                           BEQ     .+4             ;BRANCH IF NONE
1581  006060  104001                           HLT+1                   ;ERROR IN RECEIVED CHAR
1582                                                                    ;R1 = CONTENTS OF RBUF
1583                                                                    ;BIT14=UART OVERRUN
1584                                                                    ;BIT13=FRAMING ERROR
1585                                                                    ;BIT12=PARITY ERROR
1586  006062  010102                  4$:      MOV     R1, R2          ;DUPLICATE DATA WORD
1587  006064  042702  170377                  BIC     #170377, R2     ;MASK LINE#
1588  006070  000302                           SWAB    R2              ;LINE # IN LOW BYTE
1589  006072  122702  000001                  CMPB    #1, R2          ;CHECK LINE #
1590  006076  001401                           BEQ     .+4             ;BRANCH IF OK
1591  006100  104001                           HLT+1                   ;WRONG LINE # RECEIVED
1592                                                                    ;R1 = CONTENTS OF RBUF
1593                                                                    ;BITS8-11 = LINE #
1594  006102  117702  173200          5$:      MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
1595  006106  130201                           BITB    R2, R1          ;CHECK CHAR LENGTH.
1596  006110  001401                           BEQ     .+4             ;BRANCH IF OK
1597  006112  104002                           HLT+2                   ;WRONG CHARACTER LENGTH
1598                                                                    ;R1=DATA FROM FIFO
1599                                                                    ;R2=MASK (BITS SET NOT EXPECTED)
1600  006114  105102                  6$:      COMB    R2              ;REVERSE THE MASK
1601  006116  120102                           CMPB    R1, R2          ;CHECK THE ACTURAL DATA
1602  006120  001401                           BEQ     .+4             ;BRANCH IF OK
1603  006122  104002                           HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
1604                                                                    ;R1=DATA FROM FIFO (COMPLETE WORD)
1605                                                                    ;R2=DATA (LOW BYTE) EXPECTED
1606  006124  017701  173062          7$:      MOV     @RBUF, R1       ;READ FIFO
1607  006130  100001                           BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
1608  006132  104001                           HLT+1                   ;CHARACTER PRESENT STAYED SET
1609                                                                    ;R1 = CONTENTS OF RBUF
```

```
1610  006134  017701  173050          B$:     MOV     @CSR,   R1      ;SAVE THE CSR
1611  006140  022701  100405                  CMP     #100405,R1      ;CHECK THE CSR
1612  006144  001401                          BEQ     .+4             ;BRANCH IF OK
1613  006146  104001                          HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
1614                                                                   ;R1 = CONTENTS OF CSR
1615  006150  005077  173040                  CLR     @TCR            ;CLEAR TCR
1616  006154  005077  173030                  CLR     @CSR            ;CLEAR CSR
1617  006160  104400                          SCOPE
1618
1619                                ;**********************************************************************
1620                                ;TEST 34:       TEST THAT LINE 2 CAN TRANSMIT AND
1621                                ;               RECEIVE A CHARACTER. (377)
1622                                ;       1$:  CHECKS THAT DONE SETS IN REASONABLE TIME.
1623                                ;       2$:  CHECKS THAT CHAR PRESENT IS IN FIFO
1624                                ;       3$:  CHECKS THAT NO ERRORS IN FIFO
1625                                ;       4$:  CHECKS THAT RIGHT LINE # (2) IN FIFO
1626                                ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
1627                                ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
1628                                ;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
1629                                ;       8$:  CHECKS THAT DONE CLEARS
1630                                ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; CART CARD DC3 SERIES
1631                                ;**********************************************************************
1632
1633                                ;               INITIALIZE
1634                                ;       DEVICE"CSR"REGISTER
1635                                ;                                       SET:
1636  006162  004737  015566          TST34:  JSR     PC,     @#INITD :BIT3 = MAINTENANCE
1637                                                                   :BIT3 = CLEAR MOS
1638                                                                   :BIT8 = MASTER XMTR SCAN ENB
1639                                ;WAIT FOR MOS TO CLEAR
1640                                ;                                      SET:
1641                                ;                                      :BIT0 = RECEIVER ENABLE
1642                                ;
1643  006166  052777  000004  173020          BIS     #BIT2,  @TCR    ;SET XMTR CONTROL BIT, LINE 2
1644  006174  017701  173010          LOP34:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
1645  006200  100375                          BPL     LOP34
1646  006202  012777  000377  173006          MOV     #377,   @TBUF   ;SEND A RUBOUT
1647  006210  005000                          CLR     R0              ;CLEAR COUNTER
1648  006212  105305                  1$:     DECB    R5              ;SHORT WAIT LOOP
1649  006214  001376                          BNE     1$
1650  006216  105777  172766                  TSTB    @CSR            ;WAIT FOR DONE
1651  006222  100405                          BMI     2$              ;BRANCH WHEN DONE
1652  006224  005200                          INC     R0              ;TIME COUNTER
1653  006226  001371                          BNE     1$              ;BRANCH IF NOT TIME-OUT
1654  006230  017701  172754                  MOV     @CSR,   R1      ;SAVE CSR
1655  006234  104001                          HLT+1                   ;DONE NEVER CAME UP
1656                                                                   ;R1 = CONTENTS OF CSR
1657  006236  050037  001302          2$:     BIS     R0,     TIMER   ;SAVE TIMER
1658  006242  017701  172744                  MOV     @RBUF,  R1      ;READ THE FIFO
1659  006246  100401                          BMI     .+4             ;BRANCH IF CHARACTER READY
1660  006250  104001                          HLT+1                   ;CHARACTER READY DIDN'T SET
1661                                                                   ;R1 = CONTENTS OF RBUF
1662  006252  032701  070000          3$:     BIT     #70000, R1      ;CHECK FOR ERROR BITS
1663  006256  001401                          BEQ     .+4             ;BRANCH IF NONE
1664  006260  104001                          HLT+1                   ;ERROR IN RECEIVED CHAR
1665                                                                   ;R1 = CONTENTS OF RBUF
```

```
                                                                ;BIT14=UART OVERRUN
                                                                ;BIT13=FRAMING ERROR
                                                                ;BIT12=PARITY ERROR
006262  010102                  4$:    MOV     R1,     R2      ;DUPLICATE DATA WORD
006264  042702  177377                 BIC     #177377,R2      ;MASK LINE#
006270  000302                         SWAB    R2              ;LINE # IN LOW BYTE
006272  122702  000002                 CMPB    #2,     R2      ;CHECK LINE #
006276  001401                         BEQ     .+4             ;BRANCH IF OK
006300  104001                         HLT+1                   ;WRONG LINE # RECEIVED
                                                                ;R1 = CONTENTS OF RBUF
                                                                ;BITS8-11 = LINE #
006302  117702  173000          5$:    MOVB    @DDLEN, R2      ;GET MASK OF CHARACTER
006306  130201                         BITB    R2,     R1      ;CHECK CHAR LENGTH.
006310  001401                         BEQ     .+4             ;BRANCH IF OK
006312  104002                         HLT+2                   ;WRONG CHARACTER LENGTH
                                                                ;R1=DATA FROM FIFO
                                                                ;R2=MASK (BITS SET NOT EXPECTED)
006314  105102                  6$:    COMB    R2              ;REVERSE THE MASK
006316  120102                         CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
006320  001401                         BEQ     .+4             ;BRANCH IF OK
006322  104002                         HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
                                                                ;R1=DATA FROM FIFO (COMPLETE WORD)
                                                                ;R2=DATA (LOW BYTE) EXPECTED
006324  017701  172668          7$:    MOV     @RBUF,  R1      ;READ FIFO
006330  100001                         BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
006332  104001                         HLT+1                   ;CHARACTER PRESENT STAYED SET
                                                                ;R1 = CONTENTS OF RBUF
006334  017701  172650          8$:    MOV     @CSR,   R1      ;SAVE THE CSR
006340  022701  100405                 CMP     #100405,R1      ;CHECK THE CSR
006344  001401                         BEQ     .+4             ;BRANCH IF OK
006346  104001                         HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
                                                                ;R1 = CONTENTS OF CSR
006350  005077  172640                 CLR     @TCR            ;CLEAR TCR
006354  005077  172630                 CLR     @CSR            ;CLEAR CSR
006360  104400                         SCOPE

                                ;*****************************************************************
                                ;TEST 35:       TEST THAT LINE 3 CAN TRANSMIT AND
                                ;               RECEIVE A CHARACTER. (377)
                                ;       1$:  CHECKS THAT DONE SETS IN REASONABLE TIME.
                                ;       2$:  CHECKS THAT CHAR PRESENT IS IN FIFO
                                ;       3$:  CHECKS THAT NO ERRORS IN FIFO
                                ;       4$:  CHECKS THAT RIGHT LINE # (3) IN FIFO
                                ;       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:
006362  004737  015566          ST35:  JSR     PC,     @#INITD  ;BIT2 = MAINTENANCE
                                                                ;BIT3 = CLEAR MOS
                                                                ;BIT8 = MASTER XMTR SCAN ENB
```

```
                                        ;WAIT FOR MOS TO CLEAR
                                        ;                                       SET:
                                        ;                                       ;BIT0 = RECEIVER ENABLE
                                        ;
006366  052777  000010  172620          BIS     #BIT3,  @TCR    ;SET XMTR CONTROL BIT, LINE 3
006374  017701  172610          LOP35:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
006400  100375                  BPL     LOP35
006402  012777  000377  172606          MOV     #377,   @TBUF   ;SEND A RUBOUT
006410  005000                  CLR     R0              ;CLEAR COUNTER
006412  105305                  1$:     DECB    R5              ;SHORT WAIT LOOP
006414  001376                  BNE     1$
006416  105777  172566          TSTB    @CSR            ;WAIT FOR DONE
006422  100405                  BMI     2$              ;BRANCH WHEN DONE
006424  005200                  INC     R0              ;TIME COUNTER
006426  001371                  BNE     1$              ;BRANCH IF NOT TIME-OUT
006430  017701  172554          MOV     @CSR,   R1      ;SAVE CSR
006434  104001                  HLT+1                   ;DONE NEVER CAME UP
                                                        ;R1 = CONTENTS OF CSR
006436  050037  001302          2$:     BIS     R0,     TIMER   ;SAVE TIMER
006442  017701  172544          MOV     @RBUF,  R1      ;READ THE FIFO
006446  100401                  BMI     .+4             ;BRANCH IF CHARACTER READY
006450  104001                  HLT+1                   ;CHARACTER READY DIDN'T SET
                                                        ;R1 = CONTENTS OF RBUF
006452  032701  070000          3$:     BIT     #70000, R1      ;CHECK FOR ERROR BITS
006456  001401                  BEQ     .+4             ;BRANCH IF NONE
006460  104001                  HLT+1                   ;ERROR IN RECEIVED CHAR
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BIT14=UART OVERRUN
                                                        ;BIT13=FRAMING ERROR
                                                        ;BIT12=PARITY ERROR
006462  010102                  4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
006464  042702  170377          BIC     #170377,R2      ;MASK LINE#
006470  000302                  SWAB    R2              ;LINE # IN LOW BYTE
006472  122702  000003          CMPB    #3.,    R2      ;CHECK LINE #
006476  001401                  BEQ     .+4             ;BRANCH IF OK
006500  104001                  HLT+1                   ;WRONG LINE # RECEIVED
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BITS8-11 => LINE #
006502  117702  172500          5$:     MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
006506  130201                  BITB    R2,     R1      ;CHECK CHAR LENGTH.
006510  001401                  BEQ     .+4             ;BRANCH IF OK
006512  104002                  HLT+2                   ;WRONG CHARACTER LENGTH
                                                        ;R1=DATA FROM FIFO
                                                        ;R2=MASK (BITS SET NOT EXPECTED)
006514  105102                  6$:     COMB    R2              ;REVERSE THE MASK
006516  120102                  CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
006520  001401                  BEQ     .+4             ;BRANCH IF OK
006522  104002                  HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
                                                        ;R1=DATA FROM FIFO (COMPLETE WORD)
                                                        ;R2=DATA (LOW BYTE) EXPECTED
006524  017701  172462          7$:     MOV     @RBUF,  R1      ;READ FIFO
006530  100001                  BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
006532  104001                  HLT+1                   ;CHARACTER PRESENT STAYED SET
                                                        ;R1 = CONTENTS OF RBUF
006534  017701  172450          8$:     MOV     @CSR,   R1      ;SAVE THE CSR
006540  022701  100405          CMP     #100405,R1      ;CHECK THE CSR
```

```
        006644  [illegible]                           BEQ     .+4                 ;BRANCH IF OK
        006646  [illegible]                           HLT+1                       ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
                                                                                  ;R1 = CONTENTS OF CSR
        [illegible] [illegible] [illegible]           CLR     STCR                ;CLEAR TCR
        [illegible] [illegible] [illegible]           CLR     @CSR                ;CLEAR CSR
        [illegible] [illegible]                       [illegible]PE
        [illegible] [illegible] [illegible]           [illegible]  [illegible]LEN
        [illegible] [illegible] [illegible] [illegible]  [illegible]  #.+6,  [illegible]AC

                                  ;*************************************************************************
                                  ;TEST 36:       TEST THAT LINE 4 CAN TRANSMIT AND
                                  ;               RECEIVE A CHARACTER. (377)
                                  ;       1$:  CHECKS THAT DONE SETS IN REASONABLE TIME.
                                  ;       2$:  CHECKS THAT CHAR PRESENT IS IN FIFO
                                  ;       3$:  CHECKS THAT NO ERRORS IN FIFO
                                  ;       4$:  CHECKS THAT RIGHT LINE # (4) IN FIFO
                                  ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
                                  ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
                                  ;       8$:  CHECKS THAT CHARACTER PRESENT CLEARS
                                  ;       9$:  CHECKS THAT DONE CLEARS
                                  ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD DC3 SERIES
                                  ;*************************************************************************

                                  ;               INITIALIZE
                                  ;       DEVICE CSR REGISTER
                                  ;                                                 SET:
        006674  004737  015566    TST36:  JSR     PC,     @#INITD  ;BIT12 = MAINTENANCE
                                                                   ;BIT4 = CLEAR MOS
                                                                   ;BIT5 = MASTER XMTR SCAN ENB
                                  ;WAIT FOR MOS TO CLEAR
                                  ;                                                 SET:
                                  ;                                                 ;BIT0 = RECEIVER ENABLE
                                  ;
        006[illegible]  052737  000020  172406          BIS     #BIT4,  STCR     ;SET XMTR CONTROL BIT, LINE 4
        [illegible] [illegible] 172376    LOP36:  [illegible]  [illegible]SR,  R1  ;WAIT FOR XMTR READY
        [illegible] [illegible]                   BPL     [illegible]
        [illegible] [illegible] 000377  172374          MOV     #377,   STBUF    ;SEND A RUBOUT
        [illegible] [illegible]                         [illegible]  R5          ;CLEAR COUNTER
        [illegible] [illegible]           1$:           DECB    R5               ;SHORT WAIT LOOP
        [illegible] [illegible]                         BNE     .-2
        [illegible] [illegible] 172354                  TSTB    @CSR             ;WAIT FOR DONE
        [illegible] [illegible]                         BMI     2$               ;BRANCH WHEN DONE
        [illegible] [illegible]                         [illegible]  R[illegible]  ;TIME COUNTER
        [illegible] [illegible]                         BNE     1$               ;BRANCH IF NOT TIME-OUT
        [illegible] [illegible] 172342                  MOV     @CSR,   R1       ;SAVE CSR
        [illegible] [illegible]                         HLT+1                    ;DONE NEVER CAME UP
                                                                                 ;R1 = CONTENTS OF CSR
        [illegible] [illegible] [illegible]  2$:        [illegible]  R[illegible],  TIMER  ;SAVE TIMER
        [illegible] [illegible] [illegible]             MOV     @RBUF,  R1       ;READ THE FIFO
        [illegible] [illegible]                         BMI     .+4              ;BRANCH IF CHARACTER READY
        [illegible] [illegible]                         HLT+1                    ;CHARACTER READY DIDN'T SET
                                                                                 ;R1 = CONTENTS OF RBUF
        [illegible] [illegible] 070000    3$:           BIT     #70000, R1       ;CHECK FOR ERROR BITS
        [illegible] [illegible]                         BEQ     .+4              ;BRANCH IF NONE
        [illegible] [illegible]                         HLT+1                    ;ERROR IN RECEIVED CHAR
                                                                                 ;R1 = CONTENTS OF RBUF
```

```
                                ;BIT14=UART OVERRUN
                                ;BIT13=FRAMING ERROR
                                ;BIT12=PARITY ERROR
                                ;DUPLICATE DATA WORD
                                ;MASK LINE#
                                ;LINE # IN LOW BYTE
                                ;CHECK LINE #
                                ;BRANCH IF OK
                                ;WRONG LINE # RECEIVED
                                ;R1 = CONTENTS OF RBUF
                                ;BITS8-11 = LINE #
                                ;GET MASK OF CHARACTER
                                ;CHECK CHAR LENGTH.
                                ;BRANCH IF OK
                                ;WRONG CHARACTER LENGTH
                                ;R1=DATA FROM FIFO
                                ;R2=MASK (BITS SET NOT EXPECTED
                                ;REVERSE THE MASK
                                ;CHECK THE ACTURAL DATA
                                ;BRANCH IF OK
                                ;WRONG CHAR LEN OR DATA ERROR
                                ;R1=DATA FROM FIFO (COMPLETE WORD.
                                ;R2=DATA (LOW BYTE) EXPECTED
                                ;READ FIFO
                                ;BRANCH IF CHAR PRESENT NOT SET
                                ;CHARACTER PRESENT (SHOULD BE SET
                                ;R1 = CONTENTS OF RBUF
                                ;SAVE THE USR
                                ;CHECK THE USR
                                ;BRANCH IF OK
                                ;DONE DIDN'T CLEAR OR OTHER USR ERROR
                                ;R1 = CONTENTS OF USR
                                ;CLEAR RBUF
                                ;CLEAR USR
```

```
;*****************************************************************
;TEST 07:       TEST THAT LINE 5 CAN TRANSMIT AND
;               RECEIVE A CHARACTER.
;       ;CHECK THAT DONE SETS IN RESPONSE TO TRE.
;       ;CHECK THAT CHAR PRESENT IS SET
;       ;CHECK NO ERRORS IN USR
;       ;CHECK THAT RIGHT LINE # IS IN RBUF
;       ;CHECK FOR RIGHT CHARACTER RECEIVED
;       ;CHECK THAT CORRECT DATA WAS RECEIVED
;       ;CHECK THAT PARITY PRESENT CLEARED
;       ;CHECK THAT DONE CLEARS
;SECTION PASS COUNTS: 000005 000000  ALL TESTS ALL USRT UART DDCMP SERIES
;*****************************************************************

                ;INITIALIZE
        CE.ICE=CSR+REGISTER
                                SET:
000000  004737  015566  001000  $T07:  JSR     PC,     @#INITC ;0=MAINTENANCE
                                        ;1=ODD PAR
                                        ;2=EVEN PAR
                                        ;3=NO PAR
                                        ;4=8 BIT CHAR
                                        ;5=7 BIT CHAR
                                        ;6=6 BIT CHAR
                                        ;7=5 BIT CHAR
```

TEST ALL OF LINE 5 TRANSMIT AND RECEIVE LOGIC

```
                                        ;WAIT FOR XMB TO CLEAR
                                        ;
                                        ;
                                        ;
                                                        SET:
                                                        ;BIT0 = RECEIVER ENABLE

000040  172526            LOP3T:  BIS     #BIT5,  @TCR    ;SET XMTR CONTROL BIT, LINE 5
172176                  1$:     MOV     @TCSR,  R1      ;WAIT FOR XMTR READY
                                BPL     LOP3
000377  172174                  MOV     #377,   @TBUF   ;SEND A RUBOUT
                                CLR     R0              ;CLEAR COUNTER
                        13:     SOB     R0      1$      ;SHORT WAIT LOOP

172154                          TSTB    @RCSR           ;WAIT FOR DONE
                                BPL     .+6             ;BRANCH WHEN DONE
                                INC     R0              ;TIME COUNTER
                                BNE     1$              ;BRANCH IF NOT TIME-OUT

172142                          MOV     @RCSR,  R1      ;SAVE CSR
104031                          HLT+1                   ;DONE NEVER CAME UP
                                                        ;R1 = CONTENTS OF CSR

000200  052037          2$:     BIS     #TIMER, R0      ;SAVE TIMER
172136                  1$:     MOVB    @RBUF,  R1      ;READ THE FIFO
100401                          BMI     .+4             ;BRANCH IF CHARACTER READY
104001                          HLT+1                   ;CHARACTER READY DIDN'T SET
                                                        ;R1 = CONTENTS OF RBUF

070000          3$:             BIT     #70000, R1      ;CHECK FOR ERROR BITS
001402                          BEQ     .+4             ;BRANCH IF NONE
104003                          HLT+1                   ;ERROR IN RECEIVED CHAR
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BIT14=UART OVERRUN
                                                        ;BIT13=FRAMING ERROR
                                                        ;BIT12=PARITY ERROR

010102          4$:             MOV     R1,     R2      ;DUPLICATE DATA WORD
170377                          BIC     #^C377, R2      ;MASK LINE#
                                SWAB    R2              ;LINE # IN LOW BYTE
000005                          CMP     #5.,    R2      ;CHECK LINE #
001402                          BEQ     .+4             ;BRANCH IF OK
104003                          HLT+3                   ;WRONG LINE # RECEIVED
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BITS8-11 = LINE #

172166          5$:             MOVB    @DULEN, R2      ;GET MASK OF CHARACTER
                                CMPB    R2,     R1      ;CHECK CHAR LENGTH.
                                BEQ     .+4             ;BRANCH IF OK
                                HLT+2                   ;WRONG CHARACTER LENGTH
                                                        ;R1=DATA FROM FIFO
                                                        ;R2=MASK (BITS SET NOT EXPECTED)

                        6$:     COM     R2              ;REVERSE THE MASK
                                BIC     R1,     R2      ;CHECK THE ACTURAL DATA
                                BEQ     .+4             ;BRANCH IF OK
                                HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
                                                        ;R1=DATA FROM FIFO (COMPLETE WORD)
                                                        ;R2=DATA (LOW BYTE) EXPECTED

172050          7$:             MOV     @RBUF,  R1      ;READ FIFO
                                BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
                                HLT+1                   ;CHARACTER PRESENT STAYED SET
                                                        ;R1 = CONTENTS OF RBUF

172036          8$:             MOV     @CSR,   R1      ;SAVE THE CSR
100405                          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 40:       TEST THAT LINE 6 CAN TRANSMIT AND
;               RECEIVE A CHARACTER. (377)
;       1$:  CHECKS THAT DONE SETS IN REASONABLE TIME.
;       2$:  CHECKS THAT CHAR PRESENT IS IN FI/FO
;       3$:  CHECKS THAT NO ERRORS IN FI/FO
;       4$:  CHECKS THAT RIGHT LINE # (6) 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 CHIP DD3 SERIES
;*****************************************************************************

;               INITIALIZE
;       DEVICE"CSR"REGISTER
                                                SET:
TST40:  JSR     PC,     S#INITD ;BIT2 = MAINTENANCE
                                ;BIT3 = CLEAR MOS
                                ;BIT8 = MASTER XMTR SCAN ENB
;WAIT FOR MOS TO CLEAR
;
;
;                               SET:
                                ;BIT0 = RECEIVER ENABLE

        BIS     #BIT6,  @TCR    ;SET XMTR CONTROL BIT, LINE 6
LOP40:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
        BPL     LOP40
        MOV     #377,   @TBUF   ;SEND A RUBOUT
        CLR     R0              ;CLEAR COUNTER
1$:     DECB    R5              ;SHORT WAIT LOOP
        BNE     1$
        TSTB    @CSR            ;WAIT FOR DONE
        BMI     2$              ;BRANCH WHEN DONE
        INC     R0              ;TIME COUNTER
        BNE     1$              ;BRANCH IF NOT TIME-OUT
        MOV     @CSR,   R1      ;SAVE CSR
        HLT+1                   ;DONE NEVER CAME UP
                                ;R1 = CONTENTS OF CSR
2$:     BIS     R0,     TIMER   ;SAVE TIMER
        MOV     @RBUF,  R1      ;READ THE FIFO
        BMI     .+4             ;BRANCH IF CHARACTER READY
        HLT+1                   ;CHARACTER READY DIDN'T SET
                                ;R1 = CONTENTS OF RBUF
3$:     BIT     #70000, R1      ;CHECK FOR ERROR BITS
        BEQ     .+4             ;BRANCH IF NONE
        HLT+1                   ;ERROR IN RECEIVED CHAR
                                ;R1 = CONTENTS OF RBUF
                                ;BIT14=UART OVERRUN
                                ;BIT13=FRAMING ERROR
```

```
                                                        ;BIT12=PARITY ERROR
                                                        ;DUPLICATE DATA WORD
007332  013102          4$:     MOV     R1,     R2      ;MASK LINE#
007334  042702  170377          BIC     #170377,R2      ;LINE # IN LOW BYTE
007340  000302          SWAB    R2                      ;CHECK LINE #
007342  122702  000006          CMPB    #6.,    R2      ;BRANCH IF OK
007346  001401                  BEQ     .+4             ;WRONG LINE # RECEIVED
007350  104001                  HLT+1                   ;R1 = CONTENTS OF RBUF
                                                        ;BITS8-11 = LINE #
007352  117702  171756          5$:     MOVB    @DILEN, R2      ;GET MASK OF CHARACTER
007356  130201                  BITB    R2,     R1      ;CHECK CHAR LENGTH.
007360  001401                  BEQ     .+4             ;BRANCH IF OK
007362  104002                  HLT+2                   ;WRONG CHARACTER LENGTH
                                                        ;R1=DATA FROM FI/FO
                                                        ;R2=MASK (BITS SET NOT EXPECTED
007364  105102          6$:     COMB    R2              ;REVERSE THE MASK
007366  130102                  CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
007370  001401                  BEQ     .+4             ;BRANCH IF OK
007372  104003                  HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
                                                        ;R1=DATA FROM FI/FO (COMPLETE WORD)
                                                        ;R2=DATA (LOW BYTE) EXPECTED
007374  017701  171650          7$:     MOV     @RBUF,  R1      ;READ FI/FO
007400  100001                  BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
007402  104001                  HLT+1                   ;CHARACTER PRESENT STAYED SET
                                                        ;R1 = CONTENTS OF RBUF
007404  017701  171636          8$:     MOV     @CSR,   R1      ;SAVE THE CSR
007410  022701  100405          CMP     #100405,R1      ;CHECK THE CSR
007414  001401                  BEQ     .+4             ;BRANCH IF OK
007416  104001                  HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
                                                        ;R1 = CONTENTS OF CSR
007420  005077  171636          CLR     @TCR            ;CLEAR TCR
007424  005077  171616          CLR     @CSR            ;CLEAR CSR
007430  104400                  SCOPE

                        ;*****************************************************************
                        ;TEST 41:       TEST THAT LINE 7 CAN TRANSMIT AND
                        ;               RECEIVE A CHARACTER. (377)
                        ;
                        ;       1$:  CHECKS THAT DONE SETS IN REASONABLE TIME.
                        ;       2$:  CHECKS THAT CHAR PRESENT IS IN FI-FO
                        ;       3$:  CHECKS THAT NO ERRORS IN FI-FO
                        ;       4$:  CHECKS THAT RIGHT LINE # (7) 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:
007432  004737  015566  TST41:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
                                                        ;BIT3 = CLEAR MOS
                                                        ;BIT8 = MASTER XMTR SCAN ENB
                        ;WAIT FOR MOS TO CLEAR
                        ;                               SET:
```

```
                                                        ;
                                                        ;
                                                        ;BIT0 = RECEIVER ENABLE
                                                        ;
000000  000440  052737  000200  171536  LOP41:  BIS     #BIT7,  @TCR    ;SET XMTR CONTROL BIT, LINE 7
000004  000444  013701  171536          1$:     MOV     @TCSR,  R1      ;WAIT FOR XMTR READY
000010  000450  100375                  1$      BPL     1$
000012  000452  012737  000377  171534          MOV     #377,   @TBUF   ;SEND A RUBOUT
000020  000460  005000                  2$:     CLR     R0              ;CLEAR COUNTER
000022  000462  005300                  3$:     DECB    R0              ;SHORT WAIT LOOP
000024  000464  001375                          BNE     3$
000026  000466  105737  171554          4$:     TSTB    @TCSR           ;WAIT FOR DONE
000032  000472  100005                          BPL     5$              ;BRANCH WHEN DONE
000034  000474  005200                          INC     R0              ;TIME COUNTER
000036  000476  001372                          BNE     4$              ;BRANCH IF NOT TIME-OUT
000040  000500  013701  171542          5$:     MOV     @TCSR,  R1      ;SAVE CSR
000044  000504  104001                          HLT+1                   ;DONE NEVER CAME UP
                                                        ;R1 = CONTENTS OF CSR
000046  000506  050037  001300          8$:     BIS     R0,     TIMER   ;SAVE TIMER
000052  000512  013701  171536          9$:     MOV     @RBUF,  R1      ;READ THE FIFO
000056  000516  100401                          BPL     .+4             ;BRANCH IF CHARACTER READY
000060  000520  104001                          HLT+1                   ;CHARACTER READY DIDN'T SET
                                                        ;R1 = CONTENTS OF RBUF
000062  000522  032737  070000  001300  10$:     BIT     #70000, R1      ;CHECK FOR ERROR BITS
000070  000530  001401                          BEQ     .+4             ;BRANCH IF NONE
000072  000532  104001                          HLT+1                   ;ERROR IN RECEIVED CHAR
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BIT14=UART OVERRUN
                                                        ;BIT13=FRAMING ERROR
                                                        ;BIT12=PARITY ERROR
000074  000534  010102  000000  11$:     MOV     R1,     R2              ;DUPLICATE DATA WORD
000100  000536  042702  177377          12$:    BIC     #^C377, R2      ;MASK LINE#
000104  000542  122702  000000          13$:    CMPB    R2,     #0      ;LINE # IN LOW BYTE
000110  000546  001401                          BEQ     .+4             ;CHECK LINE #
000112  000550  104001                          HLT+1                   ;BRANCH IF OK
                                                        ;WRONG LINE # RECEIVED
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BITS8-11 = LINE #
000114  000552  116702  171566  000000  14$:     MOVB    @RCVLEN, R2     ;GET MASK OF CHARACTER
000122  000560  032702  000400          15$:    BIT     #400,   R2      ;CHECK CHAR LENGTH.
000126  000564  001401                          BEQ     .+4             ;BRANCH IF OK
000130  000566  104002                          HLT+2                   ;WRONG CHARACTER LENGTH
                                                        ;R1=DATA FROM FIFO
                                                        ;R2=MASK (BITS SET NOT EXPECTED
000132  000570  005102                  16$:    COM     R2              ;REVERSE THE MASK
000134  000572  030102                  17$:    BIT     R1,     R2      ;CHECK THE ACTURAL DATA
000136  000574  001401                          BEQ     .+4             ;BRANCH IF OK
000140  000576  104002                          HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
                                                        ;R1=DATA FROM FIFO (COMPLETE WORD
                                                        ;R2=DATA (LOW BYTE) EXPECTED
000142  000600  013701  171550          18$:    MOV     @RBUF,  R1      ;READ FIFO
000146  000604  100001                          BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
000150  000606  104001                          HLT+1                   ;CHARACTER PRESENT STAYED SET
                                                        ;R1 = CONTENTS OF RBUF
000152  000610  013701  171542          19$:    MOV     @TCSR,  R1      ;SAVE THE CSR
000156  000614  020127  100405          20$:    CMP     R1,     #100405 ;CHECK THE CSR
000162  000620  001401                          BEQ     .+4             ;BRANCH IF OK
000164  000622  104001                          HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
```

```
                                                        ;R1 = CONTENTS OF CSR
                        CLR     @TCR                    ;CLEAR TCR
                        CLR     @CSR                    ;CLEAR CSR
                        SCOPE
                        INC     DJLEN
                        MOV     #.+6,   LAD

                ;************************************************************************
                ;TEST 42:        TEST THAT LINE 8 CAN TRANSMIT AND
                ;                RECEIVE A CHARACTER. (377)
                ;       1$:  CHECKS THAT DONE SETS IN REASONABLE TIME.
                ;       2$:  CHECKS THAT CHAR PRESENT IS IN FI/FO
                ;       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 D3 SERIES
                ;************************************************************************

                ;               INITIALIZE
                ;       DEVICE"CSR"REGISTER
                                                        SET:
007606  004737  016666  ST42:   JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
                                                        ;BIT3 = CLEAR MOS
                                                        ;BIT8 = MASTER XMTR SCAN ENB

                ;WAIT FOR MOS TO CLEAR
                ;
                ;
                ;
                                                        SET:
                                                        ;BIT0 = RECEIVER ENABLE

007612  052777  000400  171374          BIS     #BIT8,  @TCR    ;SET XMTR CONTROL BIT, LINE 8
007620  017701  171364  LOP42:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
007624  100375                  BPL     LOP42
007626  012777  000377  171362          MOV     #377,   @TBUF   ;SEND A RUBOUT
007634  005000                  CLR     R0              ;CLEAR COUNTER
007636  105305          1$:     DECB    R5              ;SHORT WAIT LOOP
007640  001376                  BNE     1$
007642  105777  171342          TSTB    @CSR            ;WAIT FOR DONE
007646  100405                  BMI     2$              ;BRANCH WHEN DONE
007650  005200                  INC     R0              ;TIME COUNTER
007652  001371                  BNE     1$              ;BRANCH IF NOT TIME-OUT
007654  017701  171330          MOV     @CSR,   R1      ;SAVE CSR
007660  104001                  HLT+1                   ;DONE NEVER CAME UP
                                                        ;R1 = CONTENTS OF CSR
007662  050037  001302  2$:     BIS     R0,     TIMER   ;SAVE TIMER
007666  017701  171320          MOV     @RBUF,  R1      ;READ THE FI/FO
007672  100401                  BMI     .+4             ;BRANCH IF CHARACTER READY
007674  104001                  HLT+1                   ;CHARACTER READY DIDN'T SET
                                                        ;R1 = CONTENTS OF RBUF
007676  032701  070000  3$:     BIT     #70000, R1      ;CHECK FOR ERROR BITS
007702  001401                  BEQ     .+4             ;BRANCH IF NONE
007704  104001                  HLT+1                   ;ERROR IN RECEIVED CHAR
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BIT14=UART OVERRUN
                                                        ;BIT13=FRAMING ERROR
```

```
2170
                                                                ;BIT12=PARITY ERROR
007706  010102                    4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
007710  042702  170377                    BIC     #^C377,R2       ;MASK LINE#
007714  000302                            SWAB    R2              ;LINE # IN LOW BYTE
007716  122702  000010                    CMPB    #8.,    R2      ;CHECK LINE #
007722  001401                            BEQ     .+4             ;BRANCH IF OK
007724  104001                            HLT+1                   ;WRONG LINE # RECEIVED
                                                                ;R1 = CONTENTS OF RBUF
                                                                ;BITS8-11 = LINE #
007726  117702  171354            5$:     MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
007732  130201                            BITB    R2,     R1      ;CHECK CHAR LENGTH.
007734  001401                            BEQ     .+4             ;BRANCH IF OK
007736  104002                            HLT+2                   ;WRONG CHARACTER LENGTH
                                                                ;R1=DATA FROM FIFO
                                                                ;R2=MASK (BITS SET NOT EXPECTED
007740  105102                    6$:     COMB    R2
007742  120102                            CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
007744  001401                            BEQ     .+4             ;BRANCH IF OK
007746  104002                            HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
                                                                ;R1=DATA FROM FIFO (COMPLETE WORD
                                                                ;R2=DATA (LOW BYTE) EXPECTED
007750  017701  171235            7$:     MOV     @RBUF,  R1      ;READ FIFO
007754  100001                            BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
007756  104001                            HLT+1                   ;CHARACTER PRESENT STAYED SE
                                                                ;R1 = CONTENTS OF RBUF
007760  017701  171224            8$:     MOV     @CSR,   R1      ;SAVE THE CSR
007764  022701  100405                    CMP     #100405,R1      ;CHECK THE CSR
007770  001401                            BEQ     .+4             ;BRANCH IF OK
007772  104001                            HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
                                                                ;R1 = CONTENTS OF CSR
007774  005077  171214                    CLR     @TCR            ;CLEAR TCR
010000  005077  171204                    CLR     @CSR            ;CLEAR CSR
010004  104400                            SCOPE

                                ;*****************************************************************
                                ;TEST 43:       TEST THAT LINE 9 CAN TRANSMIT AND
                                ;               RECEIVE A CHARACTER. (377)
                                ;
                                ;       1$:  CHECKS THAT DONE SETS IN REASONABLE TIME.
                                ;       2$:  CHECKS THAT CHAR PRESENT IS IN FIFO
                                ;       3$:  CHECKS THAT NO ERRORS IN FIFO
                                ;       4$:  CHECKS THAT RIGHT LINE # (9) IN FIFO
                                ;       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 DD3 SERIES
                                ;*****************************************************************

                                ;               INITIALIZE
                                ;       DEVICE"CSR"REGISTER
                                ;                                       SET:
010006  004737  015566          TST43:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
                                                                ;BIT3 = CLEAR MOS
                                                                ;BIT8 = MASTER XMTR SCAN ENB
                                ;WAIT FOR MOS TO CLEAR
                                ;                               SET:
```

```
                                                        ;
                                                        ;
010012  052777  001000  171174          BIS     #BIT9,  @TCR    ;SET XMTR CONTROL BIT, LINE 9
010020  017701  171164          LOP43:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
010024  100375                  BPL     LOP43
010026  012777  000377  171162          MOV     #377.,  @TBUF   ;SEND A RUBOUT
010034  005000                  CLR     R0              ;CLEAR COUNTER
010036  105305                  1$:     DECB    R5              ;SHORT WAIT LOOP
010040  001376                  BNE     1$
010042  105777  171142                  TSTB    @CSR            ;WAIT FOR DONE
010046  100405                  BMI     2$              ;BRANCH WHEN DONE
010050  005200                  INC     R0              ;TIME COUNTER
010052  001371                  BNE     1$              ;BRANCH IF NOT TIME-OUT
010054  017701  171130          MOV     @CSR,   R1      ;SAVE CSR
010060  104001                  HLT+1                   ;DONE NEVER CAME UP
                                                        ;R1 = CONTENTS OF CSR
010062  050037  001302          2$:     BIS     R0,     TIMER   ;SAVE TIMER
010066  017701  171120          MOV     @RBUF,  R1      ;READ THE FI/FO
010072  100401                  BMI     .+4             ;BRANCH IF CHARACTER READY
010074  104001                  HLT+1                   ;CHARACTER READY DIDN'T SET
                                                        ;R1 = CONTENTS OF RBUF
010076  032701  070000          3$:     BIT     #70000, R1      ;CHECK FOR ERROR BITS
010102  001401                  BEQ     .+4             ;BRANCH IF NONE
010104  104001                  HLT+1                   ;ERROR IN RECEIVED CHAR
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BIT14=UART OVERRUN
                                                        ;BIT13=FRAMING ERROR
                                                        ;BIT12=PARITY ERROR
010106  010102                  4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
010110  042702  170377          BIC     #170377,R2      ;MASK LINE#
010114  000302                  SWAB    R2              ;LINE # IN LOW BYTE
010116  122702  000011          CMPB    #9.,    R2      ;CHECK LINE #
010122  001401                  BEQ     .+4             ;BRANCH IF OK
010124  104001                  HLT+1                   ;WRONG LINE # RECEIVED
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BITS8-11 = LINE #
010126  117702  171154          5$:     MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
010132  130201                  BITB    R2,     R1      ;CHECK CHAR LENGTH.
010134  001401                  BEQ     .+4             ;BRANCH IF OK
010136  104002                  HLT+2                   ;WRONG CHARACTER LENGTH
                                                        ;R1=DATA FROM FI/FO
                                                        ;R2=MASK (BITS SET NOT EXPECTED)
010140  105102                  6$:     COMB    R2              ;REVERSE THE MASK
010142  120102                  CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
010144  001401                  BEQ     .+4             ;BRANCH IF OK
010146  104002                  HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
                                                        ;R1=DATA FROM FI/FO (COMPLETE WORD)
                                                        ;R2=DATA (LOW BYTE) EXPECTED
010150  017701  171036          7$:     MOV     @RBUF,  R1      ;READ FI/FO
010154  100001                  BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
010156  104001                  HLT+1                   ;CHARACTER PRESENT STAYED SET
                                                        ;R1 = CONTENTS OF RBUF
010160  017701  171024          8$:     MOV     @CSR,   R1      ;SAVE THE CSR
010164  022701  100405          CMP     #100405,R1      ;CHECK THE CSR
010170  001401                  BEQ     .+4             ;BRANCH IF OK
010172  104001                  HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
```

```
                                                        ;R1 = CONTENTS OF CSR
010174  005077  171014                 CLR     @TCR     ;CLEAR TCR
010200  005077  171004                 CLR     @CSR     ;CLEAR CSR
010204  104400                         SCOPE

                              ;*****************************************************************
                              ;TEST 44:       TEST THAT LINE 10 CAN TRANSMIT AND
                              ;               RECEIVE A CHARACTER. (377)
                              ;       1$:  CHECKS THAT DONE SETS IN REASONABLE TIME.
                              ;       2$:  CHECKS THAT CHAR PRESENT IS IN FI/FO
                              ;       3$:  CHECKS THAT NO ERRORS IN FI/FO
                              ;       4$:  CHECKS THAT RIGHT LINE # (10) 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 DC3 SERIES
                              ;*****************************************************************

                              ;               INITIALIZE
                              ;       DEVICE"CSR"REGISTER
                                                        ;SET:
010206  004737  015566        TST44:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
                                                        ;BIT3 = CLEAR MOS
                                                        ;BIT8 = MASTER XMTR SCAN ENB
                              ;WAIT FOR MOS TO CLEAR
                              ;
                                                        ;SET:
                              ;
                                                        ;BIT0 = RECEIVER ENABLE
                              ;
010212  052777  002000  170774         BIS     #BIT10, @TCR    ;SET XMTR CONTROL BIT, LINE 10
010220  017701  170764         LOP44:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
010224  100375                 BPL     LOP44
010226  012777  000377  170762         MOV     #377,   @TBUF   ;SEND A RUBOUT
010234  005000                 CLR     R0              ;CLEAR COUNTER
010236  105305                 1$:     DECB    R5              ;SHORT WAIT LOOP
010240  001376                 BNE     1$
010242  105777  170742                 TSTB    @CSR            ;WAIT FOR DONE
010246  100405                 BMI     2$              ;BRANCH WHEN DONE
010250  005200                 INC     R0              ;TIME COUNTER
010252  001371                 BNE     1$              ;BRANCH IF NOT TIME-OUT
010254  017701  170730                 MOV     @CSR,   R1      ;SAVE CSR
010260  104001                 HLT+1                   ;DONE NEVER CAME UP
                                                        ;R1 = CONTENTS OF CSR
010262  050037  001302         2$:     BIS     R0,     TIMER   ;SAVE TIMER
010266  017701  170720                 MOV     @RBUF,  R1      ;READ THE FI/FO
010272  100401                 BMI     .+4             ;BRANCH IF CHARACTER READY
010274  104001                 HLT+1                   ;CHARACTER READY DIDN'T SET
                                                        ;R1 = CONTENTS OF RBUF
010276  032701  070000         3$:     BIT     #70000, R1      ;CHECK FOR ERROR BITS
010302  001401                 BEQ     .+4             ;BRANCH IF NONE
010304  104001                 HLT+1                   ;ERROR IN RECEIVED CHAR
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BIT14=UART OVERRUN
                                                        ;BIT13=FRAMING ERROR
                                                        ;BIT12=PARITY ERROR
010306  010102                 4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
```

```
 2338  010310  042702  170377          BIC     #170377,R2      ;MASK LINE#
 2339  010314  000302                  SWAB    R2              ;LINE # IN LOW BYTE
 2340  010316  122702  000012          CMPB    #10.,   R2      ;CHECK LINE #
 2341  010322  001401                  BEQ     .+4             ;BRANCH IF OK
 2342  010324  104001                  HLT+1                   ;WRONG LINE # RECEIVED
 2343                                                          ;R1 = CONTENTS OF RBUF
 2344                                                          ;BITS8-11 = LINE #
 2345  010326  117702  170754  5$:     MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
 2346  010332  130201                  BITB    R2,     R1      ;CHECK CHAR LENGTH.
 2347  010334  001401                  BEQ     .+4             ;BRANCH IF OK
 2348  010336  104002                  HLT+2                   ;WRONG CHARACTER LENGTH
 2349                                                          ;R1=DATA FROM FI/FO
 2350                                                          ;R2=MASK (BITS SET NOT EXPECTED)
 2351  010340  105102  6$:     COMB    R2                      ;REVERSE THE MASK
 2352  010342  120102                  CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
 2353  010344  001401                  BEQ     .+4             ;BRANCH IF OK
 2354  010346  104002                  HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
 2355                                                          ;R1=DATA FROM FI/FO (COMPLETE WORD)
 2356                                                          ;R2=DATA (LOW BYTE) EXPECTED
 2357  010350  017701  170636  7$:     MOV     @RBLF,  R1      ;READ FI/FO
 2358  010354  100001                  BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
 2359  010356  104001                  HLT+1                   ;CHARACTER PRESENT STAYED SET
 2360                                                          ;R1 = CONTENTS OF RBUF
 2361  010360  017701  170624  8$:     MOV     @CSR,   R1      ;SAVE THE CSR
 2362  010364  022701  100405          CMP     #100405,R1      ;CHECK THE CSR
 2363  010370  001401                  BEQ     .+4             ;BRANCH IF OK
 2364  010372  104001                  HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
 2365                                                          ;R1 = CONTENTS OF CSR
 2366  010374  005077  170614          CLR     @TCR            ;CLEAR TCR
 2367  010400  005077  170604          CLR     @CSR            ;CLEAR CSR
 2368  010404  104400                  SCOPE
 2369
 2370                          ;*****************************************************************
 2371                          ;TEST 45:       TEST THAT LINE 11 CAN TRANSMIT AND
 2372                          ;               RECEIVE A CHARACTER. (CR
 2373                          ;       1$:  CHECKS THAT DONE SETS IN REASONABLE TIME.
 2374                          ;       2$:  CHECKS THAT CHAR PRESENT IS IN FI/FO
 2375                          ;       3$:  CHECKS THAT NO ERRORS IN FI/FO
 2376                          ;       4$:  CHECKS THAT RIGHT LINE # (11) IN FI/FO
 2377                          ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
 2378                          ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
 2379                          ;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
 2380                          ;       8$:  CHECKS THAT DONE CLEARS
 2381                          ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD DJ3 SERIES
 2382                          ;*****************************************************************
 2383
 2384                          ;               INITIALIZE
 2385                          ;       DEVICE"CSR"REGISTER
 2386                                                          ;SET:
 2387  010406  004737  015566  TST45:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
 2388                                                          ;BIT3 = CLEAR MOS
 2389                                                          ;BIT8 = MASTER XMTR SCAN ENB
 2390                          ;WAIT FOR MOS TO CLEAR
 2391                                                          ;SET:
 2392                          ;                               ;BIT0 = RECEIVER ENABLE
 2393                          ;
```

```
2394  010412  052777  004000  170574          BIS     #BIT11, @TCR    ;SET XMTR CONTROL BIT, LINE 11
2395  010420  017701  170564          LOP45:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
2396  010424  100375                          BPL     LOP45
2397  010426  012777  000377  170562          MOV     #377,   @TBUF   ;SEND A RUBOUT
2398  010434  005000                          CLR     R0              ;CLEAR COUNTER
2399  010436  105305                  1$:     DECB    R5              ;SHORT WAIT LOOP
2400  010440  001376                          BNE     1$
2401  010442  105777  170542                  TSTB    @CSR            ;WAIT FOR DONE
2402  010446  100405                          BMI     2$              ;BRANCH WHEN DONE
2403  010450  005200                          INC     R0              ;TIME COUNTER
2404  010452  001371                          BNE     1$              ;BRANCH IF NOT TIME-OUT
2405  010454  017701  170530                  MOV     @CSR,   R1      ;SAVE CSR
2406  010460  104001                          HLT+1                   ;DONE NEVER CAME UP
2407                                                                  ;R1 = CONTENTS OF CSR
2408  010462  050037  001302          2$:     BIS     R0,     TIMER   ;SAVE TIMER
2409  010466  017701  170520                  MOV     @RBUF,  R1      ;READ THE FI/FO
2410  010472  100401                          BMI     .+4             ;BRANCH IF CHARACTER READY
2411  010474  104001                          HLT+1                   ;CHARACTER READY DIDN'T SET
2412                                                                  ;R1 = CONTENTS OF RBUF
2413  010476  032701  070000          3$:     BIT     #70000, R1      ;CHECK FOR ERROR BITS
2414  010502  001401                          BEQ     .+4             ;BRANCH IF NONE
2415  010504  104001                          HLT+1                   ;ERROR IN RECEIVED CHAR
2416                                                                  ;R1 = CONTENTS OF RBUF
2417                                                                  ;BIT14=UART OVERRUN
2418                                                                  ;BIT13=FRAMING ERROR
2419                                                                  ;BIT12=PARITY ERROR
2420  010506  010102                  4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
2421  010510  042702  170377                  BIC     #170377,R2      ;MASK LINE#
2422  010514  000302                          SWAB    R2              ;LINE # IN LOW BYTE
2423  010516  122702  000013                  CMPB    #11.,   R2      ;CHECK LINE #
2424  010522  001401                          BEQ     .+4             ;BRANCH IF OK
2425  010524  104001                          HLT+1                   ;WRONG LINE # RECEIVED
2426                                                                  ;R1 = CONTENTS OF RBUF
2427                                                                  ;BITS8-11 = LINE #
2428  010526  117702  170554          5$:     MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
2429  010532  130201                          BITB    R2,     R1      ;CHECK CHAR LENGTH.
2430  010534  001401                          BEQ     .+4             ;BRANCH IF OK
2431  010536  104002                          HLT+2                   ;WRONG CHARACTER LENGTH
2432                                                                  ;R1=DATA FROM FI/FO
2433                                                                  ;R2=MASK (BITS SET NOT EXPECTED)
2434  010540  105102                  6$:     COMB    R2              ;REVERSE THE MASK
2435  010542  120102                          CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
2436  010544  001401                          BEQ     .+4             ;BRANCH IF OK
2437  010546  104002                          HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
2438                                                                  ;R1=DATA FROM FI/FO (COMPLETE WORD)
2439                                                                  ;R2=DATA (LOW BYTE) EXPECTED
2440  010550  017701  170436          7$:     MOV     @RBUF,  R1      ;READ FI/FO
2441  010554  100001                          BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
2442  010556  104001                          HLT+1                   ;CHARACTER PRESENT STAYED SET
2443                                                                  ;R1 = CONTENTS OF RBUF
2444  010560  017701  170424          8$:     MOV     @CSR,   R1      ;SAVE THE CSR
2445  010564  022701  100405                  CMP     #100405,R1      ;CHECK THE CSR
2446  010570  001401                          BEQ     .+4             ;BRANCH IF OK
2447  010572  104001                          HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
2448                                                                  ;R1 = CONTENTS OF CSR
2449  010574  005 77  170414                  CLR     @TCR            ;CLEAR TCR
```

```
002450  010600  005077  170404                  CLR     @CSR            ;CLEAR CSR
002451  010604  104400                          SCOPE
002452  010606  005237  001306                  INC     DJLEN
002453  010612  012737  010620  015770          MOV     #.+6.   LAD
002454
002455                          ;*************************************************************
002456                          ;TEST 46:       TEST THAT LINE 12 CAN TRANSMIT AND
002457                          ;               RECEIVE A CHARACTER. (377)
002460                          ;       1$:  CHECKS THAT DONE SETS IN REASONABLE TIME.
002461                          ;       2$:  CHECKS THAT CHAR PRESENT IS IN FI/FO
002462                          ;       3$:  CHECKS THAT NO ERRORS IN FI/FO
002463                          ;       4$:  CHECKS THAT RIGHT LINE # (12) IN FI/FO
002464                          ;       5$:  CHECKS FOR RIGHT CHARACTER LENGTH
002465                          ;       6$:  CHECKS THAT CORRECT DATA WAS RECEIVED
002466                          ;       7$:  CHECKS THAT CHARACTER PRESENT CLEARS
002467                          ;       8$:  CHECKS THAT DONE CLEARS
002470                          ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD DC3 SERIES
002471                          ;*************************************************************
002472
002473                          ;               INITIALIZE
002474                          ;       DEVICE"CSR"REGISTER
002475                                                                  SET:
002476  010620  004737  015566          1$:T46: JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
002477                                                                  ;BIT3 = CLEAR MOS
002500                                                                  ;BIT8 = MASTER XMTR SCAN ENB
002501                          ;WAIT FOR MOS TO CLEAR
002502                          ;
002503                                                                  SET:
002504                          ;                                       ;BIT0 = RECEIVER ENABLE
002505                          ;
002506
002507  010624  052777  010000  170362          BIS     #BIT12. @TCR    ;SET XMTR CONTROL BIT, LINE 12
002510  010632  017701  170352          LOP46:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
002511  010636  100375                          BPL     LOP46
002512  010640  012777  000377  170350          MOV     #377.   @TBUF   ;SEND A RUBOUT
002513  010646  005000                          CLR     R0              ;CLEAR COUNTER
002514  010650  105305                  1$:     DECB    R5              ;SHORT WAIT LOOP
002515  010652  001376                          BNE     1$
002516  010654  105777  170330                  TSTB    @CSR            ;WAIT FOR DONE
002517  010660  100405                          BMI     2$              ;BRANCH WHEN DONE
002520  010662  005200                          INC     R0              ;TIME COUNTER
002521  010664  001371                          BNE     1$              ;BRANCH IF NOT TIME-OUT
002522  010666  017701  170316                  MOV     @CSR,   R1      ;SAVE CSR
002523  010672  104001                          HLT+1                   ;DONE NEVER CAME UP
002524                                                                  ;R1 = CONTENTS OF CSR
002525  010674  050037  001302          2$:     BIS     R0,     TIMER   ;SAVE TIMER
002526  010700  017701  170306                  MOV     @RBUF,  R1      ;READ THE FI/FO
002527  010704  100401                          BMI     .+4             ;BRANCH IF CHARACTER READY
002530  010706  104001                          HLT+1                   ;CHARACTER READY DIDN'T SET
002531                                                                  ;R1 = CONTENTS OF RBUF
002532  010710  032701  070000          3$:     BIT     #70000, R1      ;CHECK FOR ERROR BITS
002533  010714  001401                          BEQ     .+4             ;BRANCH IF NONE
002534  010716  104001                          HLT+1                   ;ERROR IN RECEIVED CHAR
002535                                                                  ;R1 = CONTENTS OF RBUF
002536                                                                  ;BIT14=UART OVERRUN
002537                                                                  ;BIT13=FRAMING ERROR
002540                                                                  ;BIT12=PARITY ERROR
002541  010720  010102          4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
```

```
                        ;TEST 46:       TEST ALL OF LINE 12 TRANSMIT AND RECEIVE LOGIC

                                        MOV     #170377,R2      ;MASK LINE#
                                        MOVB    R2,R2           ;LINE # IN LOW BYTE
                                        CMPB    #12.,   R2      ;CHECK LINE #
                                        BEQ     .+4             ;BRANCH IF OK
                                        JMP     ERR             ;WRONG LINE # RECEIVED
                                        MOVB    @R1,R1          ;R1 = CONTENTS OF RBUF
                                        BITB    R2,R1           ;BITS9-11 = LINE #
                                        BEQ     .+6             ;GET MASK OF CHARACTER
                                        BIC     #BADLEN,R1      ;CHECK CHAR LENGTH.
                                        BEQ     .+8             ;BRANCH IF OK
                                        JMP     ERR             ;WRONG CHARACTER LENGTH
                                                                ;R1=DATA FROM FIFO
                                                                ;R2=MASK BITS SET NOT EXPECTED
                                        COM     R2              ;REVERSE THE MASK
                                        BITB    R2,R1           ;CHECK THE ACTURAL DATA
                                        BEQ     .+4             ;BRANCH IF OK
                                        JMP     ERR             ;WRONG CHAR LEN OR DATA ERROR
                                                                ;R1=DATA FROM FIFO (COMPLETE WORD
                                                                ;R2=DATA (LOW BYTE) EXPECTED
                                        MOV     @#RBUF, R1      ;READ FIFO
                                        BPL     .+6             ;BRANCH IF CHAR PRESENT NOT SET
                                        BIT     #BIT7,R1        ;CHARACTER PRESENT STARTED SET
                                        BNE     .+6             ;R1 = CONTENTS OF RBUF
                                        JMP     ERR             ;SAVE THE CSR
                                        MOV     @#CSR,R1        ;CHECK THE CSR
                                        BIC     #BIT15!BIT14!BIT13!BIT12!BIT11!BIT10!BIT9!BIT8!BIT7!BIT6!BIT5!BIT4!BIT3!BIT2!BIT1!BIT0,R1
                                        BEQ     .+6             ;BRANCH IF OK
                                        JMP     ERR             ;DONE BUSY, CLEAR OR OTHER CSR ERROR
                                                                ;R1 = CONTENTS OF CSR
                                        CLR     @#CSR           ;CLEAR CSR
                                        CLR     CSR             ;CLEAR CSR
                                        SCOPE

                        ;*****************************************************************
                        ;TEST 47:       TEST THAT LINE 12 CAN TRANSMIT AND
                        ;               RECEIVE A CHARACTER. (INT)
                        ;       A:      CHECKS THAT DONE SETS IN REASONABLE TIME.
                        ;       B:      CHECKS THAT CHAR PRESENT SETS IN FIFO
                        ;       C:      CHECKS THAT NO ERRORS IN FIFO
                        ;       D:      CHECKS THAT RIGHT LINE # (12) IN FIFO
                        ;       E:      CHECKS FOR RIGHT CHARACTER LENGTH
                        ;       F:      CHECKS THAT CORRECT DATA WAS RECEIVED
                        ;       G:      CHECKS THAT CHARACTER PRESENT CLEARS
                        ;       H:      CHECKS THAT DONE CLEARS
                        ;PROBABLE FAULTY LOGIC:  M7285 (12-??) ALL; M7379 ALL; UART CARD DD3 SERIES
                        ;*****************************************************************

                                        ;INITIALIZE
                                DEVICE"CSR"REGISTER
                                                                SET:
C11CEC  CC47CF  C1E5E6  *5*47:  JSR     PC,     @#INITD         ;BIT2 = MAINTENANCE
                                                                ;BIT3 = CLEAR MOS
                                                                ;BIT8 = MASTER (MTR SCAN ENB
                        ;WAIT FOR MOS TO CLEAR
                                                                SET:
                                                                ;BIT0 = RECEIVER ENABLE
```

```
[illegible]:  TEST ALL OF LINE 13 TRANSMIT AND RECEIVE LOGIC

                                                        ;SET XMTR CONTROL BIT, LINE 13
                                                        ;WAIT FOR XMTR READY
                                                        ;SEND A RUBOUT
                                                        ;CLEAR COUNTER
                                                        ;SHORT WAIT LOOP
                                                        ;WAIT FOR DONE
                                                        ;BRANCH WHEN DONE
                                                        ;TIME COUNTER
                                                        ;BRANCH IF NOT TIME-OUT
                                                        ;SAVE CSR
                                                        ;DONE NEVER CAME UP
                                                        ;R1 = CONTENTS OF CSR
                                                        ;SAVE TIMER
                                                        ;READ THE FIFO
                                                        ;BRANCH IF CHARACTER READY
                                                        ;CHARACTER READY DIDN'T SET
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;CHECK FOR ERROR BITS
                                                        ;BRANCH IF NONE
                                                        ;ERROR IN RECEIVED CHAR
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BIT14=UART OVERRUN
                                                        ;BIT13=FRAMING ERROR
                                                        ;BIT12=PARITY ERROR
                                                        ;DUPLICATE DATA WORD
                                                        ;MASK LINE#
                                                        ;LINE # IN LOW BYTE
                                                        ;CHECK LINE #
                                                        ;BRANCH IF OK
                                                        ;WRONG LINE # RECEIVED
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BITS8-11 = LINE #
                                                        ;GET MASK OF CHARACTER
                                                        ;CHECK CHAR LENGTH.
                                                        ;BRANCH IF OK
                                                        ;WRONG CHARACTER LENGTH
                                                        ;R1=DATA FROM FIFO
                                                        ;R2=MASK (BITS SET NOT EXPECTED)
                                                        ;REVERSE THE MASK
                                                        ;CHECK THE ACTURAL DATA
                                                        ;BRANCH IF OK
                                                        ;WRONG CHAR LEN OR DATA ERROR
                                                        ;R1=DATA FROM FIFO (COMPLETE WORD
                                                        ;R2=DATA (LOW BYTE) EXPECTED
                                                        ;READ FIFO
                                                        ;BRANCH IF CHAR PRESENT NOT SET
                                                        ;CHARACTER PRESENT NOT SET
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;SAVE THE CSR
                                                        ;CHECK THE CSR
                                                        ;BRANCH IF OK
                                                        ;TIME-OUT, PARITY OR OTHER CSR ERROR
                                                        ;R1 = CONTENTS OF CSR
                                                        ;CLEAR CSR
```

```
                                        CLR     @CSR            ;CLEAR CSR
                                        SCOPE

                        ;*****************************************************************
                        ;TEST 52:       TEST THAT LINE 14 CAN TRANSMIT AND
                        ;               RECEIVE A CHARACTER. (377)
                        ;       1$:  CHECKS THAT DONE SETS IN REASONABLE TIME.
                        ;       2$:  CHECKS THAT CHAR PRESENT IS IN FIFO
                        ;       3$:  CHECKS THAT NO ERRORS IN FIFO
                        ;       4$:  CHECKS THAT RIGHT LINE # (14) IN FIFO
                        ;       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 DARC DC3 SERIES
                        ;*****************************************************************

                        ;               INITIALIZE
                        ;       DEVICE"CSR"REGISTER
                                                        SET:
D211B2  DC4737  015566  5$:     CSR     PC,     @#INITD ;BIT2 = MAINTENANCE
                                                        ;BIT3 = CLEAR MCS
                                                        ;BIT8 = MASTER XMTR SCAN ENB
                        ;WAIT FOR MCS TO CLEAR
                        ;                               SET:
                        ;                               ;BIT0 = RECEIVER ENABLE
                        ;
D211B4  052777  240000  167752          BIS     #BIT14, @TCR    ;SET XMTR CONTROL BIT, LINE 14
D211BA  013701  167752          LOP52:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
D211BE  100375                  BPL     LOP52
D211C0  012777  000377  167750          MOV     #377,   @TBUF   ;SEND A RUBOUT
D211C6  012705  000000                  MOV     #0,     R5      ;CLEAR COUNTER
D211CA  005205                  1$:     INC     R5              ;SHORT WAIT LOOP
D211CC  001375                          BNE     1$
D211CE  105777  167730                  TSTB    @CSR            ;WAIT FOR DONE
D211D2  100403                          BMI     2$              ;BRANCH WHEN DONE
D211D4  005305                          DEC     R5              ;TIME COUNTER
D211D6  001367                          BNE     1$              ;BRANCH IF NOT TIME-OUT
D211D8  013701  167716                  MOV     @CSR,   R1      ;SAVE CSR
D211DC  000401                          BR      HLT+1           ;DONE NEVER CAME UP
                                                                ;R1 = CONTENTS OF CSR
D211DE  010346                  2$:     MOV     R3,     -(SP)   ;SAVE TIMER
D211E0  013703  167706                  MOV     @RBUF,  R3      ;READ THE FIFO
D211E4  100401                          BMI     .+4             ;BRANCH IF CHARACTER READY
D211E6  000401                          BR      HLT+1           ;CHARACTER READY DIDN'T SET
                                                                ;R1 = CONTENTS OF RBUF
D211E8  032703  070000          3$:     BIT     #70000, R3      ;CHECK FOR ERROR BITS
D211EC  001401                          BEQ     .+4             ;BRANCH IF NONE
D211EE  000401                          BR      HLT+1           ;ERROR IN RECEIVED CHAR
                                                                ;R1 = CONTENTS OF RBUF
                                                                ;BIT14=UART OVERRUN
                                                                ;BIT13=FRAMING ERROR
                                                                ;BIT12=PARITY ERROR
D211F0  010302                  4$:     MOV     R3,     R2      ;DUPLICATE DATA WORD
D211F2  042702  170377                  BIC     #170377,R2      ;MASK LINE#
D211F6  000302                          SWAB    R2              ;LINE # IN LOW BYTE
```

```
011330  012703  000016          CMPB    #14.,   R2      ;CHECK LINE #
011334  001401                  BEQ     .+4             ;BRANCH IF OK
011336  104001                  HLT+1                   ;WRONG LINE # RECEIVED
                                                        ;R1 = CONTENTS OF RBUF
                                                        ;BITS8-11 = LINE #
011340  012703  177742  55:     MOVB    @DZLEN, R3      ;GET MASK OF CHARACTER
011344  130346                  BITB    R3,     R1      ;CHECK CHAR LENGTH.
011346  001401                  BEQ     .+4             ;BRANCH IF OK
011350  104002                  HLT+2                   ;WRONG CHARACTER LENGTH
                                                        ;R1=DATA FROM FIFO
                                                        ;R2=MASK BITS SET NOT EXPECTED
011352  110302          65:     MOVB    R3      R2      ;REVERSE THE MASK
011354  120201                  CMPB    R1,     R2      ;CHECK THE RETURNED DATA
011356  001401                  BEQ     .+4             ;BRANCH IF OK
011360  104003                  HLT+3                   ;WRONG CHAR LEN OR DATA ERROR
                                                        ;R1=DATA FROM FIFO COMPLEMENTED
                                                        ;R2=DATA LOW BYTE EXPECTED
011362  012703  177564  75:     MOV     @RBUF,  R3      ;READ FIFO
011366  100401                  BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
011370  104004                  HLT+4                   ;CHARACTER PRESENT STAYED SET
                                                        ;R1 = CONTENTS OF RBUF
011372  012703  177560  85:     MOV     @CSR,   R1      ;SAVE THE CSR
011376  020127  100405          CMP     #100405,R1      ;CHECK THE CSR
011402  001401                  BEQ     .+4             ;BRANCH IF OK
011404  104001                  HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
                                                        ;R1 = CONTENTS OF CSR
011406  005003  177550          CLR     @TCR            ;CLEAR TCR
011412  005003  177560          CLR     @CSR            ;CLEAR CSR
011416  104433                  SCOPE

                        ;*****************************************************************
                        ;TEST 51:       TEST THAT LINE IS CAN TRANSMIT AND
                        ;               RECEIVE A CHARACTER. (377)
                        ;       1S:  CHECKS THAT DONE SETS IN REASONABLE TIME.
                        ;       2S:  CHECKS THAT CHAR PRESENT IS IN FIFO
                        ;       3S:  CHECKS THAT NO ERRORS IN FIFO
                        ;       4S:  CHECKS THAT RIGHT LINE # (15) IN FIFO
                        ;       5S:  CHECKS FOR RIGHT CHARACTER LENGTH
                        ;       6S:  CHECKS THAT CORRECT DATA WAS RECEIVED
                        ;       7S:  CHECKS THAT CHARACTER PRESENT CLEARS
                        ;       8S:  CHECKS THAT DONE CLEARS
                        ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) ALL; M7279 ALL; UART CARD DD3 SERIES
                        ;*****************************************************************

                        ;               INITIALIZE
                        ;       DEVICE CSR REGISTER
                                                        ;               SET:
011420  004737  015566  ST51:   JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
                                                        ;BIT3 = CLEAR MOS
                                                        ;BIT8 = MASTER XMTR SCAN ENB
                        ;WAIT FOR MOS TO CLEAR
                                                        ;               SET:
                                                        ;BITC = RECEIVER ENABLE

011424  050777  100008  167562          BIS     #BIT15, @TCR    ;SET XMTR CONTROL BIT, LINE 15
011430  013701  177560  LOPS1:  MOV     @CSR,   R1      ;WAIT FOR XMTR READY
```

```
011436  000375          BFL     LOP51
011440  010467 167553           MOV     #377.,  @TBUF   ;SEND A RUBOUT
011444  005000           R0              ;CLEAR COUNTER
011446  105300           RB      R5              ;SHORT WAIT LOOP
011450  001375           BNE     1$
011452  105767 167530   1$:     TSTB    @CSR            ;WAIT FOR DONE
011456  100405           BMI     3$              ;BRANCH WHEN DONE
011460  005200           INC     R0              ;TIME COUNTER
011462  001371           BNE     1$              ;BRANCH IF NOT TIME-OUT
011464  017701 167516           MOV     @CSR,   R1      ;SAVE CSR
011470  104001           HLT+1                   ;DONE NEVER CAME UP
                                                ;R1 = CONTENTS OF CSR
011472  050037 001302   2$:     BIS     R0,     TIMER   ;SAVE TIMER
011500  017701 167506           MOV     @RBUF,  R1      ;READ THE FIFO
011504  100401           BMI     .+4             ;BRANCH IF CHARACTER READY
011506  104001           HLT+1                   ;CHARACTER READY DIDN'T SET
                                                ;R1 = CONTENTS OF RBUF
011510  032701 070000   3$:     BIT     #70000, R1      ;CHECK FOR ERROR BITS
011514  001401           BEQ     .+4             ;BRANCH IF NONE
011516  104001           HLT+1                   ;ERROR IN RECEIVED CHAR
                                                ;R1 = CONTENTS OF RBUF
                                                ;BIT14=UART OVERRUN
                                                ;BIT13=FRAMING ERROR
                                                ;BIT12=PARITY ERROR
011520  010102           4$:     MOV     R1,     R2      ;DUPLICATE DATA WORD
011522  042702 170377           BIC     #170377,R2      ;MASK LINE#
011526  000302           SWAB    R2              ;LINE # IN LOW BYTE
011530  122702 000017           CMPB    #15.,   R2      ;CHECK LINE #
011534  001401           BEQ     .+4             ;BRANCH IF OK
011536  104001           HLT+1                   ;WRONG LINE # RECEIVED
                                                ;R1 = CONTENTS OF RBUF
                                                ;BITS8-11 = LINE #
011540  117202 167542   5$:     MOVB    @DJLEN, R2      ;GET MASK OF CHARACTER
011544  130201           BITB    R2,     R1      ;CHECK CHAR LENGTH.
011546  001401           BEQ     .+4             ;BRANCH IF OK
011550  104002           HLT+2                   ;WRONG CHARACTER LENGTH
                                                ;R1=DATA FROM FIFO
                                                ;R2=MASK (BITS SET NOT EXPECTED)
011552  105102   6$:     COMB    R2              ;REVERSE THE MASK
011554  120102           CMPB    R1,     R2      ;CHECK THE ACTURAL DATA
011556  001401           BEQ     .+4             ;BRANCH IF OK
011560  104002           HLT+2                   ;WRONG CHAR LEN OR DATA ERROR
                                                ;R1=DATA FROM FIFO (COMPLETE WORD)
                                                ;R2=DATA (LOW BYTE) EXPECTED
011562  017701 167424   7$:     MOV     @RBUF,  R1      ;READ FIFO
011566  100001           BPL     .+4             ;BRANCH IF CHAR PRESENT NOT SET
011570  104001           HLT+1                   ;CHARACTER PRESENT STATED SET
                                                ;R1 = CONTENTS OF RBUF
011572  017701 167412   8$:     MOV     @CSR,   R1      ;SAVE THE CSR
011576  022701 100405           CMP     #100405,R1      ;CHECK THE CSR
011602  001401           BEQ     .+4             ;BRANCH IF OK
011604  104001           HLT+1                   ;DONE DIDN'T CLEAR OR OTHER CSR ERROR
                                                ;R1 = CONTENTS OF CSR
011606  005077 167402           CLR     @TCR            ;CLEAR TCR
011612  005077 167372           CLR     @CSR            ;CLEAR CSR
011616  104400           SCOPE
```

```
011620  162737  000003  001306          SUB     #3,     DJLEN
011626  005237  001302                  INC     TIMER                   ;WORSE CASE TIME, ONE CHARACTER
011632  013700  001302                  MOV     TIMER,  R0              ;DUP TIMER
011636  006200                          ASR     R0                      ;/2
011640  006200                          ASR     R0                      ; 4
011642  005200                          INC     R0                      ;+1
011644  006137  001302                  ROL     TIMER                   ;TIMER * 2
011650  060037  001302                  ADD     R0,     TIMER           ;2.25 TIMES ONE CHARACTER TIME
011654  012737  011662  015770          MOV     #.+6,   LAD             ;RESET LOOP ADDRESS

                                ;*****************************************************************
                                ;TEST 52:       TEST THAT CHARACTER PRESENT (BIT15) OF RBUF
                                ;               IS CLEARED (BY CLEAR MOS).
                                ;PROBABLE FAULTY LOGIC:  M7285 (D2-8: E17,E14,E15; M7279; M7280
                                ;*****************************************************************

                                ;       INITIALIZE
                                ;
011660  004737  015566          ;ST52:  JSR     PC,@#INITD
                                ;SET:
                                ;       BIT2 = MAINTENANCE
                                ;       BIT3 = CLEAR MOS
                                ;       BIT8 = TRANS SCAN ENABLE
                                ;       WAIT FOR BIT4 = MOS CLEAR
                                ;SET:
                                ;       BIT0 = RECEIVER ENABLE
011664  012777  000005  167320          MOV     #BIT0,  @TCR            ;TRANS CONTROL, LINE0
011672  012704  000004                  MOV     #4,R4                   ;SET UP COUNTER
011676  105777  167314          1$:     MOVB    @TCSR,R1                ;WAIT FOR TRANS READY
011702  100375                          BPL     1$
011704  116437  167304  001304          MOVB    R4,@TBUF                ;TRANSMIT COUNT
011712  005304                          DEC     R4                      ;COUNT DOWN
011714  001371                          BNE     1$

011716  105777  167266          2$:     TSTB    @TCSR                   ;MAKE SURE DONE IS SET
011722  100376                          BPL     2$

011724  052777  000010  167260          BIS     #BIT3,@TCSR             ;CLEAR MOS
011732  032777  000020  167252  3$:     BIT     #BIT4,@TCSR             ;WAIT FOR CLRMOS TO FINISH
011740  001374                          BNE     3$

011742  017701  167244                  MOV     @RBUF,R1                ;CHECK RBUF AND SAVE
011746  100001                          BPL     .+4
011750  005201                          INC     R1
011752  017701  167236                  MOV     @TCSR,R1                ;SAVE CSR
011756  042701  100400                  BIC     #100400,R1              ;CHECK CSR
011762  001401                          BEQ     .+4                     ;BRANCH IF OK
011764  000401                          BR      .+4                     ;CSR ERROR, POSSIBILITIES:
                                                                        ;(1) DONE DIDN'T CLEAR

                                                                        ;(2) TRANSMITTER START DIDN'T CLR.
                                                                        ;R1=CONTENTS OF CSR

011766  012737  000302  001302          MOV     TIMER,  PC              ;SET UP TIMER
011774  005305                  4$:     DECB    R5                      ;SHORT WAIT LOOP
011776  001376                          BNE     4$
```

```
012036  012737  015556  167206          TST53:  MOV     #SCSR,R1        ;SAVE CSR
012042  105711                                  TSTB    (R1)            ;CHECK FOR DONE
012044  100004                                  BPL     .+4             ;BRANCH IF OK
012046  104401                                  HLT+1                   ;DONE CAME UP!
                                                                        ;MOS MUST NOT HAVE CLEARED
012050  005302                                  DEC     R2              ;TIMER COUNT
012052  001367                                  BNE     4$

012054  012701  100405  167206                  CMP     #100405,R1      ;CHECK CSR
012060  001401                                  BEQ     .+4             ;BRANCH IF OK
012062  104001                                  HLT+1                   ;CSR ERROR

012064  017701  167202  167162                  MOV     @RBUF,R1        ;CHECK RBUF
012070  100001                                  BPL     .+4             ;BRANCH IF OK
012072  104001                                  HLT+1                   ;RBUF NOT EMPTY!

012074  005077  167154                          CLR     @TCR
012100  005077  167144                          CLR     @CSR

012104  104403                                  SCOPE


                                ;*****************************************************************
                                ;TEST 53:       TEST THAT TRANSMITTER READY CLEARS WHEN TBUF IS LOADED
                                ;       NOTE:   DUE TO THE DOUBLE BUFFERING BY THE UART, TBUF CHARACTER
                                ;               MUST BE LOADED TO INSURE SEEING TRANSMITTER READY CLEAR
                                ;PROBABLE FAULTY LOGIC:  M7285 (D2-6) E39, E23, E49
                                ;*****************************************************************

                                ;               INITIALIZE
                                ;       DEVICE CSR REGISTER
                                ;                                               SET:
012106  004737  015566          TST53:  JSR     PC,     @#INITD         ;BIT3 = MAINTENANCE
                                                                        ;BIT5 = CLEAR MOS
                                                                        ;BIT6 = MASTER XMTR SCAN ENB
                                ;WAIT FOR MOS TO CLEAR
                                ;                                               SET:
                                ;                                               ;BIT0 = RECEIVER ENABLE
                                ;

012112  052777  000001  167134          1$:     BIS     #BIT0,  @TCR    ;TRANS CONTROL, LINE 0
012120  017701  167124                  2$:     MOV     @#CSR,  R1      ;WAIT FOR XMTR READY
012124  100375                                  BPL     1$
012126  012777  000001  167122                  MOV     #1,     @TBUF   ;TRANSMIT A 1
012134  017701  167110                  3$:     MOV     @#CSR,  R1      ;WAIT FOR XMTR READY
012140  100375                                  BPL     2$
012142  012777  000002  167106                  MOV     #2,     @TBUF   ;TRANSMIT A 2
012150  017701  167074                          MOV     @#CSR,  R1      ;CHECK FOR XMTR READY
012154  100001                                  BPL     .+4             ;BRANCH IF XMTR READY CLEARED
012156  104001                                  HLT+1                   ;TRANSMITTER READY FAILED TO CLEAR
                                                                        ;R1 = CONTENTS OF CSR
012160  013702  001302                          MOV     TIMER,  R2      ;SET UP TIMER
012164  105305                          4$:     DECB    R5              ;SHORT WAIT LOOP
012166  001376                                  BNE     3$
012170  017701  167054                          MOV     @#CSR,  R1      ;SAVE CSR FOR THE RECORD
012174  000400                                  BR      .+2             ;NOP FOR TIMING
```

```
012136  005300          DEC     R0              ;TIMER COUNT
012140  001371          BNE     3$              ;BRANCH IF MORE TIME

012142  022701  100605  CMP     #100605,R1      ;CHECK CSR
012146  001401          BEQ     .+4             ;BRANCH IF OK
012150  104001          HLT+1                   ;DONE DIDN'T SET OR OTHER CSR ERROR
                                                ;R1 = CONTENTS OF CSR
012152  017701  167034  MOV     @RBUF,  R1      ;CHECK RBUF FOR CHAR PRESENT
012156  100401          SMI     .+4             ;BRANCH IF CHAR PRESENT
012160  104001          HLT+1                   ;CHAR PRESENT MISSING
                                                ;R1 = CONTENTS OF RBUF
012162  022701  100001  CMP     #100001,R1      ;CHECK THE DATA
012166  001401          BEQ     .+4             ;BRANCH IF OK
012170  104001          HLT+1                   ;RECEIVER ERROR
                                                ;R1 = CNTENTS OF RBUF
012172  017701  167014  MOV     @RBUF,  R1      ;CHECK RBUF FOR SECOND CHAR
012176  100401          BMI     .+4             ;BRANCH IF CHAR PRESENT
012200  104001          HLT+1                   ;CHAR PRESENT MISSING
                                                ;R1 = CONTENTS OF RBUF
012202  022701  100002  CMP     #100002,R1      ;CHECK THE DATA
012206  001401          BEQ     .+4             ;BRANCH IF OK
012210  104001          HLT+1                   ;RECEIVER ERROR
                                                ;R1 = CNTENTS OF RBUF
012212  017701  166774  MOV     @RBUF,  R1      ;CHECK FOR NO MORE CHARACTERS
012216  100001          BPL     .+4             ;BRANCH IF CHAR PRESENT CLEARED
012220  104001          HLT+1                   ;CHAR PRESENT NOT CLEAR!
                                                ;R1 = CONTENTS OF RBUF
012222  017701  166762  MOV     @CSR,   R1      ;SAVE CSR
012226  022701  100405  CMP     #100405,R1      ;CHECK CSR
012232  001401          BEQ     .+4             ;BRANCH IF OK
012234  104001          HLT+1                   ;CSR ERROR
                                                ;R1 = CONTENTS OF CSR
012236  005077  166752  CLR     @TCR            ;CLEAR TCR
012242  005077  166742  CLR     @CSR            ;CLEAR CSR
012246  104400          SCOPE


                        ;******************************************************************
                        ;TEST 54:       TEST THAT RECEIVER ENABLE ON A 0 INHIBITS DONE
                        ;                 AND CHARACTER PRESENT.
                        ;PROBABLE FAULTY LOGIC:  M7285 (D2-7) E32, E15
                        ;******************************************************************

012250  012777  000414  166732  TST54:  MOV     #414,   @CSR    ;BIT2 = MAINTENANCE
                                                                ;BIT3 = CLEAR MOS
                                                                ;BIT8 = MASTER TRAN SCAN ENB
012256  032777  000020  166724  10$:    BIT     #BIT4,  @CSR    ;WAIT FOR MOS TO CLEAR
012264  001374          BNE     10$
012266  052777  000000  166720          BIS     #BIT0,  @TCR    ;SET XMTR CONTROL BIT, LINE0
012274  017701  166710  1$:     MOV     @CSR,   R1      ;WAIT FOR XMTR READY
012300  100375          BPL     1$
012302  012777  000252  166706          MOV     #252,   @TBUF   ;SEND AN "*"
012310  013700  001302          MOV     TIMER,  R0      ;SET UP TIMER
012314  105305          2$:     DECB    R5              ;SHORT WAIT LOOP
012316  001376          BNE     2$
012320  017701  166664          MOV     @CSR,   R1      ;SAVE CSR FOR TYPING
```

```
012324  105701                          TSTB    R1              ;CHECK FOR DONE
012326  100002                          BPL     3$              ;BRANCH IF NOT SET
012330  104001                          HLT+1                   ;DONE SET WHEN RCV ENB CLR
                                                                ;R1=CONTENTS OF CSR
012332  000402                          BR      4$
012334  005300                  3$:     DEC     R0              ;TIMER COUNT
012336  001366                          BNE     2$              ;BRANCH IF MORE TIMER

012340  017701  166646          4$:     MOV     @RBUF,  R1      ;CHECK AND SAVE FI/FO
012344  100001                          BPL     .+4             ;BRANCH IF OK
012346  104001                          HLT+1                   ;CHARACTER PRESENT IN FI FO
                                                                ;R1=DATA FROM FI/FO
012350  005277  166634                  INC     @CSR            ;SET RECEIVER ENABLE
012354  017701  166630          5$:     MOV     @CSR,   R1      ;SAVE CSR
012360  105701                          TSTB    R1              ;CHECK FOR DONE
012362  100403                          BMI     6$              ;BRANCH IF OK
012364  105300                          DECB    R0              ;SHORT TIMER
012366  001372                          BNE     5$
012370  104001                          HLT+1                   ;DONE DIDN'T COME UP WHEN RECEIVER ENABLED
                                                                ;UART SHOULD HAVE HELD A CHARACTER
                                                                ;R1 = CONTENTS OF CSR
012372  017701  166614          6$:     MOV     @RBUF,  R1      ;CHECK FOR CHARACTER PRESENT
012376  100401                          BMI     .+4             ;BRANCH IF OK
012400  104001                          HLT+1                   ;CHARACTER PRESENT MISSING
                                                                ;R1 = CONTENTS OF RBUF
012402  005077  166606                  CLR     @TCR            ;CLR TRANS CONTROL REG

012406  104400                          SCOPE

                        ;***************************************************************************
                        ;TEST 55:       TEST THAT HALF DUPLEX (BIT1) DISABLES THE RECEIVER UARTS.
                        ;PROBABLE FAULTY LOGIC:  M7285 (D2-4) E32, E17, E22, (D2-2) E5, E1
                        ;***************************************************************************

012410  004737  015556          TST55:  JSR     PC,     @#INITC ;INITIALIZE
                                                                ;BIT1 = HALF DUPLEX
                                                                ;BIT2 = MAINTENANCE
                                                                ;BIT3 = CLEAR MOS
                                                                ;BIT8 = MASTER TRAN SCAN ENB
                                                                ;WAIT FOR MOS TO CLEAR
                                                                ;BITC = RECEIVER ENABLE
012414  012777  000001  166572          MOV     #BIT0,  @TCR    ;SET XMTR CONTROL BIT, LINE0
012422  017701  166562          1$:     MOV     @CSR,   R1      ;WAIT FOR XMTR READY
012426  100375                          BPL     1$
012430  012777  000252  166560          MOV     #252,   @TBUF   ;SEND AN "*"
012436  013700  001302                  MOV     TIMER,  R0      ;SET UP TIMER
012442  105305                  2$:     DECB    R5              ;SHORT WAIT LOOP
012444  001376                          BNE     2$
012446  017701  166536                  MOV     @CSR,   R1      ;SAVE CSR
012452  105701                          TSTB    R1              ;CHECK FOR DONE
012454  100002                          BPL     3$              ;BRANCH IF NOT SET
012456  104001                          HLT+1                   ;DONE SET WHEN HALF DUPLEX (BIT1) SET
                                                                ;R1=CONTENTS OF CSR
012460  000402                          BR      4$
012462  005300                  3$:     DEC     R0              ;TIMER COUNT
012464  001366                          BNE     2$              ;BRANCH IF MORE TIMER
```

```
                                                                                
012466  017701  166520          4$:     MOV     @RBUF,  R1      ;CHECK AND SAVE FI/FO
012472  100001                          BPL     .+4             ;BRANCH IF OK
012474  104001                          HLT+1                   ;CHARACTER PRESENT IN FI/FO
                                                                ;R1=DATA FROM FI/FO
012476  042777  000002  166504          BIC     #BIT1,  @CSR    ;CLEAR HALF DUPLEX BIT
012504  000240                          NOP
012506  000240                          NOP
012510  000240                          NOP
012512  000240                          NOP
012514  017701  166472          5$:     MOV     @RBUF,  R1      ;CHECK FOR CHAR PRESENT
012520  100001                          BPL     .+4             ;BRANCH IF CHAR NOT PRESENT
012522  104001                          HLT+1                   ;CHAR PRESENT AFTER H/D CLEARED
                                                                ;R1 = CONTENTS OF RBUF
012524  005077  166464                  CLR     @TCR            ;CLR TRANS CONTROL REG
                                                                
012530  104400                          SCOPE                   
                                                                
                                                                
                                        ;***************************************************************************
                                        ;TEST 56:       TEST THAT RECEIVER INTERRUPT DOES NOT OCCUR AT LEVEL 5
                                        ;PROBABLE FAULTY LOGIC:  M7821 WIRING, PROPER PRIORITY CHIP
                                        ;***************************************************************************
                                                                
012532  012777  012620  166460  TST56:  MOV     #ISR56, @RCVVEC ;SET UP XMTR INTERRUPT VECTOR
012540  012777  000340  166454          MOV     #340,   @RCVLVL ;AT LEVEL 7
012546  042737  000340  177776          BIC     #340,   @#PS    ;CLEAR PS LEVEL
012554  052737  000240  177776          BIS     #240,   @#PS    ;SET PS TO LEVEL 5
012562  004737  015546                  JSR     PC,     @#INITB ;SET:
                                                                ;BIT2 = MAINTENANCE
                                                                ;BIT3 = CLEAR MOS
                                                                ;BIT6 = RECEIVER INTERUPT ENABLE
                                                                ;BIT8 = MASTER TRANS SCAN ENABLE
                                                                ;WAIT FOR MOS TO CLEAR
                                                                ;BIT0 = RECEIVER ENABLE
012566  012777  000001  166420          MOV     #BIT0,  @TCR    ;SET TRAN CONTROL BIT, LINE 0
012574  017701  166410          1$:     MOV     @CSR,   R1      ;WAIT
012600  100375                          BPL     1$
012602  012777  000025  166406          MOV     #25,    @TBUF   ;SEND #25
012610  105777  166374          2$:     TSTB    @CSR            ;WAIT FOR DONE
012614  100375                          BPL     2$
012616  000404                          BR      END56           ;OK, BRANCH IF NO INTERRUPT
                                                                
012620  104000          ISR56:  HLT                             ;SHOULDN'T HAVE INTERRUPTED AT LEVEL 5
012622  012716  012630                  MOV     #END56,(SP)     ;MOVE NEW RTI ADR ONTO STACK
012626  000002                          RTI
                                                                
012630  017701  166356  END56:  MOV     @RBUF,  R1      ;READ THE CHARACTER
012634  100401                          BMI     .+4             ;BRANCH IF CHAR PRESENT
012636  104001                          HLT+1                   ;CHAR PRESENT MISSING
                                                                ;R1 = CONTENTS OF RBUF
012640  022701  100025                  CMP     #100025,R1      ;CHECK THE DATA
012644  001401                          BEQ     .+4             ;BRANCH IF OK
012646  104001                          HLT+1                   ;RECEIVED DATA ERROR
                                                                ;R1 = CONTENTS OF RBUF
012650  013777  001222  166342          MOV     RCVLVL,@RCVVEC
```

```
3066  012656  012777  000004  166336          MOV     #IOT,   @RCVLVL
3067  012664  005077  166324                  CLR     @TCR
3068  012670  005077  166314                  CLR     @CSR
3069  012674  042737  000340  177776          BIC     #340,@#PS
3070
3071  012702  104400                          SCOPE
3072
3073
3074                                  ;*************************************************************************
3075                                  ;TEST 57:       TEST THAT RECEIVER INTERRUPT OCCURS AT LEVEL 4
3076                                  ;PROBABLE FAULTY LOGIC:  M7821 WIRING, PROPER PRIORITY CHIP
3077                                  ;*************************************************************************
3078
3079  012704  012777  012774  166306  TST57:  MOV     #ISR57, @RCVVEC ;SET UP XMTR INTERRUPT VECTOR
3080  012712  012777  000340  166302          MOV     #340,   @RCVLVL ;AT LEVEL 7
3081  012720  042737  000340  177776          BIC     #340,   @#PS    ;CLEAR PS LEVEL
3082  012726  052737  000200  177776          BIS     #200,   @#PS    ;SET PS TO LEVEL 4
3083  012734  004737  015546                  JSR     PC,     @#INITB ;SET:
3084                                                                  ;BIT2 = MAINTENANCE
3085                                                                  ;BIT3 = CLEAR MOS
3086                                                                  ;BIT6 = RECEIVER INTERUPT ENABLE
3087                                                                  ;BIT8 = MASTER TRANS SCAN ENABLE
3088                                                                  ;WAIT FOR MOS TO CLEAR
3089                                                                  ;BIT0 = RECEIVER ENABLE
3090  012740  012777  000001  166246          MOV     #BIT0,  @TCR    ;SET TRAN CONTROL BIT, LINE 0
3091  012746  017701  166236          1$:     MOV     @CSR,   R1      ;WAIT
3092  012752  100375                          BPL     1$
3093  012754  012777  000025  166234          MOV     #25,    @TBUF   ;SEND #25
3094  012762  105777  166222          2$:     TSTB    @CSR            ;WAIT FOR DONE
3095  012766  100375                          BPL     2$
3096  012770  104000                          HLT                     ;SHOULD HAVE INTERRUPTED AT LEVEL 4
3097  012772  000403                          BR      END57           ;CONTINUE
3098
3099  012774  012716  013002          ISR57:  MOV     #END57,(SP)     ;MOVE NEW RTI ADR ONTO STACK
3100  013000  000002                          RTI
3101
3102  013002  017701  166204          END57:  MOV     @RBUF,  R1      ;READ THE CHARACTER
3103  013006  100401                          BMI     .+4             ;BRANCH IF CHAR PRESENT
3104  013010  104001                          HLT+1                   ;CHAR PRESENT MISSING
3105                                                                  ;R1 = CONTENTS OF RBUF
3106  013012  022701  100025                  CMP     #100025,R1      ;CHECK THE DATA
3107  013016  001401                          BEQ     .+4             ;BRANCH IF OK
3108  013020  104001                          HLT+1                   ;RECEIVED DATA ERROR
3109                                                                  ;R1 = CONTENTS OF RBUF
3110  013022  013777  001222  166170          MOV     RCVLVL,@RCVVEC
3111  013030  012777  000004  166164          MOV     #IOT,   @RCVLVL
3112  013036  005077  166152                  CLR     @TCR
3113  013042  005077  166142                  CLR     @CSR
3114  013046  042737  000340  177776          BIC     #340,@#PS
3115
3116  013054  104400                          SCOPE
3117
3118
3119                                  ;*************************************************************************
3120                                  ;TEST 60:       TEST FIFO OVERRUN
3121                                  ;               THE FIFO BUFFER SHOULD HOLD 64 CHARACTERS.
```

```
                                        ;PROBABLE FAULTY LOGIC:  M7285 (D1-7) E32, E17, E22 (D2-2) E5, E1
                                        ;*****************************************************************

                                        ;              INITIALIZE
                                        ;       DEVICE"CSR"REGISTER
                                        ;                                              SET:
013056  004737  015565          TST60:  JSR     PC,     @#INITD ;BIT2 = MAINTENANCE
                                                                ;BIT3 = CLEAR MOS
                                                                ;BIT8 = MASTER XMTR SCAN ENB
                                        ;WAIT FOR MOS TO CLEAR
                                        ;                                              SET:
                                        ;                                              ;BIT0 = RECEIVER ENABLE
                                        ;
013062  012777  177777  166124          MOV     #177777,@TCR    ;TRANS CONTROL BIT, ALL LINES
013070  012700  000100                  MOV     #100.,  R0      ;SET UP COUNTER - 64. CHAR FI/FO BUFF
013074  017701  166110          1$:     MOV     @CSR,   R1      ;SAVE AND WAIT FOR TRANS READY
013100  100375                          BPL     1$
013102  000377  166110                  SWAB    @TBUF           ;TRANSMIT LINE # ON LINE
013106  032701  020000                  BIT     #BIT13, R1      ;CHECK FI/FO OVERRUN
013112  001401                          BEQ     .+4             ;BRANCH IF OK
013114  104001                          HLT+1                   ;FI/FO OVERRUN TOO SOON
                                                                ;R1=CONTENTS OF CSR
013116  005300                          DEC     R0              ;COUNT DOWN
013120  001365                          BNE     1$

013122  013700  001302                  MOV     TIMER,  R0      ;SET UP TIMER
013126  017701  166056          2$:     MOV     @CSR,   R1      ;WAIT FOR XMTR READY
013132  100375                          BPL     2$
013134  105305                  3$:     DECB    R5              ;SHORT WAIT LOOP
013136  001376                          BNE     3$
013140  017701  166044                  MOV     @CSR,   R1      ;SAVE CSR FOR THE RECORD
013144  100401                          BMI     .+4             ;BRANCH IF TRANS READY
013146  104001                          HLT+1                   ;TRANS READY MISTERIOUSLY [illegible]
                                                                ;R1=CONTENTS OF CSR
013150  005300                          DEC     R0              ;TIME 3 CHARACTER LENGTHS
013152  001370                          BNE     3$              ;BRANCH IF MORE TIME

                                        ;FI/FO SHOULD NOW BE FULL

013154  105701                          TSTB    R1              ;CHECK THAT DONE IS SET
013156  100401                          BMI     .+4             ;BRANCH IF OK
013160  104001                          HLT+1                   ;DONE DIDN'T COME UP!
                                                                ;R1 = CONTENTS OF CSR
013162  022701  100605                  CMP     #100605,R1      ;CHECK THAT FI/FO NOT OVERRUN
013166  001401                          BEQ     .+4             ;BRANCH IF OK
013170  104001                          HLT+1                   ;FI/FO OVERRUN SET
                                                                ;OR SOME OTHER CSR ERROR
                                                                ;R1=CONTENTS OF CSR

                                        ;*****************************************************************
                                        ;TEST 60A:      TEST THAT FI/FO OVERRUN COMES UP WHEN 65TH CHARACTER
                                        ;                 IS RECEIVED WITHOUT READING FI/FO
                                        ;*****************************************************************

013172  000377  166020          T60A:   SWAB    @TBUF           ;SEND 65TH CHARACTER
013176  013700  001302                  MOV     TIMER,  R0      ;SET UP TIMER
```

```
3178  013202  105305                  11$:    DECB    R5              ;SHORT WAIT LOOP
3179  013204  001376                          BNE     11$
3180  013206  017701  165776                  MOV     @CSR,R1         ;SAVE CSR
3181  013212  032701  020000                  BIT     #BIT13,R1       ;CHECK FI/FO OVERRUN
3182  013216  001003                          BNE     12$             ;BRANCH WHEN SET
3183  013220  005300                          DEC     R0              ;TIMER
3184  013222  001367                          BNE     11$             ;BRANCH IF MORE TIME
3185  013224  104001                          HLT+1                   ;FI/FO OVERRUN DIDN'T COMEUP
3186                                                                  ;R1 = CONTENTS OF CSR
3187  013226  022701  120605          12$:    CMP     #120605,R1      ;CHECK TOTAL CSR
3188  013232  001401                          BEQ     .+4             ;BRANCH IF OK
3189  013234  104001                          HLT+1                   ;SOMETHING IN CSR FOULED UP
3190                                                                  ;R1=CONTENTS OF CSR
3191
3192                                  ;*****************************************************************
3193                                  ;TEST 60B:      TEST THAT READING THE RECEIVER BUFFER CAUSES FI/FO
3194                                  ;                 OVERRUN TO CLEAR.
3195                                  ;       NOTE:   BECAUSE OF TIMING OF THE FI/FO, FI/FO OVERRUN CAN COME
3196                                  ;                 BACK UP AFTER READING ONE CHARACTER, SO A SECOND MUST
3197                                  ;                 BE READ TO INSURE THAT FI/FO OVERRUN IS CLEAR.
3198                                  ;*****************************************************************
3199
3200  013236  012700  000002          T60B:   MOV     #2,     R0      ;SET UP COUNTER - 2 CHARACTERS
3201  013242  017701  165744          21$:    MOV     @RBUF,  R1      ;CHECK AND SAVE FIRST CHAR IN FI/FO
3202  013246  100401                          BMI     .+4             ;BRANCH IF CHAR PRESENT
3203  013250  104001                          HLT+1                   ;CHARACTER PRESENT GONE!
3204
3205  013252  032701  070000                  BIT     #070000,R1      ;CHECK RECEIVER ERRORS
3206  013256  001401                          BEQ     .+4             ;BRANCH IF OK
3207  013260  104001                          HLT+1                   ;RECEIVER  ERROR
3208                                                                  ;R1=CONTENTS OF RBUF
3209                                                                  ;BIT14=UART OVERRUN
3210                                                                  ;BIT13=FRAMMING ERROR
3211                                                                  ;BIT12=PARITY ERROR
3212
3213  013262  010102                          MOV     R1,     R2      ;PUT LINE # IN R2
3214  013264  000302                          SWAB    R2
3215  013266  042702  177760                  BIC     #177760,R2
3216  013272  120102                          CMPB    R1,     R2      ;CHECK DATA (=LINE#)
3217  013274  001401                          BEQ     .+4             ;BRANCH IF OK
3218  013276  104001                          HLT+1                   ;WRONG DATA RECEIVED
3219                                                                  ;R1=FI/FO DATA
3220                                                                  ;(DATA SHOULD=LINE#)
3221  013300  005300                  22$:    DEC     R0              ;COUNT CHARACTERS
3222  013302  001403                          BEQ     24$             ;BRANCH WHEN DONE
3223  013304  105305                  23$:    DECB    R5              ;SHORT WAIT LOOP - GIVE FI/FO TIME
3224  013306  001376                          BNE     23$
3225  013310  000754                          BR      21$             ;GO READ ANOTHER
3226
3227  013312  017701  165672          24$:    MOV     @CSR,   R1      ;SAVE CSR
3228  013316  022701  100605                  CMP     #100605,R1      ;CHECK THAT FI/FO OVERRUN CLEARED
3229  013322  001401                          BEQ     .+4             ;BRANCH IF OK
3230  013324  104001                          HLT+1                   ;FI/FO OVERRUN DIDN'T CLR
3231                                                                  ;OR SOMEOTHER CSR PROBLEM
3232                                                                  ;R1=CONTENTS OF CSR
3233
```

```
                        ;*****************************************************************
                        ;TEST 600:      TEST THAT FI FO O.ERRUN INTERRUPT
                        ;               DOESN'T OCCUR WHEN THE PROCESSOR IS AT LEVEL 5
                        ;*****************************************************************

                1600:   MOV     #340,   @#PS    ;CLEAR PSW
                        MOV     #340,   @#PS    ;SET PROCESSOR TO LEVEL 5
                        MOV     #.+6,   @#300   ;SET UP RECEIVER INTERRUPT VEC
                        MOV     #100,   @#302   ;  AT LEVEL 4
                        MOV     #100,   @#RCSR  ;SET STATUS ENABLE
                        MOV     @#RCSR, R1      ;SAVE CSR
                        BIT     #100000,R1      ;CHECK CSR
                        BNE     .+4
                        JMP     @#ERROR         ;CSR ERROR
                                                ;R1=CONTENTS OF CSR
                                                ;SEND NO LINE #
                        TSTB    @#RBUF          ;WAIT FOR TRANSMITTER READ
                        MOV     #1,     @#RCSR  ;SEND LINE #
                        MOV     @#RCSR, R1      ;SAVE CSR
                        BIT     #13,    R1      ;WAIT FOR FI FO OVERRUN
                        BEQ     .-4
                        MOVB    @#RBUF, R0      ;SKIP ISR

                        MOV     #ERR5,  @#4     ;SAVE CSR
                        MOV     #340,   @#6     ;INTERRUPT OCCURRED AT LEVEL 5
                        MOV     #'Q,    @#RBUF  ;PUT ONE CHARACTER
                        MOV     #SP1,   SP      ;RESET RETURN ADDRESS
                                                ;RETURN

                        MOV     #2,     R0      ;SET UP COUNTER - 2 CHARACTERS
                1$:     TSTB    @#RCSR          ;WAIT ONE CHARACTER
                        BPL     .-4             ;BRANCH IF CHARACTER PRESENT
                        MOVB    @#RBUF, R1

                        BIT     #70000, R1      ;CHECK ERRORS
                        BNE     .+4
                        JMP     @#ERR5

                        MOV     R1,     R2      ;DUP DATA
                        BIC     #177760,R2
                        CMP     #177760,R2      ;CLR ALL BUT LINE #
                        BEQ     .+4             ;CHECK DATA
                        JMP     @#ERR5
                        DEC     R0              ;COUNT CHARACTERS
                        BEQ     2$              ;BRANCH IF DONE
                        BR      1$              ;SHORT WAIT LOOP
                                                ;GO READ ANOTHER CHARACTER

                2$:     MOV     @#RCSR, R1      ;SAVE CSR
                        CMP     #100200,R1      ;CHECK THAT FI FO O.ERRUN CLEARED
                        BEQ     .+4             ;BRANCH IF OK
```

```
                                                HLT+1                   ;FIFO OVERRUN DIDN'T CLR
                                                                        ;OR SOMEOTHER CSR PROBLEM
                                                                        ;R1=CONTENTS OF CSR

                        ;*****************************************************************
                        ;TEST 600:      TEST THAT FIFO OVERRUN INTERRUPT
                        ;               OCCURS WHEN PROCESSOR IS AT LEVEL 4
                        ;*****************************************************************

                        TEST600:        BIC     #340,   @#PS    ;CLEAR PROCESSOR LEVEL
                                        BIS     #200,   @#PS    ;SET PROCESSOR TO LEVEL 4
                                        MOV     #400$,  @#PRCVEC ;SET UP RECEIVER INTERRUPT VEC
                                        MOV     @#CSR,  R1      ;SAVE CSR
                                        CMP     #^C<CSRDN!CSRERR!CSRFOV!CSRRDY>,R1 ;CHECK CSR
                                        BEQ     .+4
                                        HLT+1
                                        MOV     #^C<CSRDN!CSRERR!CSRFOV>,@#CSR ;SEND LINE #
                        10$:            BIT     #CSRDN,@#CSR    ;WAIT FOR TRANSMITTER READY
                                        BEQ     10$
                                        MOV     #^C<CSRDN!CSRERR!CSRFOV>,@#CSR ;SEND LINE #
                        41$:            MOV     @#CSR,  R1      ;SAVE CSR
                                        BIT     #CSRFOV,R1      ;WAIT FOR FIFO OVERRUN
                                        BEQ     41$
                                        HLT+1                   ;INTERUPT DIDN'T OCCURE WHEN OVERRUN SET
                                                                ;R1 = CONTENTS OF CSR
                                        BIC     #CSRFOV,@#CSR   ;CLEAR MOS
                                        BR      44$             ;SKIP TO THE END

                        42$:            MOV     @#CSR,  R1      ;SAVE CSR
                                        CMP     #^C<CSRDN!CSRERR!CSRFOV>,R1 ;CHECK CSR
                                        BEQ     .+4             ;BRANCH IF OK
                                        HLT+1                   ;CSR ERROR
                                                                ;R1 = CONTENTS OF CSR
                                        MOV     #10.,   R0      ;INIT UP COUNTER - 255 CHARACTERS
                        43$:            MOV     @#RBUF, R1      ;READ ONE CHARACTER
                                        BIT     #CSRDN,R1       ;BRANCH IF CHARACTER PRESENT
                                        BEQ     .+4
                                        HLT+1

                                        BIT     #^C<CSRDN!CSRERR!CSRFOV>,R1 ;CHECK ERRORS
                                        BEQ     .+4
                                        HLT+1

                                        MOV     R1,     R2      ;DUP DATA
                                        BIC     #^C<CSRDN!CSRERR!CSRFOV>,R2
                                        SUB     #177760,R2      ;CLR ALL BUT LINE #
                                        CMPB    R1,     R2      ;CHECK DATA
                                        BEQ     .+4
                                        HLT+1

                                        MOV     @#CSR,  R1      ;SAVE CSR
                                        BIC     #^C<CSRDN!CSRERR!CSRFOV>,R1
                                        CMP     #CSRDN,R1       ;CHECK FOR FIRST CHAR READ
                                        BEQ     44$             ;SKIP CSR CHECK ON FIRST CHAR
                                        CMP     #^C<CSRDN!CSRERR!CSRFOV>,R1 ;CHECK CSR
```

```
014042  012746  000435                        MOV     #435,-(SP)      ;PUSH ADDRESS ON STACK
014046  104401                                TRAP    4               ;GO TO ERROR HANDLER
014050  000745                                BR      43$
014052  022767  110435  165252          44$:  CMP     #110435,@RCSR   ;CHECK CSR
014060  001402                                BEQ     .+4             ;BRANCH IF OK
014062  104001                                HLT+1                   ;DONE DIDN'T GO AWAY
                                              ;OR OTHER CSR ERROR

014064  017767  165246  165250                MOV     @RBUF, R1       ;READ A CHARACTER
014072  100001                                BPL     .+4             ;BRANCH IF NO CHAR. PRES
014074  104001                                HLT+1                   ;CHAR. PRESENT!

014076  013767  000004  165244                MOV     RCVEC,@RCVVEC
014104  012767  000340  165240                MOV     #340,@RCVVEC+2
014112  012716  014122                        MOV     #45$,(SP)       ;RESET RETURN ADDRESS ON STACK
                                              ;RESTORE PSW
014116  005067  165176          45$:  CLR     @TCR
014122  005067  165170                CLR     @RCSR
014126  042737  000340  177776          BIC     #340,@#PS       ;LOWER PROCESSOR STATUS

014134  104400                        SCOPE

                                      ;*****************************************************************
                                      ;TEST 61:       TEST THAT UART OVERRUN IS DETECTED ON ALL LINES
                                      ;PROBABLE FAULTY LOGIC:  M7285 (D2-2) E3, E1; M7279; M7280
                                      ;*****************************************************************

014136  012767  000414  165150  TST61:  MOV     #414,@RCSR      ;BIT2 = MAINTENANCE
                                              ;BIT3 = CLEAR MOS
                                              ;BIT8 = TRANS SCAN ENABLE
014144  032767  000020  165142  10$:   BIT     #BIT4,@RCSR     ;WAIT FOR MOS TO CLEAR
014152  001374                        BNE     10$
014154  005001                        CLR     R1              ;SET UP LINE COUNTER
014156  012767  000001  165134        MOV     #1,@TCR         ;TRANS CONTROL = LINE 0
014164  017702  165124          LOP61:  MOV     @RCSR,R2        ;WAIT FOR TRANS READY
014170  100375                        BPL     LOP61
014172  012767  000001  165122        MOV     #1,@TBUF        ;SEND #1
014200  017702  165110          25$:  MOV     @RCSR,R2        ;WAIT FOR TRANS READY
014204  100375                        BPL     25$
014206  012767  000002  165106        MOV     #2,@TBUF        ;SEND #2
014214  013700  001302                MOV     TIMER,R0        ;SET UP TIMER
014220  005300                35$:  DEC     R0              ;SHORT TIME LOOP
014222  001376                        BNE     35$
014224  017702  165064                MOV     @RCSR,R2        ;SAVE CSR FOR THE RECORD
014230  000240                        NOP                     ;NOP FOR TIMING
014232  005300                        DEC     R0              ;TIMER COUNT
014234  001372                        BNE     35$
014236  012767  100000  165052        MOV     #100000,@RCSR   ;SET RECEIVER ENABLE
014244  017702  165046                MOV     @RCSR,R2        ;SAVE CSR
014250  032702  100000                BIT     #BIT15,R2       ;CHECK RECEIVER ENABLE
014254  001002                        BNE     .+4             ;BRANCH IF OK
014256  104002                        HLT+2                   ;RECEIVER ENABLE FAILED TO SET
                                              ;R1 = LINE #
```

```
                                                        ;R2 = CONTENTS OF CSR
014152  105737  165032          4$:   TSTB    @CSR      ;WAIT FOR DONE
014156  100375                      BPL     4$
014160  016102  165026              MOV     @RBUF, R2   ;READ FIFO
014164  100401                      BMI     .+4         ;BRANCH  IF CHARACTER PRESENT
014166  104002                      HLT+2               ;NO CHARACTER PRESENT
                                                        ;R1 = LINE #
                                                        ;R2 = CONTENTS OF RBUF
014170  032702  040000              BIT     #BIT14, R2  ;CHECK FOR UART OVERRUN
014174  001403                      BNE     .+4         ;BRANCH IF OK
014176  104002                      HLT+2               ;UART OVERRUN MISSING
                                                        ;R1 = LINE #
                                                        ;R2 = CONTENTS OF RBUF
014200  032702  000002              BIT     #2, R2      ;CHECK THE DATA
014204  001403                      BEQ     .+4         ;BRANCH IF OK
014206  104002                      HLT+2               ;DATA ERROR - 3RD CHAR OVERRUNS END
                                                        ;R1 = LINE #
                                                        ;R2 = CONTENTS OF RBUF
                                    MOV     R2, R3      ;DUP DATA
                                    SWAB    R3
                                    BIC     #^C377, R3  ;MASK ALL BIT LINE #, ERROR BITS
                                    CMPB    R1, R3      ;CHECK LINE #, ERRORS
                                    BEQ     .+4         ;BRANCH IF OK
                                    HLT+2               ;LINE # OR OTHER RBUF ERROR
                                                        ;R1 = LINE #
                                                        ;R2 = CONTENTS OF RBUF
                                7$:   MOV     @RBUF, R2   ;CHECK FOR MORE DATA
                                    BPL     8$          ;BRANCH IF OK
                                    HLT+2               ;EXTRA DATA IN FIFO!
                                                        ;R1 = LINE #
                                                        ;R2 = CONTENTS OF RBUF
014236  000773                      BR      7$

014240  005077  164744          8$:   CLR     @CSR        ;CLEAR RECEIVER ENABLE
014244  017702  164740              MOV     @CSR, R2    ;SAVE CSR
014250  022702  100404              CMP     #100404, R2 ;CHECK CSR
014254  001403                      BEQ     .+4         ;BRANCH IF OK
014256  104032                      HLT+2               ;CSR ERROR
                                                        ;R1 = LINE NUMBER
                                                        ;R2 = CONTENTS OF CSR
014260  005201                      INC     R1          ;COUNT LINES
014262  006377  164726              ASL     @TCR        ;GO TO NEXT LINE
014266  103274                      BCC     LOP61       ;BRANCH BACK IF MORE LINES

014270  005077  164714              CLR     @CSR

014274  104400                      SCOPE


                                ;*****************************************************************
                                ;TEST 62:       TEST BITS OF BCSR FOR READ WRITE CAPABILITY
                                ;PROBABLE FAULTY LOGIC:  M7285 (D2-2) E5, E1, (D2-3) E16, E3, E19, E35
                                ;*****************************************************************

014276  012777  002010  164704  TST62:  MOV     #002010,@BCSR   ;SET CSR
014304  012777  177777  164702          MOV     #177777,@BCSR   ;SET ALL BITS OF BCSR
```

```
 3458  014312  017701  164576          MOV     @BCSR,  R1      ;CHECK AND SAVE BCSR
 3459  014316  022701  177777          CMP     #177777,R1      ;CHECK THAT ALL THE BITS ARE SET
 3460  014322  001401                  BEQ     .+4             ;BRANCH IF OK
 3461  014324  104001                  HLT+1                   ;BIT(S) OF BCSR FAILED TO SET
 3462
 3463  014326  005077  164552          CLR     @BCSR           ;CLEAR BCSR
 3464  014332  017701  164546          MOV     @BCSR,  R1      ;CHECK THAT IT CLEARED AND SAVE
 3465  014336  001401                  BEQ     .+4             ;BRANCH IF CLR
 3466  014340  104001                  HLT+1                   ;BIT(S) OF BCSR FAILED TO CLEAR
 3467
 3468  014342  104400                  SCOPE

                                ;*****************************************************************
                                ;TEST 63:       TEST THAT LINE0 CAN TRANSMIT AND RECEIVE A BREAK
                                ;       ALSO CHECKS FRAMING ERROR(RBUF BIT13)
                                ;       ALSO CHECKS PARITY ERROR(RBUF BIT12)
                                ;       IF ODD PARITY IS SELECTED
                                ;PROBABLE FAULTY LOGIC:  M7205 (D2-2) E5, E1, (D2-3) E16, E2, E19, E3E
                                ;*****************************************************************

 3469  014344  004737  015536  TST63:  JSR     PC,     @#INITA ;INITIALIZE
                                                                ;BIT2 = MAINTENANCE
                                                                ;BIT3 = CLEAR MOS
                                                                ;BIT10= R/W BCSR
                                                                ;WAIT FOR MOS TO CLEAR
                                                                ;BIT0 = RECEIVER ENABLE
 3470  014350  012777  000001  164536  MOV     #1,     @BCSR   ;SEND BREAKS, LINE 0
 3471  014356  013700  001302          MOV     TIMER,  R0      ;SET UP TIMER
 3472  014362  105305          1$:     DECB    R5              ;SHORT WAIT LOOP
 3473  014364  001376                  BNE     1$
 3474  014366  017701  164516          MOV     @CSR,   R1      ;SAVE CSR
 3475  014372  105701                  TSTB    R1              ;CHECK FOR DONE
 3476  014374  100404                  BMI     2$              ;BRANCH WHEN DONE
 3477  014376  005200                  INC     R0              ;WAIT A WHILE
 3478  014400  001370                  BNE     1$
 3479  014402  104001                  HLT+1                   ;DONE NEVER CAME UP
                                                                ;R1=CONTENTS OF CSR
 3480  014404  000430                  BR      4$
 3481  014406  022701  002205  2$:     CMP     #2205,  R1      ;CHECK REST OF CSR
 3482  014412  001401                  BEQ     .+4             ;BRANCH IF OK
 3483  014414  104001                  HLT+1                   ;CSR ERROR
                                                                ;R1=CONTENTS OF CSR
 3484
 3485  014416  017701  164570          MOV     @RBUF,  R1      ;GET DATA FROM FIFO
 3486  014422  100401                  BMI     .+4             ;BRANCH IF OK
 3487  014424  104001                  HLT+1                   ;CHARACTER PRESENT NOT UP
                                                                ;R1=CONTENTS OF RBUF
 3488
 3489  014426  032701  020000          BIT     #020000,R1      ;CHECK FOR FRAMING ERROR
 3490  014432  001001                  BNE     .+4             ;BRANCH IF OK
 3491  014434  104001                  HLT+1                   ;FRAMING ERROR NOT UP
                                                                ;R1=CONTENTS OF RBUF
 3492  014436  133737  001310  001276  BITB    DJPAR,  PARITY  ;CHECK ODD PARITY FLAG
 3493  014444  001404                  BEQ     3$              ;BRANCH IF NOT
 3494  014446  032701  010000          BIT     #010000,R1      ;CHECK PARITY ERROR
 3495  014452  001035                  BNE     4$              ;
```

```
014454  104001                          HLT+1                   ;ODD PARITY SHOULD CAUSE PARITY ERROR
                                                                ;R1=CONTENTS OF RBUF

014456  032701  010000          3$:     BIT     #010000,R1      ;CHECK PARITY ERROR
014462  001401                          BEQ     .+4             ;BRANCH IF OK
014464  104001                          HLT+1                   ;EVEN PARITY OR NO PARITY
                                                                ;SHOULDN'T CAUSE PARITY ERROR
                                                                ;R1=CONTENTS OF RBUF
014466  032701  040000          4$:     BIT     #040000,R1      ;CHECK UART OVERRUN
014472  001401                          BEQ     .+4             ;BRANCH IF OK
014474  104001                          HLT+1                   ;UART OVERRUN SET!!
                                                                ;R1=CONTENTS OF RBUF
014476  032701  007400                  BIT     #007400,R1      ;CHECK LINE #
014502  001401                          BEQ     .+4             ;BRANCH IF OK
014504  104001                          HLT+1                   ;WRONG LINE# IN FIFO
                                                                ;R1=CONTENTS OF RBUF
014506  105701                          TSTB    R1              ;CHECK DATA
014510  001401                          BEQ     .+4             ;BRANCH IF OK
014512  104001                          HLT+1                   ;WRONG DATA RECEIVED
                                                                ;R1=CONTENTS OF RBUF

014514  017701  164472                  MOV     @RBUF, R1       ;READ FIFO AGAIN
014520  001401                          BEQ     .+4             ;BRANCH IF OK
014522  104001                          HLT+1                   ;EXTRA CHAR IN FIFO
                                                                ;R1 = CONTENTS OF RBUF
014524  005077  164464                  CLR     @#BRKCSR        ;CLEAR BREAK CONTROL REG
014530  005000          5$:     DEC     R0              ;SHORT WAIT LOOP-REGISTER = MOD4
014532  001376                  BNE     5$

014534  104400                  SCOPE


                        ;*****************************************************************
                        ;TEST 64:      TEST THAT EACH LINE CAN TRANSMIT AND RECEIVE A BREAK
                        ;              ALSO CHECKS FRAMING ERROR,RBUF BIT 13
                        ;              ALSO CHECKS PARITY ERROR,RBUF BIT 12
                        ;              EACH CHARACTER IS RE-ENTERED
                        ;PROBABLE FAULTY LOGIC:  M7265 (CD-11-B) E5, E1, CD-11-B E15, E3, E19, E35
                        ;*****************************************************************

014536  004737  015536  TST64:  JSR     R5,     $INITA  ;INITIALIZE
                                                        ;BIT 2 = MAINTENANCE
                                                        ;BIT3 = CLEAR MOS
                                                        ;BIT10= RESET BCSR
                                                        ;BIT11= FOR MOS TO CLEAR
                                                        ;BIT0 = RECEIVER ENABLE
014542  005001                  CLR     R1              ;SET UP LINE COUNTER
014544  012704  000001          MOV     #1,     R4      ;SET UP LINE MARKER
014550  013705  001302  LOP64:  MOV     @#TIMER, R5     ;SET UP TIMER
014554  050477  164434          BIS     R4,     @#BCSR  ;SET BREAK CONTROL BIT, LINE # IN R1
014560  105305          1$:     DECB    R5              ;SHORT WAIT LOOP
014562  001376                  BNE     1$
014564  017702  164420          MOV     @#CSR,  R2      ;SAVE CSR
014570  105702                  TSTB    R2              ;CHECK FOR DONE
014572  100004                  BPL     2$              ;BRANCH WHEN DONE
014574  032702  000200          BIT     #200,   R2      ;WAIT A WHILE
```

```
014576  001377          BNE     1$
014600  104002          HLT+2                   ;DONE NEVER CAME UP
                                                ;R1 = LINE #
                                                ;R2 = CONTENTS OF CSR

014602  022705  002205  2$:     CMP     #2205,  R5      ;CHECK REST OF CSR
014606  001402          BEQ     .+4             ;BRANCH IF OK
014610  104002          HLT+2                   ;CSR ERROR
                                                ;R1 = LINE #
                                                ;R2 = CONTENTS OF CSR

014612  016705  164372          MOV     @RBUF,  R5      ;GET DATA FROM FIFO
014616  100402          BPL     .+4             ;BRANCH IF OK
014620  104002          HLT+2                   ;CHARACTER PRESENT NOT UP
                                                ;R1 = LINE #
                                                ;R2 = CONTENTS OF RBUF

014622  032705  020000          BIT     #020000,R5      ;CHECK FOR FRAMING ERROR
014626  001402          BEQ     .+4             ;BRANCH IF OK
014630  104002          HLT+2                   ;FRAMING ERROR NOT UP
                                                ;R1 = LINE #
                                                ;R2 = CONTENTS OF RBUF

014632  010103          MOV     R1,     R3      ;GET LINE #
                        BIC     R3,     R3      ;
014634  133763  001310  001276  BITB    DIPAR,PARITY(3) ;CHECK ODD PARITY FLAG
014642  001402          BEQ     3$              ;BRANCH IF NOT
014644  032705  010000          BIT     #010000,R5      ;CHECK PARITY ERROR
014650  001002          BNE     4$              ;
014652  104002          HLT+2                   ;ODD PARITY SHOULD CAUSE PARITY ERROR
                                                ;R1 = LINE #
                                                ;R2 = CONTENTS OF RBUF

014654  032705  010000  3$:     BIT     #010000,R5      ;CHECK PARITY ERROR
014660  001402          BEQ     4$              ;BRANCH IF OK
014662  104002          HLT+2                   ;EVEN PARITY OR NO PARITY
                                                ;SHOULDN'T CAUSE PARITY ERROR
                                                ;R1 = LINE #
                                                ;R2 = CONTENTS OF RBUF

014664  032705  040000  4$:     BIT     #040000,R5      ;CHECK UART OVERRUN
014670  001402          BEQ     .+4             ;BRANCH IF OK
014672  104002          HLT+2                   ;UART OVERRUN SET!!
                                                ;R1 = LINE #
                                                ;R2 = CONTENTS OF RBUF

014674  010203          MOV     R2,     R3      ;DUP DATA
014676  000303          SWAB    R3              ;LINE # IN LOW BYTE
014700  042703  177760          BIC     #177760,R3      ;MASK ALL BUT LINE #
014704  020103          CMP     R1,     R3      ;CHECK FOR RIGHT LINE #
014706  001402          BEQ     .+4             ;BRANCH IF OK
014710  104002          HLT+2                   ;WRONG LINE# IN FIFO
                                                ;R1 = LINE #
                                                ;R2 = CONTENTS OF RBUF


014712  105702          TSTB    R2              ;CHECK DATA
```

```
                014722  001401                          BEQ     .+4             ;BRANCH IF OK
                014724  104002                          HLT+2                   ;WRONG DATA RECEIVED
                                                                                ;R1 = LINE #
                                                                                ;R2 = CONTENTS OF RBUF
                014726  017702  164260                  MOV     @RBUF, R2       ;READ FIFO AGAIN
                014732  100001                          BPL     .+4             ;BRANCH IF OK
                014734  104002                          HLT+2                   ;EXTRA CHAR IN FIFO
                                                                                ;R1 = LINE #
                                                                                ;R2 = CONTENTS OF RBUF
                014736  005077  164252                  CLR     @BCSR           ;CLEAR BREAK CONTROL REG
                014742  005201                          INC     R1              ;COUNT LINES
                014744  006304                          ASL     R4              ;UPDATE LINE MARKER
                014746  103300                          BCC     LOP64           ;BRANCH IF MORE LINES

                014750  005077  164234                  CLR     @CSR            ;CLEAR CSR
                014754  104400                          SCOPE

                014756  012737  000002  015772          MOV     #2,     TIMES

                                        ;*****************************************************************************
                                        ;TEST 65:       TEST THAT RESET CLEARS ALL BUFFERS
                                        ;       NOTE:   THE FIFO BUFFER IS NOT COMPLETELY CLEARED
                                        ;               BY RESET; ONLY CHARACTER PRESENT IS CLEARED.
                                        ;PROBABLE FAULTY LOGIC:  M7285 (D2-8) E13
                                        ;*****************************************************************************

                014764  052737  000340  177776  TST65:  BIS     #340,@#PS       ;SET PROCESSOR TO LEVEL 7
                014772  012777  177777  164214          MOV     #177777,@TCR    ;SET ALL TCR BITS
                015000  012777  052507  164202          MOV     #052507,@CSR    ;SET ALL R/W BITS OF CSR
                015006  012777  177777  164200          MOV     #177777,@BCSR   ;SET ALL BREAK CONTROL BITS (SEND BREAKS)
                                        ;NOTE:  ALL LINES SHOULD BE SENDING BREAKS, BUT NONE SHOULD BE RECEIVING
                                        ;         BECAUSE THE HALF DUPLEX BIT IS SET
                015014  012777  177777  164174          MOV     #177777,@TBUF   ;LOADING TRANS BUFF WHEN BREAK BIT SET
                                                                                ;  SHOULD DO NOTHING
                015022  000005                          RESET                   ;CLEAR THE WORLD
                015024  013737  001210  015034          MOV     CSR,1$          ;CHECK CSR AND SAVE
                015032  013701                          MOV     @(PC)+,R1
                015034  000000                  1$:     000000
                015036  001401                          BEQ     .+4
                015040  104001                          HLT+1

                015042  017701  164146                  MOV     @TCR,R1         ;CHECK TCR AND SAVE
                015046  001401                          BEQ     .+4
                015050  104001                          HLT+1

                015052  017701  164136                  MOV     @BCSR,R1        ;CHECK BCSR AND SAVE
                015056  001401                          BEQ     .+4
                015060  104001                          HLT+1

                015062  017701  164124                  MOV     @RBUF,R1        ;CHECK RBUF AND SAVE
                015066  100001                          BPL     .+4
                015070  104001                          HLT+1

                015072  017701  164120                  MOV     @TBUF,R1        ;CHECK TBUF AND SAVE
                015076  001401                          BEQ     .+4
                015100  104001                          HLT+1
```

```
                                        ;*****************************************************************
                                        ;TEST 66:       SEND A BINARY COUNT PATTERN ON EACH LINE
                                        ;PROBABLE FAULTY LOGIC:  COULD BE ALMOST ANYWHERE!
                                        ;*****************************************************************

015102  104400                          SCOPE

015104  005001          TST66:  CLR     R1                      ;SET UP LINE COUNTER
015106  012703  100000          MOV     #100000,R3              ;SET UP RCV DATA
015112  005004                  CLR     R4                      ;SET UP TRANS DATA
015114  042737  000340  177776  BIC     #340,   @#PS            ;CLEAR PROCESSOR PRIORITY
015122  052737  000200  177776  BIS     #200,   @#PS            ;SET PRIORITY TO 4
015130  012700  000001          MOV     #1,     R0              ;SET UP LINE MARKER
015134  012777  000010  164046  MOV     #10,@DCSR               ;CLEAR MOS
015142  012777  010505  164040  MOV     #010505,@DCSR           ;BIT0 = RECEIVE ENABLE
                                                                ;BIT2 = MAINTENANCE
                                                                ;BIT6 = RECEIVER INTERRUPT ENB
                                                                ;BIT8 = TRANS SCAN ENABLE
                                                                ;BIT12= STATUS ENABLE
015150  032777  000020  164032  10$:    BIT     #BIT4,  @DCSR   ;WAIT FOR MOS TO CLEAR
015156  001374                  BNE     10$
015160  012777  015274  164032          MOV     #ISR66,@RCVVEC  ;SET UP RECEIVER INTERRUPT VECTOR
015166  012777  000240  164026          MOV     #240,   @RCVLVL
015174  010077  164014          1$:     MOV     R0,     @TCR    ;TRANS CONTROL, ONE LINE AT A TIME
015200  005777  164004          2$:     TST     @DCSR           ;WAIT FOR TRANS READY
015204  100375                  BPL     2$
015206  010477  164004                  MOV     R4,     @TBUF   ;SEND DATA
015212  105204                  INCB    R4                      ;BINARY COUNT
015214  001371                  BNE     2$
015216  105703          3$:     TSTB    R3                      ;WAIT FOR RECEIVER DONE
015220  001376                  BNE     3$
015222  017702  163762          MOV     @DCSR,  R2              ;SAVE CSR
015226  022702  110505          CMP     #110505,R2              ;CHECK CSR
015232  001401                  BEQ     .+4                     ;BRANCH IF OK
015234  104002                  HLT+2                           ;CSR ERROR
                                                                ;R1=LINE #
                                                                ;R2=CONTENTS OF CSR
015236  017702  163750          MOV     @RBUF,  R2              ;CHECK CHARACTER PRESENT
015242  100001                  BPL     .+4                     ;BRANCH IF OK
015244  104002                  HLT+2                           ;CHARACTER PRESENT SET!!
                                                                ;R1=LINE #
                                                                ;R2=CONTENTS OF CSR
015246  062703  000400          ADD     #400,   R3              ;UPDATE LINE # IN EXPECTED DATA
015252  005201                  INC     R1                      ;UPDATE LINE #
015254  032701  000003          BIT     #3,     R1              ;CHECK FOR FOURTH LINE
015260  001002                  BNE     4$                      ;BRANCH IF NOT
015262  005237  001306          INC     DJLEN                   ;MOVE CHARACTER LENGTH POINTER
015266  006300          4$:     ASL     R0                      ;UPDATE LINE MARKER
015270  103341                  BCC     1$                      ;BRANCH IF MORE
015272  000417                  BR      END66                   ;SKIP ISR

015274  017702  163712  ISR66:  MOV     @RBUF,  R2              ;READ FIRST DATA
015300  100401                  BMI     11$                     ;BRANCH IF CHARACTER PRESENT
015302  104003                  HLT+3                           ;INTERRUPT BUT NO CHAR PRESENT
```

```
3738                                                                    ;R1=LINE #
3739                                                                    ;R2=CONTENTS OF RBUF
3740                                                                    ;R3=EXPECTED DATA
3741  015304  020203                    11$:     CMP     R2,     R3    ;CHECK THE DATA
3742  015306  001401                             BEQ     .+4           ;BRANCH IF OK
3743  015310  104003                             HLT+3                 ;DATA ERROR
3744                                                                    ;R1=LINE #
3745                                                                    ;R2=CONTENTS OF RBUF
3746                                                                    ;R3=EXPECTED DATA
3747  015312  105203                             INCB    R3            ;UPDATE EXPECTED DATA
3748  015314  147703  163766                    BICB    @DJLEN, R3    ;MASK CHARACTER LENGTH
3749  015320  001403                             BEQ     12$           ;BRANCH OUT IF DATA=0
3750  015322  017702  163664                    MOV     @RBUF,  R2    ;READ MORE DATA
3751  015326  100766                             BMI     11$           ;BRANCH IF MORE
3752  015330  000002                    12$:     RTI                   ;RETURN
3753
3754  015332  162737  000004  001306  END66:   SUB     #4,     DJLEN ;RESET CHAR LENGTH POINTER
3755  015340  013777  001222  163652            MOV     RCVLVL, @RCVVEC ;RESTORE RECEIVER INT. VEC
3756  015346  012777  000004  163646            MOV     #IOT,   @RCVLVL
3757  015354  005077  163634                    CLR     @TCR          ;CLEAR TCR
3758  015360  005077  163624                    CLR     @CSR          ;CLEAR CSR
3759  015364  104400                             SCOPE
3760
3761  015366  012737  000020  015772            MOV     #20,    TIMES
3762  015374  023737  001304  001234            CMP     DJUUT.UNITS   ;CHECK FOR LAST UNIT
3763  015402  002002                             BGE     DONE          ;BRANCH IF LAST UNIT
3764  015404  000137  002302                    JMP     RESTAR        ;JUMP IF NOT
3765
3766  015410                            DONE:
3767  015410  004737  017640                    JSR     PC,     KBDINT
3768  015414  062737  000001  001206            ADD     #1,PCNT+2     ;ADD 1 TO THE PASS COUNT
3769  015422  005537  001204                    ADC     PCNT          ;MAKE IT DOUBLE PREC.
3770  015426  032777  002000  163662            BIT     #SW10,@SWR    ;RING THE BELL?
3771  015434  001004                             BNE     1$            ;NO!
3772  015436  000004  000007                    TYPE    .BELL         ;RING THE BELL
3773  015442  000004  000177                    TYPE    ,177          ;TYPE A FILLER FOR 11/05
3774  015446  005046                    1$:      CLR     -(6)          ;CLEAR TRACE TRAP
3775  015450  032777  010000  163640            BIT     #SW12,@SWR    ;RUN WITH TRT?
3776  015456  001010                             BNE     2$            ;SKIP T BIT
3777  015460  005137  015532                    COM     .TBIT         ;COMPLIMENT FLAG
3778  015464  100005                             BPL     2$            ;SKIP IF PLUS
3779  015466  052716  000020                    BIS     #20,(6)       ;SET TRACE TRAP
3780  015472  012746  015526                    MOV     #3$,-(6)      ;JUMP TO START OF TEST
3781  015476  000002                             RTI                   ;RETURN
3782  015500  012746  015506            2$:      MOV     #4$,-(6)      ;JUMP TO START OF TEST
3783  015504  000002                             RTI                   ;RETURN
3784  015506  013700  000042            4$:      MOV     @#42,R0       ;GET MONITOR ADDRESS
3785  015512  001405                             BEQ     3$            ;IF NONE
3786  015514  000005                             RESET                 ;RESET AND
3787          015516                             $ENDAD =.
3788  015516  004710                             JSR     7,(0)         ;GO TO MONITOR
3789  015520  000240                             NOP                   ;SAVE ROOM
3790  015522  000240                             NOP                   ;FOR
3791  015524  000240                             NOP                   ;ACT11
3792  015526  000137  002302            3$:      JMP     RESTAR        ;RETURN
3793
```

```
 3794  015532  000000                  .TBIT:  0                       ;T BIT FLAG
 3795
 3796  015534  000002                  TESRT:  RTI                     ;RETURN FROM TRACE TRAP
                                       ;
                                       ;   INITIALIZATION ROUTINE
                                       ;
                                       ;       DEVICE CSR REGISTER
                                       ;
                                       ;ON FAILURE:    REGISTER 0 CONTAINS ERROR ADDRESS
                                       ;
                                       ;SET:
                                       ;BIT01 = HALF DUPLEX
                                       ;BIT02 = MAINTENANCE
                                       ;BIT03 = CLEAR MOS
                                       ;BIT06 = RECEIVER INTERRUPT ENABLE
                                       ;BIT08 = MASTER XMTR SCAN ENB
                                       ;BIT10 = R/W BCSR
                                       ;
                                       ;WAIT FOR MOS TO CLEAR
                                       ;SET:
                                       ;BIT00 = RECEIVER ENABLE
                                       ;
                                       ;                               SET
 3817  015536  012777  002014  163444  INITA:  MOV     #2014,@CSR      ;BIT(S)2,3,10 THEN 0
 3818  015544  000413                          BR      INITR
 3819
 3820  015546  012777  000514  163434  INITB:  MOV     #514,@CSR       ;BIT(S)2,3,6,8 THEN 0
 3821  015554  000407                          BR      INITR
 3822
 3823  015556  012777  000416  163424  INITC:  MOV     #416,@CSR       ;BIT(S)1,2,3,8 THEN 0
 3824  015564  000403                          BR      INITR
 3825
 3826  015566  012777  000414  163414  INITD:  MOV     #414,@CSR       ;BIT(S)2,3,8 THEN 0
 3827
 3828  015574  005000                  INITR:  CLR     R0
 3829
 3830  015576  005200                  1$:     INC     R0              ;ANTIHANG
 3831  015600  001004                          BNE     2$              ;ROUTINE
 3832
 3833  015602  011600                          MOV     (SP),R0         ;RECORD SUBROUTINE CALL RETURN
 3834  015604  162700  000002                  SUB     #2,R0           ;FORM CALL ADDRESS FOR DISPLAY
 3835
 3836  015610  104000                          HLT                     ;BIT#4 OF DEVICE CSR FAILED TO CLEAR
 3837
 3838  015612  032777  000020  163370  2$:     BIT     #BIT4,@CSR      ;TEST HAS MOS CLEARED
 3839  015620  001366                          BNE     1$              ;NO BRANCHES
 3840                                                                  ;SET:
 3841  015622  052777  000001  163360          BIS     #1,     @CSR    ;BIT00 RECEIVE ENABLE
 3842  015630  000207                          RTS     PC              ;CONTINUE
 3843                                  ;
 3844                                  ;       $SCOPE          SCOPE LOOP HANDLER
 3845
 3846                                  ;THIS ROUTINE HANDLES THE ITERATIONS, LOOPING, ERROR
 3847                                  ;LOOPING, AND THE DISPLAYING OF THE TEST NUMBER.
 3848
 3849
```

```
3850                                        :"SCOPE" IS PLACED BETWEEN EACH SUBTEST IN THE TEST AND
3851                                        ;RECORDS THE STARTING ADDRESS OF THE SUBTEST IN "LAD:"
3852
3853  015532  004737  017640        TRAP$:  JSR     PC,     KBDINT
3854  015536  032777  000400  163452        BIT     #SW8,@SWR       ;LOOP ON SPEC. TEST?
3855  015544  001404                        BEQ     1$              ;NO LOOP ON SPEC. TEST
3856  015546  127737  163444  001200        CMPB    @SWR,ICNT       ;ON RIGHT TEST?   *SW7-0*
3857  015554  001434                        BEQ     OVER$           ;NOT RIGHT TEST
3858  015556  032777  040000  163432  1$:   BIT     #SW14,@SWR      ;LOOP ON TEST?
3859  015564  001026                        BNE     KIT$            ;LOOP ON TEST IS SET
3860  015566  032777  004000  163422        BIT     #SW11,@SWR      ;KILL ITERATIONS
3861  015574  001012                        BNE     SVLAD$          ;YES - KILL ITERATIONS
3862  015576  105737  001201                TSTB    ICNT+1          ;FIRST ONE?
3863  015702  001404                        BEQ     2$              ;BRANCH IF FIRST
3864  015704  123737  015772  001201        CMPB    TIMES,ICNT+1    ;DONE?
3865  015712  001013                        BNE     KIT$            ;BRANCH IF NOT
3866  015714  112737  000001  001201  2$:   MOVB    #1,ICNT+1       ;FIRST ITERATION
3867  015722  105237  001200        SVLAD$: INCB    ICNT            ;COUNT TEST NUMBERS
3868  015726  011637  015770                MOV     (6),LAD         ;SAVE LOOP ADDRESS
3869  015732  013737  001200  001320        MOV     ICNT,@#DISPLAY  ;DISPLAY TEST NO. AND ITERATION COUNT
3870  015740  000002                        RTI                     ;RETURN
3871
3872  015742  105237  001201        KIT$:   INCB    ICNT+1          ;INC THE ITERATION COUNT
3873  015746  013737  001200  001320  OVER$:  MOV     ICNT,@#DISPLAY  ;SET UP DISPLAY
3874  015754  005737  015770                TST     LAD             ;FIRST ONE?
3875  015760  001760                        BEQ     SVLAD$          ;YES
3876  015762  013716  015770                MOV     LAD,(6)         ;FUDGE RETURN ADDRESS
3877  015766  000002                        RTI                     ;FIXES PS
3878
3879  015770  000000        LAD:    0               ;LOOP ADDRESS
3880  015772  000020        TIMES:  20              ;RUN 20 TIMES
```

```
                                        ;       $HLT            ERROR TYPEOUT HANDLER
                                        ;
                                        ;THIS ROUTINE PRINTS OUT ERROR MESSAGES STARTING WITH THE
                                        ;ADDRESS OF THE "HLT". IT ALSO COUNTS THE NUMBER OF ERRORS
                                        ;AND HAS THE CAPABILITY OF LOOPING ON ERROR, BELL ON ERROR,
                                        ;"HALT" ON ERROR, AND INHIBIT TYPEOUTS. AN OPTIONAL ARGUEMENT
                                        ;(HLT+3) WILL BE PLACED IN "HLTCT$:" FOR ADITIONAL TYPEOUTS.
                                        ;
016774  004737  017640          EMT$:   JSR     PC,     KBDINT
016000  032777  002000  163310          BIT     #SW10,@SWR      ;BELL ON ERROR?
016006  001402                          BEQ     1$              ;NO - SKIP
016010  000004  000007                  TYPE    ,BELL           ;RING BELL
016014  005237  001202          1$:     INC     ERRORS          ;COUNT THE NUMBER OF ERRORS
016020  032777  020000  163270          BIT     #SW13,@SWR      ;SKIP TYPEOUT IF SET
016026  001026                          BNE     2$              ;SKIP TYPEOUTS
016030  000004  016034                  TYPE    ,.+2            ;.ASCIZ <15><12>
016040  011637  016144                  MOV     (6),HLTADR      ;PUT ADDRESS OF INSTRUCTION ON STACK
016044  162737  000002  016144          SUB     #2,HLTADR       ;FUDGE ADDRESS
016052  117737  000066  016142          MOVB    @HLTADR,HLTCT$  ;GET HLT ARGUEMENT
016060  013705  016144                  MOV     HLTADR,TTY      ;TYPE HLTADR IN OCTAL
016064  004737  016562                  JSR     PC,PRINTR       ;TYPE LEADING ZERO'S
016070  000004  016074                  TYPE    ,.+2            ;.ASCIZ "  "
016100  004737  016146                  JSR     PC,ERROR$       ;GO TO USER ERROR ROUTINE
016104  005777  163206          2$:     TST     @SWR            ;HALT ON ERROR
016110  100001                          BPL     .+4             ;SKIP IF CONTINUE
016112  000000                          HALT                    ;HALT ON ERROR!
016114  004737  017640                  JSR     PC,KBDINT
016120  032777  001000  163170          BIT     #SW9,@SWR       ;CHECK FOR INHIBIT LOOP ON ERROR
016126  001001                          BNE     .+4             ;SKIP IF LOOP ON ERROR
016130  000002                          RTI                     ;RETURN
016132  105037  001201                  CLRB    ICNT+1          ;CLEAR ITERATION COUNT
016136  000137  015742                  JMP     KIT$            ;LOOP ON TEST UNTIL NO ERRORS
                                        ;
016142  000000          HLTCT$: 0                               ;HLT ARGUEMENT
016144  000000          HLTADR: 0                               ;LAST HLT INSTRUCTION EXECUTED
                                        ;
016146                  ERROR$:
016146  013705  001210                  MOV     CSR,TTY         ;TYPE CSR IN OCTAL
016152  004737  016562                  JSR     PC,PRINTR       ;TYPE LEADING ZERO'S
016156  042737  007700  016204          BIC     #7700,2$
016164  105337  016142          1$:     DECB    HLTCT$
016170  100411                          BMI     3$
016172  062737  000100  016204          ADD     #100,2$
016200  000004  017241                  TYPE,   SPACE
016204  010005                  2$:     MOV     %0,TTY          ;TYPE REGISTER X IN OCTAL
016206  004737  016562                  JSR     %7,PRINTR
016212  000764                          BR      1$
016214  000207          3$:     RTS     PC
```

```
                        ;SUBROUTINE TO SAVE INPUT AS OCTAL NUMBER

000000 016501 000010    EAOIN: MOV     #1.INMRE
000004 004767 000000           JSR     PC,     READCS  ;GO READ TTY UNTIL CR
000010 010001                  MOV     R1,     INMRE
000012 010146                  MOV     R1,-(SP)        ;PUSH R1 ON STACK
000014 010246                  MOV     R2,-(SP)        ;PUSH R2 ON STACK
000016 010346                  MOV     R3,-(SP)        ;PUSH R3 ON STACK
000020 005001                  CLR     R1
000022 005002                  CLR     R2
000024 112102 000060           MOVB    (R1)+,  R2
000030 122702 000120           CMPB    #'P,    R2      ;CHECK FOR "P"
000034 001403                  BEQ     1$
000036 112102                  MOVB    (R1)+,  R2
000040 001774                  BEQ     .-4
000042 000137 000000           JMP     @#ERROR
000046 012703 000015    1$:    MOV     #15,    R3
000052 005001                  CLR     R1
000054 060302                  ADD     R3,     R2
000056 160203                  SUB     #60,    R3
000060 100410                  BMI     ERROR           ;BRANCH IF BAD DATA
000062 020327 000011           CMP     R3,     #11
000066 002005                  BGE     ERROR
000070 006301                  ASL     R1
000072 006301                  ASL     R1
000074 006301                  ASL     R1
000076 060201                  ADD     R2,     R1
000100 000767                  BR      2$
000102 010100           ERROR: MOV     R1,     @#ERRBYT
000106 000137 000000           JMP     @#ERROR
000112 012603           2$:    MOV     (SP)+,  R3      ;POP R3 OFF STACK
000114 012602                  MOV     (SP)+,  R2      ;POP R2 OFF STACK
000116 012601                  MOV     (SP)+,  R1      ;POP R1 OFF STACK
000120 000207                  RTS     PC

000122 000000           INMRE: .WORD   0               ;TEMPORARY STORAGE FOR PS

000124 010046           READCS: MOV    R0,     -(SP)   ;SAVE R0
000126 010146                  MOV    R1,     -(SP)   ;SAVE R1
000130 010246                  MOV    R2,     -(SP)   ;SAVE R2
000132 010346                  MOV    R3,     -(SP)   ;SAVE R3
000134 005001                  CLR    R1              ;CLEAR R1 FOR
000136 005002                  CLR    R2              ;CHARACTER
000140 005003                  CLR    R3              ;AND COUNTER
000142 105737 177560    1$:    TSTB   @#TKS           ;WAIT FOR
000146 100375                  BPL    1$              ;KEYBOARD
000150 116702 177562           MOVB   @#TKB,  R2      ;INPUT CHAR
000154 042702 000200           BIC    #200,   R2      ;STRIP PARITY
000160 122702 000003           CMPB   #3,     R2      ;CONTROL C?
000164 001402                  BEQ    2$              ;YES
000166 122702 000015           CMPB   #15,    R2      ;CR?
000172 001005                  BNE    3$              ;NO
000174 105737 177564    2$:    TSTB   @#TPS           ;WAIT FOR
000200 100375                  BPL    2$              ;PRINTER
000202 116237 000002 177566    MOVB   2(SP),  @#TPB   ;ECHO CHAR
000210 012603                  MOV    (SP)+,  R3      ;RESTORE R3
000212 012602                  MOV    (SP)+,  R2      ;RESTORE R2
000214 012601                  MOV    (SP)+,  R1      ;RESTORE R1
000216 012600                  MOV    (SP)+,  R0      ;RESTORE R0
000220 000207                  RTS    PC              ;RETURN
000222 122702 000040    3$:    CMPB   #40,    R2      ;CONTROL CHAR?
000226 002375                  BGE    1$              ;YES
000230 105737 177564    4$:    TSTB   @#TPS           ;WAIT FOR
000234 100375                  BPL    4$              ;PRINTER
000236 116237 000002 177566    MOVB   2(SP),  @#TPB   ;ECHO CHAR
000244 110213                  MOVB   R2,     (R3)     ;STORE CHAR
000246 005203                  INC    R3              ;INCREMENT COUNTER
000250 000756                  BR     1$              ;GET NEXT CHAR
```

```
                                                TYPE    ,TYPE           ;ECHO IT
                                                CMPB    #15.,R3         ;CHECK FOR RETURN
                                                BNE     2$              ;LOOP IF NOT RETURN
                                                JSR     R5,RE
                                                MOVB    (R5)+,R0
                                                BEQ     1$
                                                TSTB    (R5)
                                                BEQ     1$
                                                JSR     R4,@(R5)+
                                                BR      .-6
                                        1$:     MOV     (SP)+,R3        ;CHAR RETURN, THE IS
                                                TYPE    ,#12            ;TYPE A LINE FEED
                                                MOV     (SP)+,R0        ;RESTORE R0
                                                RTS     PC              ;RETURN

                                        ;
                                        ;       INPUT AREA
                                        ;
                                        IBUF:   .BLKB   80.             ;INPUT BUFFER
```

```
                                    ;       $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, DUMPIS, OR BITYPE MACRO'S.

016666  016737  170101  016720  BITYP$: MOV     #170101,@#PR    ;SET BIT FLAG AND 16. CHARACTER COUNT
016672  000434          BR      .PTIT           ;NOW TYPE IT IN BIT FORM
016674  016720  000001  016720  PRINTR: MOVB    #1,.PR          ;SET ZERO FILL SWITCH
016702  000403          BR      .+8             ;SKIP
016704  005037  016720  PRINTS: CLR     .PR             ;SUPPRESS LEADING ZERO'S
016710  112737  177772  016721          MOVB    #-6,.PR+1       ;SET COUNT
016716  010446          .PTIT:  MOV     R4,-(6)         ;SAVE R4
016720  012704  016722          MOV     #.PR+2,R4       ;SET POINTER TO FIRST ASCII CHAR.
016724  105014          CLRB    (4)             ;CLEAR FIRST BYTE
016726  000411          BR      .PRF            ;ROTATE FIRST BIT
016730  105014          .PRL:   CLRB    (4)             ;CLEAR BYTE OF CHARACTER
016732  030327  000100  016730          BIT     #100,@PR        ;BIT TYPING MODE?
016736  001004          BNE     .PRF            ;YES - SKIP 2 ROTATES
016740  006104          ROL     @TTY            ;ROTATE BIT INTO C
016742  006014          ROLB    (4)             ;PACK IT
016744  006104          ROL     @TTY            ;ROTATE BIT INTO C
016746  006014          ROLB    (4)             ;PACK IT
016750  006104          .PRF:   ROL     @TTY            ;ROTATE BIT INTO C
016752  006014          ROLB    (4)             ;PACK IT
016754  105714          TSTB    (4)             ;IS IT ZERO?
016756  100006          BPL     .+16            ;SKIP IF NOT
016760  105237  016720          INCB    @PR             ;SET FILL SWITCH
016764  105737  016720          TSTB    @PR             ;CHECK FILL SWITCH
016770  100002          BPL     .+6             ;SKIP BLANKS
016772  000260          BR      .+102           ;MAKE INTO ASCII CHAR
016774  105337  016721          DECB    @PR+1           ;DEC. COUNT
017000  001357          BNE     .PRL            ;REPEAT
017002  105737  016722          TSTB    @#PR+2,R4       ;EMPTY BUFFER?
017006  100001          BPL     .+4             ;SKIP IF NOT
017010  000240          NOP                     ;LOAD 1 ZERO
017012  105204          INCB    R4              ;MAKE TERMINATOR
017014  110437  016722          MOVB    R4,@#PR+2       ;STORE IT
017020  012604          MOV     (6)+,R4         ;RESTORE R4
017022  012637  016716          MOV     (6)+,@#16       ;RESTORE
017026  000137  017360  .PR:     JMP     @#TTOUT         ;OUTPUT, SWITCH, AND OUTPUT BUFFER
```

```
                    017076  000130  PDOWN$: MOV     #LLUP,@PWRVEC$  ;SET FOR FAST UP
                    000340  000132          MOV     #340,@PWRVEC$+2 ;PRIO:7
                    010046                  MOV     R0,-(SP)        ;PUSH R0 ON STACK
                    010146                  MOV     R1,-(SP)        ;PUSH R1 ON STACK
                    010246                  MOV     R2,-(SP)        ;PUSH R2 ON STACK
                    010346                  MOV     R3,-(SP)        ;PUSH R3 ON STACK
                    010446                  MOV     R4,-(SP)        ;PUSH R4 ON STACK
                    010546                  MOV     R5,-(SP)        ;PUSH R5 ON STACK
                    017076                  MOV     SP,.SAVR6       ;SAVE SP
                    000024  000132          MOV     #PDOWN$,@PWRVEC$ ;SET UP VECTOR
                    000000                  HALT                    ;WAIT FOR PF

                    017076          PUPS:   MOV     .SAVR6,SP       ;GET SP
                    005001                  CLR     R1              ;WAIT LOOP FOR THE ???
                    005201          1$:     INC     R1              ;WAIT FOR THE INC
                    001376                  BNE     1$              ;OF  WORD
                    012605                  MOV     (SP)+,R5        ;POP STACK INTO R5
                    012604                  MOV     (SP)+,R4        ;POP STACK INTO R4
                    012603                  MOV     (SP)+,R3        ;POP STACK INTO R3
                    012602                  MOV     (SP)+,R2        ;POP STACK INTO R2
                    012601                  MOV     (SP)+,R1        ;POP STACK INTO R1
                    012600                  MOV     (SP)+,R0        ;POP STACK INTO R0
                    000024                  MOV     #PDOWN$,@#24    ;SET UP THE POWER DOWN VECTOR
                    000340                  MOV     #340,@#26       ;PRIO:7
                    000002                  RTI                     ;.ASCII <15><12>"POWER"
                    000137  000000          JMP     @#RESTAR        ;JMP TO USER ADDRESS

                            000000  LLUP:   HALT                    ;THE POWER UP SEQUENCE WAS STARTED
                    000777                  BR      .-2             ; BEFORE THE POWER DOWN WAS COMPLETE

                    000000          .SAVR6: 0                       ;PUT THE SP HERE
                    000024          PWRVEC: 24.,26                  ;POWER UP,DOWN
```

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

017104  020027 001000    IOTRAP: CMP     #1000.  (SP)    ;CHECK RETURN ADDRESS FOR FAULSE TRAP
017110  001401                  BLT     IOT$            ;BRANCH IF "TYPE" COMMAND INTENDED
017112  162716 000004            SUB     #4,     (SP)    ;GET VECTOR ADDRESS FROM RETURN ADDRESS
017116  012601                  MOV     (SP)+,  R1      ;PUT IN  R1 FOR TYPING
017120  005726                  TST     (SP)+           ;POP STACK
017122  011602                  MOV     (SP),   R2      ;SAVE RETURN ADDRESS FOR TYPING
017124  104002                  HLT+2                   ;UNEXPECTED INTERUPT OR TRAP
                                                        ;R1 = VECTOR ADDRESS
                                                        ;R2 = RETURN PC
017126  000002                  RTI                     ;CONTINUE THE PROGRAM

                        ;MCALL  STYPE
                        ;       STYPE           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.

017130  010546          IOT$:   MOV     TTY,-(6)        ;SAVE TTY
017132  016605 000002            MOV     2(6),TTY        ;GET ADDRESS TO BE TYPED
017136  032705 177400            BIT     #177400,TTY     ;IS IT A TYPE?
017142  001003                  BNE     1$              ;NO
017144  116537 017234            MOV     TTY,.TYPE       ;GET THE CHARACTER
017150  012705 017234            MOV     #.TYPE,TTY      ;FUDGE THE ADDRESS
017154  105715          1$:     TSTB    (TTY)           ;TERMINATOR?
017156  001406                  BEQ     2$              ;GET OUT IF SO
017160  112537 177566            MOVB    (TTY)+,@#177566 ;LOAD AND TYPE THE CHARACTER
017164  105737 177564            TSTB    @#177564        ;IS THE PRINTER READY
017170  100375                  BPL     .-4             ;WAIT UNTIL IT IS
017172  000767                  BR      1$              ;GET THE NEXT CHARACTER
017174  062766 000002 000004    2$:     ADD     #2,6(6) ;GET ADDRESS TO BE TYPED
017202  062706 000002            ADD     #2,SP           ;ADD 2 TO THE ADDRESS
017206  005716                  TST     (.+2,6)         ;IS IT .+2?
017210  001003                  BNE     3$              ;NO
017212  062705 000002            ADD     #2,TTY          ;ADD 2 TO THE ADDRESS
017216  005405                  NEG     TTY             ;BACK UP TO AN EVEN BYTE
017220  116605 000002            MOV     TTY,2(6)        ;RESTORE ADDRESS
017224  012605          3$:     MOV     (6)+,TTY        ;RESTORE TTY
017226  000002                  RTI                     ;RETURN
017230  000000          .TYPE:  0                       ;CHARACTER TYPE LOCATION

017232  005015          RETURN: .ASCIZ  <15><12>
017234  000040          SPACE:  .ASCIZ  " "
017236  005015 044506   MSGPDR: .ASCIZ  <15><12>"FIRST DJ11 ADDRESS:  "
017244  020124 045104   
017252  047101 042040   
017260  042522 000040   
017266  005015 044506   MSGVEC: .ASCIZ  <15><12>"VECTOR ADDRESS:  "
017274  020124 045104   
017302  047101 042040   
017310  042522 000040   
```

```
017310  042522  051523  020072
017316  000040
017320  005015  047516  020056   MSGNUM: .ASCIZ  <15><12>"NO. OF DJ11'S:  "
017326  043117  042040  030512
017334  023461  025123  020040
017342     000
017343     015  051412  040524   MSGCON: .ASCIZ  <15><12>"STANDARD CONFIGURATION"  "
017350  042116  051101  020104
[illegible]
017372     015  046012  047111   MSGLIN: .ASCIZ  <15><12>"LINES "
[illegible]
                                 MSGDAS: .ASCIZ  " - "
[illegible]                      MSGLEN: .ASCIZ  <15><12>"CHAR LENGTH:  "
[illegible]                      MSGPAR: .ASCIZ  <15><12>"PARITY:NO, ODD, EVEN :  "
[illegible]
017456  042440  042506  024516
017464  020072  000040
                                 .EVEN

                                 ;SUBROUTINE TO AUTOMATICLY DETERMINE THE NUMBER OF DJ11'S IN THE SYSTEM
                                 ;       AND WHERE THEIR INTERUPT VECTORS ARE.
                                 ;THIS ROUTINE IS ONLY USED IF [illegible] 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!

017470  012700  160000           AUTO:  MOV   #160000,R0      ;START AT NO REPONSE BASE [illegible]
[illegible]                             MOV   #1,  R1         ;COUNTER OF NON RESPONSE [illegible]
[illegible]  000002  000006             MOV   #[illegible], @#6     ;[illegible] WHEN TIME-OUT
[illegible]                      5$:    [illegible]   R1      ;[illegible] COUNTER
[illegible]                      [illegible]   [illegible]     ;[illegible]
[illegible]                             [illegible]   R0      ;CHECK FOR ANY DJ11'S
[illegible]                             [illegible]   2$      ;BRANCH IF [illegible]
[illegible]  000010                     ADD   #10,  R0        ;POINT TO NEXT DJ11 ADDRESS
[illegible]                             [illegible]           ;[illegible]
[illegible]                             BR    5$              ;LOOK FOR MORE

017526  005302                   2$:    DEC   R3              ;COUNT DOWN DEVICES
[illegible]                             BMI   [illegible]     ;BRANCH IF DONE
[illegible]  000010                     ADD   #10,  R0        ;POINT TO FIRST DJ11
017536  [illegible]  001230             MOV   R0,  DJ.ADR     ;SAVE FIRST DJ11 ADDRESS
017542  000761                          BR    5$              ;GO COUNT DJ11'S

017544  005037  000006           7$:    CLR   @#6             ;RESTORE TIME-OUT CATCHER
017550  [illegible]  001234             MOV   R1,  UNITS      ;SAVE COUNT
017554  [illegible]                     BNE   3$              ;BRANCH IF NOT ZERO
017556  [illegible]                     HLT                   ;REPORT THAT NO DJ11'S WERE FOUND
017560  [illegible]  015410             JMP   DONE            ;EXIT THIS PROGRAM

                                 ;ROUTINE TO DETERMINE VECTOR ADDRESSES

017564  010746  000020           3$:    MOV   #20,  -(SP)     ;SAVE DJ1 VECTOR ON THE STACK
```

```
                                                    ;RESET IOT VECTOR
                                                    ;SET FIRST TIME FLAG
                                                    ;SET USR
                                                    ;BIT 8 = TRACE SCAN ENABLE
                                                    ;BIT 14 = TRANS INTERRUPT ENABLE
                                                    ;INIT POINTER
                                                    ;SET TRAP TO 0
                                                    ;SET FOR TRANS INTERRUPT
                                                    ;RESTORE IOT VECTOR
                                                    ;REPOSITION ADDRESS TO BOOT
                                                    ;SAVE FIRST WORD
                                                    ;RESET STACK FROM IOT
                                                    ;RETURN FROM INTERRUPT - RESTORE STATUS

000176  001316  ABORT:  MOV     @#SWREG,SWR
                        MOV     #$
                        MOV     #TMP1
                        MOV     #2,TMP1
                        MOV     #0,@TMP1
                        MOV     #$
                        MOV     #ABORT
                1$:     MOV     #1$
                TMP1:   0

                SJSWRR: MOV     6.-(SP)
                        MOV     4,-(SP)
                        MOV     #1$,4
                        CMP     #-1,@SWR
                        BEQ     2$
                        BR      3$
                1$:     CMP     (SP)+,(SP)+
                2$:     MOV     @#SWREG,SWR
                        MOV     @#DISPREG,DISPLAY
                3$:     MOV     (SP)+,4
                        MOV     (SP)+,6
                        RTS     PC

000176  001316  CNTLC:  CMP     @#SWREG,SWR
                        BNE     1$
                        TYPE    ,SWREG
                        MOV     SWREG,TTY       ;TYPE SWREG IN OCTAL
                        JSR     PC,PRINTR       ;TYPE LEADING ZEROES
                        TYPE    ,NEWLIS
                        JSR     R5,READIN
                        .WORD   TMP1
                        BNE     CNTLC
                        CMP     @#20,CNT
                        BEQ     1$
                        MOV     TMP1,@SWR
```

```
[illegible]  000046  000227                  18.     R 5     P5
[illegible]  000050  000000                  CNT:    0
[illegible]  000052  000046  042516  036527 NEW1$:  .ASCIZ  "  NEW= "
[illegible]  000062  000072  052522  036522 SAVE$:  .ASCIZ   15  12 "SAVE= "
[illegible]  000072  000001                  .END
```

CROSS REFERENCE TABLE -- USER SYMBOLS

```
.ERR    017470          536    4158*
.ESS    001214          542*   3457*  3459    3463*   3464    3484*   3539*   3563*   3633*   3655*   3671
.BEGIN  001324          530     571*
.BELL   = 000007        496*   3773    3893
.TYPS   016552         4005*
.TYPO   = 000001        497*    967    969     979     1111    1133    1201    1219    1237    1255    1293    1321    1343
                       1377    1405   1433    1477    2812    2882    2946    2995    3045    3090    3398
.BIT1   = 000002        498*    800    801     810     1560    3015
.BIT10  = 002000        507*    884    885     894     2311
.BIT11  = 004000        508*   2394
.BIT12  = 010000        509*    905    906     915     2479    3244
.BIT13  = 020000        510*   2562   3140    3181    3255    3312
.BIT14  = 040000        511*    926    927     936     2645    3410
.BIT15  = 100000        512*   2728
.BIT2   = 000004        499*    821    822     831     948     962     981     1643
.BIT3   = 000010        500*    950    952     1726    2823    3315
.BIT4   = 000020        501*    956   1811    2824    2944    3373    3703    3838
.BIT5   = 000040        502*   1894
.BIT6   = 000100        503*    842    843     852     1977
.BIT7   = 000200        504*   2060
.BIT8   = 000400        505*    863    864     873     2145
.BIT9   = 001000        506*   2228
.CRMEC  002336          727    7229    732*
.CNT    020050         3940*   3968*   4237    4242*
.CRLF   012200          730    4200    4229*   4236
.CR     000015          659    660*    665
.DBR    001210          539*   738*    745*    750     779     780*    781*    800*    901     905     909*    910     914*
                        922     926     830*    931     942*    943     947     951*    952     963*    964     968*
                        973     984*    885     989     993*    994     905*    906     910     914*    915     919*
                        931     935*    936     948*    950*    951     967*    968     969     973     979*    980
                        994*    995*    996    1001*   1002*   1003*   1004*   1005    1019*   1023    1024*   1025
                       1030    1110*   1113    1129    1134    1149*   1154    1174    1179    1200*   1203    1220*
                       1220    1236*   1238    1249*   1264*   1266    1277*   1292*   1294    1305*   1320*   1322
                       1348*   1350    1361*   1376*   1378    1389*   1404*   1406    1417*   1432*   1434    1445*
                       1484    1488    1527    1533*   1561    1567    1571    1610    1616*   1644    1654    1665
                       1699*   1727    1733    1737    1776    1782*   1812    1818    1922    1961    1867*   1995
                       1905    1944    1950*   1978    1984    1989    2027    2033*   2061    2065    2071    2115*
                       2146    2152    2156    2195    2201*   2229    2235    2239    2278    2284*   2312    2339
                       2361    2367*   2395    2401    2405    2444    2450*   2480    2486    2490    2529    2535*
                       2569    2573    2612    2618*   2646    2652    2656    2695    2701*   2729    2735    2739
                       2784*   2814    2820    2823*   2824    2830    2843    2860*   2883    2896    2899    2902*
                       2931*   2941*   2944    2947    2953    2966*   2967    2996    3002    3015*   3046    3051
                       3091    3094    3113*   3137    3148    3152    3180    3227    3244*   3245    3251    3254
                       3287    3302    3308    3311    3316*   3319    3340    3365*   3376*   3379    3383    3386
                       3396*   3397    3403    3418*   3436    3446*   3456*   3488    3566    3640*   3654*   3666
                       3698*   3703    3708    3715    3758*   3817*   3820*   3823*   3826*   3838    3841*   3849
.DEFADR 001312          560*    605
.DEFREG 001314          561*
.DEVADR 001230          550*    601     603     605*    606*    607     745     4172*   4185
.DEVFLA 001320          564*   3869*   3873*   4222*
.DEVPRE 000174          526*   4222
.DYLEN  001306          558*    740*    747*   1511    1594    1677    1760    1784*   1945    1988    2011    2094    2118*
                       2179    2262    2345    2428    2462*   2513    2596    2679    2762    2786*   2830*   2849    2864*
.DZM/NO= 000020         515*    655
.EPAR   001310          559*    741*    748*   3510    3596
.ERCNT  001304          557*    658*    742     744*    749*    3762
```

```
                        3941    3971    3972    3998*
ICTRAP  017104           576    4077*
.OT$    017130          4078    4097*
.SR22   004464          1232    1242*
.SR23   004644          1260    1270*
.SR24   004664          1288    1298*
.SR25   005006          1316    1327*
.SR26   005126          1344    1355*
.SR27   005246          1372    1383*
.SR30   005366          1400    1411*
.SR31   005506          1428    1439*
.SR56   012620          3034    3053*
.SR57   012774          3079    3099*
.SR66   015274          3705    3735*
KBDINT  017640          3768    3853    3890    3909    4201*
KIT$    015740          3859    3965    3972*   3913
LAD     015770           766*   1101*   1451*   1795*   2119*   2453*   2794*   3868*   3874    3876    3879*
LENGTH  001236           553*    665     678     747
LEVEL?= 000340           513*    578
LOP32   005574          1478*   1479
LOP33   005774          1561*   1562
LOP34   006174          1644*   1645
LOP35   006374          1727*   1728
LOP36   006606          1812*   1813
LOP37   007006          1895*   1896
LOP40   007206          1978*   1979
LOP41   007406          2061*   2062
LOP42   007620          2146*   2147
LOP43   010020          2229*   2230
LOP44   010220          2312*   2313
LOP45   010420          2395*   2396
LOP46   010632          2480*   2481
LOP47   011032          2563*   2564
LOP50   011232          2646*   2647
LOP51   011432          2729*   2730
LOP61   014060          3383*   3384    3444
LOP64   014550          3562*   3638
MSGADR  017244           599    4122*
MSGCON  017343           660    4134*
MSGDAS  017410           684    4141*
MSGLEN  017414           689    4142*
MSGLIN  017377           681    4139*
MSGNUM  017320           622    4130*
MSGPAR  017435           704    4145*
MSGVEC  017274           610    4126*
N       = 000067         421*    770     794*    815*    836*    857*    878*    899*    920*    941*    989*   1012*   1035*
                        1053*   1077*   1100*   1102    1141*   1192*   1226*   1254*   1282*   1310*   1339*   1366*   1394*
                        1422*   1450*   1452    1535*   1618*   1701*   1784*   1786    1869*   1952*   2035*   2118*   2201*
                        2203*   2286*   2369*   2452*   2454    2537*   2620*   2703*   2796*   2795    2864*   2934*   2983*
                        3028*   3073*   3118*   3370*   3450*   3469*   3545*   3643*   3644    3695*   3761*
NEXIS   020052          4233    4244*
OPEN    = 000000         514*
OVER$   015746          3857    3873*
PARITY  001276           554*    679     718    3510    3596
PC      =000307          495*    572*    596*    623*    661*    683*    687*    690*    705*    730*   1472*   1553*   1636*
                        1719*   1804*   1827*   1970*   2053*   2139*   2221*   2304*   2387*   2472*   2555*   2638*   2721*
```

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                    2804*  2875*  2888*  3038*  3083*  3128*  3478*  3554*  3662   3767*  3842*  3853*  3932*
                    3902*  3904*  3909*  3920*  3929*  3934*  3995*  4038*  4193*  4208*  4209*  4235*  4232*
                    4240*
PCNT    001204       537*   592*   593*  3768*  3769*  3794
PDOWN$  016744       575    4040*  4062
PRINTR  016562      3902   3920   3927   4007*  4232
PRINTS  016572       693    687   4009*
PS    = 177776       486*  1234*  1235*  1250*  1262*  1263*  1278*  1290*  1291*  1306*  1319*  1319*  1334*
                    1346*  1347*  1362*  1374*  1375*  1390*  1402*  1403*  1418*  1430*  1421*  1446*  3036*
                    3037*  3069*  3081*  3082*  3114*  3240*  3241*  3299*  3300*  3366*  3652*  3694*  3695*
                    3961   3965*
PSTEMP  016362      3961*  3965   3968*
PUP$    017010      4049   4052*
PUVEC$  017100      4040*  4041*  4049*  4071*
RBUF    001212       540*   752*  1492   1523   1575   1606   1658   1689   1741   1772   1826   1857   1909
                    1940   1992   2023   2075   2106   2160   2191   2243   2274   2326   2357   2409   2440
                    2494   2525   2577   2608   2660   2691   2743   2774   2827   2855   2905   2913   2921
                    2962   2975   3011   3020   3057   3102   3201   3261   3266   3325   3356   3405   3428
                    3501   3535   3581   3630   3675   3721   3735   3750
RCVLVL  001222       546*   760*  3035*  3065   3066*  3080*  3110   3111*  3243*  3360   3361*  3706*  3755
                    3756*
RCVVEC  001220       545*   739*   746*   759   3034*  3065*  3079*  3110*  3242*  3301*  3360*  3705*  3755*
READIN  016216       600    611   3933*  4234
READS$  016364       623    661    690    705   3934   3970*
RESTAR  002302       532    597    663    671    673    724*  3764   3792   4065
RETURN  017236      4120*
R0    =%000000       487*   573*   574*   575*   576*   577*   578*   579*   580*   581*   582*   583*   585*
                     664*   668*   676*   720*   721    732*   733    734*   735*   736   1112*  1115*  1121
                    1153*  1156*  1164   1202*  1207*  1211*  1214*  1481*  1486*  1491   1564*  1569*  1574
                    1647*  1652*  1657   1730*  1735*  1740   1815*  1820*  1825   1898*  1903*  1908   1981*
                    1986*  1991   2064*  2069*  2074   2149*  2154*  2159   2232*  2237*  2242   2315*  2320*
                    2325   2398*  2403*  2408   2483*  2488*  2493   2566*  2571*  2576   2649*  2654*  2659
                    2732*  2737*  2742   2788*  2789*  2790*  2791*  2793   2839*  2848*  2893*  2898*  2950*
                    2959*  2970*  2999*  3008*  3136*  3144*  3147*  3156*  3177*  3183*  3200*  3221*  3255*
                    3281*  3324*  3341*  3343   3389*  3394*  3485*  3491*  3562*  3569*  3696*  3707   3731*
                    3784*  3828*  3830*  3833*  3834*  4042   4061*  4159*  4163   4165*  4171*  4172
R1    =%000001       488*   626*   628    630    632*   645    646*   647*   648*   650*   651*   653*   655
                     657    665*   666*   677*   682    685*   686    688*   716    750*   751*   752    753*
                     754    756*   757    758*   759    760    761    762    763    764    787*   951*   952
                     956    962    968*   980*   996*   997   1005*  1006   1020*  1030*  1042*  1043   1048*
                    1061*  1062   1070*  1071   1085*  1095*  1113*  1122*  1123*  1124*  1125   1134*  1150*
                    1167   1186*  1203*  1212*  1220*  1238*  1266*  1294*  1322*  1350*  1378*  1406*  1434*
                    1478*  1488*  1492*  1496   1503   1512   1519   1523*  1527*  1528   1561*  1571*  1575*
                    1579   1586   1595   1601   1606*  1610*  1611   1644*  1654*  1659*  1662   1669   1679
                    1684   1689*  1693*  1694   1727*  1737*  1741*  1745   1752   1761   1767   1772*  1776*
                    1777   1812*  1822*  1826*  1830   1837   1846   1852   1857*  1861*  1862   1895*  1905*
                    1909*  1913   1920   1929   1935   1940*  1944*  1945   1978*  1988*  1992*  1996   2003
                    2012   2018   2023*  2027*  2028   2061*  2071*  2075*  2079   2086   2095   2101   2106*
                    2110*  2111   2146*  2156*  2160*  2164   2171   2180   2186   2191*  2195*  2196   2229*
                    2239*  2243*  2247   2254   2263   2269   2274*  2278*  2279   2312*  2322*  2326*  2330
                    2337   2346   2352   2357*  2361*  2362   2395*  2405*  2409*  2413   2420   2429   2435
                    2440*  2444*  2445   2480*  2490*  2494*  2498   2505   2514   2520   2525*  2529*  2530
                    2563*  2573*  2577*  2581   2588   2597   2603   2608*  2612*  2613   2646*  2656*  2660*
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                    2886*  2889*  2896*  2901   2905*  2909   2913*  2917   2921*  2925*  2928   2947*  2953*
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                    2954    2962*   2967*   2968    2975*   2996*   3002*   3003    3011*   3020*   3046*   3057*   3061
                    3091*   3102*   3106    3137*   3140    3148*   3152*   3161    3165    3180*   3181    3187    3201*
                    3205    3213    3216    3227*   3228    3245*   3246    3254*   3255    3259*   3266*   3270    3274
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                    3957*   3964*   4043    4053*   4054*   4060*   4080*   4161*   4166*   4176    4185*   4186*   4189
                    4190*
R2      =%000002     489*    625*    626     635     637     639     641     678*    696*    697*    701     703*    1129*
                    1154*   1165*   1166*   1167    1179*   1503*   1504*   1505*   1506    1511*   1512    1517*   1518
                    1586*   1587*   1588*   1589    1594*   1595    1600*   1601    1669*   1670*   1671*   1672    1677*
                    1678    1683*   1684    1752*   1753*   1754*   1755    1760*   1761    1766*   1767    1837*   1838*
                    1839*   1840    1845*   1846    1851*   1852    1920*   1921*   1922*   1923    1928*   1929    1934*
                    1935    2003*   2004*   2005*   2006    2011*   2012    2017*   2018    2086*   2087*   2088*   2089
                    2094*   2095    2100*   2101    2171*   2172*   2173*   2174    2179*   2180    2185*   2186    2254*
                    2255*   2256*   2257    2262*   2263    2268*   2269    2337*   2338*   2339*   2340    2345*   2346
                    2351*   2352    2420*   2421*   2422*   2423    2428*   2429    2434*   2435    2505*   2506*   2507*
                    2508    2513*   2514    2519*   2520    2588*   2589*   2590*   2591    2596*   2597    2602*   2603
                    2671*   2672*   2673*   2674    2679*   2680    2685*   2686    2754*   2755*   2756*   2757    2762*
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                    3335*   3336    3383*   3386*   3392*   3397*   3398    3405*   3410    3415    3420    3428*   3436*
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                    3716    3721*   3735*   3741    3750*   3937    3941*   3942    3945    3963*   4044    4059*   4082*
                    4159*   4169*
R3      =%000003     490*    641*    642*    651     679*    714*    715*    718*    1174*   3420*   3421*   3422*   3423
                    3593*   3594*   3595*   3615*   3616*   3617*   3618    3692*   3713    3726*   3741    3747*   3748*
                    3938    3945*   3946    3948*   3949    3957    3962*   3970    3971*   3972    3994*   4045    4058*
R4      =%000004     491*    680*    714     719*    1151*   1152    1178    1187*   2813*   2816    2817*   3561*   3563
                    3637*   3693*   3710    3711*   4011    4012*   4032    4037*   4046    4057*
R5      =%000005     492*    600*    611*    949*    958*    1482*   1565*   1648*   1731*   1815*   1898*   1982*   2065*
                    2150*   2233*   2316*   2399*   2484*   2567*   2650*   2733*   2840*   2994*   2951*   3000*   3150*
                    3178*   3223*   3283*   3390*   3486*   3540*   3564*   3939    3966*   4047    4056*   4234*
SCOPE = 104400       483*    767     793     814     835     856     877     898     919     940     987     1011    1034
                    1052    1076    1099    1139    1190    1224    1252    1280    1308    1336    1364    1392    1420
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                    2536    2619    2702    2785    2862    2932    2981    3026    3071    3116    3369    3448    3469
                    3543    3641    3683    3759
SP      =%000006     494*    571*    645*    649*    650     725*    787     790     1243*   1271*   1299*   1327*   1355*
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                    4081    4082    4183*   4192    4195*   4196    4197    4214*   4215*   4220    4223    4224
SPACE   017241       3925    4121*
SUSWRR  017710        572    4214*
SVLAD$  015722       3861    3867*   3875
SWR     001316        563*    728    3770    3775    3854    3856    3858    3860    3991    3995    3935    3909    4201
                    4217    4221*   4228    4239*
SWREG   000176        527*    728    4201    4221    4228    4231
SWREQ   020062       4230    4246*
SW10    = 002000      435*   3770    3890    3891
SW11    = 004000      434*   3860
SW12    = 010000      433*   3771    3774    3775
SW13    = 020000      432*   3895
SW14    = 040000      431*   3858
SW15    = 100000      430*
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SW9     = 001000      437*   3909
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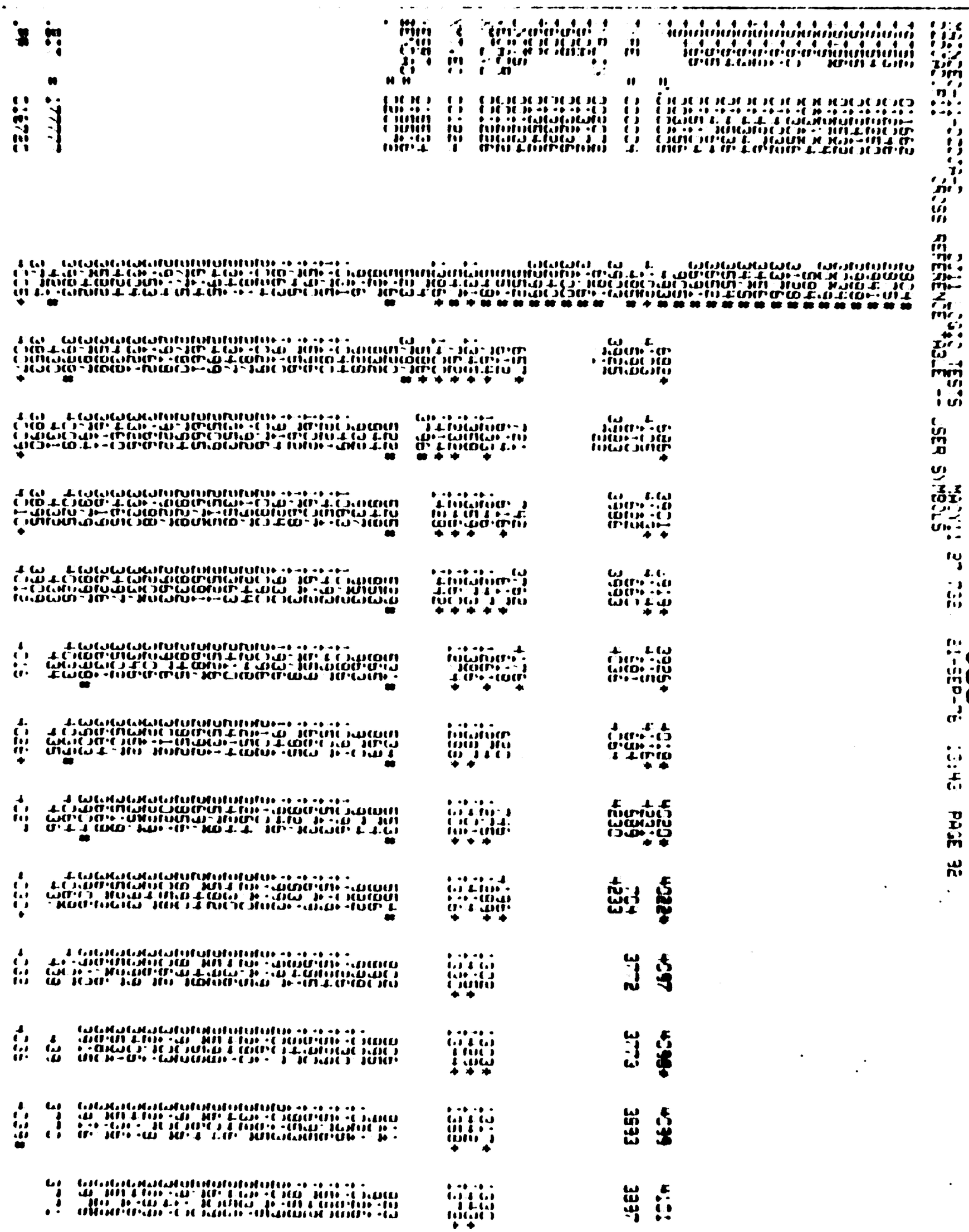

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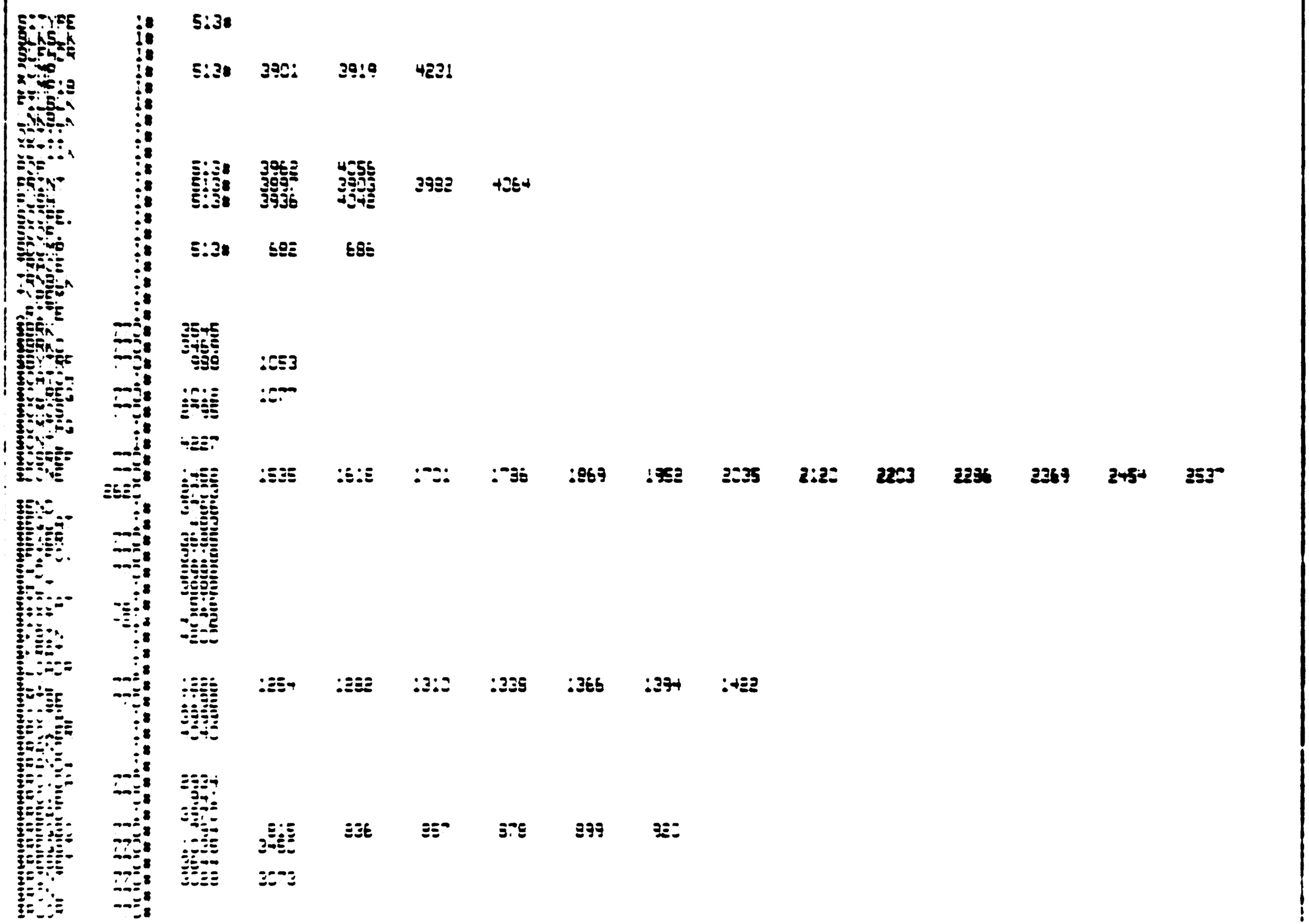

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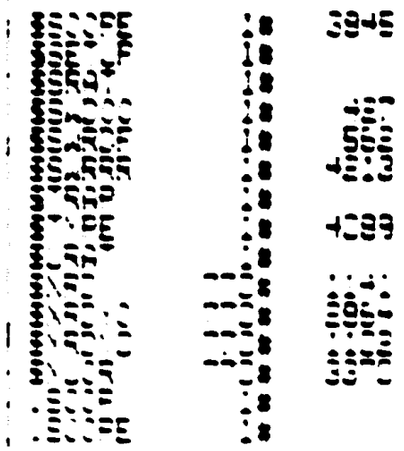

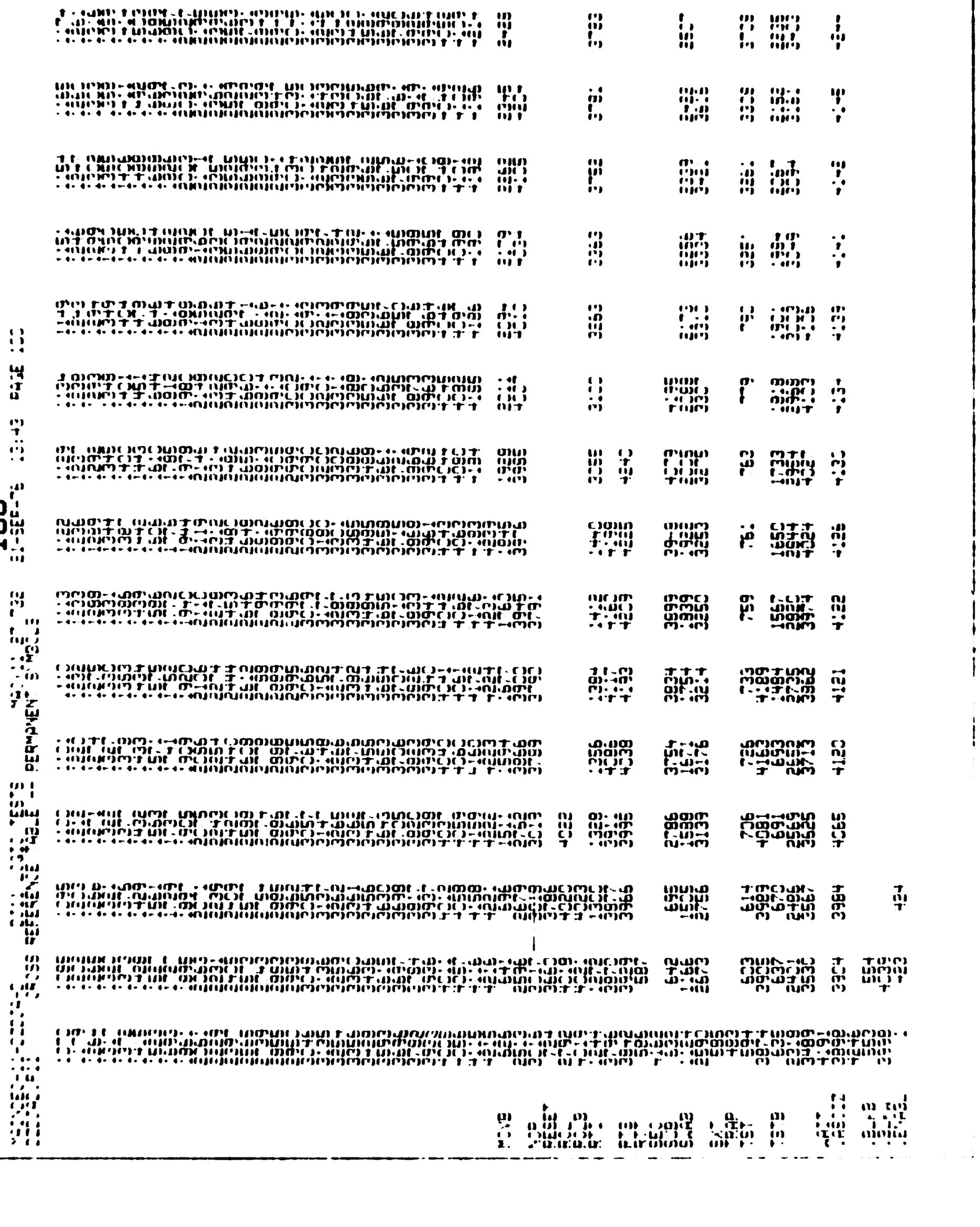

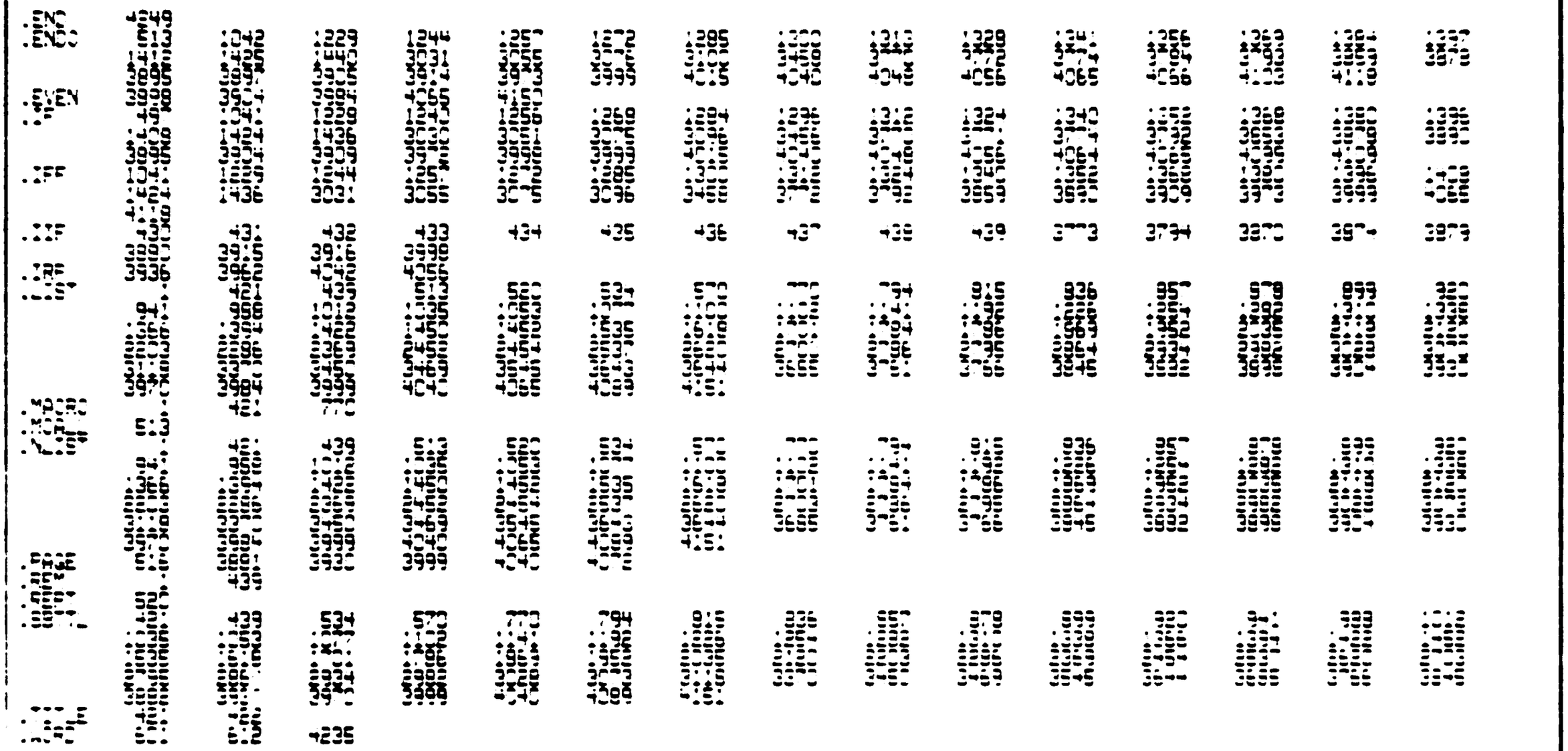

K08

Spooler runtime 16 Seconds, 71 KCS, 416 disk reads, 3 disk writes, 97 pages