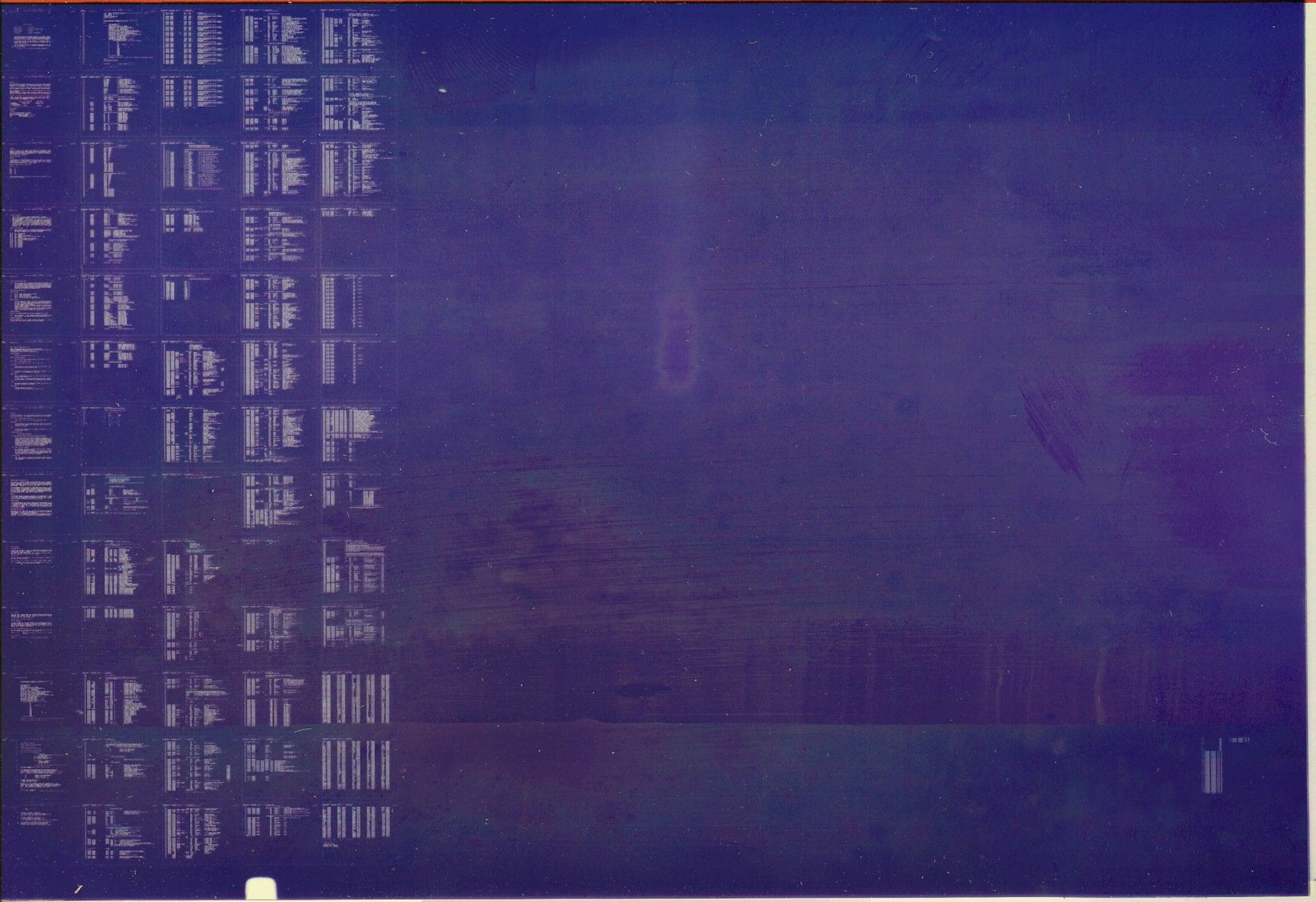
DZV11 CABLE/ECHO TST
CVDZCBO

AH-A942B-MC
FICHE 1 OF 1

digital



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.REM  &
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IDENTIFICATION

PRODUCT CODE: AC-A941B-MC

PRODUCT NAME: CVDZCB0 DZV11 CABLE/ECHO TST

DATE RELEASED: 17-FEB-82

MAINTAINER: DIAGNOSTIC ENGINEERING

1. ABSTRACT

THE FUNCTION OF THE DZV11 DIAGNOSTICS IS TO VERIFY THE OPTION OPERATES ACCORDING TO SPECIFICATIONS. THE DIAGNOSTICS ALSO VERIFY THAT THE DZV11 OPERATES IN ITS ENVIRONMENT SUCH AS THE SYSTEM IN WHICH IT IS INSTALLED.

CURRENTLY THERE ARE THREE STANDALONE DIAGNOSTICS (DVDZA,DVDZB,AND DVDZC) ONE SYSTEM MODULE FOR DEC X/11 (DZBA), AND AN OVERLAY FOR ITEP (DVDZD).

DVDZA TOGETHER WITH DVDZB WILL TEST ALL LOGICAL FUNCTIONS OF THE DZV11 INTERFACE MODULE.
DVDZC IS DESIGNED AS A NON-CHAINABLE STANDALONE DIAGNOSTIC PROVIDING THE OPERATOR WITH DIRECT CONTROL OVER THE TESTING OF ALL DZV11 EIA CABLES.

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**********************************************************************************
*                                                                          ;;GPA  *
* NOTE: THIS DIAGNOSTIC HAS BEEN MODIFIED TO RUN IN KXT11 (SBC 11/21)      *
* BASED SYSTEMS.  THE PROGRAM WILL AUTOMATICALLY ADJUST ITSELF TO RUN      *
* IN THE APPROPRIATE ENVIRONMENT AS FOLLOWS:                               *
*                                                                          *
*              LSI-11, 11/2, AND 11/23        SBC 11/21                    *
*              -----------------------        ---------                    *
* CSR RANGE:        160010 TO 163770        174000 TO 177770               *
* VECTOR RANGE:       300 TO 770              300 TO 370                   *
* AUTO-SIZING FOR...                                                       *
* ...CSR AND VECTOR:    ENABLED                 DISABLED                   *
*                                                                  ;;GPA   *
**********************************************************************************
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2. REQUIREMENTS

2.1 EQUIPMENT

AN LSI11 CPU WITH MINIMUM 4K OF MEMORY.
ASR 33 (OR EQUIVALENT FOR CONSOLE)
ASR 33 (OR EQUIVALENT) TO RUN DZV11 ECHO TEST
DZV11 INTERFACE MODULE
H325 CABLE TURNAROUND CONNECTOR.

2.2 STORAGE

PROGRAM WILL USE ALL 4K OF MEMORY EXCEPT WHERE ABL AND BOOTSTRAP LOADER RESIDE. LOCATION 1500 THRU 1740 ARE ESPECIALLY TO BE NOTED AND TO BE UNTOUCHED BY THE OPERATOR IF THE PARAMETERS HAVE BEEN ALREADY BUILT BY RUNNING EITHER THE DVDZA OR DVDZB DIAGNOSTICS. LOADING THIS DIAGNOSTIC WILL PRESERVE THESE LOCATIONS.

3. LOADING PROCEEDURE

3.1 METHOD

ALL PROGRAMS ARE IN ABSOLUTE FORMAT AND ARE LOADED USING THE ABSOLUTE LOADER. NOTE: IF THE DIAGNOSTICS ARE ON A MEDIA SUCH AS DISK ,MAGTAPE,DECTAPE, OR CASSETTE; FOLLOW INSTRUCTIONS FOR THE MONITOR WHICH HAS BEEN PROVIDED ON THAT SPECIFIC MEDIA.

ABSOLUTE LOADER STARTING ADDRESS *500

MEMORY	* SIZE
4K	17
8K	37
12K	57
16K	77
20K	117
24K	137
28K	157

3.1.1 STARTING THE PROCESSOR AT THE ABSOLUTE LOADER STARTING ADDRESS WILL LOAD THE DIAGNOSTIC INTO MEMORY.

4. STARTING PROCEEDURE

A. SET THE SWR TO ALLOW THE DESIRED PROGRAM OPTIONS TO FUNCTION.
NOTE: LOC. 000176 IS USED AS A SOFTWARE SWITCH REGISTER IN ALL OF THE DZV11 DIAGNOSTICS. (SEE SEC. 4.1)

B. START THE DIAGNOSTIC AT LOC. 200(8). THE PROGRAM WILL TYPE MAINDEC AND PROGRAM NAMES (IF THIS WAS THE FIRST START UP OF THE PROGRAM).

C. THE PROGRAM WILL THEN ASK FOR THE DEVICE ADDRESS, THE VECTOR AND THE LINE NO. OF THE DZV11 TO BE TESTED. TYPE THESE VALUES ON THE CONSOLE TERMINAL FOLLOWED BY A <CR>. THE PROGRAM WILL THEN ASK FOR WHICH TEST IS DESIRED, ECHO OR CABLE. TYPE EITHER E OR C AND A <CR>. THE DIAGNOSTIC WILL TYPE OUT THE NAME OF THE TEST THAT IS NOW RUNNING (SEE SEC. 5.1).

4.1 CONTROL SWITCH SETTINGS

NOTE: THIS PROGRAM UTILIZES A SOFTWARE SWITCH REGISTER WHICH MAY BE MODIFIED BY CHANGING LOC. 176 OR BY TYPING CONTROL "G" (^G) ON THE CONSOLE TERMINAL WHILE THE PROGRAM IS RUNNING.

SW 15	SET:	HALT ON ERROR
SW 14	SET:	RESERVED
SW 13	SET:	INHIBIT ERROR PRINT OUT
SW 12	SET:	INHIBIT **ALL** TYPE OUT/BELL ON ERROR.
SW 11	SET:	RESERVED
SW 10	SET:	GO TO END OF PASS AFTER AN ERROR
SW 09	SET:	LOOP WITH CURRENT DATA (SEE SEC. 4.1.1)
SW 08	SET:	RESTART TEST AFTER AN ERROR
SW 07	SET:	RESERVED
SW 06	SET:	RESERVED
SW 05	SET:	RESERVED
SW 04	SET:	RESERVED
SW 03	SET:	RESERVED
SW 02	SET:	RESERVED
SW 01	SET:	RESERVED
SW 00	SET:	RESERVED

4.1.1 SWITCH REGISTER RESTRICTIONS

SW 09 LOOP ON CURRENT DATA: THIS SWITCH IS ONLY USED IN THE CABLE TEST TO LOCK ON TESTING IF SETTING THE DTR BIT FOR THE DESIRED LINE IN THE TRANSMIT CONTROL REGISTER OF THE DZV11 WILL CAUSE THE CO AND RING BITS TO SET FOR THAT LINE IN THE MODEM STATUS REGISTER. THIS SWITCH IS DESIGNED TO PROVIDE AN AID FOR A TRAINED TROUBLE-SHOOTER TO SAMPLE VARIOUS SIGNALS ON THE MODULE AND IS NOT MEANT TO BE USED AS A GENERAL USER CONTROL SWITCH.

4.1.2 SWITCH REGISTER PRIORITIES

ERROR SWITCHES

1. SW 12 DELETE PRINT OUT/BELL ON ERROR.
2. SW 13 DELETE ERROR PRINTOUT.
3. SW 15 HALT ON THE ERROR.
4. SW 08 RESTART THE TEST AFTER AN ERROR
5. SW 10 GO TO THE END OF PASS AFTER AN ERROR

SCOPE SWITCHES

1. SW 09 (IF ENABLED BY 'SCOP1'). IF AN '*' IS PRINTED IN FRONT OF THE TEST NO. ON AN ERROR REPORT THEN SW09 IS INCORPORATED IN THAT TEST. THIS SWITCH PROVIDES THE OPERATOR WITH THE ABILITY TO LOCK ON A SPECIFIC TEST OPERATION.
   IF THE PROGRAM USER IS TECHNICALLY TRAINED TO ELECTRONICALLY ISOLATE SIGNAL PROBLEMS ON THE DZV11 MODULE, THIS SWITCH MIGHT PROVE TO BE A USEFUL AID.
   PRESENTLY THIS SWITCH IS ONLY USED IN THIS DIAGNOSTIC FOR THE CABLE TEST TO LOCK ON CHECKING THAT IF DTR IS SET FOR AN ACTIVE LINE THE CO AND RING WILL BECOME SET FOR THAT LINE.

4.2 STARTING ADDRESS

SA 200 - THE STARTING ADDRESS FOR ANY DZV11 DIAGNOSTIC IS LOC. 200

NOTE: THIS DIAGNOSTIC IS NOT DESIGNED TO RUN IN AN AUTOMATIC CHAIN MODE BECAUSE OF THE OPERATOR INTERVENTION REQUIRED TO RUN IT.

5. OPERATING PROCEEDURE

WHEN THE PROGRAM IS INITIALLY STARTED, MESSAGES AS DESCRIBED IN SECTION FOUR WILL BE PRINTED AND THE DIAGNOSTIC WILL BEGIN RUNNING.

5.1 HOW TO RUN THE ''CABLE/ECHO'' TESTS.

NORMAL STARTING PROCEEDURE FOR THE FIRST TIME WOULD BE:
LOAD THE DIAGNOSTIC, SET THE SWR AT LOC. 176 TO WHATEVER SETTINGS ARE DESIRED, THEN START THE PROGRAM AT LOC. 200.
THE PROGRAM WILL PRINT OUT ON THE CONSOLE TERMINAL:

''VECTOR ADDRESS-''

YOU TYPE A VECTOR FOLLOWED BY A <CR>.

''CONTROL REGISTER ADDRESS-''

YOU TYPE IN THE DZVCSR ADDRESS UNDER TEST FOLLOWED BY A <CR>.

''WHICH TEST ? ECHO OR CABLE (E OR C)''

LETS DO THE CABLE TEST FIRST. TYPE ''C'' AND A <CR>.

''BAUD RATE- ''

TYPE EITHER 50, 110, 135, 150, 300, 600, 1200 1800, 2000, 2400, 3600, 4800, 7200, 9600 FOLLOWED BY <CR>

''LINE: ''

YOU TYPE THE LINE WHICH HAS THE H325 TEST CONNECTOR. (TYPE EITHER 0, 1, 2, 3) PROGRAM WILL THEN PRINT:

''CABLE TEST''

AND IF EVERYTHING IS WORKING, THE END OF PASS MESSAGE WILL BE PRINTED AFTER EACH PASS.

TO CHANGE LINES, HIT ANY PRINTING KEY ON YOUR CONSOLE TERMINAL WHILE THE PROGRAM IS RUNNING AND THE FOLLOWING WILL BE PRINTED:

''LINE: ''

NOW CHANGE THE H325 TEST CONNECTOR TO ANOTHER LINE AND TYPE THE NEW LINE. PROGRAM WILL THEN PRINT:

''CABLE TEST''

AND BEGIN RUNNING THE DIAGNOSTIC.
CONTINUE THIS OPERATION UNTIL ALL LINES ARE TESTED.

5.2 ECHO TEST

START THE PROGRAM AT LOC. 200 AND ENTER THE VALUES FOR THE CSR ADDRESS AND THE DEVICE VECTOR. THE PROGRAM WILL THEN PRINT OUT ON THE CONSOLE:

''WHICH TEST ? ECHO OR CABLE (E OR C)''

NOW TYPE AN ''E'' TO DO THE ECHO TEST. PROGRAM WILL PRINT:

''BAUD RATE-''

TYPE THE BAUD RATE. BAUD RATE CHOICES ARE: 50,75, 110, 135, 150 300, 600 , 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600. THE PROGRAM WILL THEN PRINT:

LINE: ''

TYPE THE LINE NUMBER WHICH THE TERMINAL IS CONNECTED TO. THEN THE PROGRAM WILL PRINT:

''TERMINAL ECHO TEST''

*** AT THIS POINT THE MESSAGE:

''THE QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK 0123456789''

SHOULD BE PRINTED ON THE TERMINAL CONNECTED TO THE DZV11. IF THIS MESSAGE IS DESIRED TO BE PRINTED CONTINUOUSLY, TYPE A CONTROL G <^G> ON THE CONSOLE TERMINAL WHILE THE MESSAGE IS PRINTING. THE PROGRAM WILL PRINT A PROMPT ON THE CONSOLE ASKING FOR A NEW SWR SETTING. BY SETTING THE SWR TO 377 THE QUICK BROWN FOX MESSAGE WILL BE CONTINUOUSLY PRINTED ON THE DZV TERMINAL. A CONTROL G CAN THEN BE TYPED ON THE CONSOLE TERMINAL AT ANY TIME TO RESET THE SWR AND RETURN TO THE FLOW OF THE DIAGNOSTIC.
THE PROGRAM WILL THEN PRINT ON THE CONSOLE TERMINAL:

''TYPE A CHAR. ON DZV11 TERMINAL''

ANY PRINTABLE CHARACTER WHICH IS TYPED ON THE DZV11 TERMINAL WILL BE ECHOED BACK ON THE TERMINAL.
IF YOU TYPE CONTROL C <^C> ON THE DZV11 TERMINAL THE PROGRAM WILL PRINT THE END OF PASS MESSAGE ON THE CONSOLE TERMINAL AND THE ''QUICK BROWN FOX'' MESSAGE WILL BEGIN PRINTING ON THE DZV11 TERMINAL AGAIN, THE ECHO TEST WILL BE RESUMED.

TO CHANGE LINES:

TYPE ANY PRINTABLE CHARACTER ON THE CONSOLE TERMINAL (NOT THE DZV11 TERMINAL). THE PROGRAM WILL AGAIN TYPE ''LINE: '' AND WAIT FOR A RESPONSE.

5.3 PROGRAM AND/OR OPERATOR ACTION

THE VARIETY OF PROGRAM CONTROL SWITCHES PROVIDED IN THIS DIAGNOSTIC PACKAGE IS DESIGNED TO PROVIDE THE USER WITH A WIDE RANGE OF TROUBLE-SHOOTING TECHNIQUES. BEFORE THE USER ATTEMPTS TO RUN THIS DIAGNOSTIC HE SHOULD BECOME FAMILIAR WITH THE USE OF THESE CONTROL SWITCHES AND THEIR RESTRICTIONS. (SEE SEC. 4.1, 4.1.1, 4.1.2, 4.1.3)

WHEN THE PROGRAM DETECTS AN ERROR THE TEST NUMBER AND PC WILL BE TYPED OUT AND POSSIBLY AN ERROR MESSAGE (DEPENDING ON THE PARTICULAR ERROR). IF IT IS NECESSARY TO KNOW MORE INFORMATION CONCERNING THE ERROR REPORT THEN LOOK IN THE PROGRAM LISTING FOR THAT TEST NUMBER AND THEN NOTE THE PC OF THE ERROR REPORT. THE REASON FOR THE ERROR REPORT WILL BECOME CLEARER WHEN READING THE COMMENTS IN THE PROGRAM LISTING.

6. ERRORS

AS DESCRIBED PREVIOUSLY THERE WILL ALWAYS BE A TEST NUMBER AND PC TYPED OUT AT THE TIME OF AN ERROR (PROVIDING SW 13=0 AND SW 12=0). IN MOST CASES ADDITIONAL INFORMATION WILL BE SUPPLIED TO THE THE ERROR MESSAGE WHICH IS TO GIVE THE OPERATOR AN INDICATION OF THE ERROR.

6.1 ERROR RECOVERY

IF FOR SOME REASON THE DZV11 SHOULD 'HANG THE BUS' (GAIN CONTROL OF BUS SO THAT CONSOLE MANUAL FUNCTIONS ARE INHIBITED) AN INIT OR POWER DOWN/UP IS NECESSARY FOR THE OPERATOR TO REGAIN CONTROL OF THE CPU. IT WILL THEN BE NECESSARY TO CHECK THE PC PROCESSOR REGISTER AND REFER TO THIS LOCATION IN THE PROGRAM LISTING TO FIND OUT WHAT THE PROGRAM WAS DOING AT THE TIME OF THE ERROR.

7. OPERATING RESTRICTIONS

WHEN RUNNING THE CABLE TEST, THE LINE THAT IS DECLARED ACTIVE MUST BE TERMINATED BY AN H325 TEST CONNECTOR WHICH WILL TURN THE TRANSMITTED SIGNAL AROUND TO THE RECEIVER ON THE SAME LINE.
THE DIAGNOSTIC IS NOT DESIGNED TO DETERMINE A LOGIC PROBLEM WITH THE DZV INTERFACE. IT IS DESIGNED ONLY TO VERIFY THAT THE INTERFACE CABLE IS PROVIDING A TRUE LINK TO THE TERMINALS WHICH ARE CONNECTED TO THE DZV11.

8. MISCELLANEOUS

8.1 EXECUTION TIME

THE EXECUTION TIME FOR THE CABLE TEST DEPENDS UPON THE DESIRED BAUD RATE GIVEN AT START UP TIME. AT 9600. BAUD THE END PASS MESSAGE WILL PRINT OUT BEFORE 10 SECONDS HAVE ELAPSED.
THE EXECUTION TIME FOR THE ECHO TEST IS ENTIRELY DEPENDENT UPON THE NUMBER OF CHARACTERS THE OPERATOR WISHES TO SEND.

8.2 PASS COMPLETE

WHEN THE DIAGNOSTIC HAS COMPLETED A PASS THE FOLLOWING IS AN EXAMPLE OF THE PRINT OUT TO BE EXPECTED.

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END PASS DVDZC-A CSR:  160100 VEC:  300 PASSES:  000001 ERRORS:  000000
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NOTE: THE NUMBERS FOR CSR AND VEC ARE NOT NECESSARILY THE VALUES FOR THE DEVICE. THEY ARE ONLY FOR THIS EXAMPLE.

8.3 KEY LOCATIONS

AFTER THE BASE DEVICE ADDRESS AND THE BASE VECTOR HAVE BEEN TYPED IN, LOCATIONS 2010 THROUGH 2046 WILL CONTAIN THE VARIOUS DEVICE REGISTER ADDRESSES AND THE DEVICE VECTORS. LOCATION 1374 (SAVLIN) WILL CONTAIN THE LINE NUMBER THAT WAS DECLARED ACTIVE.

9.0 RUNNING THE DZV11 DIAGNOSTIC UNDER APT

9.1.1 THE APT INTERFACE

THE DZV DIAGNOSTICS HAVE BEEN DESIGNED TO BE COMPATIBLE WITH THE APT (AUTOMATED PRODUCT TEST) SYSTEM. THE DZV LOGIC TEST DIAGNOSTICS (DVDZA, AND DVDZB) CAN BE RUN AS STANDALONE DIAGNOSTICS OR IN EITHER OF THE APT MODES. DVDZC, HOWEVER IS DESIGNED AS A STANDALONE DIAGNOSTIC ONLY AND REQUIRES DIRECT OPERATOR PARTICIPATION.

9.1.2 SETTING UP THE DIAGNOSTIC USING APT

ONLY ONE VARIABLE IN THE REGION SUBTITLED "APT MAILBOX-ETABLE" NEEDS TO BE SET UP BEFORE RUNNING UNDER APT. THIS VARIABLE IS:

$SWREG -(1142) USED AS THE SOFTWARE SWITCH REGISTER WHILE RUNNING UNDER APT.

9.1.3 RUNNING UNDER APT

$SWREG (LOC. 1142) SHOULD BE SET UP PRIOR TO RUNNING THE DIAGNOSTIC.

10.0 PROGRAM DESCRIPTION.

THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
PACKAGE (MAINDEC-11-DZQAC-C3), JAN 19, 1977.

11 STARTING PROCEDURE
LOAD PROGRAM
START THE PROGRAM AT LOC. 000200
PROGRAM WILL TYPE DZV11 ECHO/CABLE TEST
PROGRAM WILL TYPE WHICH TEST- ECHO OR CABLE
TYPE IN E OR C RESPECTIVELY
PROGRAM WILL TYPE "VECTOR ADDRESS-"
TYPE IN THE ADDRESS OF THE RECEIVER INTERRUPT VECTOR
FOR THE DZV11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
PROGRAM WILL TYPE "CONTROL REGISTER ADDRESS-"
TYPE IN THE ADDRESS OF THE SYSTEM CONTROL REGISTER
FOR THE DZV11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
PROGRAM WILL TYPE "LINE NUMBER-"
TYPE IN THE LINE NUMBER TO BE TESTED (IN OCTAL)
,FOLLOWED BY <CARRIAGE RETURN>
PROGRAM WILL TYPE "BAUD RATE-"
TYPE IN THE BAUD RATE OF THE DZV11 TERMINAL
,FOLLOWED BY <CARRIAGE RETURN>
THE FOLLOWING BAUD RATES ARE ACCEPTED IN DECIMAL
50
75
110
135 (ROUNDED OFF 134.5)
150
300
600
1200
1800
2000
2400
3600
4800
7200
9600
ALL OTHERS ARE REJECTED

47 PROGRAM WILL TYPE "ECHO" OR "CABLE TEST" TO INDICATE THAT TESTING HAS STARTED

74 INITIAL ADDRESS OF THE STACK POINTER *** 1120 ***

```
                79      MISCELLANEOUS DEFINITIONS

                91      GENERAL PURPOSE REGISTER DEFINITIONS

               103      PRIORITY LEVEL DEFINITIONS

               113      "SWITCH REGISTER" SWITCH DEFINITIONS

               141      DATA BIT DEFINITIONS (BIT00 TO BIT15)

               169      BASIC "CPU" TRAP VECTOR ADDRESSES

               384                              BITS 15-11=CPU TYPE
                                                        11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
                                                        11/70=06,PDQ=07,Q=10
                                                BIT 10=REAL TIME CLOCK
                                                BIT  9=FLOATING POINT PROCESSOR
                                                BIT  8=MEMORY MANAGEMENT

               392                              MEM.TYPE BYTE   --  (HIGH BYTE)
                                                        900 NSEC CORE=001
                                                        300 NSEC BIPOLAR=002
                                                        500 NSEC MOS=003

               397                                MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABOVE

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

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

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

               873      INCREMENT THE PASS NUMBER ($PASS)
                        IF THERES A MONITOR GO TO IT
                        IF THERE ISN'T JUMP TO XBEGIN

               995      ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
                        THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
                        NOTE1:  $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
                        NOTE2:  $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
                        NOTE3:  $FILLC CONTAINS THE CHARACTER TO FILL AFTER.

                        CALL:
                        1) USING A TRAP INSTRUCTION
                                TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
                        OR
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                        TYPE
                        MESADR


                1728    *********   ECHO TEST   **********
                        THIS TEST WILL ACCEPT 1 CHARACTER AT A TIME
                        (IN INTERRUPT MODE) AND TRANSMIT THAT SAME CHARACTER,
                        ONE LINE AT A TIME, ANY LINE 0 THRU 7 (OCTAL)

                1799    *********   CABLE TEST   **********
                        THIS TEST TRANSMITS A BINARY COUNT PATTERN
                        VIA INTERRUPT MODE TO THE RECEIVER
                        ...THE LINE UNDER TEST MUST BE TERMINATED WITH THE TEST CONNECTOR

                1808    TEST TO VERIFY THAT SETTING DTR FOR A GIVEN LINE
                        WILL BRING UP "CO" AND "RING" FOR THE SAME LINE
                        JUMPERS W1,W2,W3 AND W4 MUST BE INSTALLED ON THE
                        INTERFACE MODULE OTHERWISE AN ERROR REPORT WILL RESULT.

        &
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                        ;;GPA   PRGFRT  ^?MAINDEC-11-DVDZCA/<200>/DZV11 ECHO AND CABLE TESTS  ?,DVDZCA
                        ;;GPA   .HEADER <MD-11-DVDZC-A>,1977
                        .TITLE  CVDZC-B
                        ;*COPYRIGHT (C) 1977,1981
                        ;*DIGITAL EQUIPMENT CORP.
                        ;*MAYNARD, MASS. 01754
                        ;*
                        ;*
                        ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                        ;*PACKAGE (MAINDEC-11-DZQAC-C5), JAN, 1981.
                        ;*
000001                  $TN=1
                                ;*STARTING PROCEDURE
                                ;*LOAD PROGRAM
                                ;*START THE PROGRAM AT LOC. 000200
                                ;*PROGRAM WILL TYPE DZV11 ECHO/CABLE TEST
                                ;*PROGRAM WILL TYPE  WHICH TEST- ECHO OR CABLE
                                ;*TYPE IN  E  OR  C  RESPECTIVELY
                                ;*PROGRAM WILL TYPE "VECTOR ADDRESS-"
                                ;*TYPE IN THE ADDRESS OF THE RECEIVER INTERRUPT VECTOR
                                ;*FOR THE DZV11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
                                ;*PROGRAM WILL TYPE "CONTROL REGISTER ADDRESS-"
                                ;*TYPE IN THE ADDRESS OF THE SYSTEM CONTROL REGISTER
                                ;*FOR THE DZV11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
                                ;*PROGRAM WILL TYPE "LINE NUMBER-"
                                ;*TYPE IN THE LINE NUMBER TO BE TESTED (IN OCTAL)
                                ;*,FOLLOWED BY <CARRIAGE RETURN>
                                ;*PROGRAM WILL TYPE "BAUD RATE-"
                                ;*TYPE IN THE BAUD RATE OF THE DZV11 TERMINAL
                                ;*,FOLLOWED BY <CARRIAGE RETURN>
                                        ;*THE FOLLOWING BAUD RATES ARE ACCEPTED IN DECIMAL
                                ;*              50
                                ;*              75
                                ;*              110
                                ;*              135     (ROUNDED OFF   134.5)
                                ;*              150
                                ;*              300
                                ;*              600
                                ;*              1200
                                ;*              1800
                                ;*              2000
                                ;*              2400
                                ;*              3600
                                ;*              4800
                                ;*              7200
                                ;*              9600
                                ;*ALL OTHERS ARE REJECTED

                                ;*PROGRAM WILL TYPE "ECHO"  OR "CABLE TEST" TO INDICATE THAT TESTING HAS STARTED

                        .REM    !
                        ;SWITCH REGISTER OPTIONS
                        ;-----------------------


                        SW15=100000             ;=1,HALT ON ERROR
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```
(1)                             SW14=40000              ;=1,LOOP ON CURRENT TEST
(1)                             SW13=20000              ;=1,INHIBIT ERROR TYPEOUT
(1)                             SW12=10000              ;=1,DELETE TYPEOUT/BELL ON ERROR.
(1)                             SW11=4000               ;=1,INHIBIT ITERATIONS
(1)                             SW10=2000               ;=1,ESCAPE TO NEXT TEST ON ERROR
(1)                             SW09=1000               ;=1,LOOP WITH CURRENT DATA
(1)                             SW08=400                ;=1,LOOP ON ERROR
(1)                             SW07=200                ;=1, DO "AUTO SIZING" ON INITAL START UP.
(1)                             SW06=100                ;=1, DESELECT SPECIFIC DEVICES
(1)                                                     ;NOTE: THIS MUST NOT EXCEED ORIGINAL COUNT
(1)                             SW05=40
(1)                             SW04=20                 ;=1, SELECT DELAY PARAMETER
(1)                             SW03=10                 ;=1, SELECT SPECIFIC PARAMETERS
(1)                             SW02=4                  ;=1, LOCK ON TEST SELECT
(1)                             SW01=2                  ;=1, RESTART PROGRAM AT SELECTED TEST
(1)                             SW00=1                  ;=1, SELECT DEVICE ADDRESS, VECTOR, ETC.
(1)                             !
(2)                             .SBTTL  BASIC DEFINITIONS
(2)
(2)                             ;*INITIAL ADDRESS OF THE STACK POINTER *** 1120 ***
(2)     001120                  STACK=  1120
(2)                             .EQUIV  EMT,ERROR       ;;BASIC DEFINITION OF ERROR CALL
(2)                             .EQUIV  IOT,SCOPE       ;;BASIC DEFINITION OF SCOPE CALL
(2)
(2)                             ;*MISCELLANEOUS DEFINITIONS
(2)     000011                  HT=     11              ;;CODE FOR HORIZONTAL TAB
(2)     000012                  LF=     12              ;;CODE FOR LINE FEED
(2)     000015                  CR=     15              ;;CODE FOR CARRIAGE RETURN
(2)     000200                  CRLF=   200             ;;CODE FOR CARRIAGE RETURN-LINE FEED
(2)     177776                  PS=     177776          ;;PROCESSOR STATUS WORD
(2)                             .EQUIV  PS,PSW
(2)     177774                  STKLMT= 177774          ;;STACK LIMIT REGISTER
(2)     177772                  PIRQ=   177772          ;;PROGRAM INTERRUPT REQUEST REGISTER
(2)     177570                  DSWR=   177570          ;;HARDWARE SWITCH REGISTER
(2)     177570                  DDISP=  177570          ;;HARDWARE DISPLAY REGISTER
(2)
(2)                             ;*GENERAL PURPOSE REGISTER DEFINITIONS
(2)     000000                  R0=     %0              ;;GENERAL REGISTER
(2)     000001                  R1=     %1              ;;GENERAL REGISTER
(2)     000002                  R2=     %2              ;;GENERAL REGISTER
(2)     000003                  R3=     %3              ;;GENERAL REGISTER
(2)     000004                  R4=     %4              ;;GENERAL REGISTER
(2)     000005                  R5=     %5              ;;GENERAL REGISTER
(2)     000006                  R6=     %6              ;;GENERAL REGISTER
(2)     000007                  R7=     %7              ;;GENERAL REGISTER
(2)     000006                  SP=     %6              ;;STACK POINTER
(2)     000007                  PC=     %7              ;;PROGRAM COUNTER
(2)
(2)                             ;*PRIORITY LEVEL DEFINITIONS
(2)     000000                  PR0=    0               ;;PRIORITY LEVEL 0
(2)     000040                  PR1=    40              ;;PRIORITY LEVEL 1
(2)     000100                  PR2=    100             ;;PRIORITY LEVEL 2
(2)     000140                  PR3=    140             ;;PRIORITY LEVEL 3
(2)     000200                  PR4=    200             ;;PRIORITY LEVEL 4
(2)     000240                  PR5=    240             ;;PRIORITY LEVEL 5
(2)     000300                  PR6=    300             ;;PRIORITY LEVEL 6
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(2)          000340                   PR7=    340             ;;PRIORITY LEVEL 7
(2)
(2)                                   ;*''SWITCH REGISTER'' SWITCH DEFINITIONS
(2)          100000                   SW15=   100000
(2)          040000                   SW14=   40000
(2)          020000                   SW13=   20000
(2)          010000                   SW12=   10000
(2)          004000                   SW11=   4000
(2)          002000                   SW10=   2000
(2)          001000                   SW09=   1000
(2)          000400                   SW08=   400
(2)          000200                   SW07=   200
(2)          000100                   SW06=   100
(2)          000040                   SW05=   40
(2)          000020                   SW04=   20
(2)          000010                   SW03=   10
(2)          000004                   SW02=   4
(2)          000002                   SW01=   2
(2)          000001                   SW00=   1
(2)                                   .EQUIV  SW09,SW9
(2)                                   .EQUIV  SW08,SW8
(2)                                   .EQUIV  SW07,SW7
(2)                                   .EQUIV  SW06,SW6
(2)                                   .EQUIV  SW05,SW5
(2)                                   .EQUIV  SW04,SW4
(2)                                   .EQUIV  SW03,SW3
(2)                                   .EQUIV  SW02,SW2
(2)                                   .EQUIV  SW01,SW1
(2)                                   .EQUIV  SW00,SW0
(2)
(2)                                   ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
(2)          100000                   BIT15=  100000
(2)          040000                   BIT14=  40000
(2)          020000                   BIT13=  20000
(2)          010000                   BIT12=  10000
(2)          004000                   BIT11=  4000
(2)          002000                   BIT10=  2000
(2)          001000                   BIT09=  1000
(2)          000400                   BIT08=  400
(2)          000200                   BIT07=  200
(2)          000100                   BIT06=  100
(2)          000040                   BIT05=  40
(2)          000020                   BIT04=  20
(2)          000010                   BIT03=  10
(2)          000004                   BIT02=  4
(2)          000002                   BIT01=  2
(2)          000001                   BIT00=  1
(2)                                   .EQUIV  BIT09,BIT9
(2)                                   .EQUIV  BIT08,BIT8
(2)                                   .EQUIV  BIT07,BIT7
(2)                                   .EQUIV  BIT06,BIT6
(2)                                   .EQUIV  BIT05,BIT5
(2)                                   .EQUIV  BIT04,BIT4
(2)                                   .EQUIV  BIT03,BIT3
(2)                                   .EQUIV  BIT02,BIT2
(2)                                   .EQUIV  BIT01,BIT1
```

```
(2)                             .EQUIV  BIT00,BIT0
(2)
(2)                             ;*BASIC "CPU" TRAP VECTOR ADDRESSES
(2)             000004          ERRVEC= 4                       ;;TIME OUT AND OTHER ERRORS
(2)             000010          RESVEC= 10                      ;;RESERVED AND ILLEGAL INSTRUCTIONS
(2)             000014          TBITVEC=14                      ;;"T" BIT
(2)             000014          TRTVEC= 14                      ;;TRACE TRAP
(2)             000014          BPTVEC= 14                      ;;BREAKPOINT TRAP (BPT)
(2)             000020          IOTVEC= 20                      ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
(2)             000024          PWRVEC= 24                      ;;POWER FAIL
(2)             000030          EMTVEC= 30                      ;;EMULATOR TRAP (EMT) **ERROR**
(2)             000034          TRAPVEC=34                      ;;"TRAP" TRAP
(2)             000060          TKVEC=  60                      ;;TTY KEYBOARD VECTOR
(2)             000064          TPVEC=  64                      ;;TTY PRINTER VECTOR
(2)             000240          PIRQVEC=240                     ;;PROGRAM INTERRUPT REQUEST VECTOR
(1)
(1)
(1)                             ;INSTRUCTION DEFINITIONS
(1)                             ;----------------------
(1)
(1)             005746          PUSH1SP=5746    ;DECREMENT PROCESSOR STACK 1 WORD
(1)             005726          POP1SP=5726     ;INCREMENT PROCESSOR STACK 1 WORD
(1)             010046          PUSHR0=10046    ;SAVE R0 ON STACK
(1)             012600          POPR0=12600     ;RESTORE R0 FROM STACK
(1)             024646          PUSH2SP=24646   ;DECREMENT STACK TWICE
(1)             022626          POP2SP=22626    ;INCREMENT STACK TWICE
(1)             000200          MASK=BIT7       ;SET INTERRUPT MASK (INHIBIT FURTHER INTERRUPTS)
(1)             000000          CLEAR=0         ;ALLOW INTERRUPTS (CLEAR PROCESSOR STATUS)
(1)
(1)
(1)                             ;DZV11 CONTROL AND STATUS REGISTER DEFINITIONS
(1)                             ;(DZVCSR)       BIT DEFINITIONS
(1)                             ;-------------------------------
(1)
(1)             000010          MAINT = BIT3    ;MAINTENANCE MODE ENABLE
(1)             000020          DCLR=BIT4       ;DEVICE CLEAR
(1)             000040          MSENAB=BIT5     ;MASTER SCAN ENABLE
(1)             000100          RIE=BIT6        ;RECEIVER INTERRUPT ENABLE
(1)             000200          RDONE=BIT7      ;RECEIVER DONE
(1)             010000          SILOEN= BIT12   ;SILO ALARM ENABLE
(1)             020000          SILOAL = BIT13  ;SILO ALARM
(1)             040000          TIE=BIT14       ;TRANSMITTER INTERRUPT ENABLE
(1)             100000          TRDY=BIT15      ;TRANSMITTER READY
(1)
(1)                             ;DZVCSR WORD DEFINITIONS
(1)                             ;----------------------
(1)             000000          TL0=0           ;TRANSMIT LINE 0
(1)             000400          TL1=BIT8        ;TRANSMIT LINE 1
(1)             001000          TL2=BIT9        ;TRANSMIT LINE 2
(1)             001400          TL3=BIT9!BIT8   ;TRANSMIT LINE 3
(1)
(1)
(1)                             ;DZVRBUF BIT DEFINITIONS
(1)                             ;----------------------
(1)
(1)             010000          PARER=BIT12     ;PARITY ERROR
```

```
(1)          020000                  FRMERR=BIT13    ;FRAME ERROR
(1)          040000                  OVRRUN=BIT14    ;OVERRUN ERROR
(1)          100000                  DVALID=BIT15    ;DATA VALID
(1)
(1)                                          ;DZVRBUF WORD DEFINITIONS
(1)                                          ;-----------------------
(1)
(1)          000000                  RL0=0           ;RECEIVER LINE 0
(1)          000400                  RL1=BIT8        ;RECEIVER LINE 1
(1)          001000                  RL2=BIT9        ;RECEIVER LINE 2
(1)          001400                  RL3=BIT9!BIT8   ;RECEIVER LINE 3
(1)
(1)                                          ;DZVLPR WORD DEFINITIONS
(1)                                          ;-----------------------
(1)
(1)          000000                  LP0=0           ;LINE PARAMETER 0
(1)          000001                  LP1=BIT0        ;LINE PARAMETER 1
(1)          000002                  LP2=BIT1        ;LINE PARAMETER 2
(1)          000003                  LP3=BIT1!BIT0   ;LINE PARAMETER 3
(1)
(1)          000000                  FIVE=0          ;FIVE BITS/CHAR,1 STOP BIT
(1)          000010                  SIX=BIT3        ;SIX BITS/CHAR,1 STOP BIT
(1)          000020                  SEVEN=BIT4      ;SEVEN BITS/CHAR,1 STOP BIT
(1)          000030                  EIGHT=BIT4!BIT3 ;EIGHT BITS/CHAR,1 STOP BIT
(1)          000040                  FIVES=BIT5      ;FIVE BITS/CHAR,2 STOP BITS
(1)          000050                  SIXS=BIT5!BIT3  ;SIX BITS/CHAR,2 STOP BITS
(1)          000060                  SEVENS=BIT5!BIT4        ;SEVEN BITS/CHAR, 2 STOP BITS
(1)          000070                  EIGHTS=BIT5!BIT4!BIT3   ;EIGHT BITS/CHAR, 2 STOP BITS
(1)
(1)          000100                  PARITY=BIT6             ;PARITY ENABLED
(1)          000200                  ODDPAR=BIT7             ;ODD PARITY ENABLED
(1)          000000                  ONESTOP=0               ;ONE STOP BIT ENABLED
(1)          000040                  TWOSTOP=BIT5            ;TWO STOP BITS ENABLED
(1)          000000                  EVEPAR=0                ;EVEN PARITY ENABLED
(1)          010000                  RCVON=BIT12             ;ENABLE RECEIVER (RECEIVER ON)
(1)
(1)          000000                  S50=0                   ;SPEED 50 BAUD
(1)          000400                  S75=BIT8                ;SPEED 75 BAUD
(1)          001000                  S110=BIT9               ;SPEED 110 BAUD
(1)          001400                  S134=BIT9!BIT8          ;SPEED 134.5 BAUD
(1)          002000                  S150=BIT10              ;SPEED 150 BAUD
(1)          002400                  S300=BIT10!BIT8         ;SPEED 300 BAUD
(1)          003000                  S600=BIT10!BIT9         ;SPEED 600 BAUD
(1)          003400                  S1200=BIT10!BIT9!BIT8   ;SPEED 1200 BAUD
(1)          004000                  S1800=BIT11             ;SPEED 1800 BAUD
(1)          004400                  S2000=BIT11!BIT8        ;SPEED 2000 BAUD
(1)          005000                  S2400=BIT11!BIT9        ;SPEED 2400 BAUD
(1)          005400                  S3600=BIT11!BIT9!BIT8   ;SPEED 3600 BAUD
(1)          006000                  S4800=BIT11!BIT10       ;SPEED 4800 BAUD
(1)          006400                  S7200=BIT11!BIT10!BIT8  ;SPEED 7200 BAUD
(1)          007000                  S9600=BIT11!BIT10!BIT9  ;SPEED 9600 BAUD
(1)          007400                  S19200=BIT11!BIT10!BIT9!BIT8    ;SPEED 19200 BAUD
(1)
(1)                                  ;DZVTCR BIT DEFINITIONS
(1)                                  ;----------------------
(1)          000001                  TCR0=BIT0               ;ENABLE TRANSMISSION ON LINE 0
```

```
(1)             000002                  TCR1=BIT1               ;ENABLE TRANSMISSION ON LINE 1
(1)             000004                  TCR2=BIT2               ;ENABLE TRANSMISSION ON LINE 2
(1)             000010                  TCR3=BIT3               ;ENABLE TRANSMISSION ON LINE 3
(1)             000400                  DTR0=BIT8               ;DATA TERMINAL READY FOR LINE 0
(1)             001000                  DTR1=BIT9               ;DATA TERMINAL READY FOR LINE 1
(1)             002000                  DTR2=BIT10              ;DATA TERMINAL READY FOR LINE 2
(1)             004000                  DTR3=BIT11              ;DATA TERMINAL READY FOR LINE 3
(1)
(1)                                     ;DZVMSR BIT DEFINITIONS
(1)                                     ;----------------------
(1)             000001                  RING0=BIT0              ;RING INDICATED ON LINE 0
(1)             000002                  RING1=BIT1              ;RING INDICATED ON LINE 1
(1)             000004                  RING2=BIT2              ;RING INDICATED ON LINE 2
(1)             000010                  RING3=BIT3              ;RING INDICATED ON LINE 3
(1)             000400                  CO0=BIT8                ;CARRIER PRESENT ON LINE 0
(1)             001000                  CO1=BIT9                ;CARRIER PRESENT ON LINE 1
(1)             002000                  CO2=BIT10               ;CARRIER PRESENT ON LINE 2
(1)             004000                  CO3=BIT11               ;CARRIER PRESENT ON LINE 3
(1)
(1)                                     ;DZVTDR BIT DEFINITIONS
(1)                                     ;----------------------
(1)
(1)             000400                  BRK0=BIT8               ;BREAK FOR LINE 0
(1)             001000                  BRK1=BIT9               ;BREAK FOR LINE 1
(1)             002000                  BRK2=BIT10              ;BREAK FOR LINE 2
(1)             004000                  BRK3=BIT11              ;BREAK FOR LINE 3
(1)
```

```
(1)                             ;TABLE OF LOOP AROUND FUNCTIONS (H325)
(1)                             ;
(1)                             ;       ------------------
(1)                             ;       I                 ^
(1)                             ;       V                 ^
(1)                             ;       REC               TRANS
(1)                             ;       DATA              DATA
(1)                             ;
(1)                             ;       ------------------
(1)                             ;       I                 ^
(1)                             ;       V                 ^
(1)                             ;       CO                RTS
(1)                             ;
(1)                             ;       ------------------
(1)                             ;       I                 ^
(1)                             ;       V                 ^
(1)                             ;       RING              DTR
```

```
(1)                             ;:*****************************************************************************
(1)                             ;-----------------------------------------------------------------------------
(1)                                     ;TRAPCATCHER FOR ILLEGAL INTERRUPTS
(1)                                     ;THE STANDARD "TRAP CATCHER" IS PLACED
(1)                                     ;BETWEEN ADDRESS 0 TO ADDRESS 776.
(1)                                     ;IT LOOKS LIKE "PC+2 HALT".
(1)                             ;-----------------------------------------------------------------------------
(1)                             ;:*****************************************************************************
(1)
(1)             000000          .=0
(1)                                     ;STANDARD INTERRUPT VECTORS
(1)                                     ;-------------------------
(1)
(1)             000024                  .=24
(1)     000024  005702                  $PWRDN                  ;POWER FAIL HANDLER
(1)     000026  000340                  340                     ;SERVICE AT PRIORITY LEVEL 7
(1)     000030  005010                  $ERROR                  ;ERROR HANDLER
(1)     000032  000340                  340                     ;SERVICE AT PRIORITY LEVEL 7
(1)     000034  004602                  .TRPSRV                 ;GENERAL HANDLER DISPATCH SERVICE
(1)     000036  000340                  340                     ;SERVICE AT PRIORITY LEVEL 7
(2)                             .SBTTL  ACT11 HOOKS
(2)
(3)                             ;:*****************************************************************************
(2)                             ;HOOKS REQUIRED BY ACT11
(2)             000040                  $SVPC=.                 ;SAVE PC
(2)             000046                  .=46
(2)     000046  002676                  $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
(2)             000052                  .=52
(2)     000052  000000                  .WORD   0               ;;2)SET LOC.52 TO ZERO
(2)             000040                  .=$SVPC                 ;; RESTORE PC
(1)
(1)             000174                  .=174
(1)     000174  000000          DISPREG:0                       ;SOFTWARE DISPLAY REGISTER FOR SWITCHLESS 11S
(1)     000176  000000          SWREG:  0                       ;SOFTARE SWITCH REGISTER FOR SWITCHLESS 11S
(1)             000200                  .=200
(1)     000200  000137  002116          JMP     .START          ;GO TO START OF PROGRAM
(1)
(2)
(2)             001000                  .=1000
(2)     001000  005200  053103  055104  MTITLE: .ASCIZ  <200><12>/CVDZCB/<200>/DZV11 ECHO AND CABLE TESTS  /<200>
(2)
```

```
(3)          001120                        .=1120
(4)                                        ;;*************************************************************************
(4)                                        .SBTTL  APT MAILBOX-ETABLE
(4)
(5)                                        ;;*************************************************************************
(4)                                        .EVEN
(4)  001120                                $MAIL:                          ;;APT MAILBOX
(4)  001120  000000                        $MSGTY: .WORD   AMSGTY          ;;MESSAGE TYPE CODE
(4)  001122  000000                        $FATAL: .WORD   AFATAL          ;;FATAL ERROR NUMBER
(4)  001124  000000                        $TESTN: .WORD   ATESTN          ;;TEST NUMBER
(4)  001126  000000                        $PASS:  .WORD   APASS           ;;PASS COUNT
(4)  001130  000000                        $DEVCT: .WORD   ADEVCT          ;;DEVICE COUNT
(4)  001132  000000                        $UNIT:  .WORD   AUNIT           ;;I/O UNIT NUMBER
(4)  001134  000000                        $MSGAD: .WORD   AMSGAD          ;;MESSAGE ADDRESS
(4)  001136  000000                        $MSGLG: .WORD   AMSGLG          ;;MESSAGE LENGTH
(4)  001140                                $ETABLE:                        ;;APT ENVIRONMENT TABLE
(4)  001140     000                        $ENV:   .BYTE   AENV            ;;ENVIRONMENT BYTE
(4)  001141     000                        $ENVM:  .BYTE   AENVM           ;;ENVIRONMENT MODE BITS
(4)  001142  000000                        $SWREG: .WORD   ASWREG          ;;APT SWITCH REGISTER
(4)  001144  000000                        $USWR:  .WORD   AUSWR           ;;USER SWITCHES
(4)  001146  000000                        $CPUOP: .WORD   ACPUOP          ;;CPU TYPE,OPTIONS
(4)                                        ;*                              BITS 15-11=CPU TYPE
(4)                                        ;*                                      11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
(4)                                        ;*                                      11/70=06,PDQ=07,Q=10
(4)                                        ;*                              BIT 10=REAL TIME CLOCK
(4)                                        ;*                              BIT  9=FLOATING POINT PROCESSOR
(4)                                        ;*                              BIT  8=MEMORY MANAGEMENT
(4)  001150     000                        $MAMS1: .BYTE   AMAMS1          ;;HIGH ADDRESS,M.S. BYTE
(4)  001151     000                        $MTYP1: .BYTE   AMTYP1          ;;MEM. TYPE,BLK#1
(4)                                        ;*                              MEM.TYPE BYTE   --  (HIGH BYTE)
(4)                                        ;*                                      900 NSEC CORE=001
(4)                                        ;*                                      300 NSEC BIPOLAR=002
(4)                                        ;*                                      500 NSEC MOS=003
(4)  001152  000000                        $MADR1: .WORD   AMADR1          ;;HIGH ADDRESS,BLK#1
(4)                                        ;*                                MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABOVE
(4)  001154     000                        $MAMS2: .BYTE   AMAMS2          ;;HIGH ADDRESS,M.S. BYTE
(4)  001155     000                        $MTYP2: .BYTE   AMTYP2          ;;MEM.TYPE,BLK#2
(4)  001156  000000                        $MADR2: .WORD   AMADR2          ;;MEM.LAST ADDRESS,BLK#2
(4)  001160     000                        $MAMS3: .BYTE   AMAMS3          ;;HIGH ADDRESS,M.S.BYTE
(4)  001161     000                        $MTYP3: .BYTE   AMTYP3          ;;MEM.TYPE,BLK#3
(4)  001162  000000                        $MADR3: .WORD   AMADR3          ;;MEM.LAST ADDRESS,BLK#3
(4)  001164     000                        $MAMS4: .BYTE   AMAMS4          ;;HIGH ADDRESS,M.S.BYTE
(4)  001165     000                        $MTYP4: .BYTE   AMTYP4          ;;MEM.TYPE,BLK#4
(4)  001166  000000                        $MADR4: .WORD   AMADR4          ;;MEM.LAST ADDRESS,BLK#4
(4)  001170  000000                        $VECT1: .WORD   AVECT1          ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
(4)  001172  000000                        $VECT2: .WORD   AVECT2          ;;INTERRUPT VECTOR#2BUS PRIORITY#2
(4)  001174  160010                        $BASE:  .WORD   ABASE           ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
(4)  001176  000000                        $DEVM:  .WORD   ADEVM           ;;DEVICE MAP
(4)  001200  000000                        $CDW1:  .WORD   ACDW1           ;;CONTROLLER DESCRIPTION WORD#1
(4)  001202  000000                        $CDW2:  .WORD   ACDW2           ;;CONTROLLER DESCRIPTION WORD#2
(4)  001204  000000                        $DDW0:  .WORD   ADDW0           ;;DEVICE DESCRIPTOR WORD#0
(4)  001206  000000                        $DDW1:  .WORD   ADDW1           ;;DEVICE DESCRIPTOR WORD#1
(4)  001210  000000                        $DDW2:  .WORD   ADDW2           ;;DEVICE DESCRIPTOR WORD#2
(4)  001212  000000                        $DDW3:  .WORD   ADDW3           ;;DEVICE DESCRIPTOR WORD#3
(4)  001214  000000                        $DDW4:  .WORD   ADDW4           ;;DEVICE DESCRIPTOR WORD#4
(4)  001216  000000                        $DDW5:  .WORD   ADDW5           ;;DEVICE DESCRIPTOR WORD#5
```

```
    (4)  001220  000000                $DDW6:  .WORD   ADDW6   ;;DEVICE DESCRIPTOR WORD#6
    (4)  001222  000000                $DDW7:  .WORD   ADDW7   ;;DEVICE DESCRIPTOR WORD#7
    (4)  001224  000000                $DDW8:  .WORD   ADDW8   ;;DEVICE DESCRIPTOR WORD#8
    (4)  001226  000000                $DDW9:  .WORD   ADDW9   ;;DEVICE DESCRIPTOR WORD#9
    (4)  001230  000000                $DDW10: .WORD   ADDW10  ;;DEVICE DESCRIPTOR WORD#10
    (4)  001232  000000                $DDW11: .WORD   ADDW11  ;;DEVICE DESCRIPTOR WORD#11
    (4)  001234  000000                $DDW12: .WORD   ADDW12  ;;DEVICE DESCRIPTOR WORD#12
    (4)  001236  000000                $DDW13: .WORD   ADDW13  ;;DEVICE DESCRIPTOR WORD#13
    (4)  001240  000000                $DDW14: .WORD   ADDW14  ;;DEVICE DESCRIPTOR WORD#14
    (4)  001242  000000                $DDW15: .WORD   ADDW15  ;;DEVICE DESCRIPTOR WORD#15
    (4)
    (4)
    (4)  001244                        $SETEND:
    (4)
```

COMMON TAGS

SEQ 0024

```
    (3)                             .SBTTL  COMMON TAGS
    (3)
    (4)                             ;;*****************************************************************
    (3)                             ;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
    (3)                             ;*USED IN THE PROGRAM.
    (3)
    (3)  001244                     $CMTAG:                         ;;START OF COMMON TAGS
    (3)  001244  000000                     .WORD   0
    (3)  001246     000             $TSTNM: .BYTE   0               ;;CONTAINS THE TEST NUMBER
    (3)  001247     000             $ERFLG: .BYTE   0               ;;CONTAINS ERROR FLAG
    (3)  001250  000000             $ICNT:  .WORD   0               ;;CONTAINS SUBTEST ITERATION COUNT
    (3)  001252  000000             $LPADR: .WORD   0               ;;CONTAINS SCOPE LOOP ADDRESS
    (3)  001254  000000             $LPERR: .WORD   0               ;;CONTAINS SCOPE RETURN FOR ERRORS
    (3)  001256  000000             $ERTTL: .WORD   0               ;;CONTAINS TOTAL ERRORS DETECTED
    (3)  001260     000             $ITEMB: .BYTE   0               ;;CONTAINS ITEM CONTROL BYTE
    (3)  001261     001             $ERMAX: .BYTE   1               ;;CONTAINS MAX. ERRORS PER TEST
    (3)  001262  000000             $ERRPC: .WORD   0               ;;CONTAINS PC OF LAST ERROR INSTRUCTION
    (3)  001264  000000             $GDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'GOOD' DATA
    (3)  001266  000000             $BDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'BAD' DATA
    (3)  001270  000000             $GDDAT: .WORD   0               ;;CONTAINS 'GOOD' DATA
    (3)  001272  000000             $BDDAT: .WORD   0               ;;CONTAINS 'BAD' DATA
    (3)  001274  000000                     .WORD   0               ;;RESERVED--NOT TO BE USED
    (3)  001276  000000                     .WORD   0
    (3)  001300     000             $AUTOB: .BYTE   0               ;;AUTOMATIC MODE INDICATOR
    (3)  001301     000             $INTAG: .BYTE   0               ;;INTERRUPT MODE INDICATOR
    (3)  001302  000000                     .WORD   0
    (3)  001304  177570             SWR:    .WORD   DSWR            ;;ADDRESS OF SWITCH REGISTER
    (3)  001306  177570             DISPLAY: .WORD  DDISP           ;;ADDRESS OF DISPLAY REGISTER
    (3)  001310  177560             $TKS:   177560                  ;;TTY KBD STATUS
    (3)  001312  177562             $TKB:   177562                  ;;TTY KBD BUFFER
    (3)  001314  177564             $TPS:   177564                  ;;TTY PRINTER STATUS REG. ADDRESS
    (3)  001316  177566             $TPB:   177566                  ;;TTY PRINTER BUFFER REG. ADDRESS
    (3)  001320     000             $NULL:  .BYTE   0               ;;CONTAINS NULL CHARACTER FOR FILLS
    (3)  001321     002             $FILLS: .BYTE   2               ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
    (3)  001322     012             $FILLC: .BYTE   12              ;;INSERT FILL CHARS. AFTER A 'LINE FEED"
    (3)  001323     000             $TPFLG: .BYTE   0               ;;'TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
    (3)  001324  000000             $REGAD: .WORD   0               ;;CONTAINS THE ADDRESS FROM
    (3)                                                             ;;WHICH  ($REG0) WAS OBTAINED
    (5)  001326  000000             $REG0:  .WORD   0               ;;CONTAINS (($REGAD)+0)
    (5)  001330  000000             $REG1:  .WORD   0               ;;CONTAINS (($REGAD)+2)
    (5)  001332  000000             $REG2:  .WORD   0               ;;CONTAINS (($REGAD)+4)
    (5)  001334  000000             $REG3:  .WORD   0               ;;CONTAINS (($REGAD)+6)
    (5)  001336  000000             $REG4:  .WORD   0               ;;CONTAINS (($REGAD)+10)
    (5)  001340  000000             $REG5:  .WORD   0               ;;CONTAINS (($REGAD)+12)
    (5)  001342  000000             $TMP0:  .WORD   0               ;;USER DEFINED
    (5)  001344  000000             $TMP1:  .WORD   0               ;;USER DEFINED
    (5)  001346  000000             $TMP2:  .WORD   0               ;;USER DEFINED
    (5)  001350  000000             $TMP3:  .WORD   0               ;;USER DEFINED
    (5)  001352  000000             $TMP4:  .WORD   0               ;;USER DEFINED
    (3)  001354  000000             $TIMES: 0                       ;;MAX. NUMBER OF ITERATIONS
    (3)  001356     077             $QUES:  .ASCII  /?/             ;;QUESTION MARK
    (3)  001357     015             $CRLF:  .ASCII  <15>            ;;CARRIAGE RETURN
    (3)  001360  000012             $LF:    .ASCIZ  <12>            ;;LINE FEED
```

```
(3)                                 .SBTTL  ERROR POINTER TABLE
(3)
(3)                                 ;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
(3)                                 ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
(3)                                 ;*LOCATION $ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
(3)                                 ;*NOTE1:        IF $ITEMB IS 0 THE ONLY PERTINENT DATA IS ($ERRPC).
(3)                                 ;*NOTE2:        EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:
(3)
(3)                                 ;*      EM              ;;POINTS TO THE ERROR MESSAGE
(3)                                 ;*      DH              ;;POINTS TO THE DATA HEADER
(3)                                 ;*      DT              ;;POINTS TO THE DATA
(3)                                 ;*      DF              ;;POINTS TO THE DATA FORMAT
(3)
(3)  001362                         $ERRTB:
(2)
(2)                                         ;PROGRAM CONTROL PARAMETERS
(2)                                         ;-------------------------
(2)
(2)  001362  000000                 NEXT:   0                       ;ADDRESS OF NEXT TEST TO BE EXECUTED
(2)  001364  000000                 LOCK:   0                       ;ADDRESS FOR LOCK ON CURRENT TEST,TIGHT LOOP
(2)
(2)                                         ;PROGRAM VARIABLES
(2)                                         ;-----------------
(2)
(2)  001366  000017                 LINE:   17                      ;DEFAULT ALL FOUR LINES RUNNING
(2)  001370  017470                 PAR:    17470                   ;PARAMETERS: 8 BITS/CHAR,2 STOP BITS,19200 BAUD,NO PARIT
(2)  001372  000000                 MODE:   0                       ;DEFAULT MAINTENANCE MODE
(2)  001374  000000                 SAVLIN: 0                       ;LINE NUMBER
(2)  001376  000000                 XMTLIN: 0                       ;TRANSMISSION LINE NUMBER
(2)  001400  000000                 XMTCNT: 0                       ;COUNT OF WORDS IN A TRANSMISSION PATTERN
(2)  001402  000000                 REGIST: 0                       ;DEVICE ADDRESS STORAGE LOCATION
(2)  001404  000000                 SAVPC:  0                       ;PROGRAM COUNTER STORAGE
(2)  001406  000001                 DZVACTV:.BLKW   1               ;*DZV11'S SELECTED ACTIVE.
(2)  001410  000001                 SAVACTV:.BLKW   1               ;*A BIT MAP OF DZV11'S IN THE SYSTEM
(2)  001412  000001                 RUN:    1                       ;*POINTER ONE PAST RUNNING DEVICE.
(2)  001414  000001                 DZVNUM: .BLKB 1                 ;*OCTAL NUMBER OF DZV11'S IN THE SYSTEM
(2)  001415      001                 SAVNUM: .BYTE 1                 ;*WORKABLE NUMBER.
(2)  001416  000001                 SAVNO:  .BLKB   1               ;*OCTAL NUMBER OF DZV11'S BEING TESTED
(2)          001420                 .EVEN
(2)  001420  001500                 ACTIVE: DZV.MAP                 ;TABLE POINTER.
```

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(2)
(2)                                     ;PROGRAM CONTROL FLAGS
(2)                                     ;---------------------
(2)
(2)  001422      000                    INIFLG: .BYTE   0               ;PROGRAM INITIALIZATION FLAG
(2)  001423      000                    HDRFLG: .BYTE   0               ;PROGRAM INITIALIZATION FLAG FOR HEADER MAP
(2)  001424      000                    MNTFLG: .BYTE   0               ;MAINTENANCE BIT SET FLAG
(2)  001425      000                    DONFLG: .BYTE   0               ;TRANSMISSION COMPLETION FLAG
(2)                                     .EVEN
(2)                                     ;DATA VARIABLES
(2)  001426  000000                     TD0:    .WORD   0
(2)  001430  000000                     TD1:    .WORD   0
(2)  001432  000000                     TD2:    .WORD   0
(2)  001434  000000                     TD3:    .WORD   0
(2)  001436  000000                     TR0:    .WORD   0
(2)  001440  000000                     TR1:    .WORD   0
(2)  001442  000000                     TR2:    .WORD   0
(2)  001444  000000                     TR3:    .WORD   0
(2)  001446                              STOP:
(2)                                     .SBTTL  APT PARAMETER BLOCK
(2)
(2)                                     ;;******************************************************************
(2)                                     ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
(2)                                     ;;******************************************************************
(2)          001446                             .$X=.   ;;SAVE CURRENT LOCATION
(2)          000024                             .=24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
(2)  000024  000200                             200     ;;FOR APT START UP
(2)          000044                             .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
(2)  000044  001446                             $APTHDR ;;POINT TO APT HEADER BLOCK
(2)          001446                             .=.$X   ;;RESET LOCATION COUNTER
(2)                                     ;;******************************************************************
(2)                                     ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
(2)                                     ;INTERFACE SPEC.
(2)
(2)  001446                             $APTHD:
(2)  001446  000000                     $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
(2)  001450  001120                     $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
(2)  001452  000000                     $TSTM:  .WORD   0.      ;;RUN TIM OF LONGEST TEST
(2)  001454  000000                     $PASTM: .WORD   0.      ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
(2)  001456  000000                     $UNITM: .WORD   0.      ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
(2)  001460  000052                             .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
(1)                                             ;DZV11 STATUS TABLE AND ADDRESS ASSIGNMENTS
(1)                                             ;------------------------------------------
(1)
(1)          001500             .=1500
(1)  001500                     DZV.MAP:
(3)
(3)  001500  000001             DZCR0:  .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 0
(3)  001502  000001             DZVC0:  .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 0
(3)  001504  000001             LINE0:  .BLKW   1       ;ALL LINES SELECTED
(3)  001506  000001             PAR0:   .BLKW   1       ;PARAMETERS
(3)  001510  000001             MANT0:  .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
(3)
(3)  001512  000001             DZCR1:  .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 1
(3)  001514  000001             DZVC1:  .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 1
(3)  001516  000001             LINE1:  .BLKW   1       ;ALL LINES SELECTED
```

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(3)  001520  000001                PAR1:    .BLKW   1       ;PARAMETERS
(3)  001522  000001                MANT1:   .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
(3)
(3)  001524  000001                DZCR2:   .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 2
(3)  001526  000001                DZVC2:   .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 2
(3)  001530  000001                LINE2:   .BLKW   1       ;ALL LINES SELECTED
(3)  001532  000001                PAR2:    .BLKW   1       ;PARAMETERS
(3)  001534  000001                MANT2:   .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
(3)
(3)  001536  000001                DZCR3:   .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 3
(3)  001540  000001                DZVC3:   .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 3
(3)  001542  000001                LINE3:   .BLKW   1       ;ALL LINES SELECTED
(3)  001544  000001                PAR3:    .BLKW   1       ;PARAMETERS
(3)  001546  000001                MANT3:   .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
(3)
(3)  001550  000001                DZCR4:   .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 4
(3)  001552  000001                DZVC4:   .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 4
(3)  001554  000001                LINE4:   .BLKW   1       ;ALL LINES SELECTED
(3)  001556  000001                PAR4:    .BLKW   1       ;PARAMETERS
(3)  001560  000001                MANT4:   .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
(3)
(3)  001562  000001                DZCR5:   .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 5
(3)  001564  000001                DZVC5:   .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 5
(3)  001566  000001                LINE5:   .BLKW   1       ;ALL LINES SELECTED
(3)  001570  000001                PAR5:    .BLKW   1       ;PARAMETERS
(3)  001572  000001                MANT5:   .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
(3)
(3)  001574  000001                DZCR6:   .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 6
(3)  001576  000001                DZVC6:   .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 6
(3)  001600  000001                LINE6:   .BLKW   1       ;ALL LINES SELECTED
(3)  001602  000001                PAR6:    .BLKW   1       ;PARAMETERS
(3)  001604  000001                MANT6:   .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
(3)
(3)  001606  000001                DZCR7:   .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 7
(3)  001610  000001                DZVC7:   .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 7
(3)  001612  000001                LINE7:   .BLKW   1       ;ALL LINES SELECTED
(3)  001614  000001                PAR7:    .BLKW   1       ;PARAMETERS
(3)  001616  000001                MANT7:   .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
(3)
(3)  001620  000001                DZCR10:  .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 10
(3)  001622  000001                DZVC10:  .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 10
(3)  001624  000001                LINE10:  .BLKW   1       ;ALL LINES SELECTED
(3)  001626  000001                PAR10:   .BLKW   1       ;PARAMETERS
(3)  001630  000001                MANT10:  .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
(3)
(3)  001632  000001                DZCR11:  .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 11
(3)  001634  000001                DZVC11:  .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 11
(3)  001636  000001                LINE11:  .BLKW   1       ;ALL LINES SELECTED
(3)  001640  000001                PAR11:   .BLKW   1       ;PARAMETERS
(3)  001642  000001                MANT11:  .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
(3)
(3)  001644  000001                DZCR12:  .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 12
(3)  001646  000001                DZVC12:  .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 12
(3)  001650  000001                LINE12:  .BLKW   1       ;ALL LINES SELECTED
(3)  001652  000001                PAR12:   .BLKW   1       ;PARAMETERS
(3)  001654  000001                MANT12:  .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
```

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    (3)
    (3)  001656  000001                DZCR13: .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 13
    (3)  001660  000001                DZVC13: .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 13
    (3)  001662  000001                LINE13: .BLKW   1       ;ALL LINES SELECTED
    (3)  001664  000001                PAR13:  .BLKW   1       ;PARAMETERS
    (3)  001666  000001                MANT13: .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
    (3)
    (3)  001670  000001                DZCR14: .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 14
    (3)  001672  000001                DZVC14: .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 14
    (3)  001674  000001                LINE14: .BLKW   1       ;ALL LINES SELECTED
    (3)  001676  000001                PAR14:  .BLKW   1       ;PARAMETERS
    (3)  001700  000001                MANT14: .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
    (3)
    (3)  001702  000001                DZCR15: .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 15
    (3)  001704  000001                DZVC15: .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 15
    (3)  001706  000001                LINE15: .BLKW   1       ;ALL LINES SELECTED
    (3)  001710  000001                PAR15:  .BLKW   1       ;PARAMETERS
    (3)  001712  000001                MANT15: .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
    (3)
    (3)  001714  000001                DZCR16: .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 16
    (3)  001716  000001                DZVC16: .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 16
    (3)  001720  000001                LINE16: .BLKW   1       ;ALL LINES SELECTED
    (3)  001722  000001                PAR16:  .BLKW   1       ;PARAMETERS
    (3)  001724  000001                MANT16: .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
    (3)
    (3)  001726  000001                DZCR17: .BLKW   1       ;CONTROL STATUS REGISTER FOR DZV11 NUMBER 17
    (3)  001730  000001                DZVC17: .BLKW   1       ;RECEIVER AND BASE VECTOR  FOR DZV11 NUMBER 17
    (3)  001732  000001                LINE17: .BLKW   1       ;ALL LINES SELECTED
    (3)  001734  000001                PAR17:  .BLKW   1       ;PARAMETERS
    (3)  001736  000001                MANT17: .BLKW   1       ;MAINTENANCE MODE FOR THIS DEVICE
    (1)
    (1)  001740  177777                DZV.END:        177777
```

```
(1)                                     ;DEFINITIONS FOR TRAP SUBROUTINE CALLS
(1)                                     ;POINTERS TO SUBROUTINES CAN BE FOUND
(1)                                     ;IN THE TABLE IMMEDIATELY FOLLOWING THE DEFINITIONS
(1)
(1)                                     ;;*************************************************************************
(1)                                     ;-------------------------------------------------------------------------
(1)  001742                             .TRPTAB:
(3)          104400                     ADVANCE=TRAP+0          ;CALL TO ADVANCE TO NEXT TEST
(2)  001742  004676                             .ADVANCE
(3)          104401                     SCOP1=TRAP+1            ;CALL TO LOOP ON CURRENT DATA HANDLER
(2)  001744  003136                             .SCOP1
(3)          104402                     TYPE=TRAP+2             ;CALL TO TELETYPE OUTPUT ROUTINE
(2)  001746  003162                             .TYPE
(3)          104403                     INSTR=TRAP+3            ;CALL TO ASCII STRING INPUT ROUTINE
(2)  001750  004002                             .INSTR
(3)          104404                     INSTER=TRAP+4           ;CALL TO INPUT ERROR HANDLER
(2)  001752  004106                             .INSTER
(3)          104405                     PARAM=TRAP+5            ;CALL TO NUMERICAL DATA INPUT ROUTINE
(2)  001754  004126                             .PARAM
(3)          104406                     SETFLG=TRAP+6           ;CALL TO  SET FLAG ROUTINE
(2)  001756  006536                             .SETFLG
(3)          104407                     SAV05=TRAP+7            ;CALL TO REGISTER SAVE ROUTINE
(2)  001760  004326                             .SAV05
(3)          104410                     RES05=TRAP+10           ;CALL TO REGISTER RESTORE ROUTINE
(2)  001762  004366                             .RES05
(3)          104411                     CONVRT=TRAP+11          ;CALL TO DATA OUTPUT ROUTINE
(2)  001764  004420                             .CONVRT
(3)          104412                     CNVRT=TRAP+12           ;CALL TO DATA OUTPUT ROUNTINE WITHOUT CR/LF.
(2)  001766  004424                             .CNVRT
(3)          104413                     DEVICE.CLR=TRAP+13              ;CALL TO ISSUE A DEVICE CLEAR
(2)  001770  004624                             .DEVICE.CLR
(3)          104414                     DELAY=TRAP+14           ;CALL TO DELAY FOR FAST CPU'S
(2)  001772  004656                             .DELAY
(3)          104415                     PARMD=TRAP+15           ;CONVERT DECIMAL STRING TO OCTAL
(2)  001774  002742                             .PARMD
(3)          104416                     PAWCH=TRAP+16           ;SET FLAG    ECHO OR  CABLE
(2)  001776  006656                             .PAWCH
(3)          104417                     DCLASM=TRAP+17          ;CLEAR DEVICE, SET MAINT. BIT IF 1 MODE
(2)  002000  004644                             .DCLASM
(3)          104420                     SHIFT=TRAP+20           ;CALL TO ROTATE LINE POINTER
(2)  002002  004710                             .SHIFT
(3)          104421                     LPRSET=TRAP+21          ;CALL TO SET UP LPR DEVICE REGISTER
(2)  002004  004726                             .LPRSET
(3)          104422                     BUFSET=TRAP+22          ;CALL TO ZERO BUFFER AREA
(2)  002006  004766                             .BUFSET
(1)
(1)                                     ;-------------------------------------------------------------------------
(1)                                     ;;*************************************************************************
```

```
(1)                                     ;DZV11 VECTOR AND REGISTER INDIRECT POINTERS
(1)                                     ;WORKING AREA
(1)
(1)  002010  160040                     DZVCSR: 160040  ;R/W
(1)  002012  160041                     HDZVCSR:160041  ;R/W
(1)  002014  160042                     DZVRBUF:160042  ;READ ONLY
(1)  002016  160043                     HDZVRBUF:160043 ;READ ONLY
(1)  002020  160042                     DZVLPR: 160042  ;WRITE ONLY
(1)  002022  160043                     HDZVLPR:160043  ;WRITE ONLY
(1)  002024  160044                     DZVTCR: 160044  ;R/W
(1)  002026  160045                     HDZVTCR:160045  ;R/W
(1)  002030  160046                     DZVMSR: 160046  ;READ ONLY
(1)  002032  160047                     HDZVMSR:160047  ;READ ONLY
(1)  002034  160046                     DZVTDR: 160046  ;WRITE ONLY
(1)  002036  160047                     HDZVTDR:160047  ;WRITE ONLY
(1)
(1)                                     ;DEFAULT DZV VECTORS
(1)
(1)  002040  000300                     DZVRIV: 300     ;REC INTR VECTOR
(1)  002042  000302                     DZVRIS: 302     ;REC INTR STATUS
(1)  002044  000304                     DZVTIV: 304     ;XMIT INTR VECTOR
(1)  002046  000306                     DZVTIS: 306     ;XMIT INTR STATUS
(1)
(1)
```

```
(1)
(1)                                     ;TIME TABLE FOR RELATIVE TIMING TESTS
(1)                                     ;-----------------------------------
(1)
(1)  002050                             TMTBL:
(1)  002050  000000                     T50:    0
(1)  002052  000000                     T75:    0
(1)  002054  000000                     T110:   0
(1)  002056  000000                     T134:   0
(1)  002060  000000                     T150:   0
(1)  002062  000000                     T300:   0
(1)  002064  000000                     T600:   0
(1)  002066  000000                     T1200:  0
(1)  002070  000000                     T1800:  0
(1)  002072  000000                     T2000:  0
(1)  002074  000000                     T2400:  0
(1)  002076  000000                     T3600:  0
(1)  002100  000000                     T4800:  0
(1)  002102  000000                     T7200:  0
(1)  002104  000000                     T9600:  0
(1)  002106  000000                     TEIGHT:0
(1)  002110  000000                     TSEVEN: 0
(1)  002112  000000                     TSIX:   0
(1)  002114  000000                     TFIVE:  0
```

```
(1)
(1)                                         ;PROGRAM INITIALIZATION
(1)                                         ;LOCK OUT INTERRUPTS
(1)                                         ;SET UP PROCESSOR STACK
(1)                                         ;SET UP POWER FAIL VECTOR
(1)                                         ;CLEAR PROGRAM CONTROL FLAGS AND COUNTS
(1)                                         ;TYPE TITLE MESSAGE
(1)
(1)  002116  000005                 .START: RESET                   ;CLEAR THE WORLD
(1)  002120  012706  001120                 MOV     #STACK,SP       ;SET UP PROCESSOR STACK
(1)  002124  106427  000200                 MTPS    #MASK           ;LOCK OUT INTERRUPTS
(1)  002130  012737  005702  000024         MOV     #$PWRDN,@#24    ;SET UP FOR POWER FAIL
(1)  002136  012737  002116  001252         MOV     #.START,$LPADR  ;SET UP IN CASE OF POWER FAIL
(1)  002144  105737  001141                 TSTB    $ENVM           ;RUNNING UNDER APT?
(1)  002150  100004                         BPL     1$              ;IF NOT SKIP SWR SETUP FOR APT
(1)  002152  012737  001142  001304         MOV     #$SWREG,SWR     ;SETUP FOR APT SWR
(1)  002160  000405                         BR      2$              ;SKIP SOFTWARE SWR SETUP
(1)  002162  012737  000176  001304  1$:    MOV     #SWREG,SWR      ;SETUP SOFTWARE SWITCH REGISTER OTHERWISE
(1)  002170  004737  005464                 CALL    GETSWR          ; GET INITIAL SWITCT SETTING    ;;GPA
(1)  002174  012737  000174  001306  2$:    MOV     #DISPREG,DISPLAY        ;SETUP DISPLAY REGISTER
(1)  002202  005037  007130                 CLR     STFLG           ;CLEAR TEST START FLAG
(1)  002206  005037  001126                 CLR     $PASS           ;CLEAR PASS COUNT
(1)  002212  005037  001256                 CLR     $ERTTL          ;CLEAR ERROR COUNT
(1)  002216  105037  001247                 CLRB    $ERFLG          ;CLEAR ERROR FLAG
(1)  002222  005037  001246                 CLR     $TSTNM          ;CLEAR TEST NO. INDICATOR
(1)  002226  005037  007134                 CLR     LAST            ;CLEAR LAST ERROR PC
(1)  002232  004737  013304                 CALL    FALCON          ; TEST FOR FALCON (KXT11)       ;;GPA
(1)  002236  001402                         BEQ     1000$           ; BR IF NOT                     ;;GPA
(1)  002240  004737  000570                 CALL    FALCINI         ; INIT FOR FALCON SYSTEM        ;;GPA
(1)  002244                         1000$:                                                          ;;GPA
(1)  002244  105737  001422                 TSTB    INIFLG          ;HAS TITLE BEEN TYPED YET?
(1)  002250  001010                         BNE     VEC1            ;IF YES SKIP PRINTING AGAIN
(1)  002252  023727  000042  002676         CMP     @#42,#$ENDAD    ;RUNNING UNDER ACT?
(1)  002260  001402                         BEQ     3$              ;IF YES DON'T PRINT TITLE
(1)  002262  104402  001000                 TYPE    ,#TITLE         ;PRINT TITLE
(1)  002266  105337  001422         3$:     DECB    INIFLG          ;INDICATE TITLE ALREADY TYPED
(1)  002272  012701  000300         VEC1:   MOV     #300,R1
(1)  002276  012702  000302                 MOV     #302,R2
(1)  002302  010221                 1$:     MOV     R2,(R1)+        ;RESTORE TRAPCATCHER
(1)  002304  005022                         CLR     (R2)+           ;IN FLOATING VECTOR AREA
(1)  002306  022122                         CMP     (R1)+,(R2)+     ;UPDATE THE POINTERS
(1)  002310  005737  013320                 TST     KXTFLAG         ; IF FALCON...                  ;;GPA
(1)  002314  001403                         BEQ     1001$                                           ;;GPA
(1)  002316  020127  000400                 CMP     R1,#400         ;...QUIT AT 400.                ;;GPA
(1)  002322  000402                         402                     ; SKIP NEXT                     ;;GPA
(1)  002324                         1001$:                                                          ;;GPA
(1)  002324  020127  001000                 CMP     R1,#1000
(1)  002330  001364                         BNE     1$
(1)
(1)          002332                 GETCSR= .               ; POINTER FOR FALCON TWEAKER.   ;;GPA
(1)  002332  104403                 INSTR                   ;INPUT ADDRESS OF DEVICE CSR
(1)  002334  007204                 MREGAD                  ;MESSAGE "CONTROL REGISTER ADDRESS-"
(1)  002336  104405                 PARAM                   ;CONVERT STRING TO OCTAL
(1)  002340  160000                 160000                  ;LOW LIMIT
(1)  002342  163770                 163770                  ;HIGH LIMIT
(1)  002344  001174                 $BASE                   ;LOCATION TO BE FILLED
```

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(1)  002346     007                        .BYTE   7               ;LSB MASK
(1)  002347     001                        .BYTE   1               ;NUMBER OF LOCATIONS
(1)
(1)             002350                     GETVEC= .               ; POINTER FOR FALCON TWEAKER.   ;;GPA
(1)  002350     104403                     INSTR                   ;INPUT ADDRESS OF DEVICE VECTOR
(1)  002352     007162                     MVECTOR                 ;MESSAGE "VECTOR ADDRESS-"
(1)  002354     104405                     PARAM                   ;CONVERT STRING TO OCTAL
(1)  002356     000300                     300                     ;LOW LIMIT
(1)  002360     000770                     770                     ;HIGH  LIMIT
(1)  002362     002040                     DZVRIV                  ;LOCATIONS TO BE FILLED
(1)  002364        003                     .BYTE   3               ;LSB MASK
(1)  002365        004                     .BYTE   4               ;NUMBER OF LOCATIONS
(1)  002366     004737  007764             JSR     PC,DZVLEV       ;GO BUILD DEVICE POINTERS
(1)
(1)  002372     104403                     INSTR                   ;INPUT WHICH TEST YOU ARE RUNNING
(1)  002374     007371                     MWHICH                  ;ECHO OR CABLE
(1)  002376     104416                     PAWCH                   ;SET FLAG
(1)  002400     007126                     WCHFLG                  ;THIS FLAG
(1)  002402     104403          BAUD:      INSTR                   ;INPUT BAUD RATE
(1)  002404     007312                     MSPEED                  ;MESSAGE "BAUD RATE-"
(1)  002406     104415                     PARMD                   ;CONVERT DECIMAL STRING TO OCTAL
(1)  002410     000062                     50.                     ;LOW LIMIT
(1)  002412     022600                     9600.                   ;HIGH LIMIT
(1)  002414     007144                     LINESP                  ;LOCATION TO BE FILLED
(1)  002416        000          .BYTE      0                       ;LSB MASK
(1)  002417        001          .BYTE      1                       ;NUMBER OF LOCATIONS
(1)  002420     104413          LINEX:     DEVICE.CLR              ;CLEAR DEVICE
(1)  002422     005037  007130             CLR     STFLG           ;CLEAR PROGRAM START FLAG
(1)  002426     104403                     INSTR                   ;INPUT LINE NUMBER
(1)  002430     007302                     MLINE                   ;MESSAGE "LINE NUMBER-"
(1)  002432     104405                     PARAM                   ;CONVERT  STRING TO OCTAL
(1)  002434     000000                     0                       ;LOW LIMIT
(1)  002436     000003                     3                       ;HIGH LIMIT
(1)  002440     001374                     SAVLIN                  ;LOCATION TO BE FILLED
(1)  002442        000          .BYTE      0                       ;LSB MASK
(1)  002443        001                     .BYTE   1               ;NUMBER OF LOCATIONS
(1)  002444     004537  006732             JSR     R5,SET
(1)
(1)  002450     106427  000200  XBEGIN:    MTPS    #MASK           ;LOCK OUT INTERRUPTS
(1)  002454     012706  001120             MOV     #STACK,SP       ;SET UP PROCESSOR STACK
(1)  002460     005037  007132             CLR     LOCKUP          ;CLEAR TIMEOUT
(1)  002464     005737  007126             TST     WCHFLG          ;ECHO OR CABLE TEST ?
(1)  002470     001413                     BEQ     2$              ;ECHO
(1)  002472     012737  010500  001252     MOV     #TST2,$LPADR    ;CABLE TEST
(1)  002500     005737  007130             TST     STFLG           ;ARE YOU LOOPING ?
(1)  002504     001017                     BNE     1$              ;YES
(1)  002506     005137  007130             COM     STFLG           ;NO
(1)  002512     104402  007464             TYPE    ,MCABLE         ;TYPE CABLE TEST
(1)  002516     000412                     BR      1$
(1)  002520     012737  010124  001252  2$:MOV     #TST1,$LPADR    ;SET UP ECHO TEST
(1)  002526     005737  007130             TST     STFLG           ;ARE YOU LOOPING ?
(1)  002532     001004                     BNE     1$              ;YES
(1)  002534     005137  007130             COM     STFLG           ;NO
(1)  002540     104402  007437             TYPE    ,MTERM          ;TYPE ECHO TEST
(1)  002544                             1$:
(1)  002544     000177  176502  RESTART:JMP     @$LPADR         ;START TESTING,THIS LOCATION IS ALSO
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   (1)                                                    ;USED BY THE POWER UP ROUTINE
  2146                          ;;GPA   PRGEND  DZV11,<END PASS OVDZC-A  >,10.
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```
  2147                                          ;END OF PASS
    (2)                                         ;TYPE NAME OF TEST
    (2)                                         ;UPDATE PASS COUNT
    (2)                                         ;CHECK FOR EXIT TO ACT-11
    (2)                                         ;RESTART TEST
    (3)                                 .SBTTL  END OF PASS ROUTINE
    (3)
    (4)                                 ;;**************************************************************************
    (3)                                 ;*INCREMENT THE PASS NUMBER ($PASS)
    (3)                                 ;*IF THERES A MONITOR GO TO IT
    (3)                                 ;*IF THERE ISN'T JUMP TO XBEGIN
    (3)
    (3)  002550                         $EOP:
    (5)  002550  005037  001262                 CLR     $ERRPC          ;CLEAR LAST ERROR PC
    (5)  002554  105037  001247                 CLRB    $ERFLG          ;CLEAR ERROR FLAG
    (5)  002560  104402  006117                 TYPE    ,MEPASS         ;TYPE END PASS
    (5)  002564  104402  006301                 TYPE    ,MCSRX          ;TYPE CSR
    (5)  002570  104412  002712                 CNVRT   ,XCSR           ;SHOW IT
    (5)  002574  104402  006307                 TYPE    ,MVECX          ;TYPE VECTOR
    (5)  002600  104412  002720                 CNVRT   ,XVEC           ;SHOW IT
    (5)  002604  005237  001126                 INC     $PASS           ;RAISE PASS COUNT
    (5)  002610  104402  006315                 TYPE    ,MPASSX         ;TYPE PASSES
    (5)  002614  104412  002726                 CNVRT   ,XPASS          ;SHOW IT
    (5)  002620  005337  001126                 DEC     $PASS           ;RESTORE PASS COUNT
    (5)  002624  104402  006326                 TYPE    ,MERRX          ;TYPE ERRORS
    (5)  002630  104412  002734                 CNVRT   ,XERR           ;SHOW IT
    (3)  002634  005037  001354                 CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
    (3)  002640  005237  001126                 INC     $PASS           ;;INCREMENT THE PASS NUMBER
    (3)  002644  042737  100000  001126        BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
    (3)  002652  005327                         DEC     (PC)+           ;;LOOP?
    (3)  002654  000001                 $EOPCT: .WORD   1
    (3)  002656  003013                         BGT     $DOAGN          ;;YES
    (3)  002660  012737                         MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
    (3)  002662  000001                 $ENDCT: .WORD   1
    (3)  002664  002654                         $EOPCT
    (3)  002666  013700  000042         $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
    (3)  002672  001405                         BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
    (3)  002674  000005                         RESET                   ;;CLEAR THE WORLD
    (3)  002676  004710                 $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
    (3)  002700  000240                         NOP                     ;;SAVE ROOM
    (3)  002702  000240                         NOP                     ;;FOR
    (3)  002704  000240                         NOP                     ;;ACT11
    (3)  002706                         $DOAGN:
    (3)  002706  000137                         JMP     @(PC)+          ;;RETURN
    (3)  002710  002450                 $RTNAD: .WORD   XBEGIN
    (2)
    (2)  002712  000001                 XCSR:   1
    (2)  002714     006      002                .BYTE   6,2
    (2)  002716  002010                         DZVCSR
    (2)  002720  000001                 XVEC:   1
    (2)  002722     003      002                .BYTE   3,2
    (2)  002724  002040                         DZVRIV
    (2)  002726  000001                 XPASS:  1
    (2)  002730     006      002                .BYTE   6,2
    (2)  002732  001126                         $PASS
    (2)  002734  000001                 XERR:   1
```

```
(2)  002736     006     002                 .BYTE   6,2
(2)  002740  001256                         $ERTTL
(1)
(1)                                          ;CONVERT DECIMAL ASCII STRING TO OCTAL
(1)  002742  011605                  .PARMD: MOV     (SP),R5
(1)  002744  012537  003126                  MOV     (R5)+,6$
(1)  002750  012537  003130                  MOV     (R5)+,7$
(1)  002754  012537  003132                  MOV     (R5)+,8$
(1)  002760  112537  003134                  MOVB    (R5)+,9$
(1)  002764  112537  003135                  MOVB    (R5)+,10$
(1)  002770  010516                          MOV     R5,(SP)
(1)  002772  005005                  2$:     CLR     R5
(1)  002774  012704  007616                  MOV     #INBUF,R4
(1)  003000  122714  000015                  CMPB    #15,(R4)
(1)  003004  001424                          BEQ     3$
(1)  003006  121427  000060          1$:     CMPB    (R4),#'0
(1)  003012  002421                          BLT     3$
(1)  003014  121427  000071                  CMPB    (R4),#'9
(1)  003020  003016                          BGT     3$
(1)  003022  142714  000060                  BICB    #'0,(R4)
(1)  003026  005002                          CLR     R2
(1)  003030  152402                          BISB    (R4)+,R2
(1)  003032  060205                          ADD     R2,R5
(1)  003034  122714  000015                  CMPB    #15,(R4)
(1)  003040  001410                          BEQ     4$
(1)  003042  006305                          ASL     R5      ;X2
(1)  003044  010502                          MOV     R5,R2   ;SAVE X2
(1)  003046  006305                          ASL     R5      ;X4
(1)  003050  006305                          ASL     R5      ;X8
(1)  003052  060205                          ADD     R2,R5   ;TIMES 10
(1)  003054  000754                          BR      1$
(1)  003056  104404                  3$:     INSTER
(1)  003060  000744                          BR      2$
(1)
(1)                                          ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
(1)
(1)  003062  020537  003130          4$:     CMP     R5,7$
(1)  003066  101373                          BHI     3$
(1)  003070  020537  003126                  CMP     R5,6$
(1)  003074  103770                          BLO     3$
(1)  003076  133705  003134                  BITB    9$,R5
(1)  003102  001365                          BNE     3$
(1)
(1)                                          ;STORE NUMBER AT SPECIFIED ADDRESS
(1)
(1)  003104  013704  003132                  MOV     8$,R4
(1)  003110  010524                  5$:     MOV     R5,(R4)+
(1)  003112  062705  000002                  ADD     #2,R5
(1)  003116  105337  003135                  DECB    10$
(1)  003122  001372                          BNE     5$
(1)  003124  000002                          RTI
(1)  003126  000000                  6$:     0
(1)  003130  000000                  7$:     0
(1)  003132  000000                  8$:     0
(1)  003134     000                  9$:     .BYTE 0
(1)  003135     000                  10$:    .BYTE 0
```

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(1)
(1)                                         ;CHECK FOR FREEZE ON CURRENT DATA
(1)                                         ;-------------------------------
(1)
(1)  003136  032777  001000  176140  .SCOP1: BIT     #SW09,@SWR      ;IS SW09=1(SET)?
(1)  003144  001405                         BEQ     1$              ;BR IF NOT SET.
(1)  003146  005737  001364                 TST     LOCK            ;IS THERE A TIGHT LOOP SPECIFIED?
(1)  003152  001402                         BEQ     1$              ;IF NO, RETURN
(1)  003154  013716  001364                 MOV     LOCK,(SP)       ;IF YES, GOTO THE ADDRESS IN LOCK.
(1)  003160  000002                 1$:     RTI                     ;GO BACK.
(1)
(1)  003162  032777  010000  176114  .TYPE:  BIT     #SW12,@SWR      ;INHIBIT ALL PRINTOUT??
(1)  003170  001403                         BEQ     $TYPE           ;IF NOT, GO TYPE
(1)  003172  062716  000002                 ADD     #2,(SP)         ;SKIP OVER MESSAGE POINTER
(1)  003176  000002                         RTI                     ;RETURN TO WHERE PROCEDURE WAS INVOKED
(2)                                 .SBTTL  TYPE ROUTINE
(2)
(3)                                 ;;**********************************************************************
(2)                                 ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
(2)                                 ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
(2)                                 ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
(2)                                 ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
(2)                                 ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
(2)                                 ;*
(2)                                 ;*CALL:
(2)                                 ;*1) USING A TRAP INSTRUCTION
(2)                                 ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
(2)                                 ;*OR
(2)                                 ;*      TYPE
(2)                                 ;*      MESADR
(2)                                 ;*
(2)
(2)  003200  105737  001323         $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
(2)  003204  100002                         BPL     1$              ;;BR IF YES
(2)  003206  000000                         HALT                    ;;HALT HERE IF NO TERMINAL
(2)  003210  000430                         BR      3$              ;;LEAVE
(2)  003212  010046                 1$:     MOV     R0,-(SP)        ;;SAVE R0
(2)  003214  017600  000002                 MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
(2)  003220  122737  000001  001140         CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
(2)  003226  001011                         BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
(2)  003230  132737  000100  001141         BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
(2)  003236  001405                         BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
(2)  003240  010037  003250                 MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
(2)  003244  004737  003542                 JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
(2)  003250  000000                 61$:    .WORD   0               ;;MESSAGE ADDRESS
(2)  003252  132737  000040  001141 62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
(2)  003260  001003                         BNE     60$             ;;YES,SKIP TYPE OUT
(2)  003262  112046                 2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
(2)  003264  001005                         BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
(2)  003266  005726                         TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
(2)  003270  012600                 60$:    MOV     (SP)+,R0        ;;RESTORE R0
(2)  003272  062716  000002         3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
(2)  003276  000002                         RTI                     ;;RETURN
(2)  003300  122716  000011         4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
(2)  003304  001430                         BEQ     8$
(2)  003306  122716  000200                 CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
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(2)  003312  001006                        BNE     5$
(2)  003314  005726                        TST     (SP)+           ;;POP  <CR><LF> EQUIV
(2)  003316  104402                        TYPE                    ;;TYPE A CR AND LF
(2)  003320  001357                        $CRLF
(2)  003322  105037  003530                CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
(2)  003326  000755                        BR      2$              ;;GET NEXT CHARACTER
(2)  003330  004737  003412          5$:   JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
(2)  003334  123726  001322          6$:   CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
(2)  003340  001350                        BNE     2$              ;;IF NO GO GET NEXT CHAR.
(2)  003342  013746  001320                MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
(2)                                                                 ;;AND THE NULL CHAR.
(2)  003346  105366  000001          7$:   DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
(2)  003352  002770                        BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
(2)  003354  004737  003412                JSR     PC,$TYPEC       ;;GO TYPE A NULL
(2)  003360  105337  003530                DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
(2)  003364  000770                        BR      7$              ;;LOOP
(2)
(2)                                 ;HORIZONTAL TAB PROCESSOR
(2)
(2)  003366  112716  000040          8$:   MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
(2)  003372  004737  003412          9$:   JSR     PC,$TYPEC       ;;TYPE A SPACE
(2)  003376  132737  000007  003530        BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
(2)  003404  001372                        BNE     9$              ;;TAB STOP
(2)  003406  005726                        TST     (SP)+           ;;POP SPACE OFF STACK
(2)  003410  000724                        BR      2$              ;;GET NEXT CHARACTER
(2)  003412                         $TYPEC:
(2)  003412  105777  175672                TSTB    @$TKS           ;;CHAR IN KYBD BUFFER?          ;MJD001
(2)  003416  100022                        BPL     10$             ;;BR IF NOT                     ;MJD001
(2)  003420  017746  175666                MOV     @$TKB,-(SP)     ;;GET CHAR                      ;MJD001
(2)  003424  042716  177600                BIC     #177600,(SP)    ;;STRIP EXTRANEOUS BITS         ;MJD001
(2)  003430  122716  000023                CMPB    #$XOFF,(SP)     ;;WAS CHAR XOFF                 ;MJD001
(2)  003434  001012                        BNE     102$            ;;BR IF NOT                     ;MJD001
(2)  003436                         101$:                                                           ;MJD001
(2)  003436  105777  175646                TSTB    @$TKS           ;;WAIT FOR CHAR                 ;MJD001
(2)  003442  100375                        BPL     101$                                            ;MJD001
(2)  003444  117716  175642                MOVB    @$TKB,(SP)      ;;GET CHAR                      ;MJD001
(2)  003450  042716  177600                BIC     #177600,(SP)    ;;STRIP IT                      ;MJD001
(2)  003454  122716  000021                CMPB    #$XON,(SP)      ;;WAS IT XON?                   ;MJD001
(2)  003460  001366                        BNE     101$            ;;BR IF NOT                     ;MJD001
(2)  003462                         102$:                                                           ;MJD001
(2)  003462  005726                        TST     (SP)+           ;;FIX STACK                     ;MJD001
(2)  003464                         10$:                                                            ;MJD001
(2)  003464  105777  175624                TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
(2)  003470  100375                        BPL     10$                                             ;MJD001
(2)  003472  116677  000002  175616        MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
(2)  003500  122766  000015  000002        CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
(2)  003506  001003                        BNE     1$              ;;BRANCH IF NO
(2)  003510  105037  003530                CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
(2)  003514  000406                        BR      $TYPEX          ;;EXIT
(2)  003516  122766  000012  000002  1$:   CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
(2)  003524  001402                        BEQ     $TYPEX          ;;BRANCH IF YES
(2)  003526  105227                        INCB    (PC)+           ;;COUNT THE CHARACTER
(2)  003530  000000          $CHARCNT:.WORD 0                       ;;CHARACTER COUNT STORAGE
(2)  003532  000207          $TYPEX: RTS    PC
(2)
(2)                                 .SBTTL  APT COMMUNICATIONS ROUTINE
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(2)
(3)                                     ;;*****************************************************************************
(2)  003534  112737  000001  004000  $ATY1:  MOVB    #1,$FFLG          ;;TO REPORT FATAL ERROR
(2)  003542  112737  000001  003776  $ATY3:  MOVB    #1,$MFLG          ;;TO TYPE A MESSAGE
(2)  003550  000403                          BR      $ATYC
(2)  003552  112737  000001  004000  $ATY4:  MOVB    #1,$FFLG          ;;TO ONLY REPORT FATAL ERROR
(2)  003560                          $ATYC:
(4)  003560  010046                          MOV     R0,-(SP)          ;;PUSH R0 ON STACK
(4)  003562  010146                          MOV     R1,-(SP)          ;;PUSH R1 ON STACK
(2)  003564  105737  003776                  TSTB    $MFLG             ;;SHOULD TYPE A MESSAGE?
(2)  003570  001450                          BEQ     5$                ;;IF NOT:  BR
(2)  003572  122737  000001  001140          CMPB    #APTENV,$ENV      ;;OPERATING UNDER APT?
(2)  003600  001031                          BNE     3$                ;;IF NOT:  BR
(2)  003602  132737  000100  001141          BITB    #APTSPOOL,$ENVM   ;;SHOULD SPOOL MESSAGES?
(2)  003610  001425                          BEQ     3$                ;;IF NOT:  BR
(2)  003612  017600  000004                  MOV     @4(SP),R0         ;;GET MESSAGE ADDR.
(2)  003616  062766  000002  000004          ADD     #2,4(SP)                  ;;BUMP RETURN ADDR.
(2)  003624  005737  001120          1$:     TST     $MSGTYPE          ;;SEE IF DONE W/ LAST XMISSION?
(2)  003630  001375                          BNE     1$                ;;IF NOT:  WAIT
(2)  003632  010037  001134                  MOV     R0,$MSGAD         ;;PUT ADDR IN MAILBOX
(2)  003636  105720                  2$:     TSTB    (R0)+             ;;FIND END OF MESSAGE
(2)  003640  001376                          BNE     2$
(2)  003642  163700  001134                  SUB     $MSGAD,R0         ;;SUB START OF MESSAGE
(2)  003646  006200                          ASR     R0                ;;GET MESSAGE LNGTH IN WORDS
(2)  003650  010037  001136                  MOV     R0,$MSGLGT        ;;PUT LENGTH IN MAILBOX
(2)  003654  012737  000004  001120          MOV     #4,$MSGTYPE       ;;TELL APT TO TAKE MSG.
(2)  003662  000413                          BR      5$
(2)  003664  017637  000004  003710  3$:     MOV     @4(SP),4$         ;;PUT MSG ADDR IN JSR LINKAGE
(2)  003672  062766  000002  000004          ADD     #2,4(SP)                  ;;BUMP RETURN ADDRESS
(4)  003700  013746  177776                  MOV     177776,-(SP)      ;;PUSH 177776 ON STACK
(2)  003704  004737  003200                  JSR     PC,$TYPE          ;;CALL TYPE MACRO
(2)  003710  000000                  4$:     .WORD   0
(2)  003712                          5$:
(2)  003712  105737  004000          10$:    TSTB    $FFLG             ;;SHOULD REPORT FATAL ERROR?
(2)  003716  001416                          BEQ     12$               ;;IF NOT:  BR
(2)  003720  005737  001140                  TST     $ENV              ;;RUNNING UNDER APT?
(2)  003724  001413                          BEQ     12$               ;;IF NOT:  BR
(2)  003726  005737  001120          11$:    TST     $MSGTYPE          ;;FINISHED LAST MESSAGE?
(2)  003732  001375                          BNE     11$               ;;IF NOT:  WAIT
(2)  003734  017637  000004  001122          MOV     @4(SP),$FATAL     ;;GET ERROR #
(2)  003742  062766  000002  000004          ADD     #2,4(SP)                  ;;BUMP RETURN ADDR.
(2)  003750  005237  001120                  INC     $MSGTYPE          ;;TELL APT TO TAKE ERROR
(2)  003754  105037  004000          12$:    CLRB    $FFLG             ;;CLEAR FATAL FLAG
(2)  003760  105037  003777                  CLRB    $LFLG             ;;CLEAR LOG FLAG
(2)  003764  105037  003776                  CLRB    $MFLG             ;;CLEAR MESSAGE FLAG
(4)  003770  012601                          MOV     (SP)+,R1          ;;POP STACK INTO R1
(4)  003772  012600                          MOV     (SP)+,R0          ;;POP STACK INTO R0
(2)  003774  000207                          RTS     PC                ;;RETURN
(2)  003776     000          $MFLG:  .BYTE   0                 ;;MESSG. FLAG
(2)  003777     000          $LFLG:  .BYTE   0                 ;;LOG FLAG
(2)  004000     000          $FFLG:  .BYTE   0                 ;;FATAL FLAG
(2)             004002                  .EVEN
(2)             000200          APTSIZE=200
(2)             000001          APTENV=001
(2)             000100          APTSPOOL=100
(2)             000040          APTCSUP=040
```

```
(1)
(1)                                     ;STRING INPUT ROUTINE
(1)                                     ;--------------------
(1)
(1)  004002  010346                .INSTR: MOV     R3,-(SP)        ;SAVE R3 ON STACK
(1)  004004  010446                        MOV     R4,-(SP)        ;SAVE R4 ON STACK
(1)  004006  017637  000004  004024        MOV     @4(SP),,MSG     ;GET THE ADDRESS OF THE MESSAGE TO BE PRINTED
(1)  004014  062766  000002  000004        ADD     #2,4(SP)        ;POINT TO INSTRUCTION AFTER ADDRESS POINTER
(1)  004022  104402                .INST1: TYPE                    ;PRINT THE MESSAGE
(1)  004024  000000                .MSG:   0                       ;MESSAGE IS POINTED TO FROM HERE
(1)  004026  012704  007616                MOV     #INBUF,R4       ;POINT R4 TO THE INPUT BUFFER
(1)  004032  012703  000007                MOV     #7,R3           ;SET THE MAXIMUM NUMBER OF CHARACTERS ALLOWED
(1)  004036  105777  175246        1$:     TSTB    @$TKS           ;HAS A CHARACTER BEEN RECEIVED?
(1)  004042  100375                        BPL     1$              ;IF NO, KEEP WAITING FOR IT
(1)  004044  117714  175242                MOVB    @$TKB,(R4)      ;IF YES, SAVE IT IN THE INPUT BUFFER
(1)  004050  142714  000200                BICB    #200,(R4)       ;KEEP ONLY THE 7-BIT ASCII INFORMATION
(1)  004054  122427  000015                CMPB    (R4)+,#15       ;IS THIS CHARACTER A LINE FEED?
(1)  004060  001417                        BEQ     INSTR2          ;IF SO, TERMINATE THE INPUT SEQUENCE
(1)  004062  105777  175226        2$:     TSTB    @$TPS           ;IF NOT, CHECK TO SEE IF THE CHARACTER CAN PRINT
(1)  004066  100375                        BPL     2$              ;IF WE CAN'T, WAIT UNTIL WE CAN
(1)  004070  017777  175216  175220        MOV     @$TKB,@$TPB     ;ECHO THE CHARACTER BACK
(1)  004076  005303                        DEC     R3              ;REDUCE THE NUMBER OF CHARACTERS RECEIVED
(1)  004100  001356                        BNE     1$              ;IF WE DON'T HAVE 7, GO GET SOME MORE
(1)  004102  012604                        MOV     (SP)+,R4        ;IF WE HAVE 7, RESTORE R4
(1)  004104  012603                        MOV     (SP)+,R3        ;RESTORE R3
(1)  004106  010346                .INSTE: MOV     R3,-(SP)        ;SAVE R3 ON THE STACK
(1)  004110  010446                        MOV     R4,-(SP)        ;SAVE R4 ON THE STACK
(1)  004112  104402  001356                TYPE    ,$QUES          ;PRINT A QUESTION MARK... WHAT'S GOING ON?
(1)  004116  000741                        BR      .INST1          ;GO PRINT THE MESSAGE AGAIN
(1)  004120  012604                INSTR2: MOV     (SP)+,R4        ;RESTORE R4
(1)  004122  012603                        MOV     (SP)+,R3        ;RESTORE R3
(1)  004124  000002                        RTI                     ;RETURN TO THE MAIN PROCEDURE
(1)
(1)                                     ;CONVERT ASCII STRING TO OCTAL
(1)                                     ;-----------------------------
(1)
(1)  004126  010546                .PARAM: MOV     R5,-(SP)        ;SAVE R5 ON THE STACK
(1)  004130  010446                        MOV     R4,-(SP)        ;SAVE R4 ON THE STACK
(1)  004132  016605  000004                MOV     4(SP),R5        ;GET THE SETUP INFORMATION POINTER
(1)  004136  012537  004316                MOV     (R5)+,LOLIM     ;SET THE LOW LIMIT FOR THE INPUT
(1)  004142  012537  004320                MOV     (R5)+,HILIM     ;SET THE HIGH LIMIT FOR THE INPUT
(1)  004146  012537  004322                MOV     (R5)+,DEVADR    ;SAVE THE ADDRESS WHERE THE RESULT WILL BE STORED
(1)  004152  112537  004324                MOVB    (R5)+,LOBITS    ;GET THE MASK OF THE INCORRECT BITS
(1)  004156  112537  004325                MOVB    (R5)+,ADRCNT    ;GET THE COUNT OF ITEMS TO BE STORED
(1)  004162  010566  000004                MOV     R5,4(SP)        ;POINT TO WHERE MAIN LINE PROGRAM WILL RESUME
(1)  004166  005005                PARAM1: CLR     R5              ;INITIALIZE THE ASCII TO OCTAL RESULT WORD
(1)  004170  012704  007616                MOV     #INBUF,R4       ;POINT TO THE INPUT BUFFER
(1)  004174  122714  000015                CMPB    #15,(R4)        ;IS THIS CHARACTER A CARRIAGE RETURN?
(1)  004200  001420                        BEQ     PARERR          ;IF SO, PRINT THE MESSAGE AGAIN
(1)  004202  121427  000060        1$:     CMPB    (R4),#60        ;IS THIS CHARACTER BELOW THE NUMERIC RANGE?
(1)  004206  002415                        BLT     PARERR          ;IF SO, GO PRINT THE MESSAGE AGAIN
(1)  004210  121427  000067                CMPB    (R4),#67        ;IS THIS CHARACTER ABOVE THE NUMERIC RANGE?
(1)  004214  003012                        BGT     PARERR          ;IF SO, GO PRINT THE MESSAGE AGAIN
(1)  004216  142714  000060                BICB    #60,(R4)        ;ISOLATE THE NUMBER THE CHARACTER REPRESENTS
(1)  004222  152405                        BISB    (R4)+,R5        ;CONCATENATE THESE BITS TO THE ALREADY EXISTING STRING
(1)  004224  122714  000015                CMPB    #15,(R4)        ;IS THE NEXT CHARACTER A CARRIAGE RETURN?
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(1)  004230  001406                    BEQ     LIMITS          ;IF SO, GO SEE IF NUMBER IS WITHIN LIMITS
(1)  004232  006305                    ASL     R5              ;CLEAR BIT POSITION 0, MOVE EXISTING STRING TO LEFT
(1)  004234  006305                    ASL     R5              ;CLEAR POSITION 1, MOVE STRING TO LEFT AGAIN
(1)  004236  006305                    ASL     R5              ;MOVE THE STRING ONE MORE TIME TO MAKE ROOM FOR
(1)                                                            ;NEXT THREE BITS
(1)  004240  000760                    BR      1$              ;GO GET THE NEXT CHARACTER
(1)  004242  104404              PARERR: INSTER                  ;THERE WAS AN ERROR... GO PRINT MESSAGE AGAIN
(1)  004244  000750                    BR      PARAM1          ;TRY GETTING THE PARAMETERS AGAIN
(1)
(1)                                                            ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
(1)                                                            ;-------------------------------------
(1)
(1)  004246  020537  004320      LIMITS: CMP     R5,HILIM        ;DOES RESULT EXCEED ITS MAXIMUM CORRECT VALUE?
(1)  004252  101373                    BHI     PARERR          ;IF YES, GO PRINT THE MESSAGE AGAIN
(1)  004254  020537  004316            CMP     R5,LOLIM        ;IS THE RESULT LOWER THAN ALLOWED?
(1)  004260  103770                    BLO     PARERR          ;IF YES, GO PRINT THE MESSAGE AGAIN
(1)  004262  133705  004324            BITB    LOBITS,R5       ;ARE ANY INCORRECT BITS SET IN THE RESULT?
(1)  004266  001365                    BNE     PARERR          ;IF SO, GO PRINT THE MESSAGE AGAIN
(1)
(1)                                                            ;STORE NUMBER AT SPECIFIED ADDRESS
(1)
(1)  004270  013704  004322            MOV     DEVADR,R4       ;POINT TO THE LOCATION WHERE THE RESULT WILL BE STORED
(1)  004274  010524              1$:   MOV     R5,(R4)+        ;STORE THE RESULT
(1)  004276  062705  000002            ADD     #2,R5           ;CALCULATE THE NEXT DATUM
(1)  004302  105337  004325            DECB    ADRCNT          ;REDUCE COUNT OF STORED RESULTS. IS IT EXCEEDED?
(1)  004306  001372                    BNE     1$              ;IF NOT, GO STORE THE NEXT DATUM
(1)  004310  012604                    MOV     (SP)+,R4        ;RESTORE R4
(1)  004312  012605                    MOV     (SP)+,R5        ;RESTORE R5
(1)  004314  000002                    RTI                     ;RETURN TO THE MAIN PROGRAM
(1)
(1)  004316  000000              LOLIM:  0                       ;LOWEST ACCEPTABLE VALUE
(1)  004320  000000              HILIM:  0                       ;HIGHEST ACCEPTABLE
(1)  004322  000000              DEVADR: 0                       ;LOCATION WHERE RESULT WILL BE STORED
(1)  004324     000              LOBITS: .BYTE   0               ;INCORRECT BITS MASK
(1)  004325     000              ADRCNT: .BYTE   0               ;COUNT OF ITEMS TO BE STORED
(1)
(1)                                                            ;SAVE PC OF TEST THAT FAILED AND R0-R5
(1)                                                            ;-------------------------------------
(1)
(1)  004326  016637  000004  001404 .SAV05: MOV     4(SP),SAVPC     ;SAVE R7 (PC)
(1)
(1)                                                            ;SAVE R0-R5
(1)
(1)  004334  010537  001340      SV05:   MOV     R5,$REG5        ;SAVE R5
(1)  004340  010437  001336              MOV     R4,$REG4        ;SAVE R4
(1)  004344  010337  001334              MOV     R3,$REG3        ;SAVE R3
(1)  004350  010237  001332              MOV     R2,$REG2        ;SAVE R2
(1)  004354  010137  001330              MOV     R1,$REG1        ;SAVE R1
(1)  004360  010037  001326              MOV     R0,$REG0        ;SAVE R0
(1)  004364  000002                      RTI                     ;LEAVE.
(1)
(1)                                                            ;RESTORE R0-R5
(1)
(1)  004366  013700  001326      .RES05: MOV     $REG0,R0        ;RESTORE R0
(1)  004372  013701  001330              MOV     $REG1,R1        ;RESTORE R1
(1)  004376  013702  001332              MOV     $REG2,R2        ;RESTORE R2
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(1)  004402  013703  001334              MOV     $REG3,R3        ;RESTORE R3
(1)  004406  013704  001336              MOV     $REG4,R4        ;RESTORE R4
(1)  004412  013705  001340              MOV     $REG5,R5        ;RESTORE R5
(1)  004416  000002                      RTI                     ;LEAVE
(1)
(1)                                      ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
(1)                                      ;-----------------------------------------------------
(1)
(1)  004420  104402  001357      .CONVR: TYPE    ,$CRLF          ;PRINT A CARRIAGE RETURN
(1)  004424  010046              .CNVRT: MOV     R0,-(SP)        ;SAVE R0
(1)  004426  010146                      MOV     R1,-(SP)        ;SAVE R1
(1)  004430  010346                      MOV     R3,-(SP)        ;SAVE R3
(1)  004432  010446                      MOV     R4,-(SP)        ;SAVE R4
(1)  004434  010546                      MOV     R5,-(SP)        ;SAVE R5
(1)  004436  017601  000012              MOV     @12(SP),R1      ;PLACE THE ADDRESS OF THE ARGUMENTS IN R1
(1)  004442  062766  000002  000012      ADD     #2,12(SP)       ;POINT TO WHERE MAIN PROGRAM WILL RESUME
(1)  004450  012137  004574              MOV     (R1)+,WRDCNT    ;GET NUMBER OF WORDS TO BE PRINTED
(1)  004454  112105              1$:     MOVB    (R1)+,R5        ;GET THE NUMBER OF CHARACTERS TO BE PRINTED
(1)  004456  112100                      MOVB    (R1)+,R0        ;GET THE NUMBER OF SPACES TO PRINT
(1)  004460  013104                      MOV     @(R1)+,R4       ;COPY THE WORD TO BE CONVERTED
(1)  004462  110537  004576              MOVB    R5,CHRCNT       ;COPY THE CHARACTER COUNT
(1)  004466  010403              3$:     MOV     R4,R3           ;COPY THE ARGUMENT WORD AGAIN
(1)  004470  042703  177770              BIC     #^C<7>,R3       ;ISOLATE THREE BITS TO BE TREATED AS A CHARACTER
(1)  004474  062703  000060              ADD     #060,R3         ;MAKE AN ASCII CHARACTER OUT OF THEM
(1)  004500  110346                      MOVB    R3,-(SP)        ;SAVE THAT CHARACTER
(1)  004502  006004                      ROR     R4              ;MOVE THE NEXT THREE BITS INTO PLACE
(1)  004504  006204                      ASR     R4              ;MOVE THEM AGAIN
(1)  004506  006204                      ASR     R4              ;AND FINALLY A THIRD TIME
(1)  004510  005305                      DEC     R5              ;REDUCE CHARACTER COUNT.ARE ALL CHARACTERS
(1)                                                              ;BUILT?
(1)  004512  001365                      BNE     3$              ;IF NO, GO BUILD THE NEXT ONE.
(1)  004514  012703  007722              MOV     #MDATA,R3       ;NOW POINT TO WHERE NUMBER WILL BE PRINTED FROM
(1)  004520  112623              4$:     MOVB    (SP)+,(R3)+     ;STORE THE CHARACTER, STARTING WITH THE MOST
(1)  004522  105337  004576              DECB    CHRCNT          ;REDUCE COUNT. ARE ALL CHARACTERS TRANSFERRED?
(1)  004526  001374                      BNE     4$              ;IF NO, GO TRANSFER ANOTHER
(1)  004530  105700                      TSTB    R0              ;ARE ANY SPACES TO BE PRINTED?
(1)  004532  001404                      BEQ     6$              ;IF NO, DON'T SET UP ANY
(1)  004534  112723  000040      5$:     MOVB    #040,(R3)+      ;ADD A SPACE TO THE OUTPUT BUFFER
(1)  004540  105300                      DECB    R0              ;REDUCE THE COUNT. SHOULD WE PRINT MORE?
(1)  004542  001374                      BNE     5$              ;IF YES, GO ADD ANOTHER SPACE
(1)  004544  105013              6$:     CLRB    (R3)            ;TERMINATE THE OUTPUT BUFFER WITH A ZERO
(1)  004546  104402  007722              TYPE    ,MDATA          ;PRINT THE STRING WE JUST BUILT
(1)  004552  005337  004574              DEC     WRDCNT          ;REDUCE THE WORD COUNT. ARE ANY MORE WORDS LEFT?
(1)  004556  001336                      BNE     1$              ;IF YES, GO CONVERT THEM
(1)  004560  012605                      MOV     (SP)+,R5        ;RESTORE R5
(1)  004562  012604                      MOV     (SP)+,R4        ;RESTORE R4
(1)  004564  012603                      MOV     (SP)+,R3        ;RESTORE R3
(1)  004566  012601                      MOV     (SP)+,R1        ;RESTORE R1
(1)  004570  012600                      MOV     (SP)+,R0        ;RESTORE R0
(1)  004572  000002                      RTI                     ;RETURN TO THE MAIN PROGRAM
(1)  004574  000000              WRDCNT: 0
(1)  004576      000             CHRCNT: .BYTE                   ;NUMBER OF CHARACTERS TO PRINT
(1)  004577      000             SPACNT: .BYTE   0               ;NUMBER OF SPACES TO PRINT
(1)
(1)  004600  000000              BINWRD: 0
(1)
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(1)
(1)                                     ;TRAP DISPATCH SERVICE
(1)                                     ;ARGUMENT OF TRAP IS EXTRACTED
(1)                                     ;AND USED AS OFFSET TO OBTAIN POINTER
(1)                                     ;TO SELECTED SUBROUTINE
(1)
(1)  004602  010046                .TRPSR: MOV     R0,-(SP)        ;SAVE R0. USE R0 TO FIND TRAP ROUTINE
(1)  004604  016600  000002                MOV     2(SP),R0        ;GET TRAP ADDRESS
(1)  004610  005740                        TST     -(R0)           ;GET TRAP
(1)  004612  111000                        MOVB    (R0),R0         ;GET RIGHT BYTE OF TRAP(TRAP OFFSET)
(1)  004614  006300                        ASL     R0              ;POSITION OFFSET FOR TABLE INDEXING
(1)  004616  016000  001742                MOV     .TRPTAB(R0),R0  ;PLACE INDEXED ADDRESS OF TABLE IN R0
(1)  004622  000200                        RTS     R0              ;TRANSFER TO THAT ADDRESS AND RESTORE OLD R0
(1)
(1)                                     ;DEVICE CLEAR ROUTINE
(1)                                     ;ISSUE A DEVICE CLEAR
(1)                                     ;--------------------
(1)  004624                        .DEVICE.CLR:
(1)  004624  052777  000020  175156        BIS     #DCLR,@DZVCSR   ;SET DCLR
(1)  004632  032777  000020  175150  1$:   BIT     #DCLR,@DZVCSR   ;DID IT CLEAR?
(1)  004640  001374                        BNE     1$              ;BR IF NO
(1)  004642  000002                        RTI                     ;EXIT ROUTINE
(1)
(1)                                     ;ROUTINE TO HANDLE MAINTENANCE BIT SETTING WITH DEVICE CLEAR
(1)                                     ;-----------------------------------------------------------
(1)  004644  104413                .DCLASM:DEVICE.CLR              ;ISSUE A DEVICE CLEAR
(1)  004646  153777  001424  175134        BISB    MNTFLG,@DZVCSR  ;LOAD THE MAINTENANCE BIT IF IT IS I MODE
(1)  004654  000002                        RTI                     ;RETURN TO CALLING ROUTINE
(1)
(1)  004656                        .DELAY:
(1)  004656  010046                        MOV     R0,-(SP)        ;SAVE R0
(1)  004660  013700  004674                MOV     DLYCNT,R0       ;SET COUNT
(1)  004664  005300                1$:     DEC     R0              ;DELAY
(1)  004666  001376                        BNE     1$              ;
(1)  004670  012600                        MOV     (SP)+,R0        ;RESTORE R0
(1)  004672  000002                        RTI                     ;LEAVE ROUTINE
(1)  004674  000001                DLYCNT: .WORD     1             ;PATCHABLE LOC FOR MORE TIME
(1)
(1)                                     ;ADVANCE TO NEXT TEST HANDLER
(1)                                     ;----------------------------
(1)
(1)  004676  013716  001362       .ADVANCE:MOV     NEXT,(SP)       ;CRUNCH STACK WITH ADDRESS OF NEXT TEST
(1)  004702  005037  001364                CLR     LOCK            ;RESET TIGHT LOOP ADDRESS
(1)  004706  000002                        RTI                     ;CHECK TO SEE IF OLD TEST GETS REPEATED
(1)
(1)                                     ;ROUTINE TO SHIFT LINE POINTER
(1)                                     ;AND SWITCH TESTS IF NECESSARY
(1)                                     ;-----------------------------
(1)  004710  106302                .SHIFT: ASLB    R2              ;POINT TO THE NEXT LINE
(1)  004712  032702  000020                BIT     #BIT4,R2        ;HAVE WE PASSED ALL LINE POINTERS?
(1)  004716  001402                        BEQ     1$              ;IF NOT, RETURN TO THE TEST
(1)  004720  022626                        POP2SP                  ;REMOVE THE TRAP CALL FROM THE STACK
(1)  004722  104400                        ADVANCE                 ;GO TO THE NEXT TEST
(1)  004724  000002                1$:     RTI                     ;RETURN TO THE PRESENT TEST
(1)
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(1)                                     ;LINE PARAMETER REGISTER SETUP ROUTINE
(1)
(1)  004726  010146                .LPRSET:MOV     R1,-(SP)        ;SAVE CONTENTS OF R1
(1)  004730  010246                        MOV     R2,-(SP)        ;SAVE CONTENTS OF R2
(1)  004732  013701  001370                MOV     PAR,R1          ;MOVE DEFAULT PARAM. INTO R1
(1)  004736  012702  000001                MOV     #1,R2   ;INIT. FOR LINE 1
(1)  004742  010177  175052        1$:     MOV     R1,@DZVLPR      ;LOAD PARAM. REGISTER
(1)  004746  005201                        INC     R1              ;SET R1 FOR NEXT LINE
(1)  004750  106302                        ASLB    R2              ;SET R2 FOR NEXT LINE
(1)  004752  032702  000020                BIT     #BIT4,R2        ;ALL LINES DONE?
(1)  004756  001771                        BEQ     1$              ;IF NO LOAD NEXT LINE
(1)  004760  012602                        MOV     (SP)+,R2        ;RELOAD R2
(1)  004762  012601                        MOV     (SP)+,R1        ;RELOAD R1
(1)  004764  000002                        RTI                     ;RETURN
(1)
(1)                                     ;ROUTINE TO ZERO DATA BUFFER
(1)
(1)  004766  010046                .BUFSET:MOV     R0,-(SP)        ;SAVE CONTENTS OF R0
(1)  004770  012700  001426                MOV     #TDO,R0         ;SET R0 TO TOP OF BUFFER
(1)  004774  005020                1$:     CLR     (R0)+           ;CLEAR BUFFER LOCATION
(1)  004776  022700  001446                CMP     #STOP,R0        ;IS BUFFER ALL CLEARED
(1)  005002  001374                        BNE     1$              ;IF NOT CLEAR NEXT LOCATION
(1)  005004  012600                        MOV     (SP)+,R0        ;RELOAD R0
(1)  005006  000002                        RTI                     ;RETURN
(1)
(1)                                     ;ERROR HANDLER
(1)                                     ;-------------
(1)
(1)  005010  004737  005436        $ERROR: JSR     PC,SERV.G       ;FIND OUT IF <^G> WAS HIT
(1)  005014  032777  010000  174262        BIT     #SW12,@SWR      ;BELL ON ERROR?
(1)  005022  001406                        BEQ     XBX             ;BR IF NO BELL
(1)  005024  105777  174264                TSTB    @STPS           ;TTY READY.
(1)  005030  100003                        BPL     XBX             ;DON'T WAIT IF TTY NOT READY.
(1)  005032  112777  000207  174256        MOVB    #207,@STPB      ;PUSH A BELL AT THE TTY.
(1)  005040  032777  020000  174236 XBX:   BIT     #SW13,@SWR      ;DELETE ERROR PRINT OUT?
(1)  005046  001113                        BNE     HALTS           ;BR IF NO PRINT OUT WANTED.
(1)  005050  021637  001262                CMP     (SP),$ERRPC     ;WAS THIS ERROR FOUND LAST TIME?
(1)  005054  001404                        BEQ     1$              ;BR IF YES
(1)  005056  011637  001262                MOV     (SP),$ERRPC     ;RECORD BEING HERE
(1)  005062  105037  001247                CLRB    $ERFLG          ;PREPARE HEADER
(1)  005066  104407                1$:     SAV05                   ;SAVE ALL PROC REGISTERS
(1)  005070  011605                        MOV     (SP),R5         ;GET THE PC OF ERROR
(1)  005072  162705  000002                SUB     #2,R5           ;GET ADDRESS OF TRAP CALL
(1)  005076  011504                        MOV     (R5),R4         ;GET ERROR INSTRUCTION
(1)  005100  110437  001260                MOVB    R4,$ITEMB       ;COPY TEST NUMBER FOR APT HANDLING
(1)  005104  006304                        ASL     R4              ;MULT BY TWO
(1)  005106  061504                        ADD     (R5),R4         ;DOUBLE IT
(1)  005110  006304                        ASL     R4              ;MULT AGAIN
(1)  005112  042704  177001                BIC     #177001,R4      ;CLEAR JUNK
(1)  005116  062704  011170                ADD     #.ERRTAB,R4     ;GET POINTER
(1)  005122  012437  005246                MOV     (R4)+,ERRMSG    ;GET ERROR MESSAGE
(1)  005126  012437  005260                MOV     (R4)+,DATAHD    ;GET DATA HEADRER
(1)  005132  011437  005272                MOV     (R4),DATABP     ;GET DATA TABLE
(1)  005136  105737  001247                TSTB    $ERFLG          ;TYPE HEADER
(1)  005142  001403                        BEQ     TYPMSG          ;BR IF YES
(1)  005144  005737  005272                TST     DATABP          ;DOES DATA TABLE EXIST?
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(1) 005150 001044                      BNE     TYPDAT          ;BR IF YES.
(1) 005152 104402 001357       TYPMSG: TYPE    ,$CRLF          ;TYPE A CARRIAGE RETURN
(1) 005156 104402 001357               TYPE    ,$CRLF          ;AND TYPE ANOTHER
(1) 005162 005737 001364               TST     LOCK
(1) 005166 001402                      BEQ     1$
(1) 005170 104402 006351               TYPE    ,MASTEK
(1) 005174 104402 006337       1$:     TYPE    ,MTSTN
(1) 005200 104412 005430               CNVRT   ,XTSTN          ;SHOW IT
(1) 005204 104402 006427               TYPE    ,MERRPC         ;TYPE PC.
(1) 005210 104412 005422               CNVRT   ,ERTABO         ;SHOW IT
(1) 005214 104402 006301               TYPE    ,MCSRX
(1) 005220 104412 002712               CNVRT   ,XCSR
(1) 005224 104402 001357               TYPE    ,$CRLF          ;GIVE A CR/LF
(1) 005230 112737 177777 001247        MOVB    #-1,$ERFLG      ;NO MORE HEADER UNLESS NO DATA TABLE.
(1) 005236 005737 005246               TST     ERRMSG          ;IS THERE AN ERROR MESSAGE?
(1) 005242 001402                      BEQ     WTBS.FM         ;BR IF NO.
(1) 005244 104402                      TYPE                    ;TYPE
(1) 005246 000000              ERRMSG: 0                       ;    ERROR MESSAGE
(1) 005250                     WTBS.FM:                        ;
(1) 005250 005737 005260               TST     DATAHD          ;DATA HEADER?
(1) 005254 001402                      BEQ     TYPDAT          ;BR IF NO
(1) 005256 104402                      TYPE                    ;TYPE
(1) 005260 000000              DATAHD: 0                       ;    DATA HEADER
(1) 005262 005737 005272       TYPDAT: TST     DATABP          ;DATA TABLE?
(1) 005266 001402                      BEQ     RESREG          ;BR IF NO.
(1) 005270 104411                      CONVRT                  ;SHOW
(1) 005272 000000              DATABP: 0                       ;    DATA TABLE
(1) 005274 104410              RESREG: RES05                   ;RESTORE PROC REGISTERS
(1) 005276 122737 000001 001140 HALTS: CMPB    #APTENV,$ENV    ;IS APT RUNNING?
(1) 005304 001007                      BNE     15$             ;SKIP APT CALL IF NOT
(1) 005306 113737 001260 005320        MOVB    $ITEMB,5$       ;COPY ERROR NUMBER
(1) 005314 004737 003552               JSR     PC,$ATY4        ;CALL APT SERVICE
(1) 005320 000000              5$:     .WORD   0               ;ERROR NUMBER STUCK HERE
(1) 005322 000777              10$:    BR      10$             ;LOCK UP HERE
(1) 005324 022737 002676 000042 15$:   CMP     #$ENDAD,@#42    ;CHECK TO SEE IF IN ACT-11 MODE
(1) 005332 001403                      BEQ     20$             ;IF SO, HANDLE ACCORDINGLY
(1) 005334 005777 173744               TST     @SWR            ;HALT ON ERROR?
(1) 005340 100004                      BPL     EXITER          ;BR IF NO HALT ON ERROR
(1) 005342 016677 000002 173736 20$:   MOV     2(SP),@DISPLAY  ;SHOW ERROR PC IN DATA DISPLAY
(1) 005350 000000                      HALT                    ;HALT
(1) 005352 005237 001256       EXITER: INC     $ERTTL          ;UPDATE ERROR COUNT
(1) 005356 004737 005436               JSR     PC,SERV.G       ;FIND OUT IF ^G WAS TYPED
(1) 005362 032777 000400 173714        BIT     #SW08,@SWR      ;GOTO TOP OF TEST?
(1) 005370 001007                      BNE     1$              ;BR IF YES
(1) 005372 032777 002000 173704        BIT     #SW10,@SWR      ;GOTO NEXT TEST?
(1) 005400 001407                      BEQ     2$              ;BR IF NO
(1) 005402 013737 001362 001252        MOV     NEXT,$LPADR     ;SET FOR NEXT TEST
(1) 005410 012706 001120       1$:     MOV     #STACK,SP       ;RESET SP
(1) 005414 000177 173632               JMP     @$LPADR         ;GOTO SPECIFIED TEST
(1) 005420 000002              2$:     RTI                     ;RETURN
(1) 005422 000001              ERTABO: 1
(1) 005424     006     002             .BYTE   6,2
(1) 005426 001404                      SAVPC
(1) 005430 000001              XTSTN:  1
(1) 005432     002     002             .BYTE   2,2
(1) 005434 001246                      $TSTNM
```

```
(1)  005436  017746  173650          SERV.G: MOV     @$TKB,-(SP)     ;OTHERWISE, GET THE LAST CHARACTER TYPED
(1)  005442  042716  000200                  BIC     #BIT7,(SP)      ;STRIP PARITY(EIGHTH) BIT
(1)  005446  122726  000007                  CMPB    #7,(SP)+        ;IS IT ^G?
(1)  005452  001076                          BNE     6$              ;IF NOT, IGNORE INPUT
(1)  005454  032777  004000  173626          BIT     #4000,@$TKS     ;RX BUSY?
(1)  005462  001365                          BNE     SERV.G          ;BR IF YES
(1)          005464                  GETSWR= .                               ;;GPA
(1)  005464  017737  173614  005672          MOV     @SWR,90$        ;SAVE (SWR).
(1)  005472  104402  005652          1$:     TYPE    ,89$            ;TYPE HEADER FOR OLD SWITCH REGISTER
(1)  005476  104412  005664                  CNVRT   ,88$            ;TYPE THE NUMBER ITSELF
(1)  005502  104402  005674                  TYPE    ,91$            ;AFTER HAVING CONVERTED IT TO ASCII
(1)  005506  105037  005700                  CLRB    92$             ;CLEAR SWR CHANGE FLAG
(1)  005512  005077  173566                  CLR     @SWR            ;CLEAR THE SOFTWARE SWITCH REGISTER
(1)  005516  105777  173566          3$:     TSTB    @$TKS           ;WAIT FOR DONE.
(1)  005522  100375                          BPL     3$              ;CONTINUE WAITING FOR IT
(1)  005524  017746  173562                  MOV     @$TKB,-(SP)     ;PUT THE CHARACTER ON THE STACK
(1)  005530  042716  000200                  BIC     #BIT7,(SP)      ;STRIP PARITY BIT
(1)  005534  122726  000015                  CMPB    #15,(SP)+       ;IS IT THE CARRIAGE RETURN CHAR?
(1)  005540  001433                          BEQ     4$              ;IF SO, GO PRINT CRLF
(1)  005542  105777  173546          2$:     TSTB    @$TPS           ;IS THE OUTPUT BUFFER AVAILABLE
(1)  005546  100375                          BPL     2$              ;IF NOT, WAIT FOR IT TO BE READY
(1)  005550  105237  005700                  INCB    92$             ;INDICATE THAT THE SWR WAS CHANGED
(1)  005554  014677  173536                  MOV     -(SP),@$TPB     ;PLACE THE CHARACTER THERE(ECHO BACK)
(1)  005560  000241                          CLC                     ;GET READY TO ROTATE
(1)  005562  006177  173516                  ROL     @SWR            ;MOVE THE EXISTING BITS OVER
(1)  005566  006177  173512                  ROL     @SWR            ;TO MAKE ROOM FOR THE INCOMING
(1)  005572  006177  173506                  ROL     @SWR            ;THREE BITS FROM THIS CHARACTER
(1)  005576  103735                          BCS     1$              ;ERROR
(1)  005600  022627  000060                  CMP     (SP)+,#60       ;IS IT LOWER THAN 0?
(1)  005604  002732                          BLT     1$              ;IF SO, GO ASK AGAIN
(1)  005606  026627  177776  000067          CMP     -2(SP),#67      ;IS IT HIGHER THAN 7?
(1)  005614  003326                          BGT     1$              ;IF SO, GO ASK AGAIN
(1)  005616  042746  177770                  BIC     #^C<7>,-(SP)    ;ISOLATE INFORMATION BITS
(1)  005622  052677  173456                  BIS     (SP)+,@SWR      ;ADD THEM TO THE SWITCH REGISTER
(1)  005626  000733                          BR      3$              ;GO CHECK FOR THE NEXT CHARACTER
(1)  005630  105737  005700          4$:     TSTB    92$             ;HAS THE SWR BEEN CHANGED?
(1)  005634  001003                          BNE     5$              ;IF YES GO TYPE CRLF
(1)  005636  013777  005672  173440          MOV     90$,@SWR        ;IF NOT RESTORE SWR
(1)  005644  104402  001357          5$:     TYPE    ,$CRLF          ;TYPE A CARRIAGE RETURN AND LINE FEED
(1)  005650  000207                  6$:     RTS     PC              ;RETURN TO CALLING PROCEDURE
(1)
(1)  005652  020200  051450  051127  89$:     .ASCIZ  <200>? (SWR)=/?
(1)                                  .EVEN
(1)  005664  000001                  88$:     1
(1)  005666     006     000                  .BYTE   6,0
(1)  005670  005672                          90$
(1)  005672  000000                  90$:     .WORD   0
(1)  005674  036457  000057          91$:     .ASCIZ  ?/=/?
(1)  005700     000                  92$:     .BYTE   0
(1)          005702                  .EVEN
(2)                                  .SBTTL  POWER DOWN AND UP ROUTINES
(2)
(3)                                  ;;**************************************************************
(2)                                  ;POWER DOWN ROUTINE
(2)  005702  012737  006046  000024  $PWRDN: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
(2)  005710  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;PRIO:7
```

```
(4)  005716  010046                          MOV     R0,-(SP)          ;;PUSH R0 ON STACK
(4)  005720  010146                          MOV     R1,-(SP)          ;;PUSH R1 ON STACK
(4)  005722  010246                          MOV     R2,-(SP)          ;;PUSH R2 ON STACK
(4)  005724  010346                          MOV     R3,-(SP)          ;;PUSH R3 ON STACK
(4)  005726  010446                          MOV     R4,-(SP)          ;;PUSH R4 ON STACK
(4)  005730  010546                          MOV     R5,-(SP)          ;;PUSH R5 ON STACK
(4)  005732  017746  173346                  MOV     @SWR,-(SP)        ;;PUSH @SWR ON STACK
(2)  005736  010637  006052                  MOV     SP,$SAVR6         ;;SAVE SP
(2)  005742  012737  005754  000024          MOV     #$PWRUP,@#PWRVEC  ;;SET UP VECTOR
(2)  005750  000000                          HALT
(2)  005752  000776                          BR      .-2               ;;HANG UP
(2)
(3)                                ;;*****************************************************************
(2)                                ;POWER UP ROUTINE
(2)  005754  012737  006046  000024  $PWRUP: MOV     #$ILLUP,@#PWRVEC  ;;SET FOR FAST DOWN
(2)  005762  013706  006052                  MOV     $SAVR6,SP         ;;GET SP
(2)  005766  005037  006052                  CLR     $SAVR6            ;;WAIT LOOP FOR THE TTY
(2)  005772  005237  006052          1$:     INC     $SAVR6            ;;WAIT FOR THE INC
(2)  005776  001375                          BNE     1$                ;;OF  WORD
(4)  006000  012677  173300                  MOV     (SP)+,@SWR        ;;POP STACK INTO @SWR
(4)  006004  012605                          MOV     (SP)+,R5          ;;POP STACK INTO R5
(4)  006006  012604                          MOV     (SP)+,R4          ;;POP STACK INTO R4
(4)  006010  012603                          MOV     (SP)+,R3          ;;POP STACK INTO R3
(4)  006012  012602                          MOV     (SP)+,R2          ;;POP STACK INTO R2
(4)  006014  012601                          MOV     (SP)+,R1          ;;POP STACK INTO R1
(4)  006016  012600                          MOV     (SP)+,R0          ;;POP STACK INTO R0
(2)  006020  012737  005702  000024          MOV     #$PWRDN,@#PWRVEC  ;;SET UP THE POWER DOWN VECTOR
(2)  006026  012737  000340  000026          MOV     #340,@#PWRVEC+2   ;;PRIO:7
(2)  006034  104402                          TYPE                      ;;REPORT THE POWER FAILURE
(2)  006036  006054                  $PWRMG: .WORD   MPFAIL            ;;POWER FAIL MESSAGE POINTER
(2)  006040  012716                          MOV     (PC)+,(SP)        ;;RESTART AT RESTART
(2)  006042  002544                  $PWRAD: .WORD   RESTART           ;;RESTART ADDRESS
(2)  006044  000002                          RTI
(2)  006046  000000                  $ILLUP: HALT                      ;;THE POWER UP SEQUENCE WAS STARTED
(2)  006050  000776                          BR      .-2               ;; BEFORE THE POWER DOWN WAS COMPLETE
(2)  006052  000000                  $SAVR6: 0                         ;;PUT THE SP HERE
(2)  006054  050200  051127  043040  MPFAIL: .ASCIZ   <200>/PWR FAILED. RESTART AT LAST TEST /
(2)  006117     200  047105  020104  MEPASS: .ASCIZ   <200>/END PASS CVDZC-B  /
(2)  006143     200  052522  047116  MR:     .ASCIZ   <200>/RUNNING   /
(2)  006157     200  051120  043517  MERR2:  .ASCIZ   <200>/PROGRAM INDICATES NO DEVICES PRESENT./
(2)  006226  044600  051516  043125  MERR3:  .ASCIZ   <200>/INSUFFICIENT DATA!/
(2)  006252  046200  041517  020113  MLOCK:  .ASCIZ   <200>/LOCK ON SELECTED TEST/
(2)  006301     103  051123  020072  MCSRX:  .ASCIZ    /CSR: /
(2)  006307     126  041505  020072  MVECX:  .ASCIZ   /VEC: /
(2)  006315     120  051501  042523  MPASSX: .ASCIZ   /PASSES: /
(2)  006326  051105  047522  051522  MERRX:  .ASCIZ   /ERRORS: /
(2)  006337     124  051505  020124  MTSTN:  .ASCIZ   /TEST NO: /
(2)  006351     052  000040          MASTEK: .ASCIZ   /* /
(2)  006354  051600  052105  051440  MNEW:   .ASCIZ   <200>/SET SWITCH REG TO DZV11'S DESIRED ACTIVE./
(2)  006427     120  035103  000040  MERRPC: .ASCIZ   /PC: /
(2)  006434  046600  050101  047440  XHEAD:  .ASCIZ   <200>/MAP OF DZV11 STATUS/<200>
(2)  006462  044600  046114  043505  MBADLN: .ASCIZ   <200>/ILLEGAL ENTRY IN STAGGERED MODE/<200>
(2)                                      .EVEN
(2)  006524  000002                  XSTATQ: 2
(2)  006526     006     003                  .BYTE   6,3
(2)  006530  001344                          $TMP1
```

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    (2)  006532      006      002                    .BYTE   6,2
    (2)  006534  001346                              $TMP2
    (1)                                .EVEN
```

```
(2)                                             ;THIS ROUTINE ESTABLISHES WHICH MAINTENANCE MODE THE DEVICE IS IN
(2)                                             ;-----------------------------------------------------------------
(2)                                             ;E=EXTERNAL LOOP BACK
(2)                                             ;I=INTERNAL LOOP BACK
(2)                                             ;S=STAGGERED LOOP BACK
(2)  006536  017605  000000          .SETFLG:MOV     @(SP),R5        ;PICK UP ADDRESS OF TAG
(2)  006542  042737  000040  007616          BIC     #40,INBUF       ;STRIP LOWER CASE
(2)  006550  122737  000105  007616          CMPB    #'E,INBUF       ;IS IT EXTERNAL LOOP BACK ?
(2)  006556  001005                          BNE     4$              ;NO
(2)  006560  013715  006650                  MOV     1$,(R5)         ;YES STORE INFO
(2)  006564  105037  001424                  CLRB    MNTFLG          ;SET MAINT BIT =0
(2)  006570  000422                          BR      7$              ;GET OUT
(2)  006572  122737  000111  007616  4$:     CMPB    #'I,INBUF       ;IS IT INTERNAL LOOP BACK ?
(2)  006600  001006                          BNE     5$              ;NO
(2)  006602  013715  006652                  MOV     2$,(R5)         ;YES STORE INFO
(2)  006606  112737  000010  001424          MOVB    #MAINT,MNTFLG   ;SET UP THE MAINTENANCE FLAG LOADER
(2)  006614  000410                          BR      7$              ;GET OUT
(2)  006616  122737  000123  007616  5$:     CMPB    #'S,INBUF       ;IS IT STAGGERED LOOP BACK ?
(2)  006624  001007                          BNE     6$              ;WHAT ?
(2)  006626  013715  006654                  MOV     3$,(R5)         ;YES STORE INFO
(2)  006632  105037  001424                  CLRB    MNTFLG          ;ZERO BITS
(2)  006636  062716  000002          7$:     ADD     #2,(SP)         ;POP AROUND
(2)  006642  000002                          RTI
(2)  006644  104404                  6$:     INSTER                  ;RETRY
(2)  006646  000733                          BR      .SETFLG         ;DITTO
(2)  006650  000200                  1$:     .WORD   200             ;EXTERNAL =  E
(2)  006652  000000                  2$:     .WORD   0               ;INTERNAL = I
(2)  006654  100000                  3$:     .WORD   100000          ;STAGGERED = S
(2)
(2)                                             ;COMPARE THE FIRST CHARACTER IN THE TELETYPE INPUT
(2)                                             ;BUFFER TO THE CHARACTERS "E" AND "C".
(2)                                             ;IF THE CHARACTER IS "E" CLEAR THE FLAG
(2)                                             ;IF THE CHARACTER IS "C" SET THE FLAG
(2)
(2)  006656  017605  000000          .PAWCH: MOV     @(SP),R5
(2)  006662  142737  000040  007616          BICB    #40,INBUF       ;SET FOR LOWER CASE INPUT
(2)  006670  122737  000105  007616          CMPB    #'E,INBUF       ;IS IT "E" ?
(2)  006676  001002                          BNE     1$
(2)  006700  105015                          CLRB    (R5)            ;000
(2)  006702  000406                          BR      2$
(2)  006704  122737  000103  007616  1$:     CMPB    #'C,INBUF       ;IS IT "C" ?
(2)  006712  001005                          BNE     3$
(2)  006714  112715  177777                  MOVB    #-1,(R5)        ;3177
(2)  006720  062716  000002          2$:     ADD     #2,(SP)
(2)  006724  000002                          RTI
(2)  006726  104404                  3$:     INSTER                  ;RETRY
(2)  006730  000752                          BR      .PAWCH
```

```
(2)                                     ;THIS ROUTINE CONVERTS LINE SPEED (LINESP) AND
(2)                                     ;LINE NUMBER (SAVLIN) FOR DZVLPR, DZVTCR AND DZVCSR
(2)                                     ;REGISTER USAGE.
(2)
(2)  006732  013737  001374  007150  SET:    MOV     SAVLIN,NUMLIN   ;SAVE SAVLIN
(2)  006740  013700  001374                   MOV     SAVLIN,R0       ;COPY THE LINE NUMBER FOR LOOP CONTROL
(2)  006744  005037  007152                   CLR     NUMTCR          ;SET A DEFAULT OF LINE 0 OR NO LINES
(2)  006750  012702  000001                   MOV     #1,R2           ;SET A BIT POINTER TO THE FIRST LINE
(2)  006754  005300                    XTCR1: DEC     R0              ;REDUCE THE INDICATOR.IS IT MINUS YET?
(2)  006756  100402                           BMI     SET1            ;IF SO, R2 POINTS TO THE RIGHT LINE
(2)  006760  006302                           ASL     R2              ;IF NOT, MOVE THE POINTER TO THE NEXT LINE
(2)  006762  000774                           BR      XTCR1           ;GO SEE IF THIS LINE IS THE ONE
(2)  006764  012701  007026            SET1:  MOV     #TABLE2,R1
(2)  006770  010237  007152                   MOV     R2,NUMTCR       ;COPY THE CORRECT BIT POINTER
(2)  006774  022137  007144            1$:    CMP     (R1)+,LINESP
(2)  007000  001407                           BEQ     2$
(2)  007002  005721                           TST     (R1)+           ;IS IT THE END OF TABLE?
(2)  007004  001373                           BNE     1$              ;NO
(2)  007006  104402  007254                   TYPE    ,MINVAL         ;INVALID BAUD RATE,BEGIN AGAIN
(2)  007012  012705  002402                   MOV     #BAUD,R5        ;JUMP TO BAUD THRU R5
(2)  007016  000402                           BR      3$
(2)  007020  011137  007146            2$:    MOV     (R1),SPEED      ;SET UP BAUD RATE
(2)  007024  000205                    3$:    RTS     R5
(2)
(2)
(2)
(2)                                     ;THE FOLLOWING IS A TABLE OF LEGAL BAUD RATES (8 BITS/CHAR)
(2)  007026  000062                    TABLE2: .WORD  50.             ;50 BAUD
(2)  007030  010070                            .WORD  10070            ;
(2)  007032  000113                            .WORD  75.              ;75 BAUD
(2)  007034  010470                            .WORD  10470            ;
(2)  007036  000156                            .WORD  110.             ;110 BAUD
(2)  007040  011070                            .WORD  11070            ;TWO STOP BITS
(2)  007042  000207                            .WORD  135.             ;134.5 BAUD
(2)  007044  011470                            .WORD  11470            ;TWO STOP BITS
(2)  007046  000226                            .WORD  150.             ;150 BAUD
(2)  007050  012070                            .WORD  12070            ;TWO STOP BITS
(2)  007052  000454                            .WORD  300.             ;300 BAUD
(2)  007054  012430                            .WORD  12430            ;ONE STOP BIT
(2)  007056  001130                            .WORD  600.             ;600 BAUD
(2)  007060  013030                            .WORD  13030            ;ONE STOP BIT
(2)  007062  002260                            .WORD  1200.            ;1200 BAUD
(2)  007064  013430                            .WORD  13430            ;ONE STOP BIT
(2)  007066  003410                            .WORD  1800.            ;1800 BAUD
(2)  007070  014030                            .WORD  14030            ;ONE STOP BIT
(2)  007072  003720                            .WORD  2000.            ;2000 BAUD
(2)  007074  014430                            .WORD  14430            ;ONE STOP BIT
(2)  007076  004540                            .WORD  2400.            ;2400 BAUD
(2)  007100  015030                            .WORD  15030            ;ONE STOP BIT
(2)  007102  007020                            .WORD  3600.            ;3600 BAUD
(2)  007104  015430                            .WORD  15430            ;ONE STOP BIT
(2)  007106  011300                            .WORD  4800.            ;4800 BAUD
(2)  007110  016030                            .WORD  16030            ;ONE STOP BIT
(2)  007112  016040                            .WORD  7200.            ;7200 BAUD
(2)  007114  016430                            .WORD  16430            ;ONE STOP BIT
(2)  007116  022600                            .WORD  9600.            ;9600 BAUD
```

```
(2)  007120  017030                        .WORD   17030           ;
(2)  007122  177777  000000                .WORD   -1,0            ;TABLE TERMINATOR
(2)
(2)
(2)  007126  000000                WCHFLG:0                        ;ECHO OR CABLE FLAG
(2)  007130  000000                STFLG: 0                        ;PROGRAM START FLAG
(2)  007132  000000                LOCKUP: 0                       ;TIMEOUT FLAG
(2)  007134  000000                LAST:   0                       ;LAST ERROR PC
(2)  007136  000000                TDATA:  0
(2)  007140  000000                RDATA:  0
(2)  007142  000000                BYTCNT: 0
(2)  007144  000156                LINESP: 110.                    ;DEFAULT BAUD RATE
(2)  007146  011070                SPEED:  11070                   ;DEFAULT 110 BAUD, 8 BITS/CHAR,
(2)                                                                ;FDX, 2 STOP BITS
(2)  007150  000000                NUMLIN: 0
(2)
(2)  007152  000001                NUMTCR: 1                       ;DEFAULT VALUE,TCR BIT 0
(2)  007154  000200                PRIO:   200                     ;DEFAULT DEVICE PRIORITY
(2)                                                                ;MASK OUT INTERRUPTS
(2)  007156  000000                RECDAT: 0
(2)  007160  000000                TBUF:   0
(2)  007162  053200  041505  047524  MVECTO: .ASCIZ  <200>/VECTOR ADDRESS- /
(2)  007204  041600  047117  051124  MREGAD: .ASCIZ  <200>/CONTROL REGISTER ADDRESS- /
(2)  007240  050200  051501  020123  MPASS:  .ASCIZ  <200>/PASS DONE./
(2)  007254  044600  053116  046101  MINVAL: .ASCIZ  <200>/INVALID BAUD RATE - /
(2)  007302  046200  047111  035105  MLINE:  .ASCIZ  <200>/LINE: /
(2)  007312  041200  052501  020104  MSPEED: .ASCIZ  <200>/BAUD RATE - /
(2)  007330  052200  050131  020105  MCHAR:  .ASCIZ  <200>/TYPE A CHAR. ON DZV11 TERMINAL /
(2)  007371     200  044127  041511  MWHICH: .ASCIZ  <200>/WHICH TEST ? ECHO OR CABLE (E OR C) /
(2)  007437     200  042524  046522  MTERM:  .ASCIZ  <200>/TERMINAL ECHO TEST /
(2)  007464  041600  041101  042514  MCABLE: .ASCIZ  <200>/CABLE TEST /
(2)  007501     377  177415  005377  MQUICK: .ASCII  <377><15><377><377><12><377><377>
(2)  007510  044124  020105  052521          .ASCII  /THE QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK 0123456789/
(2)  007605     377  177415  005377          .ASCII  <377><15><377><377><12><377><377><377><0>
(2)                                .EVEN
(2)
(2)                                ;BUFFERS FOR INPUT-OUTPUT
(2)
(2)  007616  000000                INBUF:  0
(2)          007660                .=.+40
(2)  007660  000000                TEMP:   0
(2)          007722                .=.+40
(2)  007722  000000                MDATA:  0
(2)          007764                .=.+40
(2)
```

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(1)
(1)  007764  013700  002040          ;THIS UTILITY SETS UP CSR'S,SETS UP VECTORS.
(1)  007770  062700  000002  DZVLEV: MOV     DZVRIV,R0       ;PLACE THE BASE VECTOR ADDRESS IN R0
(1)  007774  010037  002042          ADD     #2,R0           ;CALCULATE THE RECEIVER INTERRUPT STATUS ADDR.
(1)  010000  062700  000002          MOV     R0,DZVRIS       ;STORE IT HERE
(1)  010004  010037  002044          ADD     #2,R0           ;CALCULATE THE TRANSMITTER INTERRUPT VECTOR
(1)  010010  062700  000002          MOV     R0,DZVTIV       ;STORE IT HERE
(1)  010014  010037  002046          ADD     #2,R0           ;CALCULATE THE TRANSMITTER VECTOR STATUS ADDRESS
(1)                                  MOV     R0,DZVTIS       ;STORE IT HERE
(1)
(1)                                  ;THIS SEGMENT SETS UP POINTERS FOR THE GIVEN DZV11. $BASE IS THE BASE ADDRESS
(1)                                  ;OF THE DEVICE
(1)  010020  013700  001174          MOV     $BASE,R0        ;COPY THE ADDRESS BEING LOADED
(1)  010024  010037  002010          MOV     R0,DZVCSR       ;XXX0
(1)  010030  005200                  INC     R0
(1)  010032  010037  002012          MOV     R0,HDZVCSR      ;XXX1
(1)  010036  005200                  INC     R0
(1)  010040  010037  002014          MOV     R0,DZVRBUF      ;XXX2
(1)  010044  010037  002020          MOV     R0,DZVLPR       ;XXX2
(1)  010050  005200                  INC     R0
(1)  010052  010037  002016          MOV     R0,HDZVRBUF     ;XXX3
(1)  010056  010037  002022          MOV     R0,HDZVLPR      ;XXX3
(1)  010062  005200                  INC     R0
(1)  010064  010037  002024          MOV     R0,DZVTCR       ;XXX4
(1)  010070  005200                  INC     R0
(1)  010072  010037  002026          MOV     R0,HDZVTCR      ;XXX5
(1)  010076  005200                  INC     R0
(1)  010100  010037  002030          MOV     R0,DZVMSR       ;XXX6
(1)  010104  010037  002034          MOV     R0,DZVTDR       ;XXX6
(1)  010110  005200                  INC     R0
(1)  010112  010037  002032          MOV     R0,HDZVMSR      ;XXX7
(1)  010116  010037  002036          MOV     R0,HDZVTDR      ;XXX7
(1)  010122  000207                  RTS     PC
```

```
                                                ;**********   ECHO TEST   **********
                                                ;*THIS TEST WILL ACCEPT 1 CHARACTER AT A TIME
                                                ;*(IN INTERRUPT MODE) AND TRANSMIT THAT SAME CHARACTER,
                                                ;*ONE LINE AT A TIME, ANY LINE 0 THRU 7 (OCTAL)
                                
010124  104413                          TST1:   DEVICE.CLR              ;CLEAR DZV11
010126  012737  000001  001246                  MOV     #1,$TSTNM
010134  013777  007152  171662                  MOV     NUMTCR,@DZVTCR  ;SET TCR BIT
010142  013737  007150  001370                  MOV     NUMLIN,PAR      ;SET PARAMETERS
010150  053737  007146  001370                  BIS     SPEED,PAR       ;SET BAUD RATE
010156  013777  001370  171634                  MOV     PAR,@DZVLPR     ;LOAD PARAM.
010164  012777  000040  171616                  MOV     #MSENAB,@DZVCSR ;SET SCANN ENABLE
010172  005004                                  CLR     R4
010174  012705  007501                  4$:     MOV     #MQUICK,R5      ;SET MESSAGE BUFFER
010200  005777  171604                  3$:     TST     @DZVCSR         ;TRDY?
010204  100404                                  BMI     2$              ;BR IF YES
010206  104414                                  DELAY                   ;WAIT
010210  005304                                  DEC     R4              ;
010212  001372                                  BNE     3$              ;
010214  104003                                  ERROR   3               ;NO TRDY SET! WHY?
010216  005004                          2$:     CLR     R4              ;RESET COUNTER TO 0
010220  112577  171610                          MOVB    (R5)+,@DZVTDR   ;LOAD CHAR
010224  001365                                  BNE     3$              ;
010226  004737  005436                          JSR     PC,SERV.G       ;<^G>?
010232  122777  000377  171044                  CMPB    #377,@SWR       ;SWR SET TO 377?
010240  001755                                  BEQ     4$              ;IF YES LOOP ON QUICK MESSAGE
010242  012737  002550  001362                  MOV     #$EOP,NEXT
010250  012777  010324  171562                  MOV     #INTSVC,@DZVRIV ;SET UP INTERRUPT SERVICE
010256  012777  000200  171556                  MOV     #MASK,@DZVRIS   ;AND LEVEL
010264  106427  000000                          MTPS    #CLEAR          ;ALLOW INTERRUPTS
010270  012777  000140  171512                  MOV     #RIE!MSENAB,@DZVCSR ;SET RECEIVER INTERRUPT ENABLE
010276  104402  007330                          TYPE    ,MCHAR          ;TYPE "ANY CHARACTER"
010302  105777  171002                  1$:     TSTB    @$TKS           ;IF SOMBODY HITS A KEY- GET NEW LINE #
010306  100375                                  BPL     1$              ;LOOP HERE
010310  106427  000200                          MTPS    #MASK           ;MASK FURTHER INTERRUPTS
010314  004737  005436                          JSR     PC,SERV.G       ;MAKE SURE IT WASN'T <^G>
010320  000137  002420                          JMP     LINEX           ;
010324  105777  171460          INTSVC: TSTB    @DZVCSR         ;TEST REC. FLAG
010330  100401                                  BMI     .+4
010332  104004                                  ERROR   4               ;ERROR - INTERRUPT NOT CAUSED BY FLAG
010334  017737  171454  007156                  MOV     @DZVRBUF,RECDAT
010342  100401                                  BMI     .+4
010344  104023                                  ERROR   23              ;NON- VALID CHARACTER
010346  032737  020000  007156                  BIT     #BIT13,RECDAT   ;CHECK FOR FRAMING ERROR
010354  001401                                  BEQ     .+4             ;BR IF NO ERROR
010356  104025                                  ERROR   25              ;EITHER SOMBODY HIT THE
                                                                        ;"BREAK KEY" OR YOU HAVE AN ERROR!
010360  113737  007156  007160                  MOVB    RECDAT,TBUF     ;MOVE CHARACTER TO OUTPUT AREA
010366  113737  007156  007616                  MOVB    RECDAT,INBUF    ;MOVE CHARACTER TO CHECK FOR ^C
010374  042737  177600  007616                  BIC     #^C<177>,INBUF  ;STRIP JUNK PLUS PARITY
010402  042737  176377  007156                  BIC     #176377,RECDAT  ;SAVE ONLY LINE  NUMBER
010410  000337  007156                          SWAB    RECDAT
```

```
2207  010414  023737  001374  007156          CMP     SAVLIN,RECDAT   ;DOES THE LINE # COMPARE?
2208  010422  001407                          BEQ     2$
2209  010424  013737  007156  001374          MOV     RECDAT,SAVLIN   ;ADJUST LINE NO. FOR ERROR
2210  010432  104015                          ERROR   15              ;*WRONG LINE NUMBER
2211  010434  013737  007150  001374          MOV     NUMLIN,SAVLIN   ;CORRECT LINE NO. INDICATOR
2212  010442  123727  007616  000003  2$:     CMPB    INBUF,#3                ;IS IT A ^C ?
2213  010450  001004                          BNE     1$              ;NO
2214  010452  104413                          DEVICE.CLR
2215  010454  012716  002550                  MOV     #$EOP,(SP)      ;CRUNCH STACK
2216  010460  000002                          RTI
2217  010462  005777  171322          1$:     TST     @DZVCSR         ;TRDY SET
2218  010466  100375                          BPL     1$              ;IF NOT THEN WAIT
2219  010470  113777  007160  171336          MOVB    TBUF,@DZVTDR    ;TRANSMIT THE CHARACTER
2220  010476  000002                          RTI
2221
2222
2223                                          ;**********   CABLE TEST   **********
2224                                          ;*THIS TEST TRANSMITS A BINARY COUNT PATTERN
2225                                          ;*VIA INTERRUPT MODE TO THE RECEIVER
2226                                          ;*...THE LINE UNDER TEST MUST BE TERMINATED WITH THE TEST CONNECTOR
2227
2228  010500  106427  000200          TST2:   MTPS    #MASK           ;DISABLE INTERRUPTS
2229  010504  012737  000002  001246          MOV     #2,$TSTNM
2230  010512  012737  002550  001362          MOV     #$EOP,NEXT
2231  010520  104413                          DEVICE.CLR                      ;
2232                                          ;*TEST TO VERIFY THAT SETTING DTR FOR A GIVEN LINE
2233                                          ;*WILL BRING UP "CO" AND "RING" FOR THE SAME LINE
2234                                          ;*JUMPERS W1,W2,W3 AND W4 MUST BE INSTALLED ON THE
2235                                          ;*INTERFACE MODULE OTHERWISE AN ERROR REPORT WILL RESULT.
2236  010522  012737  010530  001364          MOV     #1$,LOCK        ;LOOP
2237  010530  113777  007152  171270  1$:     MOVB    NUMTCR,@HDZVTCR ;SET DTR
2238  010536  005005                          CLR     R5              ;
2239  010540  153705  007152                  BISB    NUMTCR,R5       ;BUILD EXPECTED
2240  010544  000305                          SWAB    R5              ;PUT IN HIGH BYTE
2241  010546  153705  007152                  BISB    NUMTCR,R5       ;
2242  010552  104414                          DELAY                   ;WAIT FOR CABLE DELAY
2243  010554  017704  171250                  MOV     @DZVMSR,R4      ;READY MODEM BITS
2244  010560  020504                          CMP     R5,R4           ;ARE THEY OK?
2245  010562  001401                          BEQ     2$              ;BR IF YES
2246  010564  104022                          ERROR   22              ;IS THE TEST CONNECTOR ON?
2247                                                                  ;HAS RIGHT LINE BEEN SELECTED?
2248                                                                  ;IF SO- YOU HAVE A PROBLEM!
2249                                                                  ;MODEM BITS NOT RIGHT
2250  010566  104401                  2$:     SCOP1                   ;LOOP
2251  010570  104413                  3$:     DEVICE.CLR              ;INIT DZV11
2252  010572  005037  001364                  CLR     LOCK            ;CLEAR SCOP1 LOCK ADDRESS
2253  010576  013737  007146  001370          MOV     SPEED,PAR       ;SET LINE SPEED
2254  010604  053737  007150  001370          BIS     NUMLIN,PAR      ;SELECT LINE #
2255  010612  052737  010000  001370          BIS     #RCVON,PAR      ;ENABLE THE RECEIVER FOR THIS LINE
2256  010620  013777  001370  171172          MOV     PAR,@DZVLPR     ;SET THE PARAMETERS AND TURN ON RECEIVER
2257  010626  012777  010750  171204          MOV     #INTREC,@DZVRIV ;SET UP INTR SERVICE
2258  010634  012777  000200  171200          MOV     #MASK,@DZVRIS   ;SET UP LEVEL
2259  010642  012777  011140  171174          MOV     #INTRAN,@DZVTIV ;SET UP INTR SERVICE
2260  010650  012777  000200  171170          MOV     #MASK,@DZVTIS   ;SET UP LEVEL
2261  010656  012777  040140  171124          MOV     #TIE!RIE!MSENAB,@DZVCSR ;SET TRANSMITTER INTERRUPT ENABLE
2262  010664  105037  001425                  CLRB    DONFLG          ;INIT INTERRUPT DONE INDICATOR
```

```
2263  010670  005001                          CLR     R1              ;RX DATA POINTER- SET TO 0
2264  010672  005002                          CLR     R2              ;TX DATA POINTER- SET TO 0
2265  010674  013777  007152  171122          MOV     NUMTCR,@DZVTCR  ;SET UP TCR BIT
2266  010702  106427  000000                  MTPS    #CLEAR          ;ALLOW INTERRUPTS
2267
2268                                          ;YOU RETURN HERE AFTER EVERY RECEIVER INTERRUPT
2269  010706  105777  170376          SPIN:   TSTB    @$TKS           ;IF SOMEBODY HITS A KEY- GET A NEW LINE #
2270  010712  100004                          BPL     1$              ;BRANCH IF NO KEY HIT
2271  010714  004737  005436                  JSR     PC,SERV.G       ;MAKE SURE IT WASN'T <^G>
2272  010720  000137  002420                  JMP     LINEX           ;SW02=1
2273  010724  105737  001425          1$:     TSTB    DONFLG          ;ARE ALL RECEIVER INTER. DONE
2274  010730  001004                          BNE     QUITS           ;IF YES GET OUT OF TIMING LOOP
2275  010732  005237  007132                  INC     LOCKUP          ;INC TIMEOUT FLAG
2276  010736  001363                          BNE     SPIN            ;IF NOT 0  RETURN SPINNING
2277  010740  104011                          ERROR   11              ;*RECEIVER FAILED TO INTERRUPT  CHECK CABLE/TERMINATOR
2278  010742  104413          QUITS:  DEVICE.CLR
2279  010744  000137  002550                  JMP     $EOP            ;CALL FOR END OF PASS
2280  010750  005037  007132          INTREC: CLR     LOCKUP          ;CLEAR TIMEOUT FLAG
2281  010754  105777  171030                  TSTB    @DZVCSR         ;TEST REC DONE
2282  010760  100401                          BMI     .+4             ;YES
2283  010762  104004                          ERROR   4               ;*FALSE INTERRUPT
2284  010764  017737  171024  007156          MOV     @DZVRBUF,RECDAT ;SAVE WORD
2285  010772  100401                          BMI     .+4
2286  010774  104023                          ERROR   23              ;*NON VALID CHARACTER
2287  010776  032737  040000  007156          BIT     #BIT14,RECDAT   ;DATA OVERRUN ?
2288  011004  001401                          BEQ     .+4             ;NO
2289  011006  104024                          ERROR   24              ;*YES
2290  011010  032737  020000  007156          BIT     #BIT13,RECDAT   ;FRAMING ERROR ?
2291  011016  001401                          BEQ     .+4             ;NO
2292  011020  104025                          ERROR   25              ;*YES
2293  011022  032737  010000  007156          BIT     #BIT12,RECDAT   ;PARITY ERROR ?
2294  011030  001401                          BEQ     .+4             ;NO
2295  011032  104026                          ERROR   26              ;*YES
2296  011034  110105                          MOVB    R1,R5           ;SET EXPECTED
2297  011036  113704  007156                  MOVB    RECDAT,R4       ;GET FOUND
2298  011042  042704  177400                  BIC     #^C<377>,R4     ;CLEAR HIGH BYTE
2299  011046  042705  177400                  BIC     #^C<377>,R5     ;CLEAR HIGH BYTE
2300  011052  020504                          CMP     R5,R4           ;OK?
2301  011054  001401                          BEQ     .+4
2302  011056  104005                          ERROR   5               ;DATA ERROR
2303  011060  042737  176377  007156          BIC     #176377,RECDAT  ;SAVE ONLY LINE NUMBER
2304  011066  000337  007156                  SWAB    RECDAT
2305  011072  023737  001374  007156          CMP     SAVLIN,RECDAT   ;DOES THE LINE # COMPARE ?
2306  011100  001407                          BEQ     4$              ;YES
2307  011102  013737  007156  001374          MOV     RECDAT,SAVLIN   ;ADJUST LINE NO. FOR ERROR
2308  011110  104015                          ERROR   15              ;*WRONG LINE #
2309  011112  013737  007150  001374          MOV     NUMLIN,SAVLIN   ;READJUST LINE NO.
2310  011120  120127  000377          4$:     CMPB    R1,#377         ;LAST CHARACTER ?
2311  011124  001003                          BNE     1$              ;NO
2312  011126  105237  001425                  INCB    DONFLG          ;INDICATE RECEIVER INTERRUPTS DONE
2313  011132  000401                          BR      2$
2314  011134  105201                  1$:     INCB    R1              ;UPDATE EXPECTED DATA
2315  011136  000002                  2$:     RTI
2316
2317  011140  005777  170644          INTRAN: TST     @DZVCSR ;TEST TRANSMIT FLAG
2318  011144  100401                          BMI     .+4
```

```
 2319  011146  104003                        ERROR   3               ;*FALSE INTERRUPT
 2320  011150  110277  170660                MOVB    R2,@DZVTDR      ;TRANSMIT A CHARACTER
 2321  011154  105202                        INCB    R2              ;UPDATE TX DATA
 2322  011156  001003                        BNE     1$              ;BIT PATTERN DONE?
 2323  011160  042777  040000  170622        BIC     #TIE,@DZVCSR    ;IF YES THEN CLEAR TIE
 2324  011166  000002                1$:     RTI                     ;IF NOT THEN RETURN
```

```
                                        ;ERROR TABLE
011170  000000              .ERRTAB:      0       ;ERROR 0
011172  000000                            0
011174  000000                            0

011176  011416                            EM1     ;ERROR
011200  012746                            DH1
011202  013146                            DT1

011204  011471                            EM2     ;ERROR 2
011206  012772                            DH2
011210  013160                            DT2

011212  011517                            EM3     ;ERROR 3
011214  013025                            DH3
011216  013176                            DT3

011220  011556                            EM4     ;ERROR 4
011222  013025                            DH3
011224  013176                            DT3

011226  011605                            EM5     ;ERROR 5
011230  013037                            DH4
011232  013204                            DT4

011234  011634                            EM6     ;ERROR 6
011236  013037                            DH4
011240  013204                            DT4

011242  011673                            EM7     ;ERROR 7
011244  013025                            DH3
011246  013176                            DT3

011250  011734                            EM8     ;ERROR 10
011252  013025                            DH3
011254  013176                            DT3

011256  011776                            EM9     ;ERROR 11
011260  013025                            DH3
011262  013176                            DT3

011264  012034                            EM10    ;ERROR 12
011266  013025                            DH3
011270  013176                            DT3

011272  012073                            EM13    ;ERROR 13
011274  013025                            DH3
011276  013176                            DT3

011300  012124                            EM14    ;ERROR 14
011302  013025                            DH3
011304  013176                            DT3

011306  012156                            EM15    ;ERROR 15
011310  000000                            0
011312  000000                            0
```

```
2382
2383  011314  012220                          EM16
2384  011316  013025                          DH3
2385  011320  013176                          DT3
2386
2387  011322  012272                          EM17    ;ERROR 17
2388  011324  013025                          DH3
2389  011326  013176                          DT3
2390
2391  011330  012330                          EM20
2392  011332  013025                          DH3
2393  011334  013176                          DT3
2394
2395  011336  012371                          EM21    ;ERROR 21
2396  011340  013066                          DH5
2397  011342  013222                          DT5
2398
2399  011344  012421                          EM22    ;ERROR 22
2400  011346  013037                          DH4
2401  011350  013204                          DT4
2402
2403  011352  012463                          EM23    ;ERROR 23
2404  011354  013025                          DH3
2405  011356  013176                          DT3
2406
2407  011360  012513                          EM24
2408  011362  013025                          DH3
2409  011364  013176                          DT3
2410
2411  011366  012541                          EM25
2412  011370  013025                          DH3
2413  011372  013176                          DT3
2414
2415  011374  012571                          EM26
2416  011376  013025                          DH3
2417  011400  013176                          DT3
2418
2419  011402  012620                          EM27
2420  011404  013025                          DH3
2421  011406  013176                          DT3
2422
2423  011410  012666                          EM30
2424  011412  013025                          DH3
2425  011414  013176                          DT3
```

```
                                        ;ERROR MESSAGES
011416  047200  020117  052502  EM1:    .ASCIZ  <200>/NO BUS REPLY RESPONSE FROM DZV11 REGISTER/
011471     200  042522  044507  EM2:    .ASCIZ  <200>?REGISTER R/W FAILURE?
011517     200  051124  047101  EM3:    .ASCIZ  <200>/TRANSMIT READY (TRDY) NOT SET/
011556  051200  041505  044505  EM4:    .ASCIZ  <200>/RECEIVER DONE NOT SET/
011605     200  040504  040524  EM5:    .ASCIZ  <200>/DATA COMPARISON ERROR/
011634  042200  053132  030461  EM6:    .ASCIZ  <200>/DZV11 *RECEIVER BUFFER* ERROR/
011673     200  051124  047101  EM7:    .ASCIZ  <200>/TRANSMITTER FAILED TO INTERRUPT/
011734  052600  042516  050130  EM8:    .ASCIZ  <200>/UNEXPECTED TRANSMITTER INTERRUPT/
011776  051200  041505  044505  EM9:    .ASCIZ  <200>/RECEIVER FAILED TO INTERRUPT/
012034  052600  042516  050130  EM10:   .ASCIZ  <200>/UNEXPECTED RECEIVER INTERRUPT/
012073     200  044523  047514  EM13:   .ASCIZ  <200>/SILO ALARM SET TOO SOON/
012124  051600  046111  020117  EM14:   .ASCIZ  <200>/SILO ALARM FAILED TO SET/
012156  040600  052103  047511  EM15:   .ASCIZ  <200>/ACTION DETECTED ON INVALID LINE./
012220  051200  040505  044504  EM16:   .ASCIZ  <200>/READING DZVRBUF DID NOT CLEAR SILO ALARM/
012272  042200  052101  020101  EM17:   .ASCIZ  <200>/DATA VALID SHOULD NOT BE SET/
012330  051200  041505  044505  EM20:   .ASCIZ  <200>/RECEIVER DONE SHOULD NOT BE SET/
012371     200  042522  040514  EM21:   .ASCIZ  <200>/RELATIVE TIMING ERROR./
012421     200  047515  042504  EM22:   .ASCIZ  <200>/MODEM SIGNAL ERROR ON CABLE TEST/
012463     200  040504  040524  EM23:   .ASCIZ  <200>/DATA VALID IS NOT SET!/
012513     200  040504  040524  EM24:   .ASCIZ  <200>/DATA OVERRUN IS SET!/
012541     200  051106  046501  EM25:   .ASCIZ  <200>/FRAMING ERROR OCCURRED/
012571     200  040520  044522  EM26:   .ASCIZ  <200>/PARITY ERROR OCCURRED/
012620  051600  046111  020117  EM27:   .ASCIZ  <200>/SILO ALARM FAILED TO CAUSE INTERRUPT/
012666  046200  047111  020105  EM30:   .ASCIZ  <200>/LINE DID NOT RECEIVE FULL BINARY COUNT PATTERN/

012746  052200  040522  020120  DH1:    .ASCIZ  <200>/TRAP PC  DZV11 REG/
012772  042600  050130  041505  DH2:    .ASCIZ  <200>/EXPECTED  FOUND  REGISTER/
013025     200  044514  042516  DH3:    .ASCIZ  <200>/LINE NO./
013037     200  054105  042520  DH4:    .ASCIZ  <200>/EXPECTED  FOUND  LINE/
013066  052200  020130  044514  DH5:    .ASCIZ  <200>/TX LINE PREVIOUS TIME  ACTUAL TIME  PARAMETER/

        013146                  .EVEN
                                ;DATA TABLES FOR ERROR MESSAGES
013146  000002          DT1:    2
013150     006  003             .BYTE   6,3
013152  001330                  $REG1
013154     006  001             .BYTE   6,1
013156  001326                  $REG0

013160  000003          DT2:    3
013162     006  004             .BYTE   6,4
013164  001340                  $REG5
013166     006  001             .BYTE   6,1
013170  001336                  $REG4
013172     006  001             .BYTE   6,1
013174  001326                  $REG0

013176  000001          DT3:    1
013200     003  001             .BYTE   3,1
013202  001374                  SAVLIN

013204  000003          DT4:    3
013206     006  004             .BYTE   6,4
013210  001340                  $REG5
013212     006  001             .BYTE   6,1
```

```
 2489  013214  001336                        $REG4
 2490  013216     003      001               .BYTE   3,1
 2491  013220  001374                        SAVLIN
 2492
 2493  013222  000004                DT5:    4
 2494  013224     003      005               .BYTE   3,5
 2495  013226  001374                        SAVLIN
 2496  013230     006      011               .BYTE   6,9.
 2497  013232  001340                        $REG5
 2498  013234     006      007               .BYTE   6,7
 2499  013236  001344                        $TMP1
 2500  013240     006      001               .BYTE   6,1
 2501  013242  001402                        REGIST
 2502                                        ;TABLE OF DELAY TIMES FOR INDIVIDUAL BAUD RATES
 2503                                        ;-----------------------------------------------
 2504
 2505  013244  002450                DLYTBL: 2450                    ;TIME FOR   50 BAUD
 2506  013246  001560                        1560                    ;TIME FOR   75 BAUD
 2507  013250  001120                        1120                    ;TIME FOR  110 BAUD
 2508  013252  000750                         750                    ;TIME FOR  134 BAUD
 2509  013254  000660                         660                    ;TIME FOR  150 BAUD
 2510  013256  000330                         330                    ;TIME FOR  300 BAUD
 2511  013260  000150                         150                    ;TIME FOR  600 BAUD
 2512  013262  000060                          60                    ;TIME FOR 1200 BAUD
 2513  013264  000040                          40                    ;TIME FOR 1800 BAUD
 2514  013266  000030                          30                    ;TIME FOR 2000 BAUD
 2515  013270  000020                          20                    ;TIME FOR 2400 BAUD
 2516  013272  000010                          10                    ;TIME FOR 3600 BAUD
 2517  013274  000001                           1                    ;TIME FOR 4800 BAUD
 2518  013276  000001                           1                    ;TIME FOR 7200 BAUD
 2519  013300  000001                           1                    ;TIME FOR 9600 BAUD
 2520  013302  000001                           1                    ;TIME OF DELAY FOR 19200 BAUD
 2521
 2522                                        ;DELAYS WERE COMPUTED TO ALLOW MAXIMUM TIME AT EACH BAUD RATE
 2523                                        ;FOR ALL TESTS TO FUNCTION CORRECTLY ON A LSI11.
```

```
2525                                    .SBTTL  FALCON (KXT-11) UPGRADE ROUTINES.                ;;GPA
2526                                    ;
2527                                    ; THE FOLLOWING ROUTINES HAVE BEEN ADDED TO ALLOW DIAGNOSTIC(S)
2528                                    ; TO RUN ON A FALCON (KXT-11) BASED SYSTEM.
2529                                    ; TO DETERMINE WHETHER WE'RE A FALCON OR NOT, WE'LL SIZE THE 1ST 3/4 OF
2530                                    ; THE I/O PAGE (28K TO 31K).  FALCON HAS 2KW LOCAL RAM AT 28K(+4) TO 30K
2531                                    ; AND A MACRO-ODT AT 30K TO 31K.  CONSEQUENTLY, ALL I/O DEVICES MUST
2532                                    ; BE PLACED BETWEEN 174000 AND 177776.  ADDITIONALLY, WE'LL STRAP THE
2533                                    ; EMT AND TRAP SERVICE LEVEL TO PRI6, AND SET THE HALT VECTOR SO THAT
2534                                    ; WE CAN STOP THE SUCKER !!
2535                                    ;
2536                                    ; TO MINIMIZE THE IMPACT OF THESE CHANGES ON FINAL PROGRAM SIZE, THE
2537                                    ; BULK OF THIS CODE IS PLACED IN THE FLOATING VECTOR SPACE (400-776).
2538                                    ; IF THE CPU AT HAND IS A FALCON (KXT11), IT STAYS THERE (NO HARM DONE).
2539                                    ; OTHERWISE, THE AREA IS RESTORED TO ITS ORIGINAL "TRAP-CATCHER" STATE.
2540                                    ;
2541  013304  005227  177777            FALCON: INC     #-1             ; ONCE-ONLY !!!          ;;GPA
2542  013310  001002                            BNE     1$                                       ;;GPA
2543  013312  004737  000400                    CALL    KXTCHK          ; EXECUTE FALCON CHECK   ;;GPA
2544  013316  005727                    1$:     TST     (PC)+           ; TEST FALCON FLAG...    ;;GPA
2545  013320  000000                    KXTFLAG: 0                      ;...NZ = FALCON...       ;;GPA
2546  013322  000207                            RETURN                  ;...AND RETURN TO CALLER...  ;;GPA
2547
2548          013324                            $SVPC= .                                         ;;GPA
2549          000400                            .= 400                  ; RESTORE FROM 374:376 AT END  ;;GPA
2550  000400  005037  013320            KXTCHK: CLR     KXTFLAG         ; ASSUME NOT FALCON.     ;;GPA
2551  000404  013746  000004                    MOV     @#4,-(SP)       ; SAVE ERROR VECTOR.     ;;GPA
2552  000410  012737  000504  000004            MOV     #2$,@#4         ; SET A TRAP CATCHER.    ;;GPA
2553  000416  012700  160010                    MOV     #160010,R0      ; FALCON RAM STARTS AT 28K+4.  ;;GPA
2554  000422  005720                    1$:     TST     (R0)+           ;                        ;;GPA
2555  000424  000240                            240                                              ;;GPA
2556  000426  020027  174000                    CMP     R0,#174000      ; SIZE TO 31K.           ;;GPA
2557  000432  103773                            BLO     1$                                       ;;GPA
2558  000434  010037  013320                    MOV     R0,KXTFLAG      ; MUST BE FALCON, SET THE FLAG  ;;GPA
2559  000440  012700  000040                    MOV     #40,R0          ; GET PRI1 BIT...        ;;GPA
2560  000444  040037  000006                    BIC     R0,@#6          ;...AND LOWER BUS-ERROR...  ;;GPA
2561  000450  040037  000016                    BIC     R0,@#16         ;...BPT...               ;;GPA
2562  000454  040037  000022                    BIC     R0,@#22         ;...IOT...               ;;GPA
2563  000460  040037  000032                    BIC     R0,@#32         ;...EMT...               ;;GPA
2564  000464  040037  000036                    BIC     R0,@#36         ;...AND TRAP SERVICE TO PRI6  ;;GPA
2565  000470  012737  170000  000140            MOV     #170000,@#140   ; ENABLE "BREAK" HALT.   ;;GPA
2566  000476  012637  000004                    MOV     (SP)+,@#4       ; RESTORE ERROR VECTOR...  ;;GPA
2567  000502  000207                            RETURN                  ;...AND RETURN.          ;;GPA
2568
2569  000504  012716  000512            2$:     MOV     #3$,(SP)        ; TRAP -- NOT A FALCON...  ;;GPA
2570  000510  000002                            RTI                     ;...CONTINUE.            ;;GPA
2571  000512  012637  000004            3$:     MOV     (SP)+,@#4       ; RESET ERROR VECTOR     ;;GPA
2572  000516  012700  000402                    MOV     #402,R0         ; SET-UP TO RESTORE FLOATING...  ;;GPA
2573  000522  013701  000376                    MOV     @#376,R1        ;...VECTORS (400 - 776).  ;;GPA
2574  000526  010602                            MOV     SP,R2           ; SAVE STACK POINTER IN R2  ;;GPA
2575  000530  012704  000570                    MOV     #6$,R4
2576  000534  014446                    4$:     MOV     -(R4),-(SP)     ; PUSH THE RESTORE CODE...  ;;GPA
2577  000536  020427  000546                    CMP     R4,#5$          ;...ONTO THE STACK.      ;;GPA
2578  000542  101374                            BHI     4$                                       ;;GPA
2579  000544  010607                            MOV     SP,PC           ; AND EXECUTE IT.        ;;GPA
```

```
                                    ;
                                    ; THIS CODE IS RELOCATED TO AND EXECUTED IN THE STACK AREA.
                                    ;
000546  010060  177776      5$:     MOV     R0,-2(R0)       ; RESTORE .+2...                    ;;GPA
000552  010110                      MOV     R1,(R0)         ;...HALT (OR IOT).                  ;;GPA
000554  022020                      CMP     (R0)+,(R0)+                                         ;;GPA
000556  020027  000776              CMP     R0,#776                                             ;;GPA
000562  101771                      BLOS    5$              ; LOOP 'TIL DONE                    ;;GPA
000564  010206                      MOV     R2,SP           ; THEN RESTORE SP...                ;;GPA
000566  000207                      RETURN                  ;...AND RETURN TO CALLER            ;;GPA
000570                      6$:                                                                 ;;GPA
                                    ;
                                    ; IF FALCON, THIS AREA IS FREE FOR ANY PROGRAM UNIQUE
                                    ; CHANGES OR DATA STRUCTURES.
                                    ; BE SURE IT DOESN'T GET SCREWED UP !!
                                    ;
                                    ; INIT $BASE AND $VECT1 AND TWEAK THE "$GETPAR" CALLING
                                    ; SEQUENCE TO ACCEPT THE VALID FALCON RANGE.
                                    ;
000570  023727  001174  160010  FALCINI: CMP     $BASE,#ABASE    ; IS $BASE VIRGIN ??                ;;GPA
000576  001003                      BNE     1$              ; SKIP NEXT IF NOT                  ;;GPA
000600  012737  174040  001174          MOV     #174040,$BASE   ; YES, SET ENGINEERING DEFAULT      ;;GPA
000606  023727  001170  000000  1$:     CMP     $VECT1,#AVECT1  ; IS $VECT1 VIRGIN ??               ;;GPA
000614  001003                      BNE     2$              ; SKIP NEXT IF NOT                  ;;GPA
000616  012737  000370  001170          MOV     #370,$VECT1     ; YES, SET ENGINEERING DEFAULT      ;;GPA
000624  012737  000670  002334  2$:     MOV     #3$,GETCSR+2    ; SUBSTITUE CSR TEXT...             ;;GPA
000632  012737  174000  002340          MOV     #174000,GETCSR+6                                    ;;GPA
000640  012737  177770  002342          MOV     #177770,GETCSR+10 ;...AND VALID RANGE.              ;;GPA
000646  012737  000732  002352          MOV     #4$,GETVEC+2    ; SUBSTITUTE VECTOR TEXT...         ;;GPA
000654  005037  002356                  CLR     GETVEC+6                                            ;;GPA
000660  012737  000370  002360          MOV     #370,GETVEC+10  ;...AND VALID RANGE.                ;;GPA
000666  000207                      RETURN                  ; RETURN TO CALLER.                 ;;GPA
                                    ;
000670  030600  052123  041440  3$:     .ASCIZ  <200>'1ST CSR ADDRESS (174000:177770) '         ;;GPA
000732  030600  052123  053040  4$:     .ASCIZ  <200>'1ST VECTOR ADDRESS (000:370)    '         ;;GPA
                                    .EVEN                                                       ;;GPA
                                    ;
000002                      $FREE=  <1000-.>/2              ; FREE WORDS LEFT.                  ;;GPA
                                    ;
013324                              .=$SVPC                                                     ;;GPA
013324                      CORMAX:
000001                      .END
```

```
ABASE = 160010
ACDW1 = 000000
ACDW2 = 000000
ACPUOP= 000000
ACTIVE  001420
ADDW0 = 000000
ADDW1 = 000000
ADDW10= 000000
ADDW11= 000000
ADDW12= 000000
ADDW13= 000000
ADDW14= 000000
ADDW15= 000000
ADDW2 = 000000
ADDW3 = 000000
ADDW4 = 000000
ADDW5 = 000000
ADDW6 = 000000
ADDW7 = 000000
ADDW8 = 000000
ADDW9 = 000000
ADEVCT= 000000
ADEVM = 000000
ADRCNT  004325
ADVANC= 104400
AENV  = 000000
AENVM = 000000
AFATAL= 000000
AMADR1= 000000
AMADR2= 000000
AMADR3= 000000
AMADR4= 000000
AMAMS1= 000000
AMAMS2= 000000
AMAMS3= 000000
AMAMS4= 000000
AMSGAD= 000000
AMSGLG= 000000
AMSGTY= 000000
AMTYP1= 000000
AMTYP2= 000000
AMTYP3= 000000
AMTYP4= 000000
APASS = 000000
APRIOR= 000000
APTCSU= 000040
APTENV= 000001
APTSIZ= 000200
APTSPO= 000100
ASWREG= 000000
ATESTN= 000000
AUNIT = 000000
AUSWR = 000000

AVECT = 000300
AVECT1= 000000
AVECT2= 000000
BAUD    002402
BINWRD  004600
BIT0  = 000001
BIT00 = 000001
BIT01 = 000002
BIT02 = 000004
BIT03 = 000010
BIT04 = 000020
BIT05 = 000040
BIT06 = 000100
BIT07 = 000200
BIT08 = 000400
BIT09 = 001000
BIT1  = 000002
BIT10 = 002000
BIT11 = 004000
BIT12 = 010000
BIT13 = 020000
BIT14 = 040000
BIT15 = 100000
BIT2  = 000004
BIT3  = 000010
BIT4  = 000020
BIT5  = 000040
BIT6  = 000100
BIT7  = 000200
BIT8  = 000400
BIT9  = 001000
BPTVEC= 000014
BRK0  = 000400
BRK1  = 001000
BRK2  = 002000
BRK3  = 004000
BUFSET= 104422
BYTCNT  007142
CHRCNT  004576
CLEAR = 000000
CNVRT = 104412
CONVRT= 104411
CORMAX  013324
C00   = 000400
C01   = 001000
C02   = 002000
C03   = 004000
CR    = 000015
CRLF  = 000200
DATABP  005272
DATAHD  005260
DCLASM= 104417
DCLR  = 000020

DDISP = 177570
DELAY = 104414
DEVADR  004322
DEVICE= 104413
DH1     012746
DH2     012772
DH3     013025
DH4     013037
DH5     013066
DISPLA  001306
DISPRE  000174
DLYCNT  004674
DLYTBL  013244
DONFLG  001425
DSWR  = 177570
DTR0  = 000400
DTR1  = 001000
DTR2  = 002000
DTR3  = 004000
DT1     013146
DT2     013160
DT3     013176
DT4     013204
DT5     013222
DVALID= 100000
DZCR0   001500
DZCR1   001512
DZCR10  001620
DZCR11  001632
DZCR12  001644
DZCR13  001656
DZCR14  001670
DZCR15  001702
DZCR16  001714
DZCR17  001726
DZCR2   001524
DZCR3   001536
DZCR4   001550
DZCR5   001562
DZCR6   001574
DZCR7   001606
DZVACT  001406
DZVCSR  002010
DZVC0   001502
DZVC1   001514
DZVC10  001622
DZVC11  001634
DZVC12  001646
DZVC13  001660
DZVC14  001672
DZVC15  001704
DZVC16  001716
DZVC17  001730

DZVC2   001526
DZVC3   001540
DZVC4   001552
DZVC5   001564
DZVC6   001576
DZVC7   001610
DZVLEV  007764
DZVLPR  002020
DZVMSR  002030
DZVNUM  001414
DZVRBU  002014
DZVRIS  002042
DZVRIV  002040
DZVTCR  002024
DZVTDR  002034
DZVTIS  002046
DZVTIV  002044
DZV.EN  001740
DZV.MA  001500
EIGHT = 000030
EIGHTS= 000070
EMTVEC= 000030
EM1     011416
EM10    012034
EM13    012073
EM14    012124
EM15    012156
EM16    012220
EM17    012272
EM2     011471
EM20    012330
EM21    012371
EM22    012421
EM23    012463
EM24    012513
EM25    012541
EM26    012571
EM27    012620
EM3     011517
EM30    012666
EM4     011556
EM5     011605
EM6     011634
EM7     011673
EM8     011734
EM9     011776
ERRMSG  005246
ERRVEC= 000004
ERTABO  005422
EVEPAR= 000000
EXITER  005352
FALCIN  000570
FALCON  013304

FIVE  = 000000
FIVES = 000040
FRMERR= 020000
GETCSR= 002332
GETSWR= 005464
GETVEC= 002350
HALTS   005276
HDRFLG  001423
HDZVCS  002012
HDZVLP  002022
HDZVMS  002032
HDZVRB  002016
HDZVTC  002026
HDZVTD  002036
HILIM   004320
HT    = 000011
INBUF   007616
INIFLG  001422
INSTER= 104404
INSTR = 104403
INSTR2  004120
INTRAN  011140
INTREC  010750
INTSVC  010324
IOTVEC= 000020
KXTCHK  000400
KXTFLA  013320
LAST    007134
LF    = 000012
LIMITS  004246
LINE    001366
LINESP  007144
LINEX   002420
LINE0   001504
LINE1   001516
LINE10  001624
LINE11  001636
LINE12  001650
LINE13  001662
LINE14  001674
LINE15  001706
LINE16  001720
LINE17  001732
LINE2   001530
LINE3   001542
LINE4   001554
LINE5   001566
LINE6   001600
LINE7   001612
LOBITS  004324
LOCK    001364
LOCKUP  007132
LOLIM   004316
```

CVDZC-B MACY11 30G(1063) 10-AUG-81 11:15 PAGE 25-1
CVDZCB.P11 10-AUG-81 10:56 SYMBOL TABLE SEQ 0064

```
LPRSET= 104421
LP0   = 000000
LP1   = 000001
LP2   = 000002
LP3   = 000003
MAINT = 000010
MANT0   001510
MANT1   001522
MANT10  001630
MANT11  001642
MANT12  001654
MANT13  001666
MANT14  001700
MANT15  001712
MANT16  001724
MANT17  001736
MANT2   001534
MANT3   001546
MANT4   001560
MANT5   001572
MANT6   001604
MANT7   001616
MASK  = 000200
MASTEK  006351
MBADLN  006462
MCABLE  007464
MCHAR   007330
MCSRX   006301
MDATA   007722
MEPASS  006117
MERRPC  006427
MERRX   006326
MERR2   006157
MERR3   006226
MINVAL  007254
MLINE   007302
MLOCK   006252
MNEW    006354
MNTFLG  001424
MODE    001372
MPASS   007240
MPASSX  006315
MPFAIL  006054
MQUICK  007501
MR      006143
MREGAD  007204
MSENAB= 000040
MSPEED  007312
MTERM   007437
MTITLE  001000
MTSTN   006337
MVECTO  007162
MVECX   006307
MWHICH  007371
NEXT    001362
NUMLIN  007150
NUMTCR  007152
ODDPAR= 000200
ONESTO= 000000
OVRRUN= 040000
PAR     001370
PARAM = 104405
PARAM1  004166
PARER = 010000
PARERR  004242
PARITY= 000100
PARMD = 104415
PAR0    001506
PAR1    001520
PAR10   001626
PAR11   001640
PAR12   001652
PAR13   001664
PAR14   001676
PAR15   001710
PAR16   001722
PAR17   001734
PAR2    001532
PAR3    001544
PAR4    001556
PAR5    001570
PAR6    001602
PAR7    001614
PAWCH = 104416
PIRQ  = 177772
PIRQVE= 000240
POPR0 = 012600
POP1SP= 005726
POP2SP= 022626
PRIO    007154
PR0   = 000000
PR1   = 000040
PR2   = 000100
PR3   = 000140
PR4   = 000200
PR5   = 000240
PR6   = 000300
PR7   = 000340
PS    = 177776
PSW   = 177776
PUSHR0= 010046
PUSH1S= 005746
PUSH2S= 024646
PWRVEC= 000024
QUITS   010742
RCVON = 010000
RDATA   007140
RDONE = 000200
RECDAT  007156
REGIST  001402
RESREG  005274
RESTAR  002544
RESVEC= 000010
RES05 = 104410
RIE   = 000100
RING0 = 000001
RING1 = 000002
RING2 = 000004
RING3 = 000010
RL0   = 000000
RL1   = 000400
RL2   = 001000
RL3   = 001400
RUN     001412
R6    =%000006
R7    =%000007
SAVACT  001410
SAVLIN  001374
SAVNO   001416
SAVNUM  001415
SAVPC   001404
SAV05 = 104407
SCOP1 = 104401
SERV.G  005436
SET     006732
SETFLG= 104406
SET1    006764
SEVEN = 000020
SEVENS= 000060
SHIFT = 104420
SILOAL= 020000
SILOEN= 010000
SIX   = 000010
SIXS  = 000050
SPACNT  004577
SPEED   007146
SPIN    010706
STACK = 001120
STFLG   007130
STKLMT= 177774
STOP    001446
SV05    004334
SWR     001304
SWREG   000176
SW0   = 000001
SW00  = 000001
SW01  = 000002
SW02  = 000004
SW03  = 000010
SW04  = 000020
SW05  = 000040
SW06  = 000100
SW07  = 000200
SW08  = 000400
SW09  = 001000
SW1   = 000002
SW10  = 002000
SW11  = 004000
SW12  = 010000
SW13  = 020000
SW14  = 040000
SW15  = 100000
SW2   = 000004
SW3   = 000010
SW4   = 000020
SW5   = 000040
SW6   = 000100
SW7   = 000200
SW8   = 000400
SW9   = 001000
S110  = 001000
S1200 = 003400
S134  = 001400
S150  = 002000
S1800 = 004000
S19200= 007400
S2000 = 004400
S2400 = 005000
S300  = 002400
S3600 = 005400
S4800 = 006000
S50   = 000000
S600  = 003000
S7200 = 006400
S75   = 000400
S9600 = 007000
TABLE2  007026
TBITVE= 000014
TBUF    007160
TCR0  = 000001
TCR1  = 000002
TCR2  = 000004
TCR3  = 000010
TDATA   007136
TD0     001426
TD1     001430
TD2     001432
TD3     001434
TEIGHT  002106
TEMP    007660
TFIVE   002114
TIE   = 040000
TKVEC = 000060
TL0   = 000000
TL1   = 000400
TL2   = 001000
TL3   = 001400
TMTBL   002050
TPVEC = 000064
TRAPVE= 000034
TRDY  = 100000
TRTVEC= 000014
TR0     001436
TR1     001440
TR2     001442
TR3     001444
TSEVEN  002110
TSIX    002112
TST1    010124
TST2    010500
TWOSTO= 000040
TYPDAT  005262
TYPE  = 104402
TYPMSG  005152
T110    002054
T1200   002066
T134    002056
T150    002060
T1800   002070
T2000   002072
T2400   002074
T300    002062
T3600   002076
T4800   002100
T50     002050
T600    002064
T7200   002102
T75     002052
T9600   002104
VEC1    002272
WCHFLG  007126
WRDCNT  004574
WTBS.F  005250
XBEGIN  002450
XBX     005040
XCSR    002712
XERR    002734
XHEAD   006434
XMTCNT  001400
XMTLIN  001376
XPASS   002726
XSTATQ  006524
XTCR1   006754
XTSTN   005430
XVEC    002720
```

```
CVDZC-B MACY11 30G(1063)  10-AUG-81  11:15  PAGE 25-2
CVDZCB.P11     10-AUG-81 10:56          SYMBOL TABLE                                                    SEQ 0065

XX     = 160210          $DDW6   001220          $ILLUP  006046          $REGAD  001324          $VECT1  001170
YY     = 000500          $DDW7   001222          $INTAG  001301          $REG0   001326          $VECT2  001172
ZZ     = 000020          $DDW8   001224          $ITEMB  001260          $REG1   001330          $XOFF = 000023
$APTHD  001446           $DDW9   001226          $LF     001360          $REG2   001332          $XON  = 000021
$ATYC   003560           $DEVCT  001130          $LFLG   003777          $REG3   001334          $Y    = 000023
$ATY1   003534           $DEVM   001176          $LPADR  001252          $REG4   001336          $$GET4= 000000
$ATY3   003542           $DOAGN  002706          $LPERR  001254          $REG5   001340          .     = 013324
$ATY4   003552           $E      = 000002        $MADR1  001152          $RTNAD  002710          .ADVAN  004676
$AUTOB  001300           $ENDAD  002676          $MADR2  001156          $SAVR6  006052          .BUFSE  004766
$BASE   001174           $ENDCT  002662          $MADR3  001162          $SETUP= 000000          .CNVRT  004424
$BDADR  001266           $ENV    001140          $MADR4  001166          $SVPC = 013324          .CONVR  004420
$BDDAT  001272           $ENVM   001141          $MAIL   001120          $SWR  = 164000          .DCLAS  004644
$CDW1   001200           $EOP    002550          $MAMS1  001150          $SWREG  001142          .DELAY  004656
$CDW2   001202           $EOPCT  002654          $MAMS2  001154          $TESTN  001124          .DEVIC  004624
$CHARC  003530           $ERFLG  001247          $MAMS3  001160          $TIMES  001354          .ERRTA  011170
$CMTAG  001244           $ERMAX  001261          $MAMS4  001164          $TKB    001312          .INSTE  004106
$CM1  = 000006           $ERROR  005010          $MBADR  001450          $TKS    001310          .INSTR  004002
$CM2  = 000014           $ERRPC  001262          $MFLG   003776          $TMP0   001342          .INST1  004022
$CM3  = 000006           $ERRTB  001362          $MSGAD  001134          $TMP1   001344          .LPRSE  004726
$CM4  = 000005           $ERTTL  001256          $MSGLG  001136          $TMP2   001346          .MSG    004024
$CPUOP  001146           $ETABL  001140          $MSGTY  001120          $TMP3   001350          .PARAM  004126
$CRLF   001357           $ETEND  001244          $MTYP1  001151          $TMP4   001352          .PARMD  002742
$DDW0   001204           $FATAL  001122          $MTYP2  001155          $TN   = 000001          .PAWCH  006656
$DDW1   001206           $FFLG   004000          $MTYP3  001161          $TPB    001316          .RES05  004366
$DDW10  001230           $FILLC  001322          $MTYP4  001165          $TPFLG  001323          .SAV05  004326
$DDW11  001232           $FILLS  001321          $N    = 000001          $TPS    001314          .SCOP1  003136
$DDW12  001234           $FLIP = 177777          $NULL   001320          $TSTM   001452          .SETFL  006536
$DDW13  001236           $FREE = 000002          $PASS   001126          $TSTNM  001246          .SHIFT  004710
$DDW14  001240           $GDADR  001264          $PASTM  001454          $TYPE   003200          .START  002116
$DDW15  001242           $GDDAT  001270          $PWRAD  006042          $TYPEC  003412          .TRPSR  004602
$DDW2   001210           $GET42  002666          $PWRDN  005702          $TYPEX  003532          .TRPTA  001742
$DDW3   001212           $HD   = 000001          $PWRMG  006036          $UNIT   001132          .TYPE   003162
$DDW4   001214           $HIBTS  001446          $PWRUP  005754          $UNITM  001456          .$X   = 001446
$DDW5   001216           $ICNT   001250          $QUES   001356          $USWR   001144

. ABS.  013324     000        OVR   RO    ABS   GBL   D

 ERRORS DETECTED:  0

 CVDZCB,CVDZCB=CVDZCB
 RUN-TIME: 18 9 .7 SECONDS
 RUN-TIME RATIO: 196/28=6.8
 CORE USED:  37K  (73 PAGES)
```