DJ11

EXERCISER & ON LINE TEST

MD-11-DZDJB-E

EP-DZDJB-E-DL-B

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MADE IN USA

PRODUCT CODE: MAINDEC-11-DZDJB-E-D

PRODUCT NAME: DJ11 EXERCISER AND ON-LINE TESTS

PROGRAM DATE: MAY 1977

MAINTAINER: DIAGNOSTIC ENGINEERING

CONTENTS

1.   ABSTRACT

         This program consists of three sub-programs which exercise
         the DJ11 Asyncronous Multiplexer. PROGRAM 1 is an off-line
         exerciser. PROGRAM 2 is an on-line exerciser which
         continuously transmits the last character received. PROGRAM
         3 is an echo test.

         NOTE: PROGRAM 1 will run any silo alarm level setting.
            (For PROGRAM 2 and 3 see Section 9.)

2.   REQUIREMENTS

2.1   Equipment

         PDP-11 standard computer with console teletype
         Up to 16 DJ11 asyncronous multiplexers.

2.2   Storage

         This program uses all of 8K, except absolute Loader.

2.3   Preliminary Programs

         MAINDEC-11-DZDJA   DJ11 Logic Tests

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 the program number (1, 2, or 3).
6) Select lines if SW<8> is on a 1.
7) PROGRAM 1 will loop and bell will ring once every pass.
   "EOP" is also printed on each pass.

5.   OPERATING PROCEDURE

5.1   Operational Switch Settings

At SA 200, all switches down is worst case testing. For
PROGRAM 1 only, the bell will ring and 00eop is printed upon
completion of a pass of the entire program.

The switch settings are:

SW<15> = 1 ..... HALT ON ERROR
SW<13> = 1 ..... INHIBIT PRINTOUT
SW<12> = 1 ..... PRINT SILO ALARM LEVEL (PROG1 ONLY)
SW<10> = 1 ..... BELL ON ERROR
         0 ..... BELL ON PASS COMPLETE (PROG1 ONLY)
SW<9> = 1 ..... INHIBIT MAINTENANCE (PROG1 ON-LINE)
SW<8> = 1 ..... SELECT LINES FOR TEST (SEE 5.3)
PROG1 ONLY:
SW<2:0>= 0 ..... BINARY COUNT PATTERN
         1 ..... "THE QUICK SILVER GRAY FOX ... "
         2 ..... ALPHA-NUMERIC (40-177)
         3-7 ... NOT USED

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

         (I.E.) SWR=XYYXXX 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
                      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   HLT

This routine (called by an EMT instruction) prints out an
error message (see 6.1). To inhibit typeouts, put SW<13> on
a 1. To ring the bell on an error, put SW<10> on a 1.

5.2.2   ALMCK (PROG1 only)

in the normal operation the "done" bit is set as each
character is read into the fi/fo buffer(silo). but this
"done" condition can be delayed to cause done on the 5, 9,
or 17 character. this is done by cutting one of the jumpers
(w1,w2,w3) on the m7285 control board. the program tests
for this "silo alarm level" and if sw12 is set (1) it will
print out the level (in octal) at which each djll is will
set "done". the subroutine also adjusts the character
counters to ensure that the maximum number of characters to
be transfered is a multiple of the silo alarm level. this
ensures that all data will be read out of the silo. done
will not set if the number of characters in the fi/fo buffer
is less than the silo alarm level. (note character present
is set on each character in the buffer, regardless of the
silo alarm level.)

5.2.3   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 message and
"HALT" in "IOTRAP".

5.3   Program and Operator Action

After the device parameters are reported, the program types
"PROGRAM #: ", at which time the operator enters "1", "2",
or "3" depending on the sub-program he wishes to run.

If SW<9> is on a 1, the program will TYPE OUT " N SELECT

LINES =" THE OPERATOR RESPONDS BY TYPING IN AN OCTAL NUMBER
REPRESENTING THE LINE(S) WHICH ARE TO BE TESTED FOR THAT
DJ11.(INPUT A 1 FOR LINE 0,A 7 FOR LINES 0,1,AND 2, ETC.
THE SAME AS IF YOU WERE DIRECTLY SETTING THE TCR of the
DJ11.) if more djll's are on the system the n will indicate
the next djll and the prompt is reissued.   when all lines
are selected the program will run the selected subprogram.

6.   ERRORS

6.1   Error Printout

          The format is as follows:

          ADR (R1) (R2) (R3) (R4)

          Where:

          ADR   = Address of error HLT
          (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.

6.2   Error Recovery

          Restart at 200 or 1000.

6.3   Error Counter

          An error count is kept in "ERRORS" .   IT CAN BE CLEARED FROM
          THE CONSOLE, BY RESTARTING AT 200, OR BY RELOADING THE
          PROGRAM.

7.   RESTRICTIONS

          This program requires that the device addresses follow the
          floating address convention (DJ11's will be first, starting
          at 160010, then the DH11's) and that the vector addresses
          all be contiguous. If the first DJ11 address is nonstandard
          (other than 160010) then Loc. 1270 must be changed to
          contain this nonstandard address.

          If this program is run with a monitor, i.e. ACT11 or DDP,

only PROGRAM 1 is run.

8.   MISCELLANEOUS

8.1   Execution Time (PROG1 only)

Due to the various baud rates available and the ability to
check up to 16 DJ11's at once, the exicution time can vary
anywhere from 3 seconds to nearly an hour. 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 . For multiple DJ11's, multiply these times by
the number of units selected for test.

```
  APPROX
BAUD RUN TIME
---- --------
75 00:10:00
110 00:07:00
134.5 00:05:40
150 00:05:00
300 00:02:30
600 00:01:15
1200 00:00:40
1800 00:00:30
2400 00:00:20
4800 00:00:10
9600 00:00:05
```

8.2   Stack Pointer

Stack is initally set to 1200

8.3   Pass Count (PROG1 only)

A 32 bit (2 words) pass count is kept in "PCNT" . IT CAN BE
CLEARED FROM THE CONSOLE, BY RESTARTING AT 200, OR BY
RELOADING THE PROGRAM.

8.4   POWER FAIL

EACH PROGRAM CAN BE POWER FAILED WITH NO ERRORS. TO USE,
START THE PROGRAM AS USUAL AND P 'ER DOWN THEN UP AT ANY
TIME. THE ROUTINE SHOULD TYPE "POWER" and restart the
program with no other error typeouts.

9.   PROGRAM DESCRIPTION

This program consists of three sub-programs which exercise
the logic of up to 16 DJ11 asynchronous data multiplexers.

PROGRAM 1: EXERCISER (off-line)
This program exercises up to 256 lines (16 DJ11's)
simultaneously in maintenance mode. Three different data
patterns may be selected from the switch register. The data
pattern is repeated a minimum of 16 times for each pass.
The program should be run for at least 2 passes with all
switches down.   SW<9> on a one disables the maintenance
mode, requiring turn-around cards at the termination of each
line being tested. (Note: The reciever and transmit lines
must be jumpered for the same speed.)

PROGRAM 2: CONTINUOUS ECHO EXERCISER (on-line)
This program continuously transmits the last character it
received on the respective line. A null (000) will "echo"
72 times and then turn off the transmitter.

PROGRAM 3: ECHO TEST (on-line)
This program transmits a heading (*ECHO TEST*) on each line
and then echos everything that it receives.
Caution: If characters are received faster than they can be
transmitted, the software buffers may overflow.

Note: The on-line exercisers (PROG2 and PROG3) are operator
dependent, and therefore do not loop. I.E. No passes.
ACT11 and DDP monitors will only run PROG1.

If the silo alarm level is set for anything other than 1
char.   (all 3 jumpers wired in). You must press the key on
the terminal, under test, that many times before an echo
occures. IE. if the silo alarm level is set for 5 you must
press the key 5 times before an echo back.

J01

KO1

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 44
DZDJBE.F11   08-SEP-77 15:07   SWITCH SETTINGS   SEG 00:0

```
2565
2566                                    .ENABLE ABS
2567                                    .ENABLE AMA
2568                                    ;PROGRAM BY KEN CHAPMAN
2569                                    ;MODIFIED BY DAVID L. ADAMS    MAY 1977
2570
2571
 (1)                                    ;     SWITCH                  USE
 (1)                                    ;     ------               --------------------
 (1)             100000                 SW15=    100000      ;HALT ON ERROR
 (1)             040000                 SW14=    40000       ;NOT USED
 (1)             020000                 SW13=    20000       ;INHIBIT ERROR TYPEOUTS
 (1)             010000                 SW12=    10000       ;PRINT SILO ALARM LEVEL
 (1)             004000                 SW11=    4000        ;NOT USED
 (1)             002000                 SW10=    2000        ;0 - BELL ON PASS COMPLETE
 (1)                                                         ;1 - BELL ON ERROR
 (1)             001000                 SW9=     1000        ;ON-LINE (PROG1)
 (1)             000400                 SW8=     400         ;SELECT LINES (INITIALIZATION TIME ONLY)
2572                                    ;SW<0:2>        SELECT MESSAGE (PROG1 ONLY)
2576                                    .REM!
2577
2578                                    DJ11 REGISTER BIT ASSIGNMENTS:
2579
2580                                    CONTROL STATUS REGISTER (CSR) XXXXX0
2581                                              BIT0      RECEIVER ENABLE (READ/WRITE)
2582                                              BIT1      HALF DUPLEX SELECT (READ/WRITE)
2583                                              BIT2      MAINTENANCE (READ/WRITE)
2584                                              BIT3      CLEAR MOS (WRITE ONLY)
2585                                              BIT4      CLEAR MOS FLAG (READ ONLY)
2586                                              BIT5      NOT USED
2587                                              BIT6      RECEIVER INTERUPT ENABLE (READ/WRITE,
2588                                              BIT7      DONE (READ ONLY)
2589                                              BIT8      MASTER TRANSMITTER SCAN ENABLE (READ/WRITE,
2590                                              BIT9      NOT USED
2591                                              BIT10     READ/WRITE BREAK REGISTER (READ/WRITE)
2592                                              BIT11     NOT USED
2593                                              BIT12     STATUS ENABLE (READ/WRITE)
2594                                              BIT13     FI/FO OVERRUN (READ ONLY)
2595                                              BIT14     MASTER TRANSMITTER INTERUPT ENABLE (READ/WRITE)
2596                                              BIT15     TRANSMITTER READY (READ ONLY)
2597
2598                                    RECEIVER BUFFER REGISTER (RBUF) XXXXX2 (READ ONLY)
2599
2600                                              BIT0-7    RECEIVED CHARACTER
2601                                              BIT8-11   LINE NUMBER
2602                                              BIT12     PARITY ERROR
2603                                              BIT13     FRAMING ERROR
2604                                              BIT14     UART OVERRUN ERROR
2605                                              BIT15     CHARACTER PRESENT
2606
2607                                    TRANSMITTER CONTROL REGISTER (TCR) XXXXX4 (READ/WRITE)
2608
2609                                              BIT0-15 STOP THE SCANNER ON CORRESPONDING LINE
2610
2611                                    TRANSMITTER BUFFER (TBUF) XXXXX6
2612
```

L01

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046)   08-SEP-77   15:13   PAGE 44-1
DZDJBE.P11   08-SEP-77 15:07   DJ11 SPECIFICATIONS   SEG 0011

```
2613                                          BIT0-7  TRANSMITTED CHARACTER (WRITE ONLY)
2614                                          BIT8-11 LINE NUMBER (READ ONLY)
2615
2616                                BREAK CONTROL STATUS REGISTER (BCSR) XXXXX4 (BIT10 OF CSR SET) (READ/WRITE)
2617
2618                                          BIT0-15 TRNSMIT A BREAK ON CORRESPONDING LINE!
2619
2620        104400                  SCOPE=   TRAP
 (1)        104000                  HLT=     EMT
 (1)        000004                  TYPE=    IOT
 (1)        177776                  PS=      177776
 (1)        000000                  R0=      %0
 (1)        000001                  R1=      %1
 (1)        000002                  R2=      %2
 (1)        000003                  R3=      %3
 (1)        000004                  R4=      %4
 (1)        000005                  R5=      %5
 (1)        000005                  TTY=     %5
 (1)        000006                  SP=      %6
 (1)        000007                  PC=      %7
 (1)        000007                  BELL=    7
 (1)        000001                  BIT0=           1
 (1)        000002                  BIT1=           2
 (1)        000004                  BIT2=           4
 (1)        000010                  BIT3=          10
 (1)        000020                  BIT4=          20
 (1)        000040                  BIT5=          40
 (1)        000100                  BIT6=         100
 (1)        000200                  BIT7=         200
 (1)        000400                  BIT8=         400
 (1)        001000                  BIT9=        1000
 (1)        002000                  BIT10=       2000
 (1)        004000                  BIT11=       4000
 (1)        010000                  BIT12=      10000
 (1)        020000                  BIT13=      20000
 (1)        040000                  BIT14=      40000
 (1)        100000                  BIT15=     100000
2621        000340                  LEVEL7 = 340
2622        000000                  OPEN = 0
2623        001200                  STACK = 1200
```

M01

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 44-2
DZDJBE.P11   08-SEP-77 15:07   DJ11 SPECIFICATIONS   SEG 0012

```
 2625                  000000                   . =     0               ;TRAP CATCHER IN LOCATIONS 0 THRU 776
  (1)   000000 000000 000000                            0,0             ;LOCATIONS 0 AND 2 CONTAIN "HALT" INSTRUCTIONS
  (1)                               ;LOCATIONS 4 THRU 56 CONTAIN ".+2" AND "HALT" IN EVERY VECTOR
  (1)                               ;LOCATIONS 60 THRU 776 CONTAIN ".+2" AND "IOT" IN EVERY VECTOR
  (1)
  (1)
  (1)
  (1)                  000046                   . =     46
  (1)   000046 013574                           SENDAD
  (1)
  (1)                  000174                   . =     174
  (1)   000174 000000                   DISPREG:0
  (1)   000176 000000                   SWREG:  0
  (1)
  (1)                  000200                   . =     200
  (1)   000200 000137 005312                    JMP     BEGIN    ;200 ALWAYS IS THE STARTING ADDRESS
 2626                  001000                   . =     1000     ;RESTART ADDRESS
 2627   001000 000137 006310                    JMP     RESTAR
 2628
 2629                  001200                   . =     1200
 2630   001200 000000                   ICNT:   0               ;ITERATION COUNT-LH, TEST NO.-RH
 2631   001202 000000                   ERRORS: 0               ;ERROR COUNT REGISTER
 2632   001204 000000 000000            PCNT:   0,0             ;PASS COUNT REGISTER
 2633
  (1)   001210 177570                   SWR:    177570
  (1)   001212 177570                   DISPLAY:177570
  (1)
 2634   001214 000000                   SAVIT:  0
 2635   001216 000020                   TIMES:  20              ;MINIMUM NUMBER OF MESSAGES (PROG1)
 2638   001220 000000                   SVSW0:  OPEN            ;MAP OF LINES SELECTED, DJ11 #0
  (1)   001222 000000                   SVSW1:  OPEN            ;MAP OF LINES SELECTED, DJ11 #1
  (1)   001224 000000                   SVSW2:  OPEN            ;MAP OF LINES SELECTED, DJ11 #2
  (1)   001226 000000                   SVSW3:  OPEN            ;MAP OF LINES SELECTED, DJ11 #3
  (1)   001230 000000                   SVSW4:  OPEN            ;MAP OF LINES SELECTED, DJ11 #4
  (1)   001232 000000                   SVSW5:  OPEN            ;MAP OF LINES SELECTED, DJ11 #5
  (1)   001234 000000                   SVSW6:  OPEN            ;MAP OF LINES SELECTED, DJ11 #6
  (1)   001236 000000                   SVSW7:  OPEN            ;MAP OF LINES SELECTED, DJ11 #7
  (1)   001240 000000                   SVSW10: OPEN            ;MAP OF LINES SELECTED, DJ11 #10
  (1)   001242 000000                   SVSW11: OPEN            ;MAP OF LINES SELECTED, DJ11 #11
  (1)   001244 000000                   SVSW12: OPEN            ;MAP OF LINES SELECTED, DJ11 #12
  (1)   001246 000000                   SVSW13: OPEN            ;MAP OF LINES SELECTED, DJ11 #13
  (1)   001250 000000                   SVSW14: OPEN            ;MAP OF LINES SELECTED, DJ11 #14
  (1)   001252 000000                   SVSW15: OPEN            ;MAP OF LINES SELECTED, DJ11 #15
  (1)   001254 000000                   SVSW16: OPEN            ;MAP OF LINES SELECTED, DJ11 #16
  (1)   001256 000000                   SVSW17: OPEN            ;MAP OF LINES SELECTED, DJ11 #17
 2639   001260 000000                   MARK:   0
 2640   001262 000030                   BUFSIZ: 30              ;RECEIVE BUFFER SIZE (PROG3)
 2641   001264 000000                   BUFEND: 0               ;LAST ADDR OF PROG3 BUFFER
 2642   001266 000001                   UNITS:  1               ;NUMBER OF UNITS ON THE SYSTEM
 2643   001270 160010                   DEVADR: 160010          ;FIRST DEVICE ADDRESS
 2644   001272 000300                   VECADR: 300             ;FIRST VECTOR ADDRESS
 2645   001274 000240                   RCVLVL: 240             ;RECEIVER BR LEVEL = 5
 2646   001276 000240                   XMTLVL: 240             ;TRANSMITTER BR LEVEL = 5
 2647   001300 000000                   ALMFLG: 0               ;SILO ALARM LEVEL FLAG
 2648   001302 000000                   TIMERA: 0               ;TIME COUNTERS
 2649   001304 000000                   TIMERB: 0
```

```
2650   001306   000000          COUNT:   0                          ;VALUE OF THE SILO ALARM LEVEL
2651   001310   000000          SUM:     0
2652
2653                            ;1***********************************************************************
2654                            ; TABLES
2655                            ;***********************************************************************
2656
2657   001312   000400          XMTTAB:  .BLKW    400               ;TRANSMIT DATA POINTER TABLE
2658
2659   002312   000400          RCVTAB:  .BLKW    400               ;RECEIVE DATA POINTER TABLE (PROG1)
2660                                                                ;RECEIVE DATA TABLE (PROG2 AND PROG3,
2661
2662   003312   000400          XMTCNT:  .BLKW    400               ;TRANSMIT DATA COUNTER
2663            003313          RCVCNT=XMTCNT+1                     ;RECEIVE DATA COUNTER
2664
2665   004312   000400          MASK:    .BLKW    400               ;CHARACTER MASK TABLE
2666            004313          CNTTAB=MASK+1                       ;ITERATION COUNT AND FLAGS
```

.

B02

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 45
DZDJBE.P11   08-SEP-77 15:07   SET UP AREA

SEQ 0014

```
2671
2672   005312   012706   001200            BEGIN:  MOV    #STACK, SP        ;SET UP STACK POINTER
2673   005316   004737   015210                    JSR    PC,SUSORR
2674   005322   012700   000020                    MOV    #20,R0
2675   005326   012720   014672                    MOV    #IOTRAP,(R0)+     ;IOT VECTOR (20)
2676   005332   012720   000340                    MOV    #340,  (R0)+
2677   005336   012720   014530                    MOV    #PDOWNS,(R0)+     ;POWER FAIL VECTOR (24)
2678   005342   012720   000340                    MOV    #340,  (R0)+
2679   005346   012720   013610                    MOV    #EMT$, (R0)+      ;EMT VECTOR (30)
2680   005352   012720   000340                    MOV    #340,  (R0)+
2681   005356   005037   001202                    CLR    ERRORS            ;CLEAR ERROR COUNTER
2682   005362   005037   001204                    CLR    PCNT              ;CLEAR PASS COUNTER
2683   005366   005037   001206                    CLR    PCNT+2
2684   005372   012700   000300                    MOV    #300,  R0         ;START OF FLOATING VECTOR AREA
2685   005376   005720            2S:      TST    (R0)+             ;UPDATE POINTER
2686   005400   010060   177776                    MOV    R0,    -2(R0)     ;PUT ".+2" IN EACH VECTOR
2687   005404   012720   000004                    MOV    #IOT,  (R0)+      ;AND "IOT"
2688   005410   022700   001000                    CMP    #1000, R0         ;CHECK FOR END OF FLOATING VECTOR AREA
2689   005414   003370                             BGT    2S                ;BRANCH IF MORE
2690   005416   005037   001300                    CLR    ALMFLG            ;CLEAR THE ALARM FLAG
2691   005422   012737   000400   010210            MOV    #256.,CNTNIT      ;SET MAXIMUM SIZE VALUES
2692   005430   012737   000106   010214            MOV    #70.,CNTNIT+4     ;FOR PROG #1
2693   005436   012737   000106   010220            MOV    #70.,CNTNIT+10
2694   005444   012737   000001   001216            MOV    #1,TIMES          ;SET FOR QV ON FIRST PASS
2698
2699                     ;****************************************************************************
2700                     ;ROUTINE TO MAP ALL THE DJ11'S ON THE SYSTEM
2701                     ;****************************************************************************
2702
2703   005452   013700   001270            DJMAP:  MOV    DEVADR, R0        ;GET FIRST FLOATING ADDRESS
2704   005456   012702   000001                    MOV    #1,    R2         ;COUNTER FOR DJ11'S
2705   005462   012737   000002   000006            MOV    #RTI,  @#6        ;RTI WHEN TIME-OUT
2706   005470   005001            5S:      CLR    R1                ;SET UP COUNTER
2707   005472   000261            1S:      SEC                      ;SET CARRY
2708   005474   005710                             TST    (R0)              ;CHECK FOR A DEVICE
2709   005476   103404                             BCS    7S                ;BRANCH IF NONE
2710   005500   062700   000010            6S:      ADD    #10,   R0         ;GO TO NEXT DEVICE ADDRESS
2711   005504   005201                             INC    R1                ;COUNT DJ11'S
2712   005506   000771                             BR     1S                ;LOOK FOR MORE
2713
2714   005510   005037   000006            7S:      CLR    @#6               ;RESTORE TIMEOUT VECTOR
2715   005514   010137   001256                    MOV    R1,    UNITS      ;SAVE COUNT
2716   005520   001005                             BNE    GETVEC
2717   005522   000004   015567                    TYPE,  MSG01             ;TYPE "NO DJ11'S!"
2718   005526   000000                             HALT                     ;FATAL ERROR
2719   005530   000137   013522                    JMP    @#DONE            ;RESTART
2723
2724                     ;****************************************************************************
2725                     ;ROUTINE TO DETERMINE VECTOR ADDRESSES OF DJ11'S
2726                     ;****************************************************************************
2727
2728   005534   013746   000020            GETVEC: MOV    @#20,  -(SP)      ;SAVE IOT VECTOR
2729   005540   012737   005570   000020            MOV    #1S,   @#20       ;RESET IOT VECTOR
2730   005546   013701   001270                    MOV    DEVADR, R1        ;FIRST DJ ADDRESS
2731   005552   012711   040400                    MOV    #40400, (R1)      ;SET CSR
2732                                                                        ;BIT8= TRANS SCAN ENABLE
```

C02

```
2733                                                                      ;BIT14= TRANS INTERRUPT ENABLE
2734    005556  012761  000001  000004          MOV     #1,     4(R1)    ;TCR, LINE 0
2735    005564  000001                          WAIT                     ;WAIT FOR AN INTERRUPT
2736    005566  000407                          BR      3$               ;CONTINUE AFTER INTERUPT
2737
2738    005570  011602                  1$:     MOV     (SP),   R2       ;SAVE VECTOR ADR. (+4)
2739    005572  162716  000010                  SUB     #10,    (SP)     ;REPOSITION ADR TO RCV. VEC.
2740    005576  011637  001272                  MOV     (SP),   VECADR   ;SAVE FIRST VECTOR
2741    005602  022626                          CMP     (SP)+,  (SP)+    ;RESET STACK FROM IOT
2742    005604  000002                          RTI                      ;RETURN FROM INITIAL INTERRUPT
2743
2744    005606  012637  000020          3$:     MOV     (SP)+,  @#20     ;RESTORE IOT VECTOR
2745    005612  005742                          TST     -(R2)            ;POINT TO XMT. VEC. +2
2746    005614  013703  001266                  MOV     UNITS,  R3       ;SET UP UNIT COUNTER
2747
2748                            ;CHECK THAT VECTORS ARE CONTIGUOUS
2749
2750    005620  005061  000004          2$:     CLR     4(R1)            ;CLEAR TCR
2751    005624  005011                          CLR     (R1)             ;CLEAR CSR
2752    005626  012712  000004                  MOV     #IOT,   (R2)     ;RESTORE IOT TO XMT. VEC.+2
2753    005632  005303                          DEC     R3               ;CHECK FOR MORE DJ11'S
2754    005634  001415                          BEQ     REPORT           ;BRANCH IF DONE
2755    005636  062701  000010                  ADD     #10,    R1       ;UPDATE DJ ADR. POINTER
2756    005642  062702  000010                  ADD     #10,    R2       ;UPDATE VECTOR POINTER
2757    005646  012712  000002                  MOV     #RTI,   (R2)     ;RTI ON INTERRUPT
2758    005652  012711  040400                  MOV     #40400, (R1)     ;SET CSR
2759    005656  012761  000001  000004          MOV     #1,     4(R1)    ;TCR LINE 0
2760    005664  000001                          WAIT                     ;WAIT FOR AN INTERRUPT
2761    005666  000754                          BR      2$
2762
2763                            ;REPORT CONFIGURATION
2764
2765    005670  032777  020000  173312  REPORT: BIT     #BIT13, @SWR     ;CHECK FOR INHIBIT TYPOUT
2766    005676  001026                          BNE     GETLEN           ;SKIP REPORT IF SET
2767    005700  000004  015402                  TYPE,   MSGMON
2768    005704  000004  015371                  TYPE,   RETURN
2769    005710  000004  015451                  TYPE,   MSGADR
2770    005714  013705  001270                  MOV     DEVADR,TTY       ;TYPE DEVADR IN OCTAL
 (1)    005720  004737  014346                  JSR     PC,PRINTR        ;TYPE LEADING ZERO'S
2771    005724  000004  015501                  TYPE,   MSGVEC
2772    005730  013705  001272                  MOV     VECADR,TTY       ;TYPE VECADR IN OCTAL
 (1)    005734  004737  014356                  JSR     PC,PRINTS        ;AND SUPRESS LEADING ZERO'S
2773    005740  000004  015525                  TYPE,   MSGNUM
2774    005744  013705  001266                  MOV     UNITS,TTY        ;TYPE UNITS IN OCTAL
  :     005750  004737  014356                  JSR     PC,PRINTS        ;AND SUPRESS LEADING ZERO'S
```

D02

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 46
DZDJBE.P11   08-SEP-77 15:07   CHARACTER LENGTH MAPPING ROUTINE   SEG 0016

```
2779
2780                                    ;**********************************************************************
2781                                    ;ROUTINE TO MAP CHARACTER LENGTHS
2782                                    ;**********************************************************************
2783
2784    005754  022737  000176  001210  GETLEN: CMP     #SWREG,SWR
2785    005762  001002                          BNE     6S
2786    005764  004737  015106                  JSR     PC,CNTLU
2787    005770  013700  001266          6S:     MOV     UNITS,  R0      ;SET UP UNIT COUNTER
2788    005774  013701  001270                  MOV     DEVADR, R1      ;SET UP DEVICE ADDRESS POINTER
2789    006000  012702  000001          1S:     MOV     #1,     R2      ;SET UP LINE MARKER
2790    006004  012711  000415                  MOV     #415,   (R1)    ;RCV ENB, CMOS, MAINT., TRANS SCAN ENB
2791    006010  032711  000020          10S:    BIT     #BIT4,  (R1)    ;WAIT FOR MOS TO CLEAR
2792    006014  001375                          BNE     10S
2793    006016  010261  000004          2S:     MOV     R2,     4(R1)   ;TRANS CONTROL, ONE LINE AT A TIME
2794    006022  005711                  3S:     TST     (R1)            ;WAIT FOR TRANS READY
2795    006024  100376                          BPL     3S
2796    006026  012761  000377  000006          MOV     #377,   6(R1)   ;SEND A RUBOUT
2797    006034  006302                          ASL     R2              ;SKIP 4 LINES
2798    006036  006302                          ASL     R2
2799    006040  006302                          ASL     R2
2800    006042  006302                          ASL     R2
2801    006044  103364                          BCC     2S              ;BRANCH BACK IF MORE LINES
2802    006046  005061  000004                  CLR     4(R1)           ;CLEAR TCR
2803    006052  062701  000010                  ADD     #10,    R1      ;UPDATE POINTER TO NEXT UNIT
2804    006056  005300                          DEC     R0              ;CHECK FOR MORE UNITS
2805    006060  001347                          BNE     1S
2806    006062  013700  001266                  MOV     UNITS,  R0      ;SET UP UNIT COUNTER
2807    006066  013701  001270                  MOV     DEVADR, R1      ;SET UP DEVICE ADDRESS POINTER
2808    006072  012702  004312                  MOV     #MASK,  R2      ;SET UP CHAR LEN TABLE POINTER
2809    006076  012703  000004          4S:     MOV     #4,     R3      ;SET UP CHAR COUNTER
2810    006102  016104  000002          5S:     MOV     2(R1),  R4      ;SAVE AND CHECK CHAR PRESENT
2811    006106  100375                          BPL     5S
2812    006110  010405                          MOV     R4,     R5      ;DUP DATA
2813    006112  000305                          SWAB    R5              ;LINE # IN LOW BYTE
2814    006114  042705  177760                  BIC     #177760,R5      ;CLEAR ALL BUT LINE #
2815    006120  006305                          ASL     R5              ;*2
2816    006122  060205                          ADD     R2,     R5      ;MAKE POINTER TO CHAR TABLE
2817    006124  105104                          COMB    R4              ;MAKE DATA INTO MASK
2818    006126  042704  177400                  BIC     #177400,R4      ;CLEAR UPPER BYTE
2819    006132  010425                          MOV     R4,     (R5)+   ;SAVE THE MASK
2820    006134  010425                          MOV     R4,     (R5)+   ;SAVE THE MASK
2821    006136  010425                          MOV     R4,     (R5)+   ;SAVE THE MASK
2822    006140  010425                          MOV     R4,     (R5)+   ;SAVE THE MASK
2823    006142  005303                          DEC     R3              ;COUNT TO 4
2824    006144  001356                          BNE     5S
2825    006146  062701  000010                  ADD     #10,    R1      ;ADDRESS POINTER TO NEXT DJ
2826    006152  062702  000040                  ADD     #40,    R2      ;CHAR LEN TABLE POINTER
2827    006156  005300                          DEC     R0              ;COUNT UNITS
2828    006160  001346                          BNE     4S              ;BRANCH BACK IF MORE
```

E02

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 47
DZDJBE.P11   08-SEP-77 15:07   PROGRAM SELECTION   SEG 0C17

```
2833
2834                                   ;*********************************************************************
2835                                   ;SELECT THE PROGRAM TO BE RUN
2836                                   ;PROGRAM 1:      OFF-LINE EXERCISER
2837                                   ;PROGRAM 2:      ON-LINE EXERCISER (TRANSMIT LAST CHARACTER RECEIVED)
2838                                   ;PROGRAM 3:      ON-LINE ECHO EXERCISER
2839                                   ;*********************************************************************
2840
2841    006162  005737  000042    SELPRO: TST     @#42                    ;CHECK FOR ACT 11 OR DDP
2842    006166  001040                    BNE     ALL                     ;BRANCH IF MONITOR
2843    006170  000004  015550            TYPE,   MSGPRG
2844    006174  004537  014002            JSR     R5,     READIN          ;READ A NUMBER FROM THE CTY
2845    006200  006332                    .WORD   PROGNO
2846    006202  001367                    BNE     SELPRO
2847    006204  032777  000400  172776    BIT     #BIT8,  @SWR            ;CHECK FOR SW<8>, SELECT LINES
2848    006212  001426                    BEQ     ALL                     ;BRANCH IF NOT
2849    006214  005000                    CLR     R0                      ;SET UP UNIT COUNTER, DISPLAY
2850    006216  012701  001220            MOV     #SVSW0,R1               ;SET UP SWITCH TABLE POINTER
2851    006222  000004  015371    SWITCH: TYPE,   RETURN
2852    006226  000004  015346            TYPE,   MNUM
2853    006232  010005                    MOV     R0,TTY                  ;PRINT THE NUMBER OF THE DR11C
2854    006234  004737  014356            JSR     PC,PRINTS
2855    006240  000004  015351            TYPE,   MSGSEL                  ;ASL FOR THE SELECTED LINES
2856    006244  004537  014002            JSR     R5,READIN
2857    006250  001214                    .WORD   SAVIT
2858    006252  013721  001214            MOV     SAVIT,(R1)+
2859    006256  005200·                   INC     R0                      ;COUNT UNITS
2860    006260  020037  001266            CMP     R0,     UNITS           ;CHECK FOR MORE UNITS
2861    006264  001356                    BNE     SWITCH                  ;BRANCH IF MORE
2862    006266  000410                    BR      RESTAR                  ;GO DO IT
2863
2864    006270  013700  001266    ALL:    MOV     UNITS, R0               ;SET UP UNIT COUNTER
2865    006274  012701  001220            MOV     #SVSW0,R1               ;SET UP SWITCH TABLE POINTER
2866    006300  012721  177777    1S:     MOV     #177777,(R1)+           ;SET ALL LINES
2867    006304  005300                    DEC     R0                      ;COUNT UNITS
2868    006306  001374                    BNE     1S                      ;BRANCH IF MORE
2869                                    .SBTTL     RESTART POINT
2870
2871    006310  013700  006332    RESTAR: MOV     PROGNO, R0
2872    006314  001722                    BEQ     SELPRO
2873    006316  022700  000003            CMP     #3,     R0
2874    006322  103717                    BLO     SELPRO
2875    006324  006300                    ASL     R0
2876    006326  000170  006332            JMP     @PROGAD (R0)
2877
2878    006332                    PROGNO:
2879    006332  000001            PROGAD: 1                               ;DEFAULT TO PROGRAM 1
2880    006334  006342                    PROG1
2881    006336  010762                    PROG2
2882    006340  012166                    PROG3
```

F02

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 48
DZDJBE.P11   08-SEP-77 15:07   PROG1: OFF-LINE EXERCISER   SEG 0018

```
2887
2888                              ;*********************************************************************
2889                              ;PROGRAM 1:      TRANSMIT AND RECEIVE ALL LINES SIMULTANEOUSLY
2890                              ;                OFF-LINE:  SW<9> = 0
2891                              ;                ON-LINE:   SW<9> = 1
2892                              ;                USES THE DATA TABLE SELECTED BY SW<2:0>
2893                              ;                EACH LINE REPEATS THE PATTERN AT LEAST 16 TIMES
2894                              ;                PER PASS.
2895                              ;*********************************************************************
2896
2897   006342  000005            PROG1:  RESET                       ;CLEAR OUT THE WORLD
2898   006344  012706  001200            MOV     #STACK, SP          ;RESET THE STACK POINTER
2899   006350  052737  000340  177776    BIS     #340,@#PS           ;PROCESSOR TO LEVEL 7
2900   006356  012701  001312            MOV     #XMTTAB,R1          ;FIRST TABLE POINTER
2901   006362  012702  001400            MOV     #1400,R2            ;LENGTH OF TABLES (WORDS)
2902   006366  005021            1$:     CLR     (R1)+               ;CLEAR THE TABLE
2903   006370  005302                    DEC     R2
2904   006372  001375                    BNE     1$
2905   006374  012702  000400            MOV     #400,R2             ;LENGTH OF MASK/COUNT TABLE
2906   006400  005201            2$:     INC     R1                  ;SKIP MASK
2907   006402  105021                    CLRB    (R1)+               ;CLEAR COUNT
2908   006404  005302                    DEC     R2
2909   006406  001374                    BNE     2$
2910
2911                              ;ROUTINE TO INITIALIZE ALL DJ11'S AND THEIR ISR'S:
2912                              ;SET UP ALL INTERRUPT VECTORS
2913                              ;SET UP DEVICE ADDRESSES IN LINKER ROUTINES
2914                              ;SET CSR'S EVERYTHING ENABLED
2915                              ;SET TCR'S, ALL LINES ENABLED
2916
2917   006410  005000            P1INIT: CLR     R0
2918   006412  013701  001270            MOV     DEVADR, R1
2919   006416  013702  001272            MOV     VECADR, R2
2920   006422  012703  007354            MOV     #RISR0, R3
2921   006426  010322            11$:    MOV     R3,     (R2)+       ;SET UP RECEIVER INTERUPT VECTOR
2922   006430  013722  001274            MOV     RCVLVL, (R2)+
2923   006434  022323                    CMP     (R3)+,  (R3)+       ;ADD 4 TO R3
2924   006436  010113                    MOV     R1,     (R3)        ;ADDRESS OF CSR
2925   006440  062723  000002            ADD     #2,     (R3)+       ;ADDRESS OF RBUF
2926   006444  005723                    TST     (R3)+
2927   006446  010322                    MOV     R3,     (R2)+       ;SET UP TRANSMITTER INTERUPT VECTOR
2928   006450  013722  001276            MOV     XMTLVL, (R2)+
2929   006454  022323                    CMP     (R3)+,  (R3)+
2930   006456  010123                    MOV     R1,     (R3)+       ;ADDRESS OF CSR
2931   006460  005011                    CLR     (R1)                ;CLEAR CSR
2932   006462  052711  050510            BIS     #50510, (R1)        ;SET UP CSR
2933                                                                 ;BIT3 = CLEAR MOS
2934                                                                 ;BIT6 = RECEIVER INTERUPT ENABLE
2935                                                                 ;BIT8 = TRANSMITTER SCAN ENABLE
2936                                                                 ;BIT12 = STATUS ENABLE
2937                                                                 ;BIT14 = TRANSMITTER INTERUPT ENABLE
2938   006466  032711  000020            13$:    BIT     #BIT4, (R1)     ;CHECK FOR MOS TO CLEAR
2939   006472  001375                    BNE     13$
2940   006474  005737  001300            TST     ALMFLG              ;HAS THE SILO ALARM LEVEL BEEN CHECKED?
2941   006500  001002                    BNE     10$                 ;YES
2942   006502  004737  007006            JSR     PC,ALMCK            ;NO,GO DO IT
```

G02

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 48-1
DZDJBE.P11   08-SEP-77 15:07   PROG1: OFF-LINE EXERCISER   SEG 0019

```
2943  006506  006300                 10S:    ASL     R0                      ;UNIT # * 2
2944  006510  016061  001220  000004          MOV     SVSW0(R0),4(R1)         ;SET TCR BITS (CSR + 4)
2945  006516  006200                          ASR     R0                      ;RESTORE UNIT COUNTER
2946  006520  012737  000001  001260          MOV     #1,     MARK            ;SET UP MARKER
2947  006526  017705  172456                  MOV     @SWR,   R5              ;GET SWITCH SETTINGS
2948  006532  042705  177770                  BIC     #177770,R5              ;MASK MESSAGE #
2949  006536  006305                          ASL     R5
2950  006540  006305                          ASL     R5
2951  006542  012304                          MOV     (R3)+,  R4              ;SET UP OFFSET TO TABLES
2952  006544  033761  001260  000004  14S:    BIT     MARK,   4(R1)           ;CHECK FOR LINE SELECTED IN TCR
2953  006552  001414                          BEQ     15S
2954  006554  016564  010206  001312          MOV     ADRNIT(5),XMTTAB(4)
2955  006562  016564  010206  002312          MOV     ADRNIT(5),RCVTAB(4)
2956  006570  116564  010210  003312          MOVB    CNTNIT(5),XMTCNT(4)
2957  006576  116564  010210  003313          MOVB    CNTNIT(5),RCVCNT(4)
2958  006604  005724                 15S:    TST     (R4)+                   ;INC OFFSET TO NEXT LINE
2959  006606  006337  001260                  ASL     MARK
2960  006612  103354                          BCC     14S
2961  006614  032777  001000  172366          BIT     #BIT9,  @SWR            ;CHECK FOR ON-LINE
2962  006622  001024                          BNE     21S                     ;BRANCH IF ON-LINE
2963  006624  052711  000014                  BIS     #14,    (R1)            ;SET THE MAINTENANCE BIT AND CLR MOS
2964  006630  032711  000020         20S:    BIT     #BIT4,(R1)              ;WAIT FOR MOS TO CLEAR
2965  006634  001375                          BNE     20S
2966  006636  052711  000001                  BIS     #1,(R1)                 ;TURN ON RCV ENABLE
2967  006642  062701  000010         12S:    ADD     #10,R1                  ;POINT TO THE NEXT CSR
2968  006646  005200                          INC     R0
2969  006650  020037  001266                  CMP     R0,     UNITS
2970  006654  001264                          BNE     11S
2971  006656  012737  000001  001300          MOV     #1,ALMFLG               ;SET THE ALARM LEVEL FLAG
2972  006664  042737  000140  177776          BIC     #140,   @#PS            ;LOWER PROCESSOR PRIORITY
2973  006672  000406                          BR      FORGND                  ;GO DO IT
2974
2975  006674  052711  000001         21S:    BIS     #1,(R1)                 ;TURN ON RCV EN
2976  006700  005761  000002         22S:    TST     2(R1)                   ;CLEAR JUNK OUT OF THE RBUF
2977  006704  100775                          BMI     22S
2978  006706  000755                          BR      12S
2982
2983                                  ;******************************************************************
2984                                  ;PROG1  BACKGROUND PROGRAM TO MONITOR TABLES
2985                                  ;******************************************************************
2986                                  ; NOTE - PROGRAM MAY HANG IN A LOOP.
2987                                  ; IF THIS HAPPENS, RUN DZDJA.
2988
2989  006710  012701  003312         FORGND: MOV     #XMTCNT,R1
2990  006714  012702  000400                  MOV     #400,R2
2991  006720  105711                 21S:    TSTB    (R1)                    ;CHECK FOR COUNT TABLE CLR
2992  006722  001376                          BNE     21S                     ;BRANCH IF NOT
2993  006724  062701  000002                  ADD     #2,R1                   ;GO TO NEXT LINE ENTRY
2994  006730  005302                          DEC     R2                      ;COUNT LINES
2995  006732  001372                          BNE     21S                     ;BRANCH IF MORE LINES
2996  006734  012701  003313                  MOV     #RCVCNT,R1
2997  006740  012702  000400                  MOV     #400,R2
2998  006744  121137  001306         22S:    CMPB    (R1),COUNT              ;IS # OF CHAR LEFT IN RBUF LESS THAN
2999                                                                          ;THE SILO ALARM LEVEL
3000  006750  003375                          BGT     22S                     ;IF NO WAIT FOR THEM
3001  006752  062701  000002                  ADD     #2,R1                   ;IF YES IGNORE THEM
```

```
3002  006756  005302                        DEC    R2                  ;COUNT LINES
3003  006760  001371                        BNE    22S                 ;BRANCH IF MORE LINES
3004  006762  005337  001216                DEC    TIMES               ;DO THIS AGAIN?
3005  006766  001402                        BEQ    LSS                 ;NO, GET OUT
3006  006770  000137  006342                JMP    PROG1
3007  006774  012737  000020  001216  23S:  MOV    #20,TIMES           ;DO IT 16 TIMES THE NEXT TIME
3008  007002  000137  013522                JMP    @#DONE              ;SKIP ISR'S
3009  007006  012761  000001  000004  ALMCK: MOV   #1,4(R1)            ;SET LINE 0 IN THE TCR
3010  007014  052711  000004                BIS    #BIT2,(R1)          ;SET THE MAINT BIT
3011  007020  052711  000001                BIS    #1,(R1)             ;SET RCV EN AFTER MAINTENANCE BIT
3012  007024  005037  001306                CLR    COUNT
3013  007030  005037  001310                CLR    SUM
3014  007034  005037  001302                CLR    TIMERA
3015  007040  012737  000200  001304  2S:   MOV    #200,TIMERB         ;SET UP TIME CONSTANTS
3016  007046  005711                        TST    (R1)                ;WAIT FOR TRANSFER READY BIT
3017  007050  100373                        BPL    2S
3018  007052  112761  000377  000006        MOVB   #377,6(R1)          ;OUTPUT A CHAR TO TBUF
3019  007060  005237  001306                INC    COUNT               ;COUNT EACH CHAR
3020  007064  105711                  1S:   TSTB   (R1)                ;CHECK FOR DONE IN THE CSR
3021  007066  100405                        BMI    3S                  ;IF SET GET  OUT OF THE LOOP
3022  007070  004537  007320                JSR    R5,TIME             ;GIVE DONE TIME TO SET
3023  007074  000773                        BR     1S                  ;RETURN TO TEST FOR DONE AGAIN
3024  007076  000760                        BR     2S                  ;RETURN TO OUTPUT ANOTHER CHAR
3025  007100  000742                        BR     ALMCK               ;ERROR RETURN TRY AGAIN
3026  007102  042711  000001          3S:   BIC    #BIT0,(R1)          ;TURN OFF RCV ENABLE
3027  007106  052711  000010                BIS    #BIT3,(R1)          ;CLEAR MOS
3028  007112  022737  000001  001306        CMP    #1,COUNT            ;IF SILO LEVEL SET FOR 1 THEN GET OUT
3029  007120  001437                        BEQ    4S
3030  007122  063737  001306  001310  5S:   ADD    COUNT,SUM           ;GET THE LARGEST MULTIPLE OF THE
3031  007130  023727  001310  000106        CMP    SUM,#70.            ;SILO ALARM LEVEL AND USE IT IN THE
3032  007136  002771                        BLT    5S                  ;THREE SIZE LOCATIONS
3033  007140  001403                        BEQ    6S                  ;IF EQUAL USE IT
3034  007142  163737  001306  001310        SUB    COUNT,SUM           ;IF GREATER SUBTRACT ONE COUNT OFF
3035  007150  013737  001310  010214  6S:   MOV    SUM,CNTNIT+4        ;AS CLOSE TO 70 AS POSSIBLE
3036  007156  013737  001310  010220        MOV    SUM,CNTNIT+10
3037  007164  063737  001306  001310  7S:   ADD    COUNT,SUM           ;CONTINUE TO A COUNT OF 256
3038  007172  023727  001310  000377        CMP    SUM,#377
3039  007200  002771                        BLT    7S
3040  007202  163737  001306  001310        SUB    COUNT,SUM
3041  007210  013737  001310  010210  10S:  MOV    SUM,CNTNIT          ;AS CLOSE TO 256 AS POSSIBLE
3042  007216  000411                        BR     11S                 ;ALL SET GET OUT
3043  007220  012737  000377  010210  4S:   MOV    #377,CNTNIT         ;PUT SIZE TO MAX VALUE
3044  007226  012737  000106  010214        MOV    #70.,CNTNIT+4
3045  007234  012737  000106  010220        MOV    #70.,CNTNIT+10
3046  007242  042711  000004          11S:  BIC    #BIT2,(R1)          ;TURN OFF THE MAINT BIT
3047  007246  032711  000020          12S:  BIT    #BIT4,(R1)          ;WAIT FOR MOS TO CLEAR
3048  007252  001375                        BNE    12S
3049  007254  004737  015270                JSR    PC,KBDINT           ;GET THE SWITCH REGISTER
3050  007260  032777  010000  171722        BIT    #SW12,@SWR          ;PRINT ALARM LEVEL?
3051  007266  001413                        BEQ    13S                 ;NO
3052  007270  000004  015676                TYPE,  MALARM
3053  007274  010105                        MOV    R1,TTY              ;YES, PRINT CSR FIRST
3054  007276  004737  014346                JSR    PC,PRINTR
3055  007302  000004  015672                TYPE,  MSGDAS
3056  007306  013705  001306                MOV    COUNT,TTY           ;PRINT ALARM LEVEL
3057  007312  004737  014346                JSR    PC,PRINTR
```

I02

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 48-3
DZDJBE.P11   08-SEP-77 15:07   BACKGROUND MONITOR   SEG DC2:

```
 3058  007316  000207                      13S:    RTS     PC
 3059
 3060
 3061
 3062  007320  105237   001302             TIME:   INCB    TIMERA          ;INCREMENT THROUGH ONE WORD
 3063  007324  001012                              BNE     1S              ;GO TEST FOR DONE AGAIN
 3064  007326  005337   001304                     DEC     TIMERB          ;MAKE TIMERB LARGER IF FAST PROCESSOR
 3065  007332  001007                              BNE     1S
 3066  007334  023727   001306  000022             CMP     COUNT,#22       ;HAVE OUTPUTTED 18 TIMES
 3067  007342  001002                              BNE     2S              ;NO, GO OUTPUT ANOTHER CHAR
 3068  007344  104001                              HLT+1                   ;YES,DONE DID NOT SET AFTER 18 OUTPUTS
 3069                                                                      ;R1 = CSR
 3070  007346  005725                              TST     (R5)+           ;SET R5 FOR ERROR RETURN
 3071  007350  005725             2S:              TST     (R5)+           ;SET R5 FOR NEXT OUTPUT RETURN
 3072  007352  000205             1S:              RTS     R5              ;RETURN FROM ABOVE OR RETEST DONE
 3076
 3077                                      ;*****************************************************************
 3078                                      ;PROG1  LINKERS TO DJ11 INTERRUPT SERVICE ROUTINES
 3079                                      ;*****************************************************************
 3080
 3086  007354  004037   010070    RISR0:   JSR     R0,RCVISR
  (1)  007360  160012   000000             .WORD   <160012+<0*10>>,<40*0>
  (1)  007364  004037   007754    XISR0:   JSR     R0,XMTISR
  (1)  007370  160010   000000             .WORD   <160010+<0*10>>,<40*0>
  (1)  007374  004037   010070    RISR1:   JSR     R0,RCVISR
  (1)  007400  160022   000040             .WORD   <160012+<1*10>>,<40*1>
  (1)  007404  004037   007754    XISR1:   JSR     R0,XMTISR
  (1)  007410  160020   000040             .WORD   <160010+<1*10>>,<40*1>
  (1)  007414  004037   010070    RISR2:   JSR     R0,RCVISR
  (1)  007420  160032   000100             .WORD   <160012+<2*10>>,<40*2>
  (1)  007424  004037   007754    XISR2:   JSR     R0,XMTISR
  (1)  007430  160030   000100             .WORD   <160010+<2*10>>,<40*2>
  (1)  007434  004037   010070    RISR3:   JSR     R0,RCVISR
  (1)  007440  160042   000140             .WORD   <160012+<3*10>>,<40*3>
  (1)  007444  004037   007754    XISR3:   JSR     R0,XMTISR
  (1)  007450  160040   000140             .WORD   <160010+<3*10>>,<40*3>
  (1)  007454  004037   010070    RISR4:   JSR     R0,RCVISR
  (1)  007460  160052   000200             .WORD   <160012+<4*10>>,<40*4>
  (1)  007464  004037   007754    XISR4:   JSR     R0,XMTISR
  (1)  007470  160050   000200             .WORD   <160010+<4*10>>,<40*4>
  (1)  007474  004037   010070    RISR5:   JSR     R0,RCVISR
  (1)  007500  160062   000240             .WORD   <160012+<5*10>>,<40*5>
  (1)  007504  004037   007754    XISR5:   JSR     R0,XMTISR
  (1)  007510  160060   000240             .WORD   <160010+<5*10>>,<40*5>
  (1)  007514  004037   010070    RISR6:   JSR     R0,RCVISR
  (1)  007520  160072   000300             .WORD   <160012+<6*10>>,<40*6>
  (1)  007524  004037   007754    XISR6:   JSR     R0,XMTISR
  (1)  007530  160070   000300             .WORD   <160010+<6*10>>,<40*6>
  (1)  007534  004037   010070    RISR7:   JSR     R0,RCVISR
  (1)  007540  160102   000340             .WORD   <160012+<7*10>>,<40*7>
  (1)  007544  004037   007754    XISR7:   JSR     R0,XMTISR
  (1)  007550  160100   000340             .WORD   <160010+<7*10>>,<40*7>
  (1)  007554  004037   010070    RISR10:  JSR     R0,RCVISR
  (1)  007560  160112   000400             .WORD   <160012+<10*10>>,<40*10>
  (1)  007564  004037   007754    XISR10:  JSR     R0,XMTISR
  (1)  007570  160110   000400             .WORD   <160010+<10*10>>,<40*10>
```

J02

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 48-4
DZDJBE.P11   08-SEP-77 15:07   ISR LINKUPS   SEG 0022

```
  (1)   007574  004037  010070    RISR11: JSR     R0,RCVISR
  (1)   007600  160122  000440            .WORD   <160012+<11*10>>,<40*11>
  (1)   007604  004037  007754    XISR11: JSR     R0,XMTISR
  (1)   007610  160120  000440            .WORD   <160010+<11*10>>,<40*11>
  (1)   007614  004037  010070    RISR12: JSR     R0,RCVISR
  (1)   007620  160132  000500            .WORD   <160012+<12*10>>,<40*12>
  (1)   007624  004037  007754    XISR12: JSR     R0,XMTISR
  (1)   007630  160130  000500            .WORD   <160010+<12*10>>,<40*12>
  (1)   007634  004037  010070    RISR13: JSR     R0,RCVISR
  (1)   007640  160142  000540            .WORD   <160012+<13*10>>,<40*13>
  (1)   007644  004037  007754    XISR13: JSR     R0,XMTISR
  (1)   007650  160140  000540            .WORD   <160010+<13*10>>,<40*13>
  (1)   007654  004037  010070    RISR14: JSR     R0,RCVISR
  (1)   007660  160152  000600            .WORD   <160012+<14*10>>,<40*14>
  (1)   007664  004037  007754    XISR14: JSR     R0,XMTISR
  (1)   007670  160150  000600            .WORD   <160010+<14*10>>,<40*14>
  (1)   007674  004037  010070    RISR15: JSR     R0,RCVISR
  (1)   007700  160162  000640            .WORD   <160012+<15*10>>,<40*15>
  (1)   007704  004037  007754    XISR15: JSR     R0,XMTISR
  (1)   007710  160160  000640            .WORD   <160010+<15*10>>,<40*15>
  (1)   007714  004037  010070    RISR16: JSR     R0,RCVISR
  (1)   007720  160172  000700            .WORD   <160012+<16*10>>,<40*16>
  (1)   007724  004037  007754    XISR16: JSR     R0,XMTISR
  (1)   007730  160170  000700            .WORD   <160010+<16*10>>,<40*16>
  (1)   007734  004037  010070    RISR17: JSR     R0,RCVISR
  (1)   007740  160202  000740            .WORD   <160012+<17*10>>,<40*17>
  (1)   007744  004037  007754    XISR17: JSR     R0,XMTISR
  (1)   007750  160200  003740            .WORD   <160010+<17*10>>,<40*17>
3090
3091                              ;******************************************************************
3092                              ;PROG1  TRANSMITTER INTERRUPT SERVICE ROUTINE
3093                              ;******************************************************************
3094
3095   007754                    XMTISR:
  (2)   007754  010146                    MOV     R1,-(6)         ;PUSH R1 ON STACK
  (2)   007756  010246                    MOV     R2,-(6)         ;PUSH R2 ON STACK
3096   007760  012001                    MOV     (R0)+,R1
3097   007762  005711            1$:     TST     (R1)            ;CHECK FOR TRANS READY
3098   007764  100035                    BPL     4$
3099   007766  116103  000007            MOVB    7(R1),R2        ;GET LINE NO.
3100   007772  006302                    ASL     R2
3101   007774  061002                    ADD     (R0),R2
3102   007776  105762  003312            TSTB    XMTCNT(2)       ;TST FOR ZERO
3103   010002  001410                    BEQ     2$
3104   010004  117261  001312  000006    MOVB    @XMTTAB(2),6(1) ;SEND A CHARACTER
3105   010012  105362  003312            DECB    XMTCNT(2)       ;COUNT CHARACTERS
3106   010016  005262  001312            INC     XMTTAB(2)       ;UPDATE TABLE POINTER
3107   010022  000757                    BR      1$
3108   010024  010346            2$:     MOV     R3,-(SP)
3109   010026  005062  001312            CLR     XMTTAB(2)       ;CLEAR TABLE POINTER
3110   010032  161002                    SUB     (R0),R2
3111   010034  006202                    ASR     R2
3112   010036  005003                    CLR     R3
3113   010040  000261                    SEC
3114   010042  006103            3$:     ROL     R3
3115   010044  005302                    DEC     R2
```

K02

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 48-5
DZDJBE.P11   08-SEP-77 15:07   TRANSMITTER ISR   SEG 0023

```
3116  010046  100375                     BPL     3S
3117  010050  040361  000004             BIC     R3,4(R1)       ;CLEAR TCR BIT FOR LINE
3118  010054  012603                     MOV     (SP)+,R3       ;RESTORE R3
3119  010056  000741                     BR      1S
3120  010060                     4S:
 (2)  010060  012602                     MOV     (6)+,R2        ;POP STACK INTO R2
 (2)  010062  012601                     MOV     (6)+,R1        ;POP STACK INTO R1
 (2)  010064  012600                     MOV     (6)+,R0        ;POP STACK INTO R0
3121  010066  000002                     RTI
3125
3126                      ;********************************************************************
3127                      ;PROG1  RECEIVER INTERRUPT SERVICE ROUTINE
3128                      ;********************************************************************
3129
3130  010070                     RCVISR:
 (2)  010070  010146                     MOV     R1,-(6)        ;PUSH R1 ON STACK
 (2)  010072  010246                     MOV     R2,-(6)        ;PUSH R2 ON STACK
 (2)  010074  010346                     MOV     R3,-(6)        ;PUSH R3 ON STACK
 (2)  010076  010446                     MOV     R4,-(6)        ;PUSH R4 ON STACK
3131  010100  012001                     MOV     (R0)+,R1       ;GET RBUF ADDRESS
3132  010102  011102             1S:      MOV     (R1),R2        ;READ THE DATA
3133  010104  100032                     BPL     7S             ;BRANCH IF NO CHAR PRESENT
3134  010106  032702  070000             BIT     #70000,R2      ;CHECK FOR ERRORS
3135  010112  001403                     BEQ     2S             ;BRANCH IF OK
3136  010114  104002                     HLT+2                  ;RECEIVER ERROR
3137                                                            ;R1=RBUF ADDRESS
3138                                                            ;R2=CONTENTS OF RBUF
3139                                                            ;BIT12=PARITY ERROR
3140                                                            ;BIT13=FRAMING ERROR
3141                                                            ;BIT14=UART OVERRUN
3142  010116  042702  070000             BIC     #70000, R2     ;CLEAR ERROR BITS FOR SPEED
3143  010122  010204             2S:      MOV     R2,     R4     ;DUP THE RBUF
3144  010124  105004                     CLRB    R4             ;CLEAR THE DATA
3145  010126  000304                     SWAB    R4             ;LINE # TO LOW BYTE
3146  010130  106304                     ASLB    R4             ;LINE # * 2, ALSO CLR CHAR PRESENT
3147  010132  061004                     ADD     (R0),R4        ;ADD OFFSET
3148  010134  117403  002312             MOVB    @RCVTAB(R4),R3 ;GET EXPECTED DATA
3149  010140  046403  004312             BIC     MASK(4),R3     ;MASK CHARACTER LENGTH
3150  010144  120302                     CMPB    R3,R2
3151  010146  001403                     BEQ     3S             ;BRANCH IF OK
3152  010150  042703  177400             BIC     #177400,R3     ;MAKE SURE UPPER BYTE CLEAR
3153  010154  104003                     HLT+3                  ;DATA ERROR
3154                                                            ;R1=RBUF ADDRESS
3155                                                            ;R2=CONTENTS OF RBUF(DATA)
3156                                                            ;R3=EXPECTED DATA
3157  010156  105364  003313     3S:      DECB    RCVCNT(4)
3158  010162  001403                     BEQ     7S
3159  010164  005264  002312             INC     RCVTAB(4)      ;UPDATE TABLE POINTER
3160  010170  000744                     BR      1S             ;CONTINUE
3161  010172                     7S:
 (2)  010172  012604                     MOV     (6)+,R4        ;POP STACK INTO R4
 (2)  010174  012603                     MOV     (6)+,R3        ;POP STACK INTO R3
 (2)  010176  012602                     MOV     (6)+,R2        ;POP STACK INTO R2
 (2)  010200  012601                     MOV     (6)+,R1        ;POP STACK INTO R1
 (2)  010202  012600                     MOV     (6)+,R0        ;POP STACK INTO R0
3162  010204  000002                     RTI
```

L02

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 48-6
DZDJBE.P11   08-SEP-77 15:07   DATA TABLES   SEG 0024

```
3166
3167                              ;**************************************************************************
3168                              ;PROG1  DATA TABLES
3169                              ;**************************************************************************
3170
317.   J10206   010252           ADRNIT: BINARY                    ;SW<2:0>=0 BINARY COUNT PATTERN
3172   010210   000377           CNTNIT: 377                       ;SIZE=256.
3173   010212   010652                   PHRASE                    ;SW<2:0>=1 "THE QUICK SILVER GRAY FOX..."
3174   010214   000106                   70.                       ;SIZE=70.
3175   010216   010244                   SIXBIT                    ;SW<2:0>=2 040 THRU 137
3176   010220   000106                   70.                       ;SIZE=70.
3177   010222   015734                   END
3178   010224   000001                   1
3179   010226   016334                   END+400
3180   010230   000001                   1
3181   010232   016734                   END+1000
3182   010234   000001                   1
3183   010236   017334                   END+1400
3184   010240   000001                   1
3185   010242   017734                   END+2000
3186   010244   005015  177777  177777  SIXBIT: .ASCII   <15><12><377><377><377><377>    ;CR-LF, FILLERS
3187   010252   040              BINARY: .BYTE    40
3199   010253   041                      .BYTE    41
(2)    010254   042                      .BYTE    42
(2)    010255   043                      .BYTE    43
(2)    010256   044                      .BYTE    44
(2)    010257   045                      .BYTE    45
(2)    010260   046                      .BYTE    46
(2)    010261   047                      .BYTE    47
(2)    010262   050                      .BYTE    50
(2)    010263   051                      .BYTE    51
(2)    010264   052                      .BYTE    52
(2)    010265   053                      .BYTE    53
(2)    010266   054                      .BYTE    54
(2)    010267   055                      .BYTE    55
(2)    010270   056                      .BYTE    56
(2)    010271   057                      .BYTE    57
(2)    010272   060                      .BYTE    60
(2)    010273   061                      .BYTE    61
(2)    010274   062                      .BYTE    62
(2)    010275   063                      .BYTE    63
(2)    010276   064                      .BYTE    64
(2)    010277   065                      .BYTE    65
(2)    010300   066                      .BYTE    66
(2)    010301   067                      .BYTE    67
(2)    010302   070                      .BYTE    70
(2)    010303   071                      .BYTE    71
(2)    010304   072                      .BYTE    72
(2)    010305   073                      .BYTE    73
(2)    010306   074                      .BYTE    74
(2)    010307   075                      .BYTE    75
(2)    010310   076                      .BYTE    76
(2)    010311   077                      .BYTE    77
(2)    010312   100                      .BYTE    100
(2)    010313   101                      .BYTE    101
(2)    010314   102                      .BYTE    102
```

MO2

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 48-7
DZDJ2E.P11   08-SEP-77 15:07   DATA TABLES   SEG 0025

```
(2)  010315    103                              .BYTE   103
(2)  010316    104                              .BYTE   104
(2)  010317    105                              .BYTE   105
(2)  010320    106                              .BYTE   106
(2)  010321    107                              .BYTE   107
(2)  010322    110                              .BYTE   110
(2)  010323    111                              .BYTE   111
(2)  010324    112                              .BYTE   112
(2)  010325    113                              .BYTE   113
(2)  010326    114                              .BYTE   114
(2)  010327    115                              .BYTE   115
(2)  010330    116                              .BYTE   116
(2)  010331    117                              .BYTE   117
(2)  010332    120                              .BYTE   120
(2)  010333    121                              .BYTE   121
(2)  010334    122                              .BYTE   122
(2)  010335    123                              .BYTE   123
(2)  010336    124                              .BYTE   124
(2)  010337    125                              .BYTE   125
(2)  010340    126                              .BYTE   126
(2)  010341    127                              .BYTE   127
(2)  010342    130                              .BYTE   130
(2)  010343    131                              .BYTE   131
(2)  010344    132                              .BYTE   132
(2)  010345    133                              .BYTE   133
(2)  010346    134                              .BYTE   134
(2)  010347    135                              .BYTE   135
(2)  010350    136                              .BYTE   136
(2)  010351    137                              .BYTE   137
(2)  010352    140                              .BYTE   140
(2)  010353    141                              .BYTE   141
(2)  010354    142                              .BYTE   142
(2)  010355    143                              .BYTE   143
(2)  010356    144                              .BYTE   144
(2)  010357    145                              .BYTE   145
(2)  010360    146                              .BYTE   146
(2)  010361    147                              .BYTE   147
(2)  010362    150                              .BYTE   150
(2)  010363    151                              .BYTE   151
(2)  010364    152                              .BYTE   152
(2)  010365    153                              .BYTE   153
(2)  010366    154                              .BYTE   154
(2)  010367    155                              .BYTE   155
(2)  010370    156                              .BYTE   156
(2)  010371    157                              .BYTE   157
(2)  010372    160                              .BYTE   160
(2)  010373    161                              .BYTE   161
(2)  010374    162                              .BYTE   162
(2)  010375    163                              .BYTE   163
(2)  010376    164                              .BYTE   164
(2)  010377    165                              .BYTE   165
(2)  010400    166                              .BYTE   166
(2)  010401    167                              .BYTE   167
(2)  010402    170                              .BYTE   170
(2)  010403    171                              .BYTE   171
(2)  010404    172                              .BYTE   172
```

N02

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 48-8
DZDJBE.P11   08-SEP-77 15:07   DATA TABLES   SEG 0026

```
(2)   010405      173                        .BYTE    173
(2)   010406      174                        .BYTE    174
(2)   010407      175                        .BYTE    175
(2)   010410      176                        .BYTE    176
(2)   010411      177                        .BYTE    177
(2)   010412      200                        .BYTE    200
(2)   010413      201                        .BYTE    201
(2)   010414      202                        .BYTE    202
(2)   010415      203                        .BYTE    203
(2)   010416      204                        .BYTE    204
(2)   010417      205                        .BYTE    205
(2)   010420      206                        .BYTE    206
(2)   010421      207                        .BYTE    207
(2)   010422      210                        .BYTE    210
(2)   010423      211                        .BYTE    211
(2)   010424      212                        .BYTE    212
(2)   010425      213                        .BYTE    213
(2)   010426      214                        .BYTE    214
(2)   010427      215                        .BYTE    215
(2)   010430      216                        .BYTE    216
(2)   010431      217                        .BYTE    217
(2)   010432      220                        .BYTE    220
(2)   010433      221                        .BYTE    221
(2)   010434      222                        .BYTE    222
(2)   010435      223                        .BYTE    223
(2)   010436      224                        .BYTE    224
(2)   010437      225                        .BYTE    225
(2)   010440      226                        .BYTE    226
(2)   010441      227                        .BYTE    227
(2)   010442      230                        .BYTE    230
(2)   010443      231                        .BYTE    231
(2)   010444      232                        .BYTE    232
(2)   010445      233                        .BYTE    233
(2)   010446      234                        .BYTE    234
(2)   010447      235                        .BYTE    235
(2)   010450      236                        .BYTE    236
(2)   010451      237                        .BYTE    237
(2)   010452      240                        .BYTE    240
(2)   010453      241                        .BYTE    241
(2)   010454      242                        .BYTE    242
(2)   010455      243                        .BYTE    243
(2)   010456      244                        .BYTE    244
(2)   010457      245                        .BYTE    245
(2)   010460      246                        .BYTE    246
(2)   010461      247                        .BYTE    247
(2)   010462      250                        .BYTE    250
(2)   010463      251                        .BYTE    251
(2)   010464      252                        .BYTE    252
(2)   010465      253                        .BYTE    253
(2)   010466      254                        .BYTE    254
(2)   010467      255                        .BYTE    255
(2)   010470      256                        .BYTE    256
(2)   010471      257                        .BYTE    257
(2)   010472      260                        .BYTE    260
(2)   010473      261                        .BYTE    261
(2)   010474      262                        .BYTE    262
```

B03

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 48-9
DZDJBE.P11   08-SEP-77 15:07   DATA TABLES   SEG 0027

```
(2)  010475    263                    .BYTE    263
(2)  010476    264                    .BYTE    264
(2)  010477    265                    .BYTE    265
(2)  010500    266                    .BYTE    266
(2)  010501    267                    .BYTE    267
(2)  010502    270                    .BYTE    270
(2)  010503    271                    .BYTE    271
(2)  010504    272                    .BYTE    272
(2)  010505    273                    .BYTE    273
(2)  010506    274                    .BYTE    274
(2)  010507    275                    .BYTE    275
(2)  010510    276                    .BYTE    276
(2)  010511    277                    .BYTE    277
(2)  010512    300                    .BYTE    300
(2)  010513    301                    .BYTE    301
(2)  010514    302                    .BYTE    302
(2)  010515    303                    .BYTE    303
(2)  010516    304                    .BYTE    304
(2)  010517    305                    .BYTE    305
(2)  010520    306                    .BYTE    306
(2)  010521    307                    .BYTE    307
(2)  010522    310                    .BYTE    310
(2)  010523    311                    .BYTE    311
(2)  010524    312                    .BYTE    312
(2)  010525    313                    .BYTE    313
(2)  010526    314                    .BYTE    314
(2)  010527    315                    .BYTE    315
(2)  010530    316                    .BYTE    316
(2)  010531    317                    .BYTE    317
(2)  010532    320                    .BYTE    320
(2)  010533    321                    .BYTE    321
(2)  010534    322                    .BYTE    322
(2)  010535    323                    .BYTE    323
(2)  010536    324                    .BYTE    324
(2)  010537    325                    .BYTE    325
(2)  010540    326                    .BYTE    326
(2)  010541    327                    .BYTE    327
(2)  010542    330                    .BYTE    330
(2)  010543    331                    .BYTE    331
(2)  010544    332                    .BYTE    332
(2)  010545    333                    .BYTE    333
(2)  010546    334                    .BYTE    334
(2)  010547    335                    .BYTE    335
(2)  010550    336                    .BYTE    336
(2)  010551    337                    .BYTE    337
(2)  010552    340                    .BYTE    340
(2)  010553    341                    .BYTE    341
(2)  010554    342                    .BYTE    342
(2)  010555    343                    .BYTE    343
(2)  010556    344                    .BYTE    344
(2)  010557    345                    .BYTE    345
(2)  010560    346                    .BYTE    346
(2)  010561    347                    .BYTE    347
(2)  010562    350                    .BYTE    350
(2)  010563    351                    .BYTE    351
(2)  010564    352                    .BYTE    352
```

C03

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 48-10
DZDJBE.P11   08-SEP-77 15:07   DATA TABLES   SEG 0C28

```
        (2)  010565      353                      .BYTE   353
        (2)  010566      354                      .BYTE   354
        (2)  010567      355                      .BYTE   355
        (2)  010570      356                      .BYTE   356
        (2)  010571      357                      .BYTE   357
        (2)  010572      360                      .BYTE   360
        (2)  010573      361                      .BYTE   361
        (2)  010574      362                      .BYTE   362
        (2)  010575      363                      .BYTE   363
        (2)  010576      364                      .BYTE   364
        (2)  010577      365                      .BYTE   365
        (2)  010600      366                      .BYTE   366
        (2)  010601      367                      .BYTE   367
        (2)  010602      370                      .BYTE   370
        (2)  010603      371                      .BYTE   371
        (2)  010604      372                      .BYTE   372
        (2)  010605      373                      .BYTE   373
        (2)  010606      374                      .BYTE   374
        (2)  010607      375                      .BYTE   375
        (2)  010610      376                      .BYTE   376
        (2)  010611      377                      .BYTE   377
3205         010612      000                      .BYTE   0
        (2)  010613      001                      .BYTE   1
        (2)  010614      002                      .BYTE   2
        (2)  010615      003                      .BYTE   3
        (2)  010616      004                      .BYTE   4
        (2)  010617      005                      .BYTE   5
        (2)  010620      006                      .BYTE   6
        (2)  010621      007                      .BYTE   7
        (2)  010622      010                      .BYTE   10
        (2)  010623      011                      .BYTE   11
        (2)  010624      012                      .BYTE   12
        (2)  010625      013                      .BYTE   13
        (2)  010626      014                      .BYTE   14
        (2)  010627      015                      .BYTE   15
        (2)  010630      016                      .BYTE   16
        (2)  010631      017                      .BYTE   17
        (2)  010632      020                      .BYTE   20
        (2)  010633      021                      .BYTE   21
        (2)  010634      022                      .BYTE   22
        (2)  010635      023                      .BYTE   23
        (2)  010636      024                      .BYTE   24
        (2)  010637      025                      .BYTE   25
        (2)  010640      026                      .BYTE   26
        (2)  010641      027                      .BYTE   27
        (2)  010642      030                      .BYTE   30
        (2)  010643      031                      .BYTE   31
        (2)  010644      032                      .BYTE   32
        (2)  010645      033                      .BYTE   33
        (2)  010646      034                      .BYTE   34
        (2)  010647      035                      .BYTE   35
        (2)  010650      036                      .BYTE   36
        (2)  010651      037                      .BYTE   37
3206
3207  010652  005015  177777  177777  PHRASE: .ASCII   <15><12><377><377><377><377>
3208  010660  044124  020105  052521          .ASCIZ   "THE QUICK SILVER GRAY FOX JUMPED OVER 9,876,543,210.0 LAZY DOGS!"
```

D03

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 48-11
DZDJBE.P11   08-SEP-77 15:07   DATA TABLES   SEG 0029

```
        010666  041511  020113  044523
        010674  053114  051105  043440
        010702  040522  020131  047506
        010710  020130  052512  050115
        010716  042105  047440  042526
        010724  020122  026071  033470
        010732  026066  032065  026063
        010740  030462  027060  020060
        010746  040514  054532  042040
        010754  043517  020523     000
3209            010762                  .EVEN
```

E03

```
3214
3215                              ;************************************************************
3216                              ;PROGRAM 2:      ON-LINE MULTI-ECHO EXERCISER
3217                              ;                TRANSMITS THE LAST CHARACTER RECEIVED ON ITS RESPECTIVE
3218                              ;                LINE.  A CARRIAGE RETURN AND LINE FEED ARE INSERTED
3219                              ;                EVERY 72 CHARACTERS.
3220                              ;
3221                              ;************************************************************
3222    010762  000005           PROG2:  RESET                    ;CLEAR OUT THE WORLD
3223    010764  012706  001200           MOV     #STACK, SP       ;RESET THE STACK POINTER
3224    010770  052737  000340  177776   BIS     #340,    @#PS    ;PROCESSOR TO LEVEL 7
3225    010776  012701  001312           MOV     #XMTTAB,R1       ;FIRST TABLE POINTER
3226    011002  012702  001400           MOV     #1400,   R2              ;LENGTH OF TABLES (WORDS)
3227    011006  005021           1S:     CLR     (R1)+            ;CLEAR THE TABLE
3228    011010  005302                   DEC     R2
3229    011012  001375                   BNE     1S
3230    011014  012702  000400           MOV     #400,R2          ;LENGTH OF MASK/COUNT TABLE
3231    011020  005201           2S:     INC     R1               ;SKIP MASK
3232    011022  105021                   CLRB    (R1)+            ;CLEAR COUNT
3233    011024  005302                   DEC     R2
3234    011026  001374                   BNE     2S
3235
3236                              ;ROUTINE TO INITIALIZE ALL DJ11'S AND THEIR ISR'S:
3237                              ;SET UP ALL INTERRUPT VECTORS
3238                              ;SET UP DEVICE ADDRESSES IN LINKER ROUTINES
3239                              ;SET CSR'S EVERYTHING ENABLED
3240                              ;SET TCR'S, ALL LINES ENABLED
3241
3242    011030  005000           P2INIT: CLR     R0
3243    011032  013701  001270           MOV     DEVADR, R1
3244    011036  013702  001272           MOV     VECADR, R2
3245    011042  012703  011220           MOV     #R2SR0,R3        ;SET UP POINTER TO LINKERS
3246    011046  010322           1S:     MOV     R3,      (R2)+   ;SET UP RECEIVER INTERUPT VECTOR
3247    011050  013722  001274           MOV     RCVLVL,  (R2)+
3248    011054  022323                   CMP     (R3)+,   (R3)+   ;ADD 4 TO R3
3249    011056  010113                   MOV     R1,      (R3)    ;ADDRESS OF CSR
3250    011060  062723  000002           ADD     #2,      (R3)+   ;ADDRESS OF RBUF
3251    011064  005723                   TST     (R3)+
3252    011066  010322                   MOV     R3,      (R2)+   ;SET UP TRANSMITTER INTERRUPT VECTOR
3253    011070  013722  001276           MOV     XMTLVL,  (R2)+
3254    011074  022323                   CMP     (R3)+,   (R3)+
3255    011076  010123                   MOV     R1,      (R3)+   ;ADDRESS OF CSR
3256    011100  012721  050501           MOV     #50501,  (R1)+   ;SET UP CSR
3257                                                              ;BIT0 = RECEIVER ENABLE
3258                                                              ;BIT6 = RECEIVER INTERUPT ENABLE
3259                                                              ;BIT8 = TRANSMITTER SCAN ENABLE
3260                                                              ;BIT12 = STATUS ENABLE
3261                                                              ;BIT14 = TRANSMITTER INTERRUPT ENABLE
3262    011104  005721                   TST     (R1)+
3263    011106  006300                   ASL     R0               ;UNIT # * 2
3264    011110  016011  001220           MOV     SVSW0(R0),(R1)   ;SET TCR BITS FOR SELECTED LINES
3265    011114  006200                   ASR     R0               ;RESET UNIT COUNTER
3266    011116  012737  000001  001260   MOV     #1,      MARK    ;SET UP MARKER
3267    011124  012304                   MOV     (R3)+,   R4      ;SET UP OFFSET TO TABLES
3268    011126  033711  001260           4S:     BIT     MARK,    (R1)   ;CHECK FOR LINE SELECTED
3269    011132  001406                   BEQ     5S
```

F03

```
3270  011134  012764  015604  001312          MOV     #MSGP2, XMTTAB(4) ;SET UP XMTR TABLE
3271  011142  012764  000045  003312          MOV     #45,    XMTCNT(4) ;SET UP COUNT
3272  011150  005724                  5S:     TST     (R4)+             ;INC OFFSET TO NEXT LINE
3273  011152  006337  001260                  ASL     MARK
3274  011156  103363                           BCC     4S
3275  011160  022121                           CMP     (R1)+,  (R1)+    ;ADD 4
3276  011162  005200                           INC     RO
3277  011164  020037  001266                  CMP     RO,     UNITS
3278  011170  001326                           BNE     1S
3279  011172  042737  000140  177776          BIC     #140,   2#PS      ;LOWER PROCESSOR PRIORITY
3283
3284                                          ;************************************************************************
3285                                          ;PROG2  FOREGROUND PROGRAM TO READ/WRITE MEMORY
3286                                          ;************************************************************************
3287
3288  011200  012700  020000          FORP2:  MOV     #20000,RO         ;TOP OF 4K BANK OF MEMORY
3289  011204  000241                           CLC
3290  011206  005540                  1S:     ADC     -(RO)             ;FAST READ/WRITE TO MEMORY
3291  011210  001376                           BNE     1S                ;RAPID REPEAT
3292  011212  005700                           TST     RO                ;CHECK FOR LOC 0
3293  011214  001374                           BNE     1S                ;BRANCH IF MORE MEMORY
3294  011216  000770                           BR      FORP2             ;LOOP FOR EVER!
3298
3299                                          ;************************************************************************
3300                                          ;PROG2 LINKERS TO DJ11 INTERRUPT SERVICE ROUTINES
3301                                          ;************************************************************************
3302
3308  011220  004037  012012          R2SR0:  JSR     RO,P2RISR
 (1)  011224  160012  000000                  .WORD   <160012+<0*10>>,<0*40>
 (1)  011230  004037  011620          X2SR0:  JSR     RO,P2XISR
 (1)  011234  160020  000000                  .WORD   <160020+<0*10>>,<0*40>
 (1)  011240  004037  012012          R2SR1:  JSR     RO,P2RISR
 (1)  011244  160022  000040                  .WORD   <160012+<1*10>>,<1*40>
 (1)  011250  004037  011620          X2SR1:  JSR     RO,P2XISR
 (1)  011254  160030  000040                  .WORD   <160020+<1*10>>,<1*40>
 (1)  011260  004037  012012          R2SR2:  JSR     RO,P2RISR
 (1)  011264  160032  000100                  .WORD   <160012+<2*10>`,<2*40>
 (1)  011270  004037  011620          X2SR2:  JSR     RO,P2XISR
 (1)  011274  160040  000100                  .WORD   <160020+<2*10>>,<2*40>
 (1)  011300  004037  012012          R2SR3:  JSR     RO,P2RISR
 (1)  011304  160042  000140                  .WORD   <160012+<3*10>>,<3*40>
 (1)  011310  004037  011620          X2SR3:  JSR     RO,P2XISR
 (1)  011314  160050  000140                  .WORD   <160020+<3*10>>,<3*40>
 (1)  011320  004037  012012          R2SR4:  JSR     RO,P2RISR
 (1)  011324  160052  000200                  .WORD   <160012+<4*10>>,<4*40>
 (1)  011330  004037  011620          X2SR4:  JSR     RO,P2XISR
 (1)  011334  160060  000200                  .WORD   <160020+<4*10>>,<4*40>
 (1)  011340  004037  012012          R2SR5:  JSR     RO,P2RISR
 (1)  011344  160062  000240                  .WORD   <160012+<5*10>>,<5*40>
 (1)  011350  004037  011620          X2SR5:  JSR     RO,P2XISR
 (1)  011354  160070  000240                  .WORD   <160020+<5*10>>,<5*40>
 (1)  011360  004037  012012          R2SR6:  JSR     RO,P2RISR
 (1)  011364  160072  000300                  .WORD   <160012+<6*10>>,<6*40
 (1)  011370  004037  011620          X2SR6:  JSR     RO,P2XISR
 (1)  011374  160100  000300                  .WORD   <160020+<6*10>>,<6*40>
 (1)  011400  004037  012012          R2SR7:  JSR     RO,P2RISR
```

```
 .')   011404  160102  000340                  .WORD   <160012+<7*10>>,<7*40>
 .,)   011410  004037  011620         X2SR7:   JSR     R0,P2XISR
 (1)   011414  160110  000340                  .WORD   <16002C <7*10>>,<7*40>
 (1)   011420  004037  012012         R2SR10:  JSR     R0,P2RISR
 .)    011424  160112  000400                  .WORD   <160012+<10*10>>,<10*40>
 (1)   011430  004037  011620         X2SR10:  JSR     R0,P2XISR
 (1)   011434  160120  000400                  .WORD   <160020+<10*10>>,<10*40>
 (1)   011440  004037  012012         R2SR11:  JSR     R0,P2RISR
 (1)   011444  160122  000440                  .WORD   <160012+<11*10>>,<11*40>
 (1)   011450  004037  011620         X2SR11:  JSR     R0,P2XISR
 .1)   011454  160130  000440                  .WORD   <160020+<11*10>>,<11*40>
 (1)   011460  004037  012012         R2SR12:  JSR     R0,P2RISR
 (1)   011464  160132  000500                  .WORD   <160012+<12*10>>,<12*40>
 (1)   011470  004037  011620         X2SR12:  JSR     R0,P2XISR
 (1)   011474  160140  000500                  .WORD   <160020+<12*10>>,<12*40>
 (1)   011500  004037  012012         R2SR13:  JSR     R0,P2RISR
 (1)   011504  160142  000540                  .WORD   <160012+<13*10>>,<13*40>
 (1)   011510  004037  011620         X2SR13:  JSR     R0,P2XISR
 (1)   011514  160150  000540                  .WORD   <160020+<13*10>>,<13*40>
 (1)   011520  004037  012012         R2SR14:  JSR     R0,P2RISR
 (1)   011524  160152  000600                  .WORD   <160012+<14*10>>,<14*40>
 (1)   011530  004037  011620         X2SR14:  JSR     R0,P2XISR
 (1)   011534  160160  000600                  .WORD   <160020+<14*10>>,<14*4C>
 (1)   011540  004037  012012         R2SR15:  JSR     R0,P2RISR
 (1)   011544  160162  000640                  .WORD   <160012+<15*10>>,<15*40>
 (1)   011550  004037  011620         X2SR15:  JSR     R0,P2XISR
 (1)   011554  160170  000640                  .WORD   <160020+<15*10>>,<15*40>
 (1)   011560  004037  012012         R2SR16:  JSR     R0,P2RISR
 (1)   011564  160172  000700                  .WORD   <160012+<16*10>>,<16*40>
 (1)   011570  004037  011620         X2SR16:  JSR     R0,P2XISR
 (1)   011574  160200  000700                  .WORD   <160020+<16*10>>,<16*40>
 (1)   011600  004037  012012         R2SR17:  JSR     R0,P2RISR
 (1)   011604  160202  000740                  .WORD   <160012+<17*10>>,<17*40>
 (1)   011610  004037  011620         X2SR17:  JSR     R0,P2XISR
 (1.   011614  160210  000740                  .WORD   <160020+<17*10>>,<17*40>
3312
3313                                    ;***********************************************************************
3314                                    ;PROG2  TRANSMITTER INTERRUPT SERVICE ROUTINE
3315                                    ;***********************************************************************
3316
3317   011620                          P2XISR:
(2)    011620  010146                           MOV     R1,-(6)      ;PUSH R1 ON STACK
(2)    011622  010246                           MOV     R2,-(6)      ;PUSH R2 ON STACK
3318   011624  01200!                           MOV     (R0)+,R1
3319   011626  005711                  1S:      TST     (R1)         ;CHECK FOR TRANS READY
3320   011630  100064                           BPL     4S
3321   011632  116102  000007                   MOVB    7(R1),R2     ;GET LINE NO.
3322   011636  006302                           ASL     R2
3323   011640  061002                           ADD     (R0),R2
3324   011642  105762  003312                   TSTB    XMTCNT(2)    ;TST FOR ZERO
3325   011646  001413                           BEQ     2S           ;GET OUT
3326   011650  117261  001312  000006           MOVB    @XMTTAB(2),6(R1);SEND A CHARACTER
3327   011656  105362  003312                   DECB    XMTCNT(2)    ;COUNT CHARACTERS
3328   011662  105762  004313                   TSTB    CNTTAB(2)    ;CHECK FOR MESSAGE OR DATA
3329   011666  001357                           BNE     1S           ;BRANCH IF DATA
3330   011670  005262  0C1312                   INC     XMTTAB(2)    ;UPDATE TABLE POINTER
```

```
3331   011674  000754                      BR    1S
3332   011676  105162  004313       2S:    COMB  CNTTAB(2)        ;CHANGE FLAG
3333   011702  001430                      BEQ   3S               ;BRANCH IF WAS DATA
3334   011704  012762  002312  001312      MOV   #RCVTAB,XMTTAB(2) ;SET UP POINTER TO RECEIVER TABLE
3335   011712  060262  001312              ADD   R2,    XMTTAB(2) ;ADD OFFSET
3336   011716  112762  000110  003312      MOVB  #72,   XMTCNT(2) ;COUNT 72. CHARACTERS TO THE LINE
3337   011724  105762  002312              TSTB  RCVTAB(2)        ;CHECK FOR A BREAK
3338   011730  001336                      BNE   1S               ;BRANCH IF REAL DATA
3339   011732  161002                      SUB   (R0),  R2        ;RECOVER LINE NUMBER
3340   011734  006202                      ASR   R2
3341   011736  005037  001260              CLR   MARK             ;SET UP MARKER
3342   011742  000261                      SEC
3343   011744  006137  001260       5S:    ROL   MARK             ;MOVE MARKER
3344   011750  005302                      DEC   R2               ;COUNT LINES
3345   011752  100374                      BPL   5S               ;BRANCH IF MORE
3346   011754  043761  001260  000004      BIC   MARK,  4(R1)     ;CLEAR TCR BIT
3347   011762  000721                      BR    1S               ;CONTINUE
3348   011764  012762  015371  001312 3S:  MOV   #RETURN,XMTTAB(2) ;TYPE CARRIAGE RETURN, LINE FEED
3349   011772  112762  000002  003312      MOVB  #2,    XMTCNT(2) ;COUNTER OF 2 CHARACTERS
3350   012000  000712                      BR    1S
3351   012002                       4S:
 (2)   012002  012602                      MOV   (6)+,R2          ;POP STACK INTO R2
 (2)   012004  012601                      MOV   (6)+,R1          ;POP STACK INTO R1
 (2)   012006  012600                      MOV   (6)+,R0          ;POP STACK INTO R0
3352   012010  000002                      RTI
3356
3357                                 ;**************************************************************
3358                                 ;PROG2  RECEIVER INTERRUPT SERVICE ROUTINE
3359                                 ;**************************************************************
3360
3361   012012                       P2RISR:
 (2)   012012  010146                      MOV   R1,-(6)          ;PUSH R1 ON STACK
 (2)   012014  010246                      MOV   R2,-(6)          ;PUSH R2 ON STACK
 (2)   012016  010346                      MOV   R3,-(6)          ;PUSH R3 ON STACK
3362   012020  012001                      MOV   (R0)+,R1         ;GET RBUF ADDRESS
3363   012022  011102               1S:    MOV   (R1),R2          ;READ THE DATA
3364   012024  100053                      BPL   7S               ;BRANCH IF NO CHAR PRESENT
3365   012026  032702  070000              BIT   #70000,R2        ;CHECK FOR ERRORS
3366   012032  001402                      BEQ   2S               ;BRANCH IF OK
3367   012034  104002                      HLT+2                  ;RECEIVER ERROR
3368                                                              ;R1=RBUF ADDRESS
3369                                                              ;R2=CONTENTS OF RBUF
3370                                                              ;BIT12=PARITY ERROR
3371                                                              ;BIT13=FRAMING ERROR
3372                                                              ;BIT14=UART OVERRUN
3373   012036  000771                      BR    1S               ;FORGET THE DATA
3374
3375   012040  010203               2S:    MOV   R2,    R3        ;DUP THE RBUF
3376   012042  105003                      CLRB  R3               ;CLEAR THE DATA
3377   012044  000303                      SWAB  R3               ;LINE # TO LOW BYTE
3378   012046  106303                      ASLB  R3               ;LINE # * 2, ALSO CLR CHAR PRESENT
3379   012050  061003                      ADD   (R0),R3          ;ADD OFFSET
3380   012052  136302  004312              BITB  MASK(3),R2       ;CHECK CHARACTER LENGTH
3381   012056  001401                      BEQ   3S               ;BRANCH IF OK
3382   012060  104002                      HLT+2                  ;CHARACTER LENGTH ERROR
3383                                                              ;R1=RBUF ADDRESS
```

I03

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 49-4
DZDJBE.P11   08-SEP-77 15:07   RECEIVER ISR

SEG 0C34

```
3384                                                ;R2=CONTENTS OF RBUF(DATA)
3385   012062  105763  002312          3S:    TSTB   RCVTAB(3)         ;CHECK FOR BREAK
3386   012066  001017                         BNE    5S                ;BRANCH IF REAL DATA
3387   012070  110263  002312                 MOVB   R2,     RCVTAB(3) ;SAVE THE DATA
3388   012074  161003                         SUB    (R0),   R3        ;RECOVER LINE NUMBER
3389   012076  006203                         ASR    R3
3390   012100  005037  001260                 CLR    MARK              ;SET UP MARKER
3391   012104  000261                         SEC
3392   012106  006137  001260          4S:    ROL    MARK              ;UPDATE MARKER
3393   012112  005303                         DEC    R3                ;COUNT LINES
3394   012114  100374                         BPL    4S                ;BRANCH IF MORE
3395   012116  053761  001260  000002         BIS    MARK,   2(R1)     ;SET TCR BIT
3396   012124  000736                         BR     1S                ;CONTINUE
3397
3398   012126  110263  002312          5S:    MOVB   R2,     RCVTAB(3) ;SAVE THE DATA
3399   012132  105163  004313                 COMB   CNTTAB(3)         ;SET MESSAGE FLAG
3400   012136  012763  015371  001312         MOV    #RETURN,XMTTAB(3) ;TYPE CARRIAGE RETURN, LINE FEED
3401   012144  112763  000002  003312         MOVB   #2,     XMTCNT(3) ;MESSAGE LENGTH
3402   012152  000723                         BR     1S
3403   012154                         7S:
 (2)   012154  012603                         MOV    (6)+,R3           ;POP STACK INTO R3
 (2)   012156  012602                         MOV    (6)+,R2           ;POP STACK INTO R2
 (2)   012160  012601                         MOV    (6)+,R1           ;POP STACK INTO R1
 (2)   012162  012600                         MOV    (6)+,R0           ;POP STACK INTO R0
3404   012164  000002                         RTI
```

J03

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 50
DZDJBE.P11   08-SEP-77 15:07   PROG3: ECHO EXERCISER   SEG 0035

```
3409
3410                              ;*******************************************************************
3411                              ;PROGRAM 3:      ECHO EXERCISER
3412                              ;*******************************************************************
3413
3414   012166  000005     PROG3.  RESET                       ;CLEAR OUT THE WORLD
3415   012170  012706  001200     MOV    #STACK, SP           ;RESET THE STACK POINTER
3416   012174  052737  000340  177776  BIS  #340,  @#PS       ;PROCESSOR TO LEVEL 7
3417   012202  012701  001312     MOV    #XMTTAB,R1           ;FIRST TABLE POINTER
3418   012206  012702  001400     MOV    #1400,  R2           ;LENGTH OF TABLES (WORDS)
3419   012212  005021     1S:     CLR    (R1)+                ;CLEAR THE TABLE
3420   012214  005302             DEC    R2
3421   012216  001375             BNE    1S
3422   012220  012702  000400     MOV    #400,R2              ;LENGTH OF MASK/COUNT TABLE
3423   012224  005201     2S:     INC    R1                   ;SKIP MASK
3424   012226  105021             CLRB   (R1)+                ;CLEAR COUNT
3425   012230  005302             DEC    R2
3426   012232  001374             BNE    2S
3427   012234  012737  015734  001264  MOV  #END,BUFEND       ;GENERATE LAST BUFFER ADDRESS
3428   012242  063737  001262  001264  ADD  BUFSIZ,BUFEND
3429   012250  012705  015734     MOV    #END,   R5           ;SET UP BUFFER POINTER

3430
3431                              ;ROUTINE TO INITIALIZE ALL DJ11'S AND THEIR ISR'S:
3432                              ;SET UP ALL INTERRUPT VECTORS
3433                              ;SET UP DEVICE ADDRESSES IN LINKER ROUTINES
3434                              ;SET CSR'S EVERYTHING ENABLED
3435                              ;SET TCR'S, ALL LINES ENABLED
3436
3437   012254  005000     P3INIT: CLR    R0
3438   012256  013701  001270     MOV    DEVADR, R1
3439   012262  013702  001272     MOV    VECADR, R2
3440   012266  012703  012550     MOV    #R3SR0,R3            ;SET UP POINTER TO LINKERS
3441   012272  010322     1S:     MOV    R3,     (R2)+        ;SET UP RECEIVER INTERUPT VECTOR
3442   012274  013722  001274     MOV    RCVLVL, (R2)+
3443   012300  022323             CMP    (R3)+,  (R3)+        ;ADD 4 TO R3
3444   012302  010113             MOV    R1,     (R3)         ;ADDRESS OF CSR
3445   012304  062723  000002     ADD    #2,     (R3)+        ;ADDRESS OF RBUF
3446   012310  005723             TST    (R3)+
3447   012312  010322             MOV    R3,     (R2)+        ;SET UP TRANSMITTER INTERUPT VECTOR
3448   012314  013722  001276     MOV    XMTLVL, (R2)+
3449   012320  022323             CMP    (R3)+,  (R3)+
3450   012322  010123             MOV    R1,     (R3)+        ;ADDRESS OF CSR
3451   012324  012721  050400     MOV    #50400, (R1)+        ;SET UP CSR, TRANSMITTER ONLY
3452                                                          ;BIT8 = TRANSMITTER SCAN ENABLE
3453                                                          ;BIT12 = STATUS ENABLE
3454                                                          ;BIT14 = TRANSMITTER INTERUPT ENABLE
3455   012330  005721             TST    (R1)+
3456   012332  006300             ASL    R0                   ;UNIT # * 2
3457   012334  016011  001220     MOV    SVSW0(R0),(R1)       ;SET TCR BITS FOR SELECTED LINES
3458   012340  006200             ASR    R0                   ;RESET UNIT COUNTER
3459   012342  012737  000001  001260  MOV  #1,     MARK      ;SET UP MARKER
3460   012350  012304             MOV    (R3)+,  R4           ;SET UP OFFSET TO TABLES
3461   012352  010246             MOV    R2,-(6)              ;PUSH R2 ON STACK
  '2,   012354  010346             MOV    R3,-(6)              ;PUSH R3 ON STACK
3462   012356  033711  001260     2S:     BIT  MARK,   (R1)    ;CHECK FOR LINE SELECTED
3463   012362  001420             BEQ    6S
```

K03

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 50-1
DZDJBE.P11   08-SEP-77 15:07   PROG3: ECHO EXERCISER   SEG 0036

```
3464   012364  010564  001312            MOV    R5, XMTTAB(4)          ;SET UP HEADER MESSAGE
3465   012370  010564  002312            MOV    R5, RCVTAB(4)          ;SET UP RECEIVER TABLE
3466   012374  013702  001262            MOV    BUFSIZ, R2             ;SET UP COUNTER
3467   012400  012703  015652            MOV    #MSGP3, R3             ;SET UP MESSAGE POINTER
3468   012404  112325            3S:     MOVB   (R3)+, (R5)+           ;MOVE MESSAGE INTO BUFFER
3469   012406  001404                    BEQ    5S                     ;BRANCH IF END OF MESSAGE
3470   012410  005302                    DEC    R2                     ;COUNT BUFFER SIZE
3471   012412  001374                    BNE    3S                     ;BRANCH IF MORE
3472   012414  000403                    BR     6S                     ;BRANCH IF DONE
3473   012416  105025            4S:     CLRB   (R5)+                  ;CLEAR REST OF BUFFER
3474   012420  005302            5S:     DEC    R2                     ;COUNT BUFFER SIZE
3475   012422  001375                    BNE    4S                     ;BRANCH IF MORE
3476   012424  005724            6S:     TST    (R4)+                  ;INC OFFSET TO NEXT LINE
3477   012426  006337  001260            ASL    MARK
3478   012432  103351                    BCC    2S
3479   012434  012603                    MOV    (6)+,R3                ;POP STK-  INTO R3
(?)    012436  012602                    MOV    (6)+,R2                ;POP STACK INTO R2
3480   012440  022121                    CMP    (R1)+, (R1)+           ;ADD 4
3481   012442  005200                    INC    R0
3482   012444  020037  001266            CMP    R0,     UNITS
3483   012450  001310                    BNE    1S
3484   012452  042737  000140  177776    BIC    #140,   @#PS           ;LOWER PROCESSOR PRIORITY
3488
3489                       ;***********************************************************************
3490                       ;PROG3 FOREGROUND PROGRAM TO START RECEIVERS, THEN EXERCISE MEMORY.
3491                       ;***********************************************************************
3492
3493   012460  012701  001312    FORP3:  MOV    #XMTTAB,R1
3494   012464  012702  000400            MOV    #400,R2
3495   012470  005711            1S:     TST    (R1)                   ;CHECK FOR XMTR TABLE CLR
3496   012472  001376                    BNE    1S                     ;BRANCH IF NOT
3497   012474  062701  000002            ADD    #2,R1                  ;GO TO NEXT LINE ENTRY
3498   012500  005302                    DEC    R2                     ;COUNT LINES
3499   012502  001372                    BNE    1S                     ;BRANCH IF MORE LINES
3500   012504  013700  001266            MOV    UNITS,  R0             ;SET UP UNIT COUNTER
3501   012510  013701  001270            MOV    DEVADR, R1             ;AND DEVICE ADDRESS POINTER
3502   012514  052711  000101    2S:     BIS    #101,   (R1)           ;SET RECEIVER ENABLES OF CSR
3503                                                                   ;BIT0 = RECEIVER ENABLE
3504                                                                   ;BIT6 = RCV INTERRUPT ENABLE
3505   012520  062701  000010            ADD    #10,    R1             ;UPDATE TO NEXT DJ11
3506   012524  005300                    DEC    R0                     ;COUNT DJ11'S
3507   012526  001372                    BNE    2S
3508   012530  012700  020000    MEMX3:  MOV    #20000,R0              ;TOP OF 4K BANK OF MEMORY
3509   012534  000241                    CLC
3510   012536  005540            1S:     ADC    -(R0)                  ;FAST READ/WRITE TO MEMORY
3511   012540  001376                    BNE    1S                     ;RAPID REPEAT
3512   012542  005700                    TST    R0                     ;CHECK FOR LOC 0
3513   012544  001374                    BNE    1S                     ;BRANCH IF MORE MEMORY
3514   012546  000770                    BR     MEMX3                  ;LOOP FOR EVER!
3518
3519                       ;***********************************************************************
3520                       ;PROG3 LINKERS TO DJ11 INTERRUPT SERVICE ROUTINES
3521                       ;***********************************************************************
3522
3528   012550  004037  013300    R3SR0:  JSR    R0,P3RISR
(?)    012554  160012  000000            .WORD  <160012+<0*10>>,<0*40>
```

L03

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 50-2
DZDJBE.P11   08-SEP-77 15:07   ISR LINKERS   SEG 0037

```
(1)   012560  004037  013150    X3SR0:   JSR    R0,P3XISR
(1)   012564  160020  000000             .WORD  <160020+<0*10>>,<0*40>
(1)   012570  004037  013300    R3SR1:   JSR    R0,P3RISR
(1)   012574  160022  000040             .WORD  <160012+<1*10>>,<1*40>
(1)   012600  004037  013150    X3SR1:   JSR    R0,P3XISR
(1)   012604  160030  000040             .WORD  <160020+<1*10>>,<1*40>
(1)   012610  004037  013300    R3SR2:   JSR    R0,P3RISR
(1)   012614  160032  000100             .WORD  <160012+<2*10>>,<2*40>
(1)   012620  004037  013150    X3SR2:   JSR    R0,P3XISR
(1)   012624  160040  000100             .WORD  <160020+<2*10>>,<2*40>
(1)   012630  004037  013300    R3SR3:   JSR    R0,P3RISR
(1)   012634  160042  000140             .WORD  <160012+<3*10>>,<3*40>
(1)   012640  004037  013150    X3SR3:   JSR    R0,P3XISR
(1)   0:2644  160050  000140             .WORD  <160020+<3*10>>,<3*40>
(1)   012650  004037  013300    R3SR4:   JSR    R0,P3RISR
(1)   012654  160052  000200             .WORD  <160012+<4*10>>,<4*40>
(1)   012660  004037  013150    X3SR4:   JSR    R0,P3XISR
(1)   012664  160060  000200             .WORD  <160020+<4*10>>,<4*40>
(1)   012670  004037  013300    R3SR5:   JSR    R0,P3RISR
(1)   012674  160062  000240             .WORD  <160012+<5*10>>,<5*40>
(1)   012700  004037  013150    X3SR5:   JSR    R0,P3XISR
(1)   012704  160070  00024U             .WORD  <160020+<5*10>>,<5*40>
(1)   012710  004037  013300    R3SR6:   JSR    R0,P3RJSP
(1)   012714  150072  000300             .WORD  <16001 +<6*10>>,<6*40>
(1)   012720  004037  013150    X3SR6:   JSR    R0,P3X SR
(1)   012724  160100  000300             .WORD  <16002C+<6*10>>,<6*40>
(1)   012730  004037  013300    R3SR7:   JSR    R0,P3RISR
(1)   012734  160102  000340             .WORD  <160012+<7*10>>,<7*40>
(1)   012740  004037  013150    X3SR7:   JSR    R0,P3XISR
(1)   012744  160110  000340             .WORD  <160020+<7*10>>,<7*40>
(1)   012750  004037  013300    R3SR10:  JSR    R0,P3RISR
(1)   012754  160112  000400             .WORD  <160012+<10*10>>,<10*40>
(1)   012760  004037  013150    X3SR10:  JSR    R0,P3XISR
(1)   012764  160120  000400             .WORD  <160020+<10*10>>,<10*40>
(1)   012770  004037  013300    R3SR11:  JSR    R0,P3RISR
(1)   012774  160122  000440             .WORD  <160012+<11*10>>,<11*40>
(1)   013000  004037  013150    X3SR11:  JSR    R0,P3XISR
(1)   013004  160130  000440             .WORD  <160020+<11*10>>,<11*40>
(1)   013010  004037  013300    R3SR12:  JSR    R0,P3RISR
(1)   013014  160132  000500             .WORD  <160012+<12*10>>,<12*40>
(1)   013020  004037  013150    X3SR12:  JSR    R0,P3XISR
(1)   013024  160140  000500             .WORD  <160020+<12*10>>,<12*40>
(1)   013030  004037  013300    R3SR13:  JSR    R0,P3RISR
(1)   013034  160142  000540             .WORD  <160012+<13*10>>,<13*40>
(1)   013040  004037  013150    X3SR13:  JSR    R0,P3XISR
(1)   013044  160150  000540             .WORD  <160020+<13*10>>,<13*40>
(1)   013050  004037  013300    R3SR14:  JSR    R0,P3RISR
(1)   013054  160152  000600             .WORD  <160012+<14*10>>,<14*40>
(1)   013060  004037  013150    X3SR14:  JSR    R0,P3XISR
(1)   013064  160160  000600             .WORD  <160020+<14*10>>,<14*40>
(1)   013070  004037  013300    R3SR15:  JSR    R0,P3RISR
(1)   013074  160162  000640             .WORD  <160012+<15*10>>,<15*40>
(1)   013100  004037  013150    X3SR15:  JSR    R0,P3XISR
(1)   013104  160170  000640             .WORD  <160020+<15*10>>,<15*40>
(1)   013110  004037  013300    R3SR16:  JSR    R0,P3RISR
(1)   013114  160172  000700             .WORD  <160012+<16*10>>,<16*40
```

M03

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 50-3
DZDJBE.P11   08-SEP-77 15:07   ISR LINKERS   SEG 0038

```
 (1)  013120  004037  013150       X3SR16: JSR     R0,P3XISR
 (1)  013124  160200  000700               .WORD   <160020+<16*10>>,<16*40>
 (1)  013130  004037  013300       R3SR17: JSR     R0,P3RISR
 (1)  013134  160202  000740               .WORD   <160012+<17*10>>,<17*40>
 (1)  013140  004037  013150       X3SR17: JSR     R0,P3XISR
 (1)  013144  160210  000740               .WORD   <160020+<17*10>>,<17*40>
3532
3533                               ;*********************************************************************
3534                               ;PROG3  TRANSMITTER INTERRUPT SERVICE ROUTINE
3535                               ;*********************************************************************
3536
3537  013150                      P3XISR:
 (2)  013150  010146                       MOV     R1,-(6)              ;PUSH R1 ON STACK
 (2)  013152  010246                       MOV     R2,-(6)              ;PUSH R2 ON STACK
3538  013154  012001                       MOV     (R0)+,R1
3539  013156  005711               1S:     TST     (R1)                 ;CHECK FOR TRANS READY
3540  013160  100043                       BPL     4S
3541  013162  116102  000007               MOVB    7(R1),R2             ;GET LINE NO.
3542  013166  006302                       ASL     R2
3543  013170  061002                       ADD     (R0),R2
3544  013172  117261  001312  000006       MOVB    @XMTTAB(2),6(R1);SEND A CHARACTER
3545  013200  105072  001312               CLRB    @XMTTAB(2)           ;CLR TABLE AFTER USE
3546  013204  005262  001312               INC     XMTTAB(2)            ;UPDATE TABLE POINTER
3547  013210  023762  001264  001312       CMP     BUFEND,XMTTAB(2) ;CHECK FOR END OF BUFFER
3548  013216  001003                       BNE     5S                   ;BRANCH IF NOT
3549  013220  012762  015734  001312       MOV     #END,XMTTAB(2) ;RESET BUFFER POINTER
3550  013226  105772  001312       5S:     TSTB    @XMTTAB(2)           ;CHECK NEXT CHARACTER
3551  013232  001351                       BNE     1S                   ;BRANCH IF MORE DATA
3552  013234  010346               2S:     MOV     R3,-(SP)
3553  013236  005062  001312               CLR     XMTTAB(2)            ;CLEAR TABLE POINTER
3554  013242  161002                       SUB     (R0),R2
3555  013244  006202                       ASR     R2
3556  013246  005003                       CLR     R3
3557  013250  000261                       SEC
3558  013252  006103               3S:     ROL     R3
3559  013254  005302                       DEC     R2
3560  013256  100375                       BPL     3S
3561  013260  040361  000004               BIC     R3,4(R1)             ;CLEAR TCR BIT FOR LINE
3562  013264  012603                       MOV     (SP)+,R3             ;RESTORE R3
3563  013266  000733                       BR      1S
3564  013270                      4S:
 (2)  013270  012602                       MOV     (6)+,R2              ;POP STACK INTO R2
 (2)  013272  012601                       MOV     (6)+,R1              ;POP STACK INTO R1
 (2)  013274  012600                       MOV     (6)+,R0              ;POP STACK INTO R0
3565  013276  000002                       RTI
3569
3570                               ;*********************************************************************
3571                               ;PROG3  RECEIVER INTERRUPT SERVICE ROUTINE
3572                               ;*********************************************************************
3573
3574  013300                      P3RISR:
 (2)  013300  010146                       MOV     R1,-(6)              ;PUSH R1 ON STACK
 (2)  013302  010246                       MOV     R2,-(6)              ;PUSH R2 ON STACK
 (2)  013304  010346                       MOV     R3,-(6)              ;PUSH R3 ON STACK
 (2)  013306  010446                       MOV     R4,-(6)              ;PUSH R4 ON STACK
3575  013310  012001                       MOV     (R0)+,R1             ;GET RBUF ADDRESS
```

```
3576   013312  011102              1$:     MOV     (R1),R2              ;READ THE DATA
3577   013314  100074                      BPL     8$                   ;BRANCH IF NO CHAR PRESENT
3578   013316  032702   070000             BIT     #70000,R2            ;CHECK FOR ERRORS
3579   013322  001402                      BEQ     2$                   ;BRANCH IF OK
3580   013324  104002                      HLT+2                        ;RECEIVER ERROR
3581                                                                    ;R1=RBUF ADDRESS
3582                                                                    ;R2=CONTENTS OF RBUF
3583                                                                    ;BIT12=PARITY ERROR
3584                                                                    ;BIT13=FRAMING ERROR
3585                                                                    ;BIT14=UART OVERRUN
3586   013326  000771                      BR      1$                   ;SKIP BAD DATA
3587   013330  010204              2$:     MOV     R2,      R4          ;DUP THE RBUF
3588   013332  105004                      CLRB    R4                   ;CLEAR THE DATA
3589   013334  000304                      SWAB    R4                   ;LINE # TO LOW BYTE
3590   013336  106304                      ASLB    R4                   ;LINE # * 2, ALSO CLR CHAR PRESENT
3591   013340  061004                      ADD     (R0),R4              ;ADD OFFSET
3592   013342  136402   004312             BITB    MASK(4),R2           ;CHECK CHARACTER LENGTH
3593   013346  001401                      BEQ     3$                   ;BRANCH IF OK
3594   013350  104002                      HLT+2                        ;CHARACTER LENGTH ERROR
3595                                                                    ;R1=RBUF ADDRESS
3596                                                                    ;R2=CONTENTS OF RBUF(DATA)
3597   013352  005764   002312     3$:     TST     RCVTAB(4)            ;CHECK FOR UNSELECTED LINE
3598   013356  001002                      BNE     4$                   ;BRANCH IF OK
3599   013360  104002                      HLT+2                        ;RECEIVED DATA ON UNSELECTED LINE
3600                                                                    ;R1 = RBUF ADDRESS
3601                                                                    ;R2 = CONTENTS OF RBUF
3602   013362  000753                      BR      1$                   ;IGNORE THE DATA
3603   013364  105774   002312     4$:     TSTB    @RCVTAB(4)           ;CHECK FOR DATA BUFFER FULL
3604   013370  001403                      BEQ     5$                   ;BRANCH IF OK
3605   013372  104002                      HLT+2                        ;SOFTWARE DATA BUFFER OVERFLOW
3606                                                                    ;POSSIBLE TRANSMITTER PROBLEM
3607                                                                    ;R1 = RBUF ADDRESS
3608                                                                    ;R2 = CONTENTS OF RBUF
3609                            ;NOTE:  IF THE ABOVE ERROR WAS DUE TO OVERLOAD, INCREASING THE CONTENTS
3610                            ;       OF "BUFSIZ" MAY RECTIFY THE PROBLEM.
3611                            ;       "BUFSIZ" MUST BE A MULTIPLE OF 2.
3612                            ;       INCREASING IT MAY CAUSE THE BUFFERS TO OVERFLOW 4K.
3613   013374  000137   012166             JMP     PROG3                ;RESTART ON THIS TYPE ERROR
3614
3615   013400  005764   001312     5$:     TST     XMTTAB(4)            ;CHECK FOR TRANSMITTER ACTIVE
3616   013404  001414                      BEQ     6$                   ;BRANCH IF INACTIVE
3617   013406  110274   002312             MOVB    R2, @RCVTAB(4)       ;PUT THE DATA IN THE BUFFER
3618   013412  005264   002312             INC     RCVTAB(4)            ;UPDATE POINTER TO NEXT SPACE
3619   013416  023764   001264   002312    CMP     BUFEND,RCVTAB(4)     ;CHECK FOR END OF BUFFER
3620   013424  001332                      BNE     1$                   ;BRANCH IF NOT
3621   013426  012764   015734   002312    MOV     #END,RCVTAB(4)       ;RESET BUFFER POINTER
3622   013434  000726                      BR      1$
3623   013436  012764   015734   002312 6$: MOV    #END,    RCVTAB(4)   ;RESET TABLE POINTER
3624   013444  016464   002312   001312    MOV     RCVTAB(4),XMTTAB(4)
3625   013452  110274   002312             MOVB    R2, @RCVTAB(4)
3626   013456  005264   002312             INC     RCVTAB(4)            ;UPDATE POINTER TO NEXT SPACE
3627   013462  161004                      SUB     (R0),R4
3628   013464  006204                      ASR     R4
3629   013466  005003                      CLR     R3
3630   013470  000261                      SEC
3631   013472  006103              7$:     ROL     R3
```

B04

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 50-5
DZDJBE.P11   08-SEP-77 15:07   RECEIVER ISR   SEG 0040

```
3632   013474   005304                      DEC     R4
3633   013476   100375                      BPL     7$
3634   013500   050361   000002             BIS     R3,2(R1)          ;SET TCR BIT FOR LINE
3635   013504   000702                      BR      1$
3636   013506                        8$:
 (2)   013506   012604                      MOV     (6)+,R4           ;POP STACK INTO R4
 (2)   013510   012603                      MOV     (6)+,R3           ;POP STACK INTO R3
 (2)   013512   012602                      MOV     (6)+,R2           ;POP STACK INTO R2
 (2)   013514   012601                      MOV     (6)+,R1           ;POP STACK INTO R1
 (2)   013516   012600                      MOV     (6)+,R0           ;POP STACK INTO R0
3637   013520   000002                      RTI
3638   013522                        DONE:
 (1)   013522   004737   015270             JSR     PC,     KBDINT
 (1)   013526   062737   000001  001206     ADD     #1,PCNT+2         ;ADD 1 TO THE PASS COUNT
 (1)   013534   005537   001204             ADC     PCNT              ;MAKE IT DOUBLE PREC.
 (1)   013540   000004   015340             TYPE    .MEOP             ;END OF PASS INDICATOR
 (1)   013544   032777   002000  165436     BIT     #SW10,@SWR        ;RING THE BELL?
 (1)   013552   001004                      BNE     4$                ;NO!
 (1)   013554   000004   000007             TYPE    .BELL             ;RING THE BELL
 (1)   013560   000004   000177             TYPE    .177              ;TYPE A FILLER FOR 11/05
 (1)   013564   013700   000042      4$:    MOV     @#42,R0           ;GET MC ITCR ADDRESS
 (1)   013570   001405                      BEQ     3$                ;IF NONE
 (1)   013572   000005                      RESET                    ;RESET AND
 (1)            013574               SENDAD = .
 (1)   013574   004710                      JSR     7,(0)             ;GO TO MONITOR
 (1)   013576   000240                      NOP                      ;SAVE ROOM
 (1)   013600   000240                      NOP                      ;FOR
 (1)   013602   000240                      NOP                      ;ACT11
 (1)   013604   000137   006310      3$:    JMP     RESTAR           ;RETURN
```

C04

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 51
DZDJBE.P11   08-SEP-77 15:07   BELL AND SCOPE ROUTINE   SEG 0041

```
3640
3641                                   ;          SHLT                ERROR TYPEOUT HANDLER
(1)
(1)                                    ;THIS ROUTINE PRINTS OUT ERROR MESSAGES STARTING WITH THE
(1)                                    ;ADDRESS OF THE "HLT". IT ALSO COUNTS THE NUMBER OF ERRORS
(1)                                    ;AND HAS THE CAPABILITY OF LOOPING ON ERROR, BELL ON ERROR,
(1)                                    ;"HALT" ON ERROR, AND INHIBIT TYPEOUTS. AN OPTIONAL ARGUEMENT
(1)                                    ;(HLT+3) WILL BE PLACED IN "HLTCTS:" FOR ADITIONAL TYPEOUTS.
(1)
(1)    013610  004737  015270          EMTS:   JSR     PC,    KBDINT
(1)    013614  032777  002000  165366          BIT     #SW10,@SWR      ;BELL ON ERROR?
(1)    013622  001402                          BEQ     1S              ;NO - SKIP
(1)    013624  000004  000007                  TYPE    .BELL           ;RING BELL
(1)    013630  005237  001202          1S:     INC     ERRORS          ;COUNT THE NUMBER OF ERRORS
(1)    013634  032777  020000  165346          BIT     #SW13,@SWR      ;SKIP TYPEOUT IF SET
(1)    013642  001026                          BNE     2S              ;SKIP TYPEOUTS
(2)    013644  000004  013650                  TYPE    .+2             ;.ASCIZ <15><12>
(1)    013654  011637  013740                  MOV     (6),HLTADR      ;PUT ADDRESS OF INSTRUCTION ON STACK
(1)    013660  162737  000002  013740          SUB     #2,HLTADR       ;FUDGE ADDRESS
(1)    013666  117737  000046  013736          MOVB    @HLTADR,HLTCTS  ;GET HLT ARGUEMENT
(2)    013674  013705  013740                  MOV     HLTADR,TTY      ;TYPE HLTADR IN OCTAL
(2)    013700  004737  014346                  JSR     PC,PRINTR       ;TYPE LEADING ZERO'S
(2)    013704  000004  013710                  TYPE    .+2             ;.ASCIZ " "
(1)    013714  004737  013742                  JSR     PC,ERRORS       ;GO TO USER ERROR ROUTINE
(1)    013720  005777  165264          2S:     TST     @SWR            ;HALT ON ERROR
(1)    013724  100001                          BPL     .+4             ;SKIP IF CONTINUE
(1)    013726  000000                          HALT                    ;HALT ON ERROR!
(1)    013730  004737  015270                  JSR     PC,KBDINT
(1)    013734  000002                          RTI                     ;RETURN
(1)
(1)    013736  000000                  HLTCTS: 0                       ;HLT ARGUEMENT
(1)    013740  000000                  HLTADR: 0                       ;LAST HLT INSTRUCTION EXECUTED
3642
3643    013742  042737  007700  013764  ERRORS: BIC     #7700,2S
3644    013750  105337  013736          1S:     DECB    HLTCTS
3645    013754  100411                          BMI     3S
3646    013756  062737  000100  013764          ADD     #100,2S
3647    013764  010005                  2S:     MOV     %0,TTY          ;TYPE REGISTER X IN OCTAL
3648    013766  004737  014346                  JSR     %7,PRINTR
3649    013772  000004  015377                  TYPE,   SPACE
3650    013776  000764                          BR      1S
3651    014000  000207                  3S:     RTS     PC
```

D04

MAINDEC-11-DZDJB-E-D   DJI1 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 51-1
DZDJBE.P11   08-SEP-77 15:07   OCTAL NUMBER INPUT ROUTINE   SEQ 0042

```
3656                                            ;SUBROUTINE TO SAVE INPUT AS OCTAL NUMBER
3657
3658
3659    014002  012737  000001  014274  READIN: MOV     #1,INHRE
3660    014010  004737  014150          JSR     PC,     READS   ;GO READ TTY UNTIL CR
3661    014014  005037  014274          CLR     INHRE
3662    014020  010146          MOV     R1,-(6)         ;PUSH R1 ON STACK
 (2)    014022  010246          MOV     R2,-(6)         ;PUSH R2 ON STACK
 (2)    014024  010346          MOV     R3,-(6)         ;PUSH R3 ON STACK
3663    014026  012501          MOV     (R5)+, R1
3664    014030  012737  000020  015166  MOV     #20,CNT
3665    014036  012702  014276          MOV     #INPUT,R2
3666    014042  122712  000120          CMPB    #120,(R2)       ;CHECK FOR "P"
3667    014046  001425          BEQ     3$
3668    014050  005011          CLR     (R1)
3669    014052  112203                  1$:     MOVB    (R2)+,R3
3670    014054  120327  000015          CMPB    R3,#15
3671    014060  001420          BEQ     3$              ;BRANCH WHEN DONE
3672    014062  162703  000060          SUB     #60,R3
3673    014066  032703  177770          BIT     #177770,R3
3674    014072  001013          BNE     3$              ;BRANCH IF BAD DATA
3675    014074  006311          ASL     (R1)
3676    014076  103410          BCS     2$
3677    014100  006311          ASL     (R1)
3678    014102  103406          BCS     2$
3679    014104  006311          ASL     (R1)
3680    014106  103404          BCS     2$
3681    014110  050311          BIS     R3,(R1)
3682    014112  005337  015166          DEC     CNT
3683    014116  000755          BR      1$
3684    014120  000244                  2$:     CLZ             ;MAKE SURE Z-BIT IS CLR
3685    014122  013737  177776  014146  3$:     MOV     @#PS,   PSTEMP  ;SAVE CONDITION CODES
3686    014130  012603          MOV     (6)+,R3         ;POP STACK INTO R3
 (2)    014132  012602          MOV     (6)+,R2         ;POP STACK INTO R2
 (2)    014134  012601          MOV     (6)+,R1         ;POP STACK INTO R1
3687    014136  013737  014146  177776  MOV     PSTEMP,@#PS     ;RESTORE CONDITION CODES
3688    014144  000205          RTS     R5
3689
3690    014146  000000          PSTEMP: 0               ;TEMPORARY STORAGE FOR PS
3691
3692    014150  010346          READS:  MOV     R3,-(6)         ;SAVE R3
 (1)    014152  012703  014276  1$:     MOV     #INPUT,R3       ;GET ADDRESS
 (1)    014156  022703  014316  2$      CMP     #INPUT+20,R3    ;BUFFER FULL?
 (1)    014162  001415          BEQ     4$              ;YES - TYPE "?"
 (1)    014164  105737  177560          TSTB    @#177560        ;WAIT FOR
 (1)    014170  100375          BPL     .-4             ;A CHARACTER
 (1)    014172  113713  177562          MOVB    @#177562,(3)    ;GET CHARACTER
 (1)    014176  142713  000200          BICB    #200,(3)        ;GET RID OF JUNK
 (1)    014202  122713  000177          CMPB    #177,(3)        ;IS IT A RUBOUT
 (1)    014206  001403          BEQ     4$              ;SKIP IF NOT
 (1)    014210  122713  000025          CMPB    #25,(3)
 (1)    014214  001006          BNE     3$
        014216                  4$:
 (2)    014216  000004  014222          TYPE    .+2             ;.ASCIZ "?"<15><12>"= "
        014220  000750          BR      1$              ;ZAP THE BUFFER AND LOOP
        014232  111337  015104  3$:     MOVB    (3),.TYPE       ;SET UP FOR TYPING
```

E04

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 51-2
DZDJBE.P11   08-SEP-77 15:07   TTY INPUT ROUTINE   SEG 0043

```
    (1)   014236  000004  015104              TYPE    .TYPE           ;ECHO IT
    (1)   014242  122723  000015              CMPB    #15,(3)+        ;CHECK FOR RETURN
    (1)   014246  001343                      BNE     2$              ;LOOP IF NOT RETURN
    (1)   014250  005737  014274              TST     INHRE
    (1)   014254  001401                      BEQ     5$
    (1)   014256  000402                      BR      6$
    (1)   014260  105063  177777      5$:     CLRB    -1(3)           ;ZAP RETURN (THE 15)
    (1)   014264  000004  000012      6$:     TYPE    12              ;TYPE A LINE FEED
    (1)   014270  012603                      MOV     (6)+,R3         ;RESTORE R3
    (1)   014272  000207                      RTS     PC              ;RETURN
    (1)
    (1)   014274  000000              INHRE:  0
    (1)   014276  000020              INPUT:  .BLKW   20              ;TTY INPUT AREA
   3693                               ;       $OCTAL          OCTAL TYPEOUT ROUTINE
    (1)
    (1)                               ;THIS ROUTINE IS USED TO TYPE AN OCTAL NUMBER ON THE TTY. IT WILL TYPE
    (1)                               ;ALL 6 CHARACTERS, SUPPRESS LEADING ZEROES, TYPE AN 18 BIT ADDRESS, OR TYPE
    (1)                               ;THE 16 BITS. IT IS CALLED VIA THE DUMP, SDUMP, DUMP18, OR BITYPE MACRO'S.
    (1)
    (1)   014336  012737  170101  014504  BITYPS: MOV    #170101,.PR     ;SET BIT FLAG ANS 16. CHARACTER COUNT
    (1)   014344  000411                      BR      .PTIT           ;NOW TYPE IT IN BIT FORM
    (1)   014346  112737  000001  014504  PRINTR: MOVB   #1,.PR         ;SET ZERO FILL SWITCH
    (1)   014354  000402                      BR      .+6             ;SKIP
    (1)   014356  005037  014504      PRINTS: CLR     .PR             ;SUPRESS LEADING ZERO'S
    (1)   014362  112737  177772  014505      MOVB    #-6,.PR+1       ;SET COUNT
    (1)   014370  010446              .PTIT:  MOV     R4,-(6)         ;SAVE R4
    (1)   014372  012704  014506              MOV     #.PR+2,R4       ;SET POINTER TO FIRST ASCII CHAR.
    (1)   014376  105014                      CLRB    (4)             ;CLEAR FIRST BYTE
    (1)   014400  000411                      BR      .PRF            ;ROTATE FIRST BIT
    (1)   014402  105014              .PRL:   CLRB    (4)             ;CLEAR BYTE OF CHARACTER
    (1)   014404  032737  000100  014504      BIT     #100,.PR        ;BIT TYPING MODE?
    (1)   014412  001004                      BNE     .PRF            ;YES - SKIP 2 ROTATES
    (1)   014414  006105                      ROL     TTY             ;ROTATE BIT INTO C
    (1)   014416  106114                      ROLB    (4)             ;PACK IT
    (1)   014420  006105                      ROL     TTY             ;ROTATE BIT INTO C
    (1)   014422  106114                      ROLB    (4)             ;PACK IT
    (1)   014424  006105              .PRF:   ROL     TTY             ;ROTATE BIT INTO C
    (1)   014426  106114                      ROLB    (4)             ;PACK IT
    (1)   014430  105714                      TSTB    (4)             ;IS IT ZERO?
    (1)   014432  001402                      BEQ     .+6             ;SKIP INC
    (1)   014434  105237  014504              INCB    .PR             ;SET FILL SWITCH
    (1)   014440  105737  014504              TSTB    .PR             ;CHECK FILL SWITCH
    (1)   014444  001402                      BEQ     .+6             ;SKIP BITSET
    (1)   014446  152724  000060              BISB    #'0,(4)+        ;MAKE INTO ASCII CHAR
    (1)   014452  105237  014505              INCB    .PR+1           ;INC COUNT
    (1)   014456  001351                      BNE     .PRL            ;REPEAT
    (1)   014460  022704  014506              CMP     #.PR+2,R4       ;EMPTY BUFFER?
    (1)   014464  001002                      BNE     .+6             ;SKIP IF NOT
    (1)   014466  112724  000060              MOVB    #'0,(4)+        ;LOAD 1 ZERO
    (1)   014472  105014                      CLRB    (4)             ;NULL TERMINATOR
    (1)   014474  000004  014506              TYPE    .PR+2           ;TYPE IT
    (1)   014500  012604                      MOV     (6)+,R4         ;RESTORE R4
    (1)   014502  000207                      RTS     PC              ;RETURN
    (1)   014504  000012              .PR:    .BLKW   12              ;COUNT, SWITCH, AND OUTPUT BUFFER
```

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 51-3
DZDJBE.P11   08-SEP-77 15:07   POWER DOWN AND UP ROUTINES

SEQ 0044

```
3695   014530  012777  014656  000126   PDOWNS: MOV     #ILLUP,@PUVECS    ;SET FOR FAST UP
 (1)   014536  012777  000340  000122           MOV     #340,@PUVECS+2    ;PRIO:7
 (3)   014544  010046                            MOV     R0,-(6)           ;PUSH R0 ON STACK
 (3)   014546  010146                            MOV     R1,-(6)           ;PUSH R1 ON STACK
 (3)   014550  010246                            MOV     R2,-(6)           ;PUSH R2 ON STACK
 (3)   014552  010346                            MOV     R3,-(6)           ;PUSH R3 ON STACK
 (3)   014554  010446                            MOV     R4,-(6)           ;PUSH R4 ON STACK
 (3)   014556  010546                            MOV     R5,-(6)           ;PUSH R5 ON STACK
 (1)   014560  010637  014662                    MOV     SP,.SAVR6         ;SAVE SP
 (1)   014564  012777  014574  000072            MOV     #PUPS,@PUVECS     ;SET UP VECTOR
 (1)   014572  000000                            HALT                      ;WAIT FOR PF
 (1)
 (1)   014574  013706  014662           PUPS:   MOV     .SAVR6,SP         ;GET SP
 (1)   014600  005001                            CLR     R1                ;WAIT LOOP FOR THE TTY
 (1)   014602  005201                    1S:     INC     R1                ;WAIT FOR THE INC
 (1)   014604  001376                            BNE     1S                ;OF  WORD
 (3)   014606  012605                            MOV     (6)+,R5           ;POP STACK INTO R5
 (3)   014610  012604                            MOV     (6)+,R4           ;POP STACK INTO R4
 (3)   014612  012603                            MOV     (6)+,R3           ;POP STACK INTO R3
 (3)   014614  012602                            MOV     (6)+,R2           ;POP STACK INTO R2
 (3)   014616  012601                            MOV     (6)+,R1           ;POP STACK INTO R1
 (3)   014620  012600                            MOV     (6)+,R0           ;POP STACK INTO R0
 (1)   014622  012737  014530  000024            MOV     #PDOWNS,@#24      ;SET UP THE POWER DOWN VECTOR
 (1)   014630  012737  000340  000026            MOV     #340,@#26         ;PRIO:7
 (2)   014636  000004  014642                    TYPE    .+2               ;.ASCIZ <15><12>"POWER"
 (1)   014652  000137  006310                    JMP     RESTAR            ;JMP TO USER ADDRESS
 (1)
 (1)   014656  000000                   ILLUP:  HALT                      ;THE POWER UP SEQUENCE WAS STARTED
 (1)   014660  000776                            BR      .-2               ; BEFORE THE POWER DOWN WAS COMPLETE
 (1)
 (1)   014662  000000                   .SAVR6: 0                         ;PUT THE SP HERE
 (1)   014664  000024  000026           PUVECS: 24,26                     ;POWER UP VECTOR
3696
3697
3698   014670  000002                   YESRT:  RTI                       ;RETURN FROM TRACE TRAP
```

G04

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 51-4
DZDJBE.P11   08-SEP-77 15:07   IOT HANDLER   SEG 0045

```
3703
3704                    ;********************************************************************
3705                    ;IOT HANDLER - REENTERENT ROUTINE TO INDICATE A FALSE
3706                    ;               INTERRUPT OR TRAP, OR TO TYPE A MESSAGE
3707                    ;********************************************************************
3708
3709  014672 022716 001000       IOTRAP: CMP    #1000, (SP)     ;CHECK RETURN ADDRESS
3710  014676 002440                       BLT    IOTS            ;BRANCH IF TYPE COMMAND
3711  014700 162716 000004                SUB    #4, (SP)        ;GET VECTOR ADDRESS
3712  014704 000004 014710                TYPE   .+2             ;TYPE MESSAGE
3713  014710 005015 047125 054105         .ASCIZ <15><12>"UNEXPECTED INTERUPT TO "
      014716 042520 052103 042105
      014724 044440 052116 051105
      014732 050125 020124 047524
      014740 000040
3714  014742 012605                       MOV    (SP)+,TTY       ;TYPE (SP)+ IN OCTAL
(1)   014744 004737 014356                JSR    PC,PRINTS       ;AND SUPRESS LEADING ZERO'S
3715  014750 005726                       TST    (SP)+           ;POP STACK
3716  014752 000004 014756                TYPE   .+2             ;TYPE MESSAGE
3717  014756 043040 047522 020115         .ASCIZ " FROM "
      014764    000
3718  014766                              .EVEN
3719  014766 011605                       MOV    (SP),TTY        ;TYPE (SP) IN OCTAL
(1)   014770 004737 014356                JSR    PC,PRINTS       ;AND SUPRESS LEADING ZERO'S
3720  014774 000000                       HALT                   ;FATAL ERROR
3721  014776 000002                       RTI                    ;CONTINUE IF DESIRED
3722
3723                    ;      STYPE              MESSAGE TYPEOUT ROUTINE
(1)
(1)                    ;THIS ROUTINE IS USE TO TYPE ASCII MESSAGES ON THE TTY. THE
(1)                    ;CALL CAN BE IN ONE OF 3 FORMS: 1) "TYPE ,ADR" - TYPES THE
(1)                    ;MESSAGE STARTING IN LOCATION "ADR:", 2) "TYPE ,CHAR" - TYPES
(1)                    ;THE ASCII "CHAR", AND 3) "PRINT <<15><12>"MESSAGE"> - TYPES
(1)                    ;THE MESSAGE WHICH IS INLINE ASCII.
(1)
(1)   015000 010546              IOTS:   MOV    TTY,-(6)        ;SAVE TTY
(1)   015002 017605 000002               MOV    @2(6),TTY       ;GET ADDRESS TO BE TYPED
(1)   015006 032705 177400               BIT    #177400,TTY     ;IS IT A TYPEM?
(1)   015012 001004                      BNE    1$              ;NO
(1)   015014 010537 015104               MOV    TTY,.TYPE       ;GET THE CHARACTER
(1)   015020 012705 015104               MOV    #.TYPE,TTY      ;FUDGE THE ADDRESS
(1)   015024 105715              1$:     TSTB   (TTY)           ;TERMINATOR?
(1)   015026 001406                      BEQ    2$              ;GET OUT IF SO
(1)   015030 112537 177566               MOVB   (TTY)+,@#177566 ;LOAD AND TYPE THE CHARACTER
(1)   015034 105737 177564               TSTB   @#177564        ;IS THE PRINTER READY
(1)   015040 100375                      BPL    .-4             ;WAIT UNTIL IT IS
(1)   015042 000770                      BR     1$              ;GET THE NEXT CHARACTER
(1)   015044 017646 000002       2$:     MOV    @2(6),-(6)      ;GET ADDRESS TO BE TYPED
(1)   015050 062766 000002 000004        ADD    #2,4(6)         ;ADD 2 TO THE ADDRESS
(1)   015056 022666 000002               CMP    (6)+,2(6)       ;IS IT .+2?
(1)   015062 001006                      BNE    3$              ;NO
(1)   015064 062705 000002               ADD    #2,TTY          ;ADD 2 TO THE ADDRESS
(1)   015070 042705 000001               BIC    #1,TTY          ;BACK UP TO AN EVEN BYTE
(1)   015074 010566 000002               MOV    TTY,2(6)        ;RESTORE ADDRESS
(1)   015100 012605              3$:     MOV    (6)+,TTY        ;RESTORE TTY
(1)   015102 000002                      RTI                    ;RETURN
```

H04

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 51-5
DZDJBE.P11   08-SEP-77 15:07   TYPE ROUTINE   SEG 2046

```
    (1)   015104  000000                       .TYPE:   0                    ;CHARACTER TYPE LOCATION
  3724
    (1)   015106  022737  000176  001210  CNTLU:  CMP    #SWREG,SWR
    (1)   015114  001023                          BNE    1S
    (1)   015116  000004  015200                  TYPE   .SWREQ
    (2)   015122  013705  000176                  MOV    SWREG,TTY            ;TYPE SWREG IN OCTAL
    (2)   015126  004737  014346                  JSR    PC,PRINTR            ;TYPE LEADING ZERO'S
    (1)   015132  000004  015170                  TYPE   .NEWIS
    (1)   015136  004537  014002                  JSR    R5,READIN
    (1)   015142  015336                          .WORD  TMP1
    (1)   015144  001360                          BNE    CNTLU
    (1)   015146  022737  000020  015166          CMP    #20,CNT
    (1)   015154  001403                          BEQ    1S
    (1)   015156  013777  015336  164024          MOV    TMP1,@SWR
    (1)   015164  000207               1S:        RTS    PC
    (1)
    (1)   015166  000000               CNT:       0
    (1)
    (1)   015170  020040  042516  036527  NEWIS:  .ASCIZ  "  NEW= "
    (1)   015176  000040
    (1)   015200  005015  053523  036522  SWREQ:  .ASCIZ  <15><12>"SWR= "
    (1)   015206  000040
  3725
    (1)   015210  013746  000006          SUSWRR: MOV    6,-(SP)
    (1)   015214  013746  000004                  MOV    4,-(SP)
    (1)   015220  012737  015240  000004          MOV    #1S,4
    (1)   015226  022777  177777  163754          CMP    #-1,@SWR
    (1)   015234  001402                          BEQ    2S
    (1)   015236  000407                          BR     3S
    (1)   015240  022626               1S:        CMP    (SP)+,(SP)+
    (1)   015242  012737  000176  001210  2S:      MOV    #SWREG,SWR
    (1)   015250  012737  000174  001212          MOV    #DISPREG,DISPLAY
    (1)   015256  012637  000004       3S:        MOV    (SP)+,4
    (1)   015262  012637  000006                  MOV    (SP)+,6
    (1)   015266  000207                          RTS    PC
  3726
    (1)   015270  022737  000176  001210  KBDINT: CMP    #SWREG,SWR
    (1)   015276  001016                          BNE    1S
    (1)   015300  005037  015336                  CLR    TMP1
    (1)   015304  113737  177562  015336          MOVB   177562,TMP1
    (1)   015312  142737  000200  015336          BICB   #200,TMP1
    (1)   015320  122737  000007  015336          CMPB   #7,TMP1
    (1)   015326  001002                          BNE    1S
    (1)   015330  004737  015106                  JSR    PC,CNTLU
    (1)   015334  000207               1S:        RTS    PC
    (1)
    (1)   015336  000000               TMP1:      0
  3727
  3728   015340  005015  047505  000120  MEOP:   .ASCIZ <15><12>"EOP"
  3729   015346  020043     000          MNUM:   .ASCIZ "# "
  3730   015351    040    042523  042514  MSGSEL: .ASCIZ " SELECT LINE = "
         015356  052103  046040  047111
         015364  020105  020075     000
```

IO4

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 51-6
DZDJBE.P11   08-SEP-77 15:07   TYPE ROUTINE   SEG 0047

```
 3731   015371      015   177412  177777   RETURN: .ASCIZ  <15><12><377><377><377>
        015376      000
 3732   015377      040   000040            SPACE:  .ASCIZ  " "
 3733   015402   005015   046777  044501   MSGMDN: .ASCIZ  <15><12><377>"MAINDEC-11-DZDJB-E   DJ11 EXERCISER"
        015410   042116   041505  030455
        015416   026461   055104  045104
        015424   026502   020105  020040
        015432   045104   030461  042440
        015440   042530   041522  051511
        015446   051105      000
 3734   015451      015   043012  051111   MSGADR: .ASCIZ  <15><12>"FIRST DJ11 ADDRESS:  "
        015456   052123   042040  030512
        015464   020061   042101  051104
        015472   051505   035123  020040
        015500      000
 3735   015501      015   053012  041505   MSGVEC: .ASCIZ  <15><12>"VECTOR ADDRESS:  "
        015506   047524   020122  042101
        015514   051104   051505  035123
        015522   020040      000
 3736   015525      015   047012  027117   MSGNUM: .ASCIZ  <15><12>"NO. OF DJ11'S:  "
        015532   047440   020106  045104
        015540   030461   051447  020072
        015546   000040
 3737   015550   005015   051120  043517   MSGPRG: .ASCIZ  <15><12>"PROGRAM #:  "
        015556   040522   020115  035043
        015564   020040      000
 3738   015567      015   047012  020117   MSGO1:  .ASCIZ  <15><12>"NO DJ11'S!"
        015574   045104   030461  051447
        015602   000041
 3739   015604   005015   051120  043517   MSGP2:  .ASCIZ  <15><12>"PROG2:  CONTINUOUS ECHO EXERCISER"<15><12>
        015612   035062   020040  047503
        015620   052116   047111  047525
        015626   051525   042440  044103
        015634   020117   054105  051105
        015642   044503   042523  006522
        015650   000012
 3740   015652   005015   042452  044103   MSGP3:  .ASCIZ  <15><12>"*ECHO TEST*"<15><12>
        015660   020117   042524  052123
        015666   006452   000012
 3741   015672   026440   000040            MSGDAS: .ASCIZ  " - "
 3742   015676   005015   044523  047514   MALARM: .ASCIZ <15><12>"SILO ALARM LEVEL FOR CSR"<15><12>
        015704   040440   040514  046522
        015712   046040   053105  046105
        015720   043040   051117  041440
        015726   051123   005015     000
 3743            015734                      .EVEN
 3744   015734   000000                     END:    0
 3745            000001                      .END
```

J04

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 52
DZDJBE.P11   08-SEP-77 15:07   CROSS REFERENCE TABLE -- USER SYMBOLS   SEG 0048

Symbol	Value											
ADRNIT	010206	2954	2955	3171#								
ALL	006270	2842	2848	2864#								
ALMCK	007006	2942	3009#	3025								
ALMFLG	001300	2647#	2690#	2940	2971#							
BEGIN	005312	2625	2672#									
BELL =	000007	2620#	3638	3641								
BINARY	010252	3171	3187#									
BITYPS	014336	3693#										
BIT0 =	000001	2620#	3026									
BIT1 =	000002	2620#										
BIT10 =	002000	2620#										
BIT11 =	004000	2620#										
BIT12 =	010000	2620#										
BIT13 =	020000	2620#	2765									
BIT14 =	040000	2620#										
BIT15 =	100000	2620#										
BIT2 =	000004	2620#	3010	3046								
BIT3 =	000010	2620#	3027									
BIT4 =	000020	2620#	2791	2938	2964	3047						
BIT5 =	000040	2620#										
BIT6 =	000100	2620#										
BIT7 =	000200	2620#										
BIT8 =	000400	2620#	2847									
BIT9 =	001000	2620#	2961									
BJFEND	001264	2641#	3427#	3428#	3547	3619						
BJFSIZ	001262	2640#	3428	3466								
CNT	015166	3664#	3682#	3724#								
CNTLU	015106	2786	3724#	3726								
CNTNIT	010210	2691#	2692#	2693#	2956	2957	3035#	3036#	3041#	3043#	3044#	3045#	3172#
CNTTAB=	004313	2666#	3328	3332#	3399#								
COUNT	001306	2650#	2998	3012#	3019#	3028	3030	3034	3037	3040	3056	3066	
DEVADR	001270	2643#	2703	2730	2770	2788	2807	2918	3243	3438	3501		
DISPLA	001212	2633#	3725#									
DISPRE	000174	2625#	3725									
DJMAP	005452	2703#										
DONE	013522	2719	3008	3638#								
EMTS	013610	2679	3641#									
END	015734	3177	3179	3181	3183	3185	3427	3429	3549	3621	3623	3744#
ERRORS	001202	2631#	2681#	3641#								
ERRORS	013742	3641	3643#									
FORGND	006710	2973	2989#									
FORP2	011200	3288#	3294									
FORP3	012460	3493#										
GETLEN	005754	2766	2784#									
GETVEC	005534	2716	2728#									
HLT =	104000	2620#	3068	3136	3153	3367	3382	3580	3594	3599	3605	
HLTADR	013740	3641##										
HLTCTS	013736	3641##	3644#									
ICNT	001200	2630#										
ILLUP	014656	3695#										
INHPE	014274	3659#	3661#	3692#								
INPUT	014276	3665	3692#									
ICTRAP	014672	2675	3709#									
IOTS	015000	3710	3723#									
VECINT	015270	3049	3638	3641	3726#							
LEVEL7=	000340	2621#										

K04

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 52-1
DZDJBE.P11   08-SEP-77 15:07   CROSS REFERENCE TABLE -- USER SYMBOLS   SEG 0049

```
MALARM   015676            3052    3742#
MARK     001260            2639#   2946#   2952    2959#   3266#   3268    3273#   3341#   3343#   3346    3390#   3392#   3399
                          3459#   3462    3477#
MASK     004312            2665#   2666    2808    3149    3380    3592
MEMX3    012530            3508#   3514
MEOP     015340            3636    3728#
MNUM     015346            2852    3729#
MSGADR   015451            2769    3734#
MSGDAS   015672            3055    3741#
MSGMON   015402            2767    3733#
MSGNUM   015525            2773    3736#
MSGPRG   015550            2843    3737#
MSGP2    015604            3270    3739#
MSGP3    015652            3467    3740#
MSGSEL   015351            2855    3730#
MSGVEC   015501            2771    3735#
MSG01    015567            2717    3738#
N      = 000040            2563#   3189#   3199#   3201#   3205#
NEWIS    015170            3724#
OPEN   = 000000            2622#   2638
PCNT     001204            2632#   2682#   3683#   3638#
PDOWNS   014530            2677    3695#
PHRASE   010652            3173    3207#
PRINTR   014346            2770    3054    3057    3641    3648    3693#   3724
PRINTS   014356            2772    2774    2854    3693#   3714    3719
PROGAD   006332            2876    2879#
PROGNO   006332            2845    2871    2878#
PROG1    006342            2880    2897#   3006
PROG2    010762            2881    3222#
PROG3    012166            2882    3414#   3613
PS     = 177776            2620#   2899#   2972#   3224#   3279#   3416#   3484#   3685    3687#
PSTEMP   014146            3685#   3687    3690#
PUPS     014574            3695#
PUVECS   014664            3695##
P1INIT   006410            2917#
P2INIT   011030            3242#
P2RISR   012012            3308    3361#
P2XISR   011620            3308    3317#
P3INIT   012254            3437#
P3RISR   013300            3528    3574#
P3XISR   013150            3528    3537#
RCVCNT = 003313            2663#   2957#   2996    3157#
RCVISR   010070            3086    3130#
RCVLVL   001274            2645#   2922    3247    3442
RCVTAB   002312            2659#   2955#   3148    3159#   3334    3337    3385    3387#   3398#   3465#   3597    3603    3617#
                          3618#   3619    3621#   3623#   3624    3625#   3626#
READIN   014002            2844    2856    3659#   3724
READS    014150            3660    3692#
REPORT   005670            2754    2765#
RESTAR   006310            2627    2862    2871#   3638    3695
RETURN   015371            2768    2851    3348    3400    3731#
RISR0    007354            2920    3086#
RISR1    007374            3086#
RISR10   007554            3086#
RISR11   007574            3086#
RISR12   007614            3086#
```

L04

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 52-2
DZDJBE.P11   08-SEP-77 15:07   CROSS REFERENCE TABLE -- USER SYMBOLS   SEG 0050

```
RISR13  007634        3086#
RISR14  007654        3086#
RISR15  007674        3086#
RISR16  007714        3086#
RISR17  007734        3086#
RISR2   007414        3086#
RISR3   007434        3086#
RISR4   007454        3086#
RISR5   007474        3086#
RISR6   007514        3086#
RISR7   007534        3086#
R2SR0   011220        3245    3308#
R2SR1   011240        3308#
R2SR10  011420        3308#
R2SR11  011440        3308#
R2SR12  011460        3308#
R2SR13  011500        3308#
R2SR14  011520        3308#
R2SR15  011540        3308#
R2SR16  011560        3308#
R2SR17  011600        3308#
R2SR2   011260        3308#
R2SR3   011300        3308#
R2SR4   011320        3308#
R2SR5   011340        3308#
R2SR6   011360        3308#
R2SR7   011400        3308#
R3SR0   012550        3440    3528#
R3SR1   012570        3528#
R3SR10  012750        3528#
R3SR11  012770        3528#
R3SR12  013010        3528#
R3SR13  013030        3528#
R3SR14  013050        3528#
R3SR15  013070        3528#
R3SR16  013110        3528#
R3SR17  013130        3528#
R3SR2   012610        3528#
R3SR3   012630        3528#
R3SR4   012650        3528#
R3SR5   012670        3528#
R3SR6   012710        3528#
R3SR7   012730        3528#
SAVIT   001214        2634#   2857    2858
SCOPE = 104400        2620#
SELPRO  006162        2841#   2846    2872    2874
SIXBIT  010244        3175    3186#
SPACE   015377        3649    3732#
STACK = 001200        2623#   2672    2898    3223    3415
SUM     001310        2651#   3013*   3030*   3031    3034*   3035    3036    3037*   3038    3040*   3041
SUSWRR  015210        2673    3725#
SVSW0   001220        2638#   2850    2865    2944    3264    3457
SVSW1   001222        2638#
SVSW10  001240        2638#
SVSW11  001242        2638#
SVSW12  001244        2638#
```

M04

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 52-3
DZDJBE.P11   08-SEP-77 15:07   CROSS REFERENCE TABLE -- USER SYMBOLS   SEG 0051

SVSW13	001246	2638#											
SVSW14	001250	2638#											
SVSW15	001252	2638#											
SVSW16	001254	2638#											
SVSW17	001256	2638#											
SVSW2	001224	2638#											
SVSW3	001226	2638#											
SVSW4	001230	2638#											
SVSW5	001232	2638#											
SVSW6	001234	2638#											
SVSW7	001236	2638#											
SWITCH	006222	2951#	2861										
SWR	001210	2633#	2765	2784	2847	2947	2961	3050	3638	3641	3724*	3725*	3726
SWREG	000176	2625#	2784	3724	3725	3726							
SWREQ	015200	3724#											
SW10 =	002000	2571#	3638	3641									
SW11 =	004000	2571#											
SW12 =	010000	2571#	3050										
SW13 =	020000	2571#	3641										
SW14 =	040000	2571#											
SW15 =	100000	2571#											
SW8 =	000400	2571#											
SW9 =	001000	2571#	3641										
TIME	007320	3022	3062#										
TIMERA	001302	2648#	3014*	3062*									
TIMERB	001304	2649#	3015*	3064*									
TIMES	001216	2635#	2694*	3004*	3007*								
TMP1	015336	3724	3726##										
TYPE =	000004	2620#	2717	2767	2768	2769	2771	2773	2843	2851	2852	2855	3052	3055
		3638	3641	3649	3692	3693	3695	3712	3716	3724			
UNITS	001266	2642#	2715*	2746	2774	2787	2806	2860	2864	2969	3277	3482	3500
VECADR	001272	2644#	2740*	2772	2919	3244	3439						
XISR0	007364	3086#											
XISR1	007404	3086#											
XISR10	007564	3086#											
XISR11	007604	3086#											
XISR12	007624	3086#											
XISR13	007644	3086#											
XISR14	007664	3086#											
XISR15	007704	3086#											
XISR16	007724	3086#											
XISR17	007744	3086#											
XISR2	007424	3086#											
XISR3	007444	3086#											
XISR4	007464	3086#											
XISR5	007504	3086#											
XISR6	007524	3086#											
XISR7	007544	3086#											
XMTCNT	003312	2662#	2663	2956*	2989	3102	3105*	3271*	3324	3327*	3336*	3349*	3401*
XMTISR	007754	3086	3095#										
XMTLVL	001276	2646#	2928	3253	3448								
XMTTAB	001312	2657#	2900	2954*	3104	3106*	3109*	3225	3270*	3326	3330*	3334*	3335*	3348*
		3400*	3417	3464*	3493	3544	3545*	3546*	3547	3549*	3550	3553*	3615	3624*
X2SR0	011230	3308#											
X2SR1	011250	3308#											
X2SR10	011430	3308#											

N04

MAINDEC-11-DZDJB-E-D   DJ11 EXERCISER AND ON-LINE TESTS   MACY11 30(1046) 08-SEP-77 15:13 PAGE 52-4
DZDJBE.P11   08-SEP-77 15:07   CROSS REFERENCE TABLE -- USER SYMBOLS   SEG 0052

```
X2SR11  011450          3308#
X2SR12  011470          3308#
X2SR13  011510          3308#
X2SR14  011530          3308#
X2SR15  011550          3308#
X2SR16  011570          3308#
X2SR17  011610          3308#
X2SR2   011270          3308#
X2SR3   011310          3308#
X2SR4   011330          3308#
X2SR5   011350          3308#
X2SR6   011370          3308#
X2SR7   011410          3308#
X3SR0   012560          3528#
X3SR1   012600          3528#
X3SR10  012760          3528#
X3SR11  013000          3528#
X3SR12  013020          3528#
X3SR13  013040          3528#
X3SR14  013060          3528#
X3SR15  013100          3528#
X3SR16  013120          3528#
X3SR17  013140          3528#
X3SR2   012620          3528#
X3SR3   012640          3528#
X3SR4   012660          3528#
X3SR5   012700          3528#
X3SR6   012720          3528#
X3SR7   012740          3528#
YESRT   014670          3698#
SENDAD= 013574          2625    3638#
.     = 015736          2625#   2626#   2629#   2657#   2659#   2662#   2665#   3209#   3638   3641#   3692#   3693#   3695
                        3712    3716    3718#   3723    3743#
.BIT  = 132000          2562#   2571    3638    3641
.PR     014504          3693#*
.PRF    014424          3693#
.PRL    014402          3693#
.PTIT   014370          3693#
.SAVR6  014662          3695#*
.TYPE   015104          3692*   3723#*
```

BCP	3191#	3199	3205						
BITYPE	525#	2620#							
BLKBLK	1196#								
BUFHDR	1189#								
DUMP	515#	2620#	2770	3641	3724				
DUMP18	538#								
FILBLK	1181#								
LNKBLK	1173#								
OCT11	1224#								
OCT11X	1740#								
POP	571#	2620#	3120	3161	3351	3403	3479	3564	3636	3686	3695
PRINT	530#	2620#	3641	3692	3695				
PUSH	564#	2620#	3095	3130	3317	3361	3461	3537	3574	3662	3695
SCOPE.	353#								
SCOP.	382#								
SDUMP	520#	2620#	2772	2774	3714	3719			
TRACE	1154#								
TRNBLK	1202#								
TYPEM	543#								
WRITE	1210#								
SCATCH	578#								
SCHTAG	293#								
SCNTL	2475#	3724							
SEND	606#	3638							
SEQUAT	451#	2620							
SHLT	725#	3641							
SIOCAT	2509#	2625							
SIOT	2538#								
SKBIN	2459#	3726							
SKRAT	134#								
SLOADR	397#								
SOCTAL	789#	3693							
SPOWER	871#	3695							
SRAND	1074#								
SRAND4	1117#								
SREAD	1023#	3692							
SSCOPE	654#								
SSETUP	311#								
SSRAT	191#								
SSWDOC	103#	2571							
SSWROF	2497#	2633							
SSWRRR	2442#	3725							
STRAP	978#								
STYPE	916#	3723							
SURAT	242#								
.SCOP	374#								
.SCOPE	345#								

. ABS. 015736   000

ERRORS DETECTED: 0

DZDJBE,DZDJBE/CRF=DZDJBE.MAC,DZDJBE.P11
RUN-TIME: 57.5 SECONDS

C05

RUN-TIME RATIO: 228/14=16.0
CORE USED: 32K (63 PAGES)