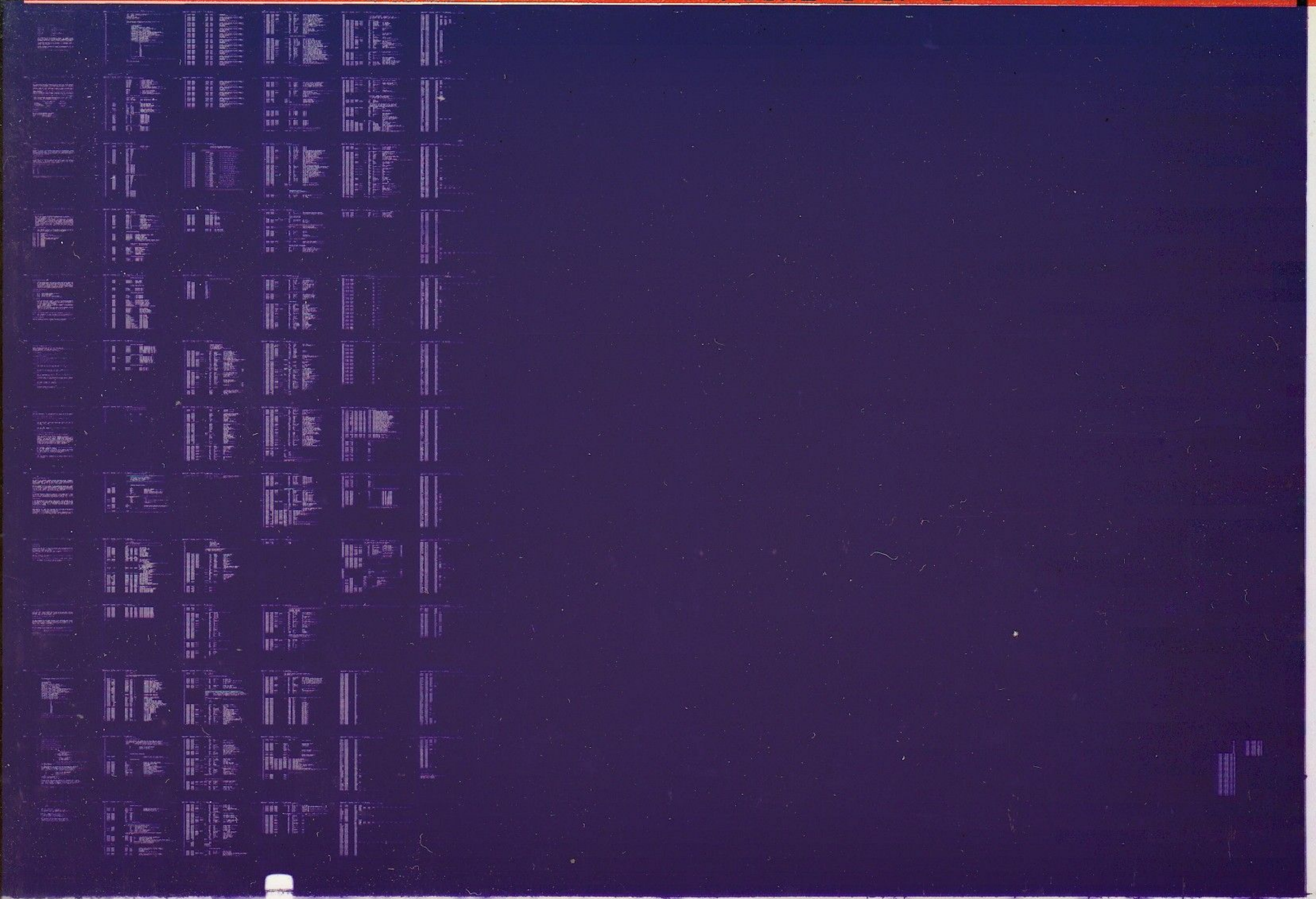
DZV11 CABLE/ECHO TST
CNDZCA0

AH-T440A-MC
FICHE 1 OF 1

digital



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        .REM    &
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IDENTIFICATION

PRODUCT CODE:	AC-T439A-MC
PRODUCT NAME:	CNDZCA0 DZV11 CABLE/ECHO TST
PRODUCT DATE:	DEC, 1982
MAINTAINER:	DIAGNOSTIC SERVICES/ISS
AUTHOR:	L.FLORYAN

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).

CNDZA TOGETHER WITH CNDZB WILL TEST ALL LOGICAL FUNCTIONS OF THE DZV11 INTERFACE MODULE.
CNDZC 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 CNDZA OR CNDZB 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.

END PASS CNDZC-A CSR: 160100 VEC: 300 PASSES: 000001 ERRORS: 000000

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 (CNDZA, AND CNDZB) CAN BE RUN AS STANDALONE DIAGNOSTICS OR IN EITHER OF THE APT MODES. CNDZC, 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, 1982.

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
```

```
                                                    N 1
                        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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 7820                    ;;GPA   PRGFRT  ^?MAINDEC-11-CNDZCA/<200>/DZV11 ECHO AND CABLE TESTS  ?,CNDZCA
 7821                    ;;GPA   .HEADER <MD-11-CNDZC-A>,1982
  (2)                    .TITLE  CNDZC-A
  (2)                    ;*COPYRIGHT (C) 1982
  (2)                    ;*DIGITAL EQUIPMENT CORP.
  (2)                    ;*MAYNARD, MASS. 01754
  (2)                    ;*
  (2)                    ;*
  (2)                    ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
  (2)                    ;*PACKAGE (MAINDEC-11-DZQAC-C3), JAN 19, 1977.
  (2)                    ;*
  (2)          000001    $TN=1
  (2)                            ;*STARTING PROCEDURE
  (2)                            ;*LOAD PROGRAM
  (2)                            ;*START THE PROGRAM AT LOC. 000200
  (2)                            ;*PROGRAM WILL TYPE DZV11 ECHO/CABLE TEST
  (2)                            ;*PROGRAM WILL TYPE  WHICH TEST- ECHO OR CABLE
  (2)                            ;*TYPE IN  E  OR  C   RESPECTIVELY
  (2)                            ;*PROGRAM WILL TYPE "VECTOR ADDRESS-"
  (2)                            ;*TYPE IN THE ADDRESS OF THE RECEIVER INTERRUPT VECTOR
  (2)                            ;*FOR THE DZV11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
  (2)                            ;*PROGRAM WILL TYPE "CONTROL REGISTER ADDRESS-"
  (2)                            ;*TYPE IN THE ADDRESS OF THE SYSTEM CONTROL REGISTER
  (2)                            ;*FOR THE DZV11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
  (2)                            ;*PROGRAM WILL TYPE "LINE NUMBER-"
  (2)                            ;*TYPE IN THE LINE NUMBER TO BE TESTED (IN OCTAL)
  (2)                            ;*,FOLLOWED BY <CARRIAGE RETURN>
  (2)                            ;*PROGRAM WILL TYPE "BAUD RATE-"
  (2)                            ;*TYPE IN THE BAUD RATE OF THE DZV11 TERMINAL
  (2)                            ;*,FOLLOWED BY <CARRIAGE RETURN>
  (2)                                  ;*THE FOLLOWING BAUD RATES ARE ACCEPTED IN DECIMAL
  (2)                            ;*              50
  (2)                            ;*              75
  (2)                            ;*              110
  (2)                            ;*              135     (ROUNDED OFF   134.5)
  (2)                            ;*              150
  (2)                            ;*              300
  (2)                            ;*              600
  (2)                            ;*              1200
  (2)                            ;*              1800
  (2)                            ;*              2000
  (2)                            ;*              2400
  (2)                            ;*              3600
  (2)                            ;*              4800
  (2)                            ;*              7200
  (2)                            ;*              9600
  (2)                            ;*ALL OTHERS ARE REJECTED
  (2)
  (2)                            ;*PROGRAM WILL TYPE "ECHO"  OR "CABLE TEST" TO INDICATE THAT TESTING HAS STARTED
  (2)
  (1)                    .REM    !
  (1)                    ;SWITCH REGISTER OPTIONS
  (1)                    ;----------------------
  (1)
  (1)
  (1)                    SW15=100000             ;=1,HALT ON ERROR
```

```
(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)                                 ;*****  THE FOLLOWING ODT START ADDRESS FOR SBC 11/21 IS ADDED
(2)         170000                  ODTST=  170000
(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
(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)                             ;*****  THE FOLLOWING BREAK VECTOR AND LINE CLOCK VECTOR ARE INCLUDED
(2)             000100          LKVEC=  100             ;;LINE CLOCK VECTOR
(2)             000140          BRKVEC= 140             ;;BREAK 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  005622                  $PWRDN                  ;POWER FAIL HANDLER
(1)     000026  000300                  300                     ;SERVICE AT PRIORITY LEVEL 6 VER:0
(1)     000030  004730                  $ERROR                  ;ERROR HANDLER
(1)     000032  000300                  300                     ;SERVICE AT PRIORITY LEVEL 6 VER:0
(1)     000034  004522                  .TRPSRV                 ;GENERAL HANDLER DISPATCH SERVICE
(1)     000036  000300                  300                     ;SERVICE AT PRIORITY LEVEL 6 VER:0
(2)                             .SBTTL  ACT11 HOOKS
(2)
(3)                             ;;*****************************************************************
(2)                             ;HOOKS REQUIRED BY ACT11
(2)             000040                  $SVPC=.                 ;SAVE PC
(2)             000046                  .=46
(2)     000046  002670                  $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  047103  055104  MTITLE: .ASCIZ  <200><12>/CNDZCA/<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
(4)                                          ;;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
(4)                                          ;;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                        $ETEND:
   (4)
```

```
(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)
(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)
(3)                                     ;;**************************************************************
(2)                                     ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
(3)                                     ;;**************************************************************
(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
(3)                                     ;;**************************************************************
(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
```

```
(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  004616                             .ADVANCE
(3)          104401                     SCOP1=TRAP+1            ;CALL TO LOOP ON CURRENT DATA HANDLER
(2)  001744  003130                             .SCOP1
(3)          104402                     TYPE=TRAP+2             ;CALL TO TELETYPE OUTPUT ROUTINE
(2)  001746  003154                             .TYPE
(3)          104403                     INSTR=TRAP+3            ;CALL TO ASCII STRING INPUT ROUTINE
(2)  001750  003722                             .INSTR
(3)          104404                     INSTER=TRAP+4           ;CALL TO INPUT ERROR HANDLER
(2)  001752  004026                             .INSTER
(3)          104405                     PARAM=TRAP+5            ;CALL TO NUMERICAL DATA INPUT ROUTINE
(2)  001754  004046                             .PARAM
(3)          104406                     SETFLG=TRAP+6           ;CALL TO  SET FLAG ROUTINE
(2)  001756  006456                             .SETFLG
(3)          104407                     SAV05=TRAP+7            ;CALL TO REGISTER SAVE ROUTINE
(2)  001760  004246                             .SAV05
(3)          104410                     RES05=TRAP+10           ;CALL TO REGISTER RESTORE ROUTINE
(2)  001762  004306                             .RES05
(3)          104411                     CONVRT=TRAP+11          ;CALL TO DATA OUTPUT ROUTINE
(2)  001764  004340                             .CONVRT
(3)          104412                     CNVRT=TRAP+12           ;CALL TO DATA OUTPUT ROUNTINE WITHOUT CR/LF.
(2)  001766  004344                             .CNVRT
(3)          104413                     DEVICE.CLR=TRAP+13              ;CALL TO ISSUE A DEVICE CLEAR
(2)  001770  004544                             .DEVICE.CLR
(3)          104414                     DELAY=TRAP+14           ;CALL TO DELAY FOR FAST CPU'S
(2)  001772  004576                             .DELAY
(3)          104415                     PARMD=TRAP+15           ;CONVERT DECIMAL STRING TO OCTAL
(2)  001774  002734                             .PARMD
(3)          104416                     PAWCH=TRAP+16           ;SET FLAG    ECHO OR  CABLE
(2)  001776  006576                             .PAWCH
(3)          104417                     DCLASM=TRAP+17          ;CLEAR DEVICE, SET MAINT. BIT IF I MODE
(2)  002000  004564                             .DCLASM
(3)          104420                     SHIFT=TRAP+20           ;CALL TO ROTATE LINE POINTER
(2)  002002  004630                             .SHIFT
(3)          104421                     LPRSET=TRAP+21          ;CALL TO SET UP LPR DEVICE REGISTER
(2)  002004  004646                             .LPRSET
(3)          104422                     BUFSET=TRAP+22          ;CALL TO ZERO BUFFER AREA
(2)  002006  004706                             .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  005622  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$:    MOV     #SWREG,SWR     ;SETUP SOFTWARE SWITCH REGISTER OTHERWISE
(1)  002170  004737  005404                CALL    GETSWR         ; GET INITIAL SWITCT SETTING    ;;GPA
(1)  002174  012737  000174  001306  2$:    MOV     #DISPREG,DISPLAY       ;SETUP DISPLAY REGISTER
(1)  002202  005037  007050                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     $TSTNM         ;CLEAR TEST NO. INDICATOR
(1)  002226  005037  007054                CLR     LAST           ;CLEAR LAST ERROR PC
(1)                                ;FOLLOWING TWO LINES DELETED TO BE SPECIFIC TO FALCON
(1)                                ;       CALL    FALCON         ; TEST FOR FALCON (KXT11)       ;;GPA
(1)                                ;       BEQ     1000$          ; BR IF NOT                     ;;GPA
(1)  002232  004737  013224                CALL    FALCINI        ; INIT FOR FALCON SYSTEM        ;;GPA
(1)  002236                        1000$:                                                         ;;GPA
(1)  002236  105737  001422                TSTB    INIFLG         ;HAS TITLE BEEN TYPED YET?
(1)  002242  001010                        BNE     VEC1           ;IF YES SKIP PRINTING AGAIN
(1)  002244  023727  000042  002670        CMP     @#42,#$ENDAD   ;RUNNING UNDER ACT?
(1)  002252  001402                        BEQ     3$             ;IF YES DON'T PRINT TITLE
(1)  002254  104402  001000                TYPE    ,MTITLE        ;PRINT TITLE
(1)  002260  105337  001422        3$:     DECB    INIFLG         ;INDICATE TITLE ALREADY TYPED
(1)  002264  012701  000300        VEC1:   MOV     #300,R1
(1)  002270  012702  000302                MOV     #302,R2
(1)  002274  010221                1$:     MOV     R2,(R1)+       ;RESTORE TRAPCATCHER
(1)  002276  005022                        CLR     (R2)+          ;IN FLOATING VECTOR AREA
(1)  002300  022122                        CMP     (R1)+,(R2)+    ;UPDATE THE POINTERS
(1)  002302  005737  013502                TST     KXTFLAG        ; IF FALCON...                  ;;GPA
(1)  002306  001403                        BEQ     1001$                                          ;;GPA
(1)  002310  020127  000400                CMP     R1,#400        ;...QUIT AT 400.                ;;GPA
(1)  002314  000402                        402                    ; SKIP NEXT                     ;;GPA
(1)  002316                        1001$:                                                         ;;GPA
(1)  002316  020127  001000                CMP     R1,#1000
(1)  002322  001364                        BNE     1$
(1)
(1)          002324                        GETCSR= .              ; POINTER FOR FALCON TWEAKER.   ;;GPA
(1)  002324  104403                        INSTR                  ;INPUT ADDRESS OF DEVICE CSR
(1)  002326  007124                        MREGAD                 ;MESSAGE "CONTROL REGISTER ADDRESS-"
(1)  002330  104405                        PARAM                  ;CONVERT STRING TO OCTAL
(1)  002332  160000                        160000                 ;LOW LIMIT
(1)  002334  163770                        163770                 ;HIGH LIMIT
```

```
(1)  002336  001174                          $BASE                   ;LOCATION TO BE FILLED
(1)  002340     007                          .BYTE   7               ;LSB MASK
(1)  002341     001                          .BYTE   1               ;NUMBER OF LOCATIONS
(1)
(1)          002342                          GETVEC= .               ; POINTER FOR FALCON TWEAKER.   ;;GPA
(1)  002342  104403                          INSTR                   ;INPUT ADDRESS OF DEVICE VECTOR
(1)  002344  007102                          MVECTOR                 ;MESSAGE "VECTOR ADDRESS-"
(1)  002346  104405                          PARAM                   ;CONVERT STRING TO OCTAL
(1)  002350  000300                          300                     ;LOW LIMIT
(1)  002352  000770                          770                     ;HIGH  LIMIT
(1)  002354  002040                          DZVRIV                  ;LOCATIONS TO BE FILLED
(1)  002356     003                          .BYTE   3               ;LSB MASK
(1)  002357     004                          .BYTE   4               ;NUMBER OF LOCATIONS
(1)  002360  004737  007704                  JSR     PC,DZVLEV       ;GO BUILD DEVICE POINTERS
(1)
(1)  002364  104403                          INSTR                   ;INPUT WHICH TEST YOU ARE RUNNING
(1)  002366  007311                          MWHICH                  ;ECHO OR CABLE
(1)  002370  104416                          PAWCH                   ;SET FLAG
(1)  002372  007046                          WCHFLG                  ;THIS FLAG
(1)  002374  104403                BAUD:     INSTR                   ;INPUT BAUD RATE
(1)  002376  007232                          MSPEED                  ;MESSAGE 'BAUD RATE-"
(1)  002400  104415                          PARMD                   ;CONVERT DECIMAL STRING TO OCTAL
(1)  002402  000062                          50.                     ;LOW LIMIT
(1)  002404  022600                          9600.                   ;HIGH LIMIT
(1)  002406  007064                          LINESP                  ;LOCATION TO BE FILLED
(1)  002410     000                .BYTE     0                       ;LSB MASK
(1)  002411     001                .BYTE     1                       ;NUMBER OF LOCATIONS
(1)  002412  104413                LINEX:    DEVICE.CLR              ;CLEAR DEVICE
(1)  002414  005037  007050                  CLR     STFLG           ;CLEAR PROGRAM START FLAG
(1)  002420  104403                          INSTR                   ;INPUT LINE NUMBER
(1)  002422  007222                          MLINE                   ;MESSAGE "LINE NUMBER-"
(1)  002424  104405                          PARAM                   ;CONVERT  STRING TO OCTAL
(1)  002426  000000                          0                       ;LOW LIMIT
(1)  002430  000003                          3                       ;HIGH LIMIT
(1)  002432  001374                          SAVLIN                  ;LOCATION TO BE FILLED
(1)  002434     000                .BYTE     0                       ;LSB MASK
(1)  002435     001                          .BYTE   1               ;NUMBER OF LOCATIONS
(1)  002436  004537  006652                  JSR     R5,SET
(1)
(1)  002442  106427  000200        XBEGIN:   MTPS    #MASK           ;LOCK OUT INTERRUPTS
(1)  002446  012706  001120                  MOV     #STACK,SP       ;SET UP PROCESSOR STACK
(1)  002452  005037  007052                  CLR     LOCKUP          ;CLEAR TIMEOUT
(1)  002456  005737  007046                  TST     WCHFLG          ;ECHO OR CABLE TEST ?
(1)  002462  001413                          BEQ     2$              ;ECHO
(1)  002464  012737  010420  001252          MOV     #TST2,$LPADR    ;CABLE TEST
(1)  002472  005737  007050                  TST     STFLG           ;ARE YOU LOOPING ?
(1)  002476  001017                          BNE     1$              ;YES
(1)  002500  005137  007050                  COM     STFLG           ;NO
(1)  002504  104402  007404                  TYPE    ,MCABLE         ;TYPE CABLE TEST
(1)  002510  000412                          BR      1$
(1)  002512  012737  010044  001252  2$:     MOV     #TST1,$LPADR    ;SET UP ECHO TEST
(1)  002520  005737  007050                  TST     STFLG           ;ARE YOU LOOPING ?
(1)  002524  001004                          BNE     1$              ;YES
(1)  002526  005137  007050                  COM     STFLG           ;NO
(1)  002532  104402  007357                  TYPE    ,MTERM          ;TYPE ECHO TEST
(1)  002536                        1$:
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CNDZC-A MACY11 30(1046)  14-DEC-82  10:09  PAGE 77-20
CNDZCA.P11    10-DEC-82 15:31          PROGRAM INITIALIZATION AND START UP.                                    SEQ 0034

   (1)  002536  000177  176510          RESTART:JMP     @$LPADR          ;START TESTING,THIS LOCATION IS ALSO
   (1)                                                                   ;USED BY THE POWER UP ROUTINE
  7822                                  ;;GPA   PRGEND  DZV11,<END PASS CNDZC-A  >,10.
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 7823                                           ;END OF PASS
  (2)                                           ;TYPE NAME OF TEST
  (2)                                           ;UPDATE PASS COUNT
  (2)                                           ;CHECK FOR EXIT TO ACT-11
  (2)                                           ;RESTART TEST
  (3)                                   .SBTTL  END OF PASS ROUTINE
  (3)
  (4)                                   ;;*****************************************************************
  (3)                                   ;*INCREMENT THE PASS NUMBER ($PASS)
  (3)                                   ;*IF THERES A MONITOR GO TO IT
  (3)                                   ;*IF THERE ISN'T JUMP TO XBEGIN
  (3)
  (3)  002542                           $EOP:
  (5)  002542  005037  001262                   CLR     $ERRPC          ;CLEAR LAST ERROR PC
  (5)  002546  105037  001247                   CLRB    $ERFLG          ;CLEAR ERROR FLAG
  (5)  002552  104402  006037                   TYPE    ,MEPASS         ;TYPE END PASS
  (5)  002556  104402  006221                   TYPE    ,MCSRX          ;TYPE CSR
  (5)  002562  104412  002704                   CNVRT   ,XCSR           ;SHOW IT
  (5)  002566  104402  006227                   TYPE    ,MVECX          ;TYPE VECTOR
  (5)  002572  104412  002712                   CNVRT   ,XVEC           ;SHOW IT
  (5)  002576  005237  001126                   INC     $PASS           ;RAISE PASS COUNT
  (5)  002602  104402  006235                   TYPE    ,MPASSX         ;TYPE PASSES
  (5)  002606  104412  002720                   CNVRT   ,XPASS          ;SHOW IT
  (5)  002612  005337  001126                   DEC     $PASS           ;RESTORE PASS COUNT
  (5)  002616  104402  006246                   TYPE    ,MERRX          ;TYPE ERRORS
  (5)  002622  104412  002726                   CNVRT   ,XERR           ;SHOW IT
  (3)  002626  005037  001354                   CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
  (3)  002632  005237  001126                   INC     $PASS           ;;INCREMENT THE PASS NUMBER
  (3)  002636  042737  100000  001126          BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
  (3)  002644  005327                           DEC     (PC)+           ;;LOOP?
  (3)  002646  000001           $EOPCT: .WORD   1
  (3)  002650  003013                           BGT     $DOAGN          ;;YES
  (3)  002652  012737                           MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
  (3)  002654  000001           $ENDCT: .WORD   1
  (3)  002656  002646                           $EOPCT
  (3)  002660  013700  000042   $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
  (3)  002664  001405                           BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
  (3)  002666  000005                           RESET                   ;;CLEAR THE WORLD
  (3)  002670  004710           $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
  (3)  002672  000240                           NOP                     ;;SAVE ROOM
  (3)  002674  000240                           NOP                     ;;FOR
  (3)  002676  000240                           NOP                     ;;ACT11
  (3)  002700                   $DOAGN:
  (3)  002700  000137                           JMP     @(PC)+          ;;RETURN
  (3)  002702  002442           $RTNAD: .WORD   XBEGIN
  (3)
  (3)
  (2)
  (2)  002704  000001           XCSR:   1
  (2)  002706     006     002           .BYTE   6,2
  (2)  002710  002010                   DZVCSR
  (2)  002712  000001           XVEC:   1
  (2)  002714     003     002           .BYTE   3,2
  (2)  002716  002040                   DZVRIV
  (2)  002720  000001           XPASS:  1
  (2)  002722     006     002           .BYTE   6,2
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(2)  002724  001126                          $PASS
(2)  002726  000001                  XERR:   1
(2)  002730     006      002                 .BYTE   6,2
(2)  002732  001256                          $ERTTL
(1)
(1)                                          ;CONVERT DECIMAL ASCII STRING TO OCTAL
(1)  002734  011605                  .PARMD: MOV     (SP),R5
(1)  002736  012537  003120                  MOV     (R5)+,6$
(1)  002742  012537  003122                  MOV     (R5)+,7$
(1)  002746  012537  003124                  MOV     (R5)+,8$
(1)  002752  112537  003126                  MOVB    (R5)+,9$
(1)  002756  112537  003127                  MOVB    (R5)+,10$
(1)  002762  010516                          MOV     R5,(SP)
(1)  002764  005005                  2$:     CLR     R5
(1)  002766  012704  007536                  MOV     #INBUF,R4
(1)  002772  122714  000015                  CMPB    #15,(R4)
(1)  002776  001424                          BEQ     3$
(1)  003000  121427  000060          1$:     CMPB    (R4),#'0
(1)  003004  002421                          BLT     3$
(1)  003006  121427  000071                  CMPB    (R4),#'9
(1)  003012  003016                          BGT     3$
(1)  003014  142714  000060                  BICB    #'0,(R4)
(1)  003020  005002                          CLR     R2
(1)  003022  152402                          BISB    (R4)+,R2
(1)  003024  060205                          ADD     R2,R5
(1)  003026  122714  000015                  CMPB    #15,(R4)
(1)  003032  001410                          BEQ     4$
(1)  003034  006305                          ASL     R5      ;X2
(1)  003036  010502                          MOV     R5,R2   ;SAVE X2
(1)  003040  006305                          ASL     R5      ;X4
(1)  003042  006305                          ASL     R5      ;X8
(1)  003044  060205                          ADD     R2,R5   ;TIMES 10
(1)  003046  000754                          BR      1$
(1)  003050  104404                  3$:     INSTER
(1)  003052  000744                          BR      2$
(1)
(1)                                          ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
(1)
(1)  003054  020537  003122          4$:     CMP     R5,7$
(1)  003060  101373                          BHI     3$
(1)  003062  020537  003120                  CMP     R5,6$
(1)  003066  103770                          BLO     3$
(1)  003070  133705  003126                  BITB    9$,R5
(1)  003074  001365                          BNE     3$
(1)
(1)                                          ;STORE NUMBER AT SPECIFIED ADDRESS
(1)
(1)  003076  013704  003124                  MOV     8$,R4
(1)  003102  010524                  5$:     MOV     R5,(R4)+
(1)  003104  062705  000002                  ADD     #2,R5
(1)  003110  105337  003127                  DECB    10$
(1)  003114  001372                          BNE     5$
(1)  003116  000002                          RTI
(1)  003120  000000                  6$:     0
(1)  003122  000000                  7$:     0
(1)  003124  000000                  8$:     0
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(1)  003126     000                    9$:     .BYTE 0
(1)  003127     000                    10$:    .BYTE 0
(1)
(1)                                    ;CHECK FOR FREEZE ON CURRENT DATA
(1)                                    ;--------------------------------
(1)
(1)  003130  032777  001000  176146  .SCOP1: BIT     #SW09,@SWR      ;IS SW09=1(SET)?
(1)  003136  001405                          BEQ     1$              ;BR IF NOT SET.
(1)  003140  005737  001364                  TST     LOCK            ;IS THERE A TIGHT LOOP SPECIFIED?
(1)  003144  001402                          BEQ     1$              ;IF NO, RETURN
(1)  003146  013716  001364                  MOV     LOCK,(SP)       ;IF YES, GOTO THE ADDRESS IN LOCK.
(1)  003152  000002                  1$:     RTI                     ;GO BACK.
(1)
(1)  003154  032777  010000  176122  .TYPE:  BIT     #SW12,@SWR      ;INHIBIT ALL PRINTOUT??
(1)  003162  001403                          BEQ     $TYPE           ;IF NOT, GO TYPE
(1)  003164  062716  000002                  ADD     #2,(SP)         ;SKIP OVER MESSAGE POINTER
(1)  003170  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)  003172  105737  001323          $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
(2)  003176  100002                          BPL     1$              ;;BR IF YES
(2)  003200  000000                          HALT                    ;;HALT HERE IF NO TERMINAL
(2)  003202  000430                          BR      3$              ;;LEAVE
(2)  003204  010046                  1$:     MOV     R0,-(SP)        ;;SAVE R0
(2)  003206  017600  000002                  MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
(2)  003212  122737  000001  001140          CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
(2)  003220  001011                          BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
(2)  003222  132737  000100  001141          BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
(2)  003230  001405                          BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
(2)  003232  010037  003242                  MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
(2)  003236  004737  003462                  JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
(2)  003242  000000                  61$:    .WORD   0               ;;MESSAGE ADDRESS
(2)  003244  132737  000040  001141  62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
(2)  003252  001003                          BNE     60$             ;;YES,SKIP TYPE OUT
(2)  003254  112046                  2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
(2)  003256  001005                          BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
(2)  003260  005726                          TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
(2)  003262  012600                  60$:    MOV     (SP)+,R0        ;;RESTORE R0
(2)  003264  062716  000002          3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
(2)  003270  000002                          RTI                     ;;RETURN
(2)  003272  122716  000011          4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
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(2)  003276  001430                          BEQ     8$
(2)  003300  122716  000200                 CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
(2)  003304  001006                          BNE     5$
(2)  003306  005726                          TST     (SP)+           ;;POP  <CR><LF> EQUIV
(2)  003310  104402                          TYPE                    ;;TYPE A CR AND LF
(2)  003312  001357                          $CRLF
(2)  003314  105037  003450                  CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
(2)  003320  000755                          BR      2$              ;;GET NEXT CHARACTER
(2)  003322  004737  003404          5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
(2)  003326  123726  001322          6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
(2)  003332  001350                          BNE     2$              ;;IF NO GO GET NEXT CHAR.
(2)  003334  013746  001320                  MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
(2)                                                                  ;;AND THE NULL CHAR.
(2)  003340  105366  000001          7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
(2)  003344  002770                          BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
(2)  003346  004737  003404                  JSR     PC,$TYPEC       ;;GO TYPE A NULL
(2)  003352  105337  003450                  DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
(2)  003356  000770                          BR      7$              ;;LOOP
(2)
(2)                                  ;HORIZONTAL TAB PROCESSOR
(2)
(2)  003360  112716  000040          8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
(2)  003364  004737  003404          9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
(2)  003370  132737  000007  003450          BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
(2)  003376  001372                          BNE     9$              ;;TAB STOP
(2)  003400  005726                          TST     (SP)+           ;;POP SPACE OFF STACK
(2)  003402  000724                          BR      2$              ;;GET NEXT CHARACTER
(2)  003404  105777  175704          $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
(2)  003410  100375                          BPL     $TYPEC
(2)  003412  116677  000002  175676          MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
(2)
(2)  003420  122766  000015  000002  CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
(2)  003426  001003                          BNE     1$              ;;BRANCH IF NO
(2)  003430  105037  003450                  CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
(2)  003434  000406                          BR      $TYPEX          ;;EXIT
(2)  003436  122766  000012  000002  1$:     CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
(2)  003444  001402                          BEQ     $TYPEX          ;;BRANCH IF YES
(2)  003446  105227                          INCB    (PC)+           ;;COUNT THE CHARACTER
(2)  003450  000000                  $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
(2)  003452  000207                  $TYPEX: RTS     PC
(2)
(2)
(2)
(2)                                  .SBTTL  APT COMMUNICATIONS ROUTINE
(2)
(3)                                  ;;**************************************************************************
(2)  003454  112737  000001  003720  $ATY1:  MOVB    #1,$FFLG        ;;TO REPORT FATAL ERROR
(2)  003462  112737  000001  003716  $ATY3:  MOVB    #1,$MFLG        ;;TO TYPE A MESSAGE
(2)  003470  000403                          BR      $ATYC
(2)  003472  112737  000001  003720  $ATY4:  MOVB    #1,$FFLG        ;;TO ONLY REPORT FATAL ERROR
(2)  003500                          $ATYC:
(4)  003500  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
(4)  003502  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
(2)  003504  105737  003716                  TSTB    $MFLG           ;;SHOULD TYPE A MESSAGE?
(2)  003510  001450                          BEQ     5$              ;;IF NOT:  BR
(2)  003512  122737  000001  001140          CMPB    #APTENV,$ENV    ;;OPERATING UNDER APT?
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(2)  003520  001031                        BNE     3$                ;;IF NOT:  BR
(2)  003522  132737  000100  001141        BITB    #APTSPOOL,$ENVM   ;;SHOULD SPOOL MESSAGES?
(2)  003530  001425                        BEQ     3$                ;;IF NOT:  BR
(2)  003532  017600  000004                MOV     @4(SP),R0         ;;GET MESSAGE ADDR.
(2)  003536  062766  000002  000004        ADD     #2,4(SP)                    ;;BUMP RETURN ADDR.
(2)  003544  005737  001120          1$:   TST     $MSGTYPE          ;;SEE IF DONE W/ LAST XMISSION?
(2)  003550  001375                        BNE     1$                ;;IF NOT:  WAIT
(2)  003552  010037  001134                MOV     R0,$MSGAD
(2)                                        ;;PUT ADDR IN MAILBOX
(2)  003556  105720                  2$:   TSTB    (R0)+             ;;FIND END OF MESSAGE
(2)  003560  001376                        BNE     2$
(2)  003562  163700  001134                SUB     $MSGAD,R0         ;;SUB START OF MESSAGE
(2)  003566  006200                        ASR     R0                ;;GET MESSAGE LNGTH IN WORDS
(2)  003570  010037  001136                MOV     R0,$MSGLGT        ;;PUT LENGTH IN MAILBOX
(2)  003574  012737  000004  001120        MOV     #4,$MSGTYPE       ;;TELL APT TO TAKE MSG.
(2)  003602  000413                        BR      5$
(2)  003604  017637  000004  003630  3$:   MOV     @4(SP),4$         ;;PUT MSG ADDR IN JSR LINKAGE
(2)  003612  062766  000002  000004        ADD     #2,4(SP)                    ;;BUMP RETURN ADDRESS
(4)  003620  013746  177776                MOV     177776,-(SP)      ;;PUSH 177776 ON STACK
(2)  003624  004737  003172                JSR     PC,$TYPE          ;;CALL TYPE MACRO
(2)  003630  000000                  4$:   .WORD   0
(2)  003632                          5$:
(2)  003632  105737  003720         10$:   TSTB    $FFLG             ;;SHOULD REPORT FATAL ERROR?
(2)  003636  001416                        BEQ     12$               ;;IF NOT:  BR
(2)  003640  005737  001140                TST     $ENV              ;;RUNNING UNDER APT?
(2)  003644  001413                        BEQ     12$               ;;IF NOT:  BR
(2)  003646  005737  001120         11$:   TST     $MSGTYPE          ;;FINISHED LAST MESSAGE?
(2)  003652  001375                        BNE     11$               ;;IF NOT:  WAIT
(2)  003654  017637  000004  001122        MOV     @4(SP),$FATAL     ;;GET ERROR #
(2)  003662  062766  000002  000004        ADD     #2,4(SP)                    ;;BUMP RETURN ADDR.
(2)  003670  005237  001120                INC     $MSGTYPE          ;;TELL APT TO TAKE ERROR
(2)  003674  105037  003720         12$:   CLRB    $FFLG             ;;CLEAR FATAL FLAG
(2)  003700  105037  003717                CLRB    $LFLG             ;;CLEAR LOG FLAG
(2)  003704  105037  003716                CLRB    $MFLG             ;;CLEAR MESSAGE FLAG
(4)  003710  012601                        MOV     (SP)+,R1          ;;POP STACK INTO R1
(4)  003712  012600                        MOV     (SP)+,R0          ;;POP STACK INTO R0
(2)  003714  000207                        RTS     PC                ;;RETURN
(2)  003716     000          $MFLG:  .BYTE  0                 ;;MESSG. FLAG
(2)  003717     000          $LFLG:  .BYTE  0
(2)                                        ;;LOG FLAG
(2)  003720     000          $FFLG:  .BYTE  0                 ;;FATAL FLAG
(2)          003722                     .EVEN
(2)          000200          APTSIZE=200
(2)          000001          APTENV=001
(2)          000100          APTSPOOL=100
(2)          000040          APTCSUP=040
(1)
(1)                                        ;STRING INPUT ROUTINE
(1)                                        ;--------------------
(1)
(1)  003722  010346          .INSTR: MOV     R3,-(SP)          ;SAVE R3 ON STACK
(1)  003724  010446                  MOV     R4,-(SP)          ;SAVE R4 ON STACK
(1)  003726  017637  000004  003744  MOV     @4(SP),.MSG       ;GET THE ADDRESS OF THE MESSAGE TO BE PRINTED
(1)  003734  062766  000002  000004  ADD     #2,4(SP)          ;POINT TO INSTRUCTION AFTER ADDRESS POINTER
(1)  003742  104402          .INST1: TYPE                      ;PRINT THE MESSAGE
(1)  003744  000000          .MSG:   0                         ;MESSAGE IS POINTED TO FROM HERE
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(1)  003746  012704  007536                MOV     #INBUF,R4       ;POINT R4 TO THE INPUT BUFFER
(1)  003752  012703  000007                MOV     #7,R3           ;SET THE MAXIMUM NUMBER OF CHARACTERS ALLOWED
(1)  003756  105777  175326          1$:   TSTB    @$TKS           ;HAS A CHARACTER BEEN RECEIVED?
(1)  003762  100375                        BPL     1$              ;IF NO, KEEP WAITING FOR IT
(1)  003764  117714  175322                MOVB    @$TKB,(R4)      ;IF YES, SAVE IT IN THE INPUT BUFFER
(1)  003770  142714  000200                BICB    #200,(R4)       ;KEEP ONLY THE 7-BIT ASCII INFORMATION
(1)  003774  122427  000015                CMPB    (R4)+,#15       ;IS THIS CHARACTER A LINE FEED?
(1)  004000  001417                        BEQ     INSTR2          ;IF SO, TERMINATE THE INPUT SEQUENCE
(1)  004002  105777  175306          2$:   TSTB    @$TPS           ;IF NOT, CHECK TO SEE IF THE CHARACTER CAN PRINT
(1)  004006  100375                        BPL     2$              ;IF WE CAN'T, WAIT UNTIL WE CAN
(1)  004010  017777  175276  175300       MOV     @$TKB,@$TPB     ;ECHO THE CHARACTER BACK
(1)  004016  005303                        DEC     R3              ;REDUCE THE NUMBER OF CHARACTERS RECEIVED
(1)  004020  001356                        BNE     1$              ;IF WE DON'T HAVE 7, GO GET SOME MORE
(1)  004022  012604                        MOV     (SP)+,R4        ;IF WE HAVE 7, RESTORE R4
(1)  004024  012603                        MOV     (SP)+,R3        ;RESTORE R3
(1)  004026  010346          .INSTE: MOV     R3,-(SP)        ;SAVE R3 ON THE STACK
(1)  004030  010446                        MOV     R4,-(SP)        ;SAVE R4 ON THE STACK
(1)  004032  104402  001356                TYPE    ,$QUES          ;PRINT A QUESTION MARK... WHAT'S GOING ON?
(1)  004036  000741                        BR      .INST1          ;GO PRINT THE MESSAGE AGAIN
(1)  004040  012604          INSTR2: MOV     (SP)+,R4        ;RESTORE R4
(1)  004042  012603                        MOV     (SP)+,R3        ;RESTORE R3
(1)  004044  000002                        RTI                     ;RETURN TO THE MAIN PROCEDURE
(1)
(1)                                        ;CONVERT ASCII STRING TO OCTAL
(1)                                        ;-----------------------------
(1)
(1)  004046  010546          .PARAM: MOV     R5,-(SP)        ;SAVE R5 ON THE STACK
(1)  004050  010446                        MOV     R4,-(SP)        ;SAVE R4 ON THE STACK
(1)  004052  016605  000004                MOV     4(SP),R5        ;GET THE SETUP INFORMATION POINTER
(1)  004056  012537  004236                MOV     (R5)+,LOLIM     ;SET THE LOW LIMIT FOR THE INPUT
(1)  004062  012537  004240                MOV     (R5)+,HILIM     ;SET THE HIGH LIMIT FOR THE INPUT
(1)  004066  012537  004242                MOV     (R5)+,DEVADR    ;SAVE THE ADDRESS WHERE THE RESULT WILL BE STORED
(1)  004072  112537  004244                MOVB    (R5)+,LOBITS    ;GET THE MASK OF THE INCORRECT BITS
(1)  004076  112537  004245                MOVB    (R5)+,ADRCNT    ;GET THE COUNT OF ITEMS TO BE STORED
(1)  004102  010566  000004                MOV     R5,4(SP)        ;POINT TO WHERE MAIN LINE PROGRAM WILL RESUME
(1)  004106  005005          PARAM1: CLR     R5              ;INITIALIZE THE ASCII TO OCTAL RESULT WORD
(1)  004110  012704  007536                MOV     #INBUF,R4       ;POINT TO THE INPUT BUFFER
(1)  004114  122714  000015                CMPB    #15,(R4)        ;IS THIS CHARACTER A CARRIAGE RETURN?
(1)  004120  001420                        BEQ     PARERR          ;IF SO, PRINT THE MESSAGE AGAIN
(1)  004122  121427  000060          1$:   CMPB    (R4),#60        ;IS THIS CHARACTER BELOW THE NUMERIC RANGE?
(1)  004126  002415                        BLT     PARERR          ;IF SO, GO PRINT THE MESSAGE AGAIN
(1)  004130  121427  000067                CMPB    (R4),#67        ;IS THIS CHARACTER ABOVE THE NUMERIC RANGE?
(1)  004134  003012                        BGT     PARERR          ;IF SO, GO PRINT THE MESSAGE AGAIN
(1)  004136  142714  000060                BICB    #60,(R4)        ;ISOLATE THE NUMBER THE CHARACTER REPRESENTS
(1)  004142  152405                        BISB    (R4)+,R5        ;CONCATENATE THESE BITS TO THE ALREADY EXISTING STRING
(1)  004144  122714  000015                CMPB    #15,(R4)        ;IS THE NEXT CHARACTER A CARRIAGE RETURN?
(1)  004150  001406                        BEQ     LIMITS          ;IF SO, GO SEE IF NUMBER IS WITHIN LIMITS
(1)  004152  006305                        ASL     R5              ;CLEAR BIT POSITION 0, MOVE EXISTING STRING TO LEFT
(1)  004154  006305                        ASL     R5              ;CLEAR POSITION 1, MOVE STRING TO LEFT AGAIN
(1)  004156  006305                        ASL     R5              ;MOVE THE STRING ONE MORE TIME TO MAKE ROOM FOR
(1)                                                                ;NEXT THREE BITS
(1)  004160  000760                        BR      1$              ;GO GET THE NEXT CHARACTER
(1)  004162  104404          PARERR: INSTER                  ;THERE WAS AN ERROR... GO PRINT MESSAGE AGAIN
(1)  004164  000750                        BR      PARAM1          ;TRY GETTING THE PARAMETERS AGAIN
(1)
(1)                                        ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
```

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(1)                                          ;-------------------------------------
(1)
(1)  004166  020537  004240          LIMITS: CMP     R5,HILIM        ;DOES RESULT EXCEED ITS MAXIMUM CORRECT VALUE?
(1)  004172  101373                          BHI     PARERR          ;IF YES, GO PRINT THE MESSAGE AGAIN
(1)  004174  020537  004236                  CMP     R5,LOLIM        ;IS THE RESULT LOWER THAN ALLOWED?
(1)  004200  103770                          BLO     PARERR          ;IF YES, GO PRINT THE MESSAGE AGAIN
(1)  004202  133705  004244                  BITB    LOBITS,R5       ;ARE ANY INCORRECT BITS SET IN THE RESULT?
(1)  004206  001365                          BNE     PARERR          ;IF SO, GO PRINT THE MESSAGE AGAIN
(1)
(1)                                          ;STORE NUMBER AT SPECIFIED ADDRESS
(1)
(1)  004210  013704  004242                  MOV     DEVADR,R4       ;POINT TO THE LOCATION WHERE THE RESULT WILL BE STORED
(1)  004214  010524                  1$:     MOV     R5,(R4)+        ;STORE THE RESULT
(1)  004216  062705  000002                  ADD     #2,R5           ;CALCULATE THE NEXT DATUM
(1)  004222  105337  004245                  DECB    ADRCNT          ;REDUCE COUNT OF STORED RESULTS. IS IT EXCEEDED?
(1)  004226  001372                          BNE     1$              ;IF NOT, GO STORE THE NEXT DATUM
(1)  004230  012604                          MOV     (SP)+,R4        ;RESTORE R4
(1)  004232  012605                          MOV     (SP)+,R5        ;RESTORE R5
(1)  004234  000002                          RTI                     ;RETURN TO THE MAIN PROGRAM
(1)
(1)  004236  000000                  LOLIM:  0                       ;LOWEST ACCEPTABLE VALUE
(1)  004240  000000                  HILIM:  0                       ;HIGHEST ACCEPTABLE
(1)  004242  000000                  DEVADR: 0                       ;LOCATION WHERE RESULT WILL BE STORED
(1)  004244     000                  LOBITS: .BYTE   0               ;INCORRECT BITS MASK
(1)  004245     000                  ADRCNT: .BYTE   0               ;COUNT OF ITEMS TO BE STORED
(1)
(1)                                          ;SAVE PC OF TEST THAT FAILED AND R0-R5
(1)                                          ;-------------------------------------
(1)
(1)  004246  016637  000004  001404  .SAV05: MOV     4(SP),SAVPC     ;SAVE R7 (PC)
(1)
(1)                                          ;SAVE R0-R5
(1)
(1)  004254  010537  001340          SV05:   MOV     R5,$REG5        ;SAVE R5
(1)  004260  010437  001336                  MOV     R4,$REG4        ;SAVE R4
(1)  004264  010337  001334                  MOV     R3,$REG3        ;SAVE R3
(1)  004270  010237  001332                  MOV     R2,$REG2        ;SAVE R2
(1)  004274  010137  001330                  MOV     R1,$REG1        ;SAVE R1
(1)  004300  010037  001326                  MOV     R0,$REG0        ;SAVE R0
(1)  004304  000002                          RTI                     ;LEAVE.
(1)
(1)                                          ;RESTORE R0-R5
(1)
(1)  004306  013700  001326          .RES05: MOV     $REG0,R0        ;RESTORE R0
(1)  004312  013701  001330                  MOV     $REG1,R1        ;RESTORE R1
(1)  004316  013702  001332                  MOV     $REG2,R2        ;RESTORE R2
(1)  004322  013703  001334                  MOV     $REG3,R3        ;RESTORE R3
(1)  004326  013704  001336                  MOV     $REG4,R4        ;RESTORE R4
(1)  004332  013705  001340                  MOV     $REG5,R5        ;RESTORE R5
(1)  004336  000002                          RTI                     ;LEAVE
(1)
(1)                                          ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
(1)                                          ;-------------------------------------------------------
(1)
(1)  004340  104402  001357          .CONVR: TYPE    ,$CRLF          ;PRINT A CARRIAGE RETURN
(1)  004344  010046                  .CNVRT: MOV     R0,-(SP)        ;SAVE R0
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(1)  004346  010146                        MOV     R1,-(SP)        ;SAVE R1
(1)  004350  010346                        MOV     R3,-(SP)        ;SAVE R3
(1)  004352  010446                        MOV     R4,-(SP)        ;SAVE R4
(1)  004354  010546                        MOV     R5,-(SP)        ;SAVE R5
(1)  004356  017601  000012                MOV     @12(SP),R1      ;PLACE THE ADDRESS OF THE ARGUMENTS IN R1
(1)  004362  062766  000002  000012        ADD     #2,12(SP)       ;POINT TO WHERE MAIN PROGRAM WILL RESUME
(1)  004370  012137  004514                MOV     (R1)+,WRDCNT    ;GET NUMBER OF WORDS TO BE PRINTED
(1)  004374  112105                1$:     MOVB    (R1)+,R5        ;GET THE NUMBER OF CHARACTERS TO BE PRINTED
(1)  004376  112100                        MOVB    (R1)+,R0        ;GET THE NUMBER OF SPACES TO PRINT
(1)  004400  013104                        MOV     @(R1)+,R4       ;COPY THE WORD TO BE CONVERTED
(1)  004402  110537  004516                MOVB    R5,CHRCNT       ;COPY THE CHARACTER COUNT
(1)  004406  010403                3$:     MOV     R4,R3           ;COPY THE ARGUMENT WORD AGAIN
(1)  004410  042703  177770                BIC     #^C<7>,R3       ;ISOLATE THREE BITS TO BE TREATED AS A CHARACTER
(1)  004414  062703  000060                ADD     #060,R3         ;MAKE AN ASCII CHARACTER OUT OF THEM
(1)  004420  110346                        MOVB    R3,-(SP)        ;SAVE THAT CHARACTER
(1)  004422  006004                        ROR     R4              ;MOVE THE NEXT THREE BITS INTO PLACE
(1)  004424  006204                        ASR     R4              ;MOVE THEM AGAIN
(1)  004426  006204                        ASR     R4              ;AND FINALLY A THIRD TIME
(1)  004430  005305                        DEC     R5              ;REDUCE CHARACTER COUNT.ARE ALL CHARACTERS
(1)                                                                ;BUILT?
(1)  004432  001365                        BNE     3$              ;IF NO, GO BUILD THE NEXT ONE.
(1)  004434  012703  007642                MOV     #MDATA,R3       ;NOW POINT TO WHERE NUMBER WILL BE PRINTED FROM
(1)  004440  112623                4$:     MOVB    (SP)+,(R3)+     ;STORE THE CHARACTER, STARTING WITH THE MOST
(1)  004442  105337  004516                DECB    CHRCNT          ;REDUCE COUNT. ARE ALL CHARACTERS TRANSFERRED?
(1)  004446  001374                        BNE     4$              ;IF NO, GO TRANSFER ANOTHER
(1)  004450  105700                        TSTB    R0              ;ARE ANY SPACES TO BE PRINTED?
(1)  004452  001404                        BEQ     6$              ;IF NO, DON'T SET UP ANY
(1)  004454  112723  000040        5$:     MOVB    #040,(R3)+      ;ADD A SPACE TO THE OUTPUT BUFFER
(1)  004460  105300                        DECB    R0              ;REDUCE THE COUNT. SHOULD WE PRINT MORE?
(1)  004462  001374                        BNE     5$              ;IF YES, GO ADD ANOTHER SPACE
(1)  004464  105013                6$:     CLRB    (R3)            ;TERMINATE THE OUTPUT BUFFER WITH A ZERO
(1)  004466  104402  007642                TYPE    ,MDATA          ;PRINT THE STRING WE JUST BUILT
(1)  004472  005337  004514                DEC     WRDCNT          ;REDUCE THE WORD COUNT. ARE ANY MORE WORDS LEFT?
(1)  004476  001336                        BNE     1$              ;IF YES, GO CONVERT THEM
(1)  004500  012605                        MOV     (SP)+,R5        ;RESTORE R5
(1)  004502  012604                        MOV     (SP)+,R4        ;RESTORE R4
(1)  004504  012603                        MOV     (SP)+,R3        ;RESTORE R3
(1)  004506  012601                        MOV     (SP)+,R1        ;RESTORE R1
(1)  004510  012600                        MOV     (SP)+,R0        ;RESTORE R0
(1)  004512  000002                        RTI                     ;RETURN TO THE MAIN PROGRAM
(1)  004514  000000                WRDCNT: 0
(1)  004516     000                CHRCNT: .BYTE                   ;NUMBER OF CHARACTERS TO PRINT
(1)  004517     000                SPACNT: .BYTE   0               ;NUMBER OF SPACES TO PRINT
(1)
(1)  004520  000000                BINWRD: 0
(1)
(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)  004522  010046                .TRPSR: MOV     R0,-(SP)        ;SAVE R0. USE R0 TO FIND TRAP ROUTINE
(1)  004524  016600  000002                MOV     2(SP),R0        ;GET TRAP ADDRESS
(1)  004530  005740                        TST     -(R0)           ;GET TRAP
(1)  004532  111000                        MOVB    (R0),R0         ;GET RIGHT BYTE OF TRAP(TRAP OFFSET)
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(1)  004534  006300                        ASL     R0                  ;POSITION OFFSET FOR TABLE INDEXING
(1)  004536  016000  001742                MOV     .TRPTAB(R0),R0      ;PLACE INDEXED ADDRESS OF TABLE IN R0
(1)  004542  000200                        RTS     R0                  ;TRANSFER TO THAT ADDRESS AND RESTORE OLD R0
(1)
(1)                                        ;DEVICE CLEAR ROUTINE
(1)                                        ;ISSUE A DEVICE CLEAR
(1)                                        ;--------------------
(1)  004544                          .DEVICE.CLR:
(1)  004544  052777  000020  175236        BIS     #DCLR,@DZVCSR       ;SET DCLR
(1)  004552  032777  000020  175230  1$:   BIT     #DCLR,@DZVCSR       ;DID IT CLEAR?
(1)  004560  001374                        BNE     1$                  ;BR IF NO
(1)  004562  000002                        RTI                         ;EXIT ROUTINE
(1)
(1)                                        ;ROUTINE TO HANDLE MAINTENANCE BIT SETTING WITH DEVICE CLEAR
(1)                                        ;-------------------------------------------------------
(1)  004564  104413                  .DCLASM:DEVICE.CLR                 ;ISSUE A DEVICE CLEAR
(1)  004566  153777  001424  175214        BISB    MNTFLG,@DZVCSR      ;LOAD THE MAINTENANCE BIT IF IT IS I MODE
(1)  004574  000002                        RTI                         ;RETURN TO CALLING ROUTINE
(1)
(1)  004576                          .DELAY:
(1)  004576  010046                        MOV     R0,-(SP)            ;SAVE R0
(1)  004600  013700  004614                MOV     DLYCNT,R0           ;SET COUNT
(1)  004604  005300                  1$:   DEC     R0                  ;DELAY
(1)  004606  001376                        BNE     1$                  ;
(1)  004610  012600                        MOV     (SP)+,R0            ;RESTORE R0
(1)  004612  000002                        RTI                         ;LEAVE ROUTINE
(1)  004614  000001                  DLYCNT: .WORD     1               ;PATCHABLE LOC FOR MORE TIME
(1)
(1)                                        ;ADVANCE TO NEXT TEST HANDLER
(1)                                        ;---------------------------
(1)
(1)  004616  013716  001362          .ADVANCE:MOV    NEXT,(SP)           ;CRUNCH STACK WITH ADDRESS OF NEXT TEST
(1)  004622  005037  001364                CLR     LOCK                ;RESET TIGHT LOOP ADDRESS
(1)  004626  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)  004630  106302                  .SHIFT: ASLB    R2                  ;POINT TO THE NEXT LINE
(1)  004632  032702  000020                BIT     #BIT4,R2            ;HAVE WE PASSED ALL LINE POINTERS?
(1)  004636  001402                        BEQ     1$                  ;IF NOT, RETURN TO THE TEST
(1)  004640  022626                        POP2SP                      ;REMOVE THE TRAP CALL FROM THE STACK
(1)  004642  104400                        ADVANCE                     ;GO TO THE NEXT TEST
(1)  004644  000002                  1$:   RTI                         ;RETURN TO THE PRESENT TEST
(1)
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(1)                                             ;LINE PARAMETER REGISTER SETUP ROUTINE
(1)
(1)  004646  010146                 .LPRSET:MOV     R1,-(SP)        ;SAVE CONTENTS OF R1
(1)  004650  010246                         MOV     R2,-(SP)        ;SAVE CONTENTS OF R2
(1)  004652  013701  001370                 MOV     PAR,R1          ;MOVE DEFAULT PARAM. INTO R1
(1)  004656  012702  000001                 MOV     #1,R2   ;INIT. FOR LINE 1
(1)  004662  010177  175132         1$:     MOV     R1,@DZVLPR      ;LOAD PARAM. REGISTER
(1)  004666  005201                         INC     R1              ;SET R1 FOR NEXT LINE
(1)  004670  106302                         ASLB    R2              ;SET R2 FOR NEXT LINE
(1)  004672  032702  000020                 BIT     #BIT4,R2        ;ALL LINES DONE?
(1)  004676  001771                         BEQ     1$              ;IF NO LOAD NEXT LINE
(1)  004700  012602                         MOV     (SP)+,R2        ;RELOAD R2
(1)  004702  012601                         MOV     (SP)+,R1        ;RELOAD R1
(1)  004704  000002                         RTI                     ;RETURN
(1)
(1)                                             ;ROUTINE TO ZERO DATA BUFFER
(1)
(1)  004706  010046                 .BUFSET:MOV     R0,-(SP)        ;SAVE CONTENTS OF R0
(1)  004710  012700  001426                 MOV     #TDO,R0         ;SET R0 TO TOP OF BUFFER
(1)  004714  005020                 1$:     CLR     (R0)+           ;CLEAR BUFFER LOCATION
(1)  004716  022700  001446                 CMP     #STOP,R0        ;IS BUFFER ALL CLEARED
(1)  004722  001374                         BNE     1$              ;IF NOT CLEAR NEXT LOCATION
(1)  004724  012600                         MOV     (SP)+,R0        ;RELOAD R0
(1)  004726  000002                         RTI                     ;RETURN
(1)
(1)                                             ;ERROR HANDLER
(1)                                             ;-------------
(1)
(1)  004730  004737  005356         $ERROR: JSR     PC,SERV.G       ;FIND OUT IF <^G> WAS HIT
(1)  004734  032777  010000  174342         BIT     #SW12,@SWR      ;BELL ON ERROR?
(1)  004742  001406                         BEQ     XBX             ;BR IF NO BELL
(1)  004744  105777  174344                 TSTB    @$TPS           ;TTY READY.
(1)  004750  100003                         BPL     XBX             ;DON'T WAIT IF TTY NOT READY.
(1)  004752  112777  000207  174336         MOVB    #207,@$TPB      ;PUSH A BELL AT THE TTY.
(1)  004760  032777  020000  174316 XBX:    BIT     #SW13,@SWR      ;DELETE ERROR PRINT OUT?
(1)  004766  001113                         BNE     HALTS           ;BR IF NO PRINT OUT WANTED.
(1)  004770  021637  001262                 CMP     (SP),$ERRPC     ;WAS THIS ERROR FOUND LAST TIME?
(1)  004774  001404                         BEQ     1$              ;BR IF YES
(1)  004776  011637  001262                 MOV     (SP),$ERRPC     ;RECORD BEING HERE
(1)  005002  105037  001247                 CLRB    $ERFLG          ;PREPARE HEADER
(1)  005006  104407                 1$:     SAV05                   ;SAVE ALL PROC REGISTERS
(1)  005010  011605                         MOV     (SP),R5         ;GET THE PC OF ERROR
(1)  005012  162705  000002                 SUB     #2,R5           ;GET ADDRESS OF TRAP CALL
(1)  005016  011504                         MOV     (R5),R4         ;GET ERROR INSTRUCTION
(1)  005020  110437  001260                 MOVB    R4,$ITEMB       ;COPY TEST NUMBER FOR APT HANDLING
(1)  005024  006304                         ASL     R4              ;MULT BY TWO
(1)  005026  061504                         ADD     (R5),R4         ;DOUBLE IT
(1)  005030  006304                         ASL     R4              ;MULT AGAIN
(1)  005032  042704  177001                 BIC     #177001,R4      ;CLEAR JUNK
(1)  005036  062704  011110                 ADD     #.ERRTAB,R4     ;GET POINTER
(1)  005042  012437  005166                 MOV     (R4)+,ERRMSG    ;GET ERROR MESSAGE
(1)  005046  012437  005200                 MOV     (R4)+,DATAHD    ;GET DATA HEADRER
(1)  005052  011437  005212                 MOV     (R4),DATABP     ;GET DATA TABLE
(1)  005056  105737  001247                 TSTB    $ERFLG          ;TYPE HEADER
(1)  005062  001403                         BEQ     TYPMSG          ;BR IF YES
(1)  005064  005737  005212                 TST     DATABP          ;DOES DATA TABLE EXIST?
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(1)  005070  001044                      BNE     TYPDAT          ;BR IF YES.
(1)  005072  104402  001357      TYPMSG: TYPE    ,$CRLF          ;TYPE A CARRIAGE RETURN
(1)  005076  104402  001357              TYPE    ,$CRLF          ;AND TYPE ANOTHER
(1)  005102  005737  001364              TST     LOCK
(1)  005106  001402                      BEQ     1$
(1)  005110  104402  006271              TYPE    ,MASTEK
(1)  005114  104402  006257      1$:     TYPE    ,MTSTN
(1)  005120  104412  005350              CNVRT   ,XTSTN          ;SHOW IT
(1)  005124  104402  006347              TYPE    ,MERRPC         ;TYPE PC.
(1)  005130  104412  005342              CNVRT   ,ERTABO         ;SHOW IT
(1)  005134  104402  006221              TYPE    ,MCSRX
(1)  005140  104412  002704              CNVRT   ,XCSR
(1)  005144  104402  001357              TYPE    ,$CRLF          ;GIVE A CR/LF
(1)  005150  112737  177777  001247      MOVB    #-1,$ERFLG      ;NO MORE HEADER UNLESS NO DATA TABLE.
(1)  005156  005737  005166              TST     ERRMSG          ;IS THERE AN ERROR MESSAGE?
(1)  005162  001402                      BEQ     WTBS.FM         ;BR IF NO.
(1)  005164  104402                      TYPE                    ;TYPE
(1)  005166  000000      ERRMSG: 0                               ;    ERROR MESSAGE
(1)  005170              WTBS.FM:                                ;
(1)  005170  005737  005200              TST     DATAHD          ;DATA HEADER?
(1)  005174  001402                      BEQ     TYPDAT          ;BR IF NO
(1)  005176  104402                      TYPE                    ;TYPE
(1)  005200  000000      DATAHD: 0                               ;    DATA HEADER
(1)  005202  005737  005212      TYPDAT: TST     DATABP          ;DATA TABLE?
(1)  005206  001402                      BEQ     RESREG          ;BR IF NO.
(1)  005210  104411                      CONVRT                  ;SHOW
(1)  005212  000000      DATABP: 0                               ;    DATA TABLE
(1)  005214  104410      RESREG: RES05                           ;RESTORE PROC REGISTERS
(1)  005216  122737  000001  001140  HALTS:  CMPB    #APTENV,$ENV    ;IS APT RUNNING?
(1)  005224  001007                      BNE     15$             ;SKIP APT CALL IF NOT
(1)  005226  113737  001260  005240      MOVB    $ITEMB,5$       ;COPY ERROR NUMBER
(1)  005234  004737  003472              JSR     PC,$ATY4        ;CALL APT SERVICE
(1)  005240  000000              5$:     .WORD   0               ;ERROR NUMBER STUCK HERE
(1)  005242  000777              10$:    BR      10$             ;LOCK UP HERE
(1)  005244  022737  002670  000042  15$:     CMP     #$ENDAD,@#42    ;CHECK TO SEE IF IN ACT-11 MODE
(1)  005252  001403                      BEQ     20$             ;IF SO, HANDLE ACCORDINGLY
(1)  005254  005777  174024              TST     @SWR            ;HALT ON ERROR?
(1)  005260  100004                      BPL     EXITER          ;BR IF NO HALT ON ERROR
(1)  005262  016677  000002  174016  20$:     MOV     2(SP),@DISPLAY  ;SHOW ERROR PC IN DATA DISPLAY
(1)  005270  000000                      HALT                    ;HALT
(1)  005272  005237  001256      EXITER: INC     $ERTTL          ;UPDATE ERROR COUNT
(1)  005276  004737  005356              JSR     PC,SERV.G       ;FIND OUT IF ^G WAS TYPED
(1)  005302  032777  000400  173774      BIT     #SW08,@SWR      ;GOTO TOP OF TEST?
(1)  005310  001007                      BNE     1$              ;BR IF YES
(1)  005312  032777  002000  173764      BIT     #SW10,@SWR      ;GOTO NEXT TEST?
(1)  005320  001407                      BEQ     2$              ;BR IF NO
(1)  005322  013737  001362  001252      MOV     NEXT,$LPADR     ;SET FOR NEXT TEST
(1)  005330  012706  001120      1$:     MOV     #STACK,SP       ;RESET SP
(1)  005334  000177  173712              JMP     @$LPADR         ;GOTO SPECIFIED TEST
(1)  005340  000002              2$:     RTI                     ;RETURN
(1)  005342  000001      ERTABO: 1
(1)  005344     006     002              .BYTE   6,2
(1)  005346  001404                      SAVPC
(1)  005350  000001      XTSTN:  1
(1)  005352     002     002              .BYTE   2,2
(1)  005354  001246                      $TSTNM
```

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(1)  005356  017746  173730          SERV.G: MOV     @$TKB,-(SP)     ;OTHERWISE, GET THE LAST CHARACTER TYPED
(1)  005362  042716  000200                  BIC     #BIT7,(SP)      ;STRIP PARITY(EIGHTH) BIT
(1)  005366  122726  000007                  CMPB    #7,(SP)+        ;IS IT ^G?
(1)  005372  001076                          BNE     6$              ;IF NOT, IGNORE INPUT
(1)  005374  032777  004000  173706          BIT     #4000,@$TKS     ;RX BUSY?
(1)  005402  001365                          BNE     SERV.G          ;BR IF YES
(1)          005404                  GETSWR= .                                               ;;GPA
(1)  005404  017737  173674  005612          MOV     @SWR,90$        ;SAVE (SWR).
(1)  005412  104402  005572          1$:     TYPE    ,89$            ;TYPE HEADER FOR OLD SWITCH REGISTER
(1)  005416  104412  005604                  CNVRT   ,88$            ;TYPE THE NUMBER ITSELF
(1)  005422  104402  005614                  TYPE    ,91$            ;AFTER HAVING CONVERTED IT TO ASCII
(1)  005426  105037  005620                  CLRB    92$             ;CLEAR SWR CHANGE FLAG
(1)  005432  005077  173646                  CLR     @SWR            ;CLEAR THE SOFTWARE SWITCH REGISTER
(1)  005436  105777  173646          3$:     TSTB    @$TKS           ;WAIT FOR DONE.
(1)  005442  100375                          BPL     3$              ;CONTINUE WAITING FOR IT
(1)  005444  017746  173642                  MOV     @$TKB,-(SP)     ;PUT THE CHARACTER ON THE STACK
(1)  005450  042716  000200                  BIC     #BIT7,(SP)      ;STRIP PARITY BIT
(1)  005454  122726  000015                  CMPB    #15,(SP)+       ;IS IT THE CARRIAGE RETURN CHAR?
(1)  005460  001433                          BEQ     4$              ;IF SO, GO PRINT CRLF
(1)  005462  105777  173626          2$:     TSTB    @$TPS           ;IS THE OUTPUT BUFFER AVAILABLE
(1)  005466  100375                          BPL     2$              ;IF NOT, WAIT FOR IT TO BE READY
(1)  005470  105237  005620                  INCB    92$             ;INDICATE THAT THE SWR WAS CHANGED
(1)  005474  014677  173616                  MOV     -(SP),@$TPB     ;PLACE THE CHARACTER THERE(ECHO BACK)
(1)  005500  000241                          CLC                     ;GET READY TO ROTATE
(1)  005502  006177  173576                  ROL     @SWR            ;MOVE THE EXISTING BITS OVER
(1)  005506  006177  173572                  ROL     @SWR            ;TO MAKE ROOM FOR THE INCOMING
(1)  005512  006177  173566                  ROL     @SWR            ;THREE BITS FROM THIS CHARACTER
(1)  005516  103735                          BCS     1$              ;ERROR
(1)  005520  022627  000060                  CMP     (SP)+,#60       ;IS IT LOWER THAN 0?
(1)  005524  002732                          BLT     1$              ;IF SO, GO ASK AGAIN
(1)  005526  026627  177776  000067          CMP     -2(SP),#67      ;IS IT HIGHER THAN 7?
(1)  005534  003326                          BGT     1$              ;IF SO, GO ASK AGAIN
(1)  005536  042746  177770                  BIC     #^C<7>,-(SP)    ;ISOLATE INFORMATION BITS
(1)  005542  052677  173536                  BIS     (SP)+,@SWR      ;ADD THEM TO THE SWITCH REGISTER
(1)  005546  000733                          BR      3$              ;GO CHECK FOR THE NEXT CHARACTER
(1)  005550  105737  005620          4$:     TSTB    92$             ;HAS THE SWR BEEN CHANGED?
(1)  005554  001003                          BNE     5$              ;IF YES GO TYPE CRLF
(1)  005556  013777  005612  173520          MOV     90$,@SWR        ;IF NOT RESTORE SWR
(1)  005564  104402  001357          5$:     TYPE    ,$CRLF          ;TYPE A CARRIAGE RETURN AND LINE FEED
(1)  005570  000207                  6$:     RTS     PC              ;RETURN TO CALLING PROCEDURE
(1)
(1)  005572  020200  051450  051127  89$:     .ASCIZ  <200>? (SWR)=/?
(1)  005600  036451  000057
(1)                                  .EVEN
(1)  005604  000001                  88$:     1
(1)  005606     006     000                  .BYTE   6,0
(1)  005610  005612                          90$
(1)  005612  000000                  90$:     .WORD   0
(1)  005614  036457  000057          91$:     .ASCIZ  ?/=/?
(1)  005620     000                  92$:     .BYTE   0
(1)          005622                  .EVEN
(2)                                  .SBTTL  POWER DOWN AND UP ROUTINES
(2)
(3)                                  ;;******************************************************************
(2)                                  ;POWER DOWN ROUTINE
(2)  005622  012737  005766  000024  $PWRDN: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
```

```
(2)  005630  012737  000300  000026          MOV     #PR6,@#PWRVEC+2 ;;PRIO:6
(4)  005636  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
(4)  005640  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
(4)  005642  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
(4)  005644  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
(4)  005646  010446                          MOV     R4,-(SP)        ;;PUSH R4 ON STACK
(4)  005650  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
(4)  005652  017746  173426                  MOV     @SWR,-(SP)      ;;PUSH @SWR ON STACK
(2)  005656  010637  005772                  MOV     SP,$SAVR6       ;;SAVE SP
(2)  005662  012737  005674  000024          MOV     #$PWRUP,@#PWRVEC ;;SET UP VECTOR
(2)  005670  000000                          HALT
(2)  005672  000776                          BR      .-2             ;;HANG UP
(2:
(3)                                     ;;**************************************************************************
(2)                                     ;POWER UP ROUTINE
(2)  005674  012737  005766  000024  $PWRUP: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST DOWN
(2)  005702  013706  005772                  MOV     $SAVR6,SP       ;;GET SP
(2)  005706  005037  005772                  CLR     $SAVR6          ;;WAIT LOOP FOR THE TTY
(2)  005712  005237  005772          1$:     INC     $SAVR6          ;;WAIT FOR THE INC
(2)  005716  001375                          BNE     1$              ;;OF  WORD
(4)  005720  012677  173360                  MOV     (SP)+,@SWR      ;;POP STACK INTO @SWR
(4)  005724  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
(4)  005726  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
(4)  005730  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
(4)  005732  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
(4)  005734  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
(4)  005736  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
(2)  005740  012737  005622  000024          MOV     #$PWRDN,@#PWRVEC ;;SET UP THE POWER DOWN VECTOR
(2)  005746  012737  000300  000026          MOV     #PR6,@#PWRVEC+2 ;;PRIO:6
(2)  005754  104402                          TYPE                    ;;REPORT THE POWER FAILURE
(2)  005756  005774                  $PWRMG: .WORD   MPFAIL          ;;POWER FAIL MESSAGE POINTER
(2)  005760  012716                          MOV     (PC)+,(SP)      ;;RESTART AT RESTART
(2)  005762  002536                  $PWRAD: .WORD   RESTART         ;;RESTART ADDRESS
(2)  005764  000002                          RTI
(2)  005766  000000                  $ILLUP: HALT                    ;;THE POWER UP SEQUENCE WAS STARTED
(2)  005770  000776                          BR      .-2             ;; BEFORE THE POWER DOWN WAS COMPLETE
(2)  005772  000000                  $SAVR6: 0                       ;;PUT THE SP HERE
(2)  005774  050200  051127  043040  MPFAIL: .ASCIZ   <200>/PWR FAILED. RESTART AT LAST TEST /
(2)  006037     200  047105  020104  MEPASS: .ASCIZ   <200>/END PASS CNDZC-A  /
(2)  006063     200  052522  047116  MR:     .ASCIZ   <200>/RUNNING   /
(2)  006077     200  051120  043517  MERR2:  .ASCIZ   <200>/PROGRAM INDICATES NO DEVICES PRESENT./
(2)  006146  044600  051516  043125  MERR3:  .ASCIZ   <200>/INSUFFICIENT DATA!/
(2)  006172  046200  041517  020113  MLOCK:  .ASCIZ   <200>/LOCK ON SELECTED TEST/
(2)  006221     103  051123  020072  MCSRX:  .ASCIZ    /CSR: /
(2)  006227     126  041505  020072  MVECX:  .ASCIZ   /VEC: /
(2)  006235     120  051501  042523  MPASSX: .ASCIZ   /PASSES: /
(2)  006246  051105  047522  051522  MERRX:  .ASCIZ   /ERRORS: /
(2)  006257     124  051505  020124  MTSTN:  .ASCIZ   /TEST NO: /
(2)  006271     052  000040          MASTEK: .ASCIZ   /* /
(2)  006274  051600  052105  051440  MNEW:   .ASCIZ   <200>/SET SWITCH REG TO DZV11'S DESIRED ACTIVE./
(2)  006347     120  035103  000040  MERRPC: .ASCIZ   /PC: /
(2)  006354  046600  050101  047440  XHEAD:  .ASCIZ   <200>/MAP OF DZV11 STATUS/<200>
(2)  006402  044600  046114  043505  MBADLN: .ASCIZ   <200>/ILLEGAL ENTRY IN STAGGERED MODE/<200>
(2)                                     .EVEN
(2)  006444  000002                  XSTATQ: 2
(2)  006446     006     003                  .BYTE   6,3
```

```
    (2)  006450  001344                          $TMP1
    (2)  006452     006      002                 .BYTE   6,2
    (2)  006454  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)  006456  017605  000000          .SETFLG:MOV     @(SP),R5        ;PICK UP ADDRESS OF TAG
(2)  006462  042737  000040  007536            BIC     #40,INBUF       ;STRIP LOWER CASE
(2)  006470  122737  000105  007536            CMPB    #'E,INBUF       ;IS IT EXTERNAL LOOP BACK ?
(2)  006476  001005                            BNE     4$              ;NO
(2)  006500  013715  006570                    MOV     1$,(R5)         ;YES STORE INFO
(2)  006504  105037  001424                    CLRB    MNTFLG          ;SET MAINT BIT =0
(2)  006510  000422                            BR      7$              ;GET OUT
(2)  006512  122737  000111  007536  4$:       CMPB    #'I,INBUF       ;IS IT INTERNAL LOOP BACK ?
(2)  006520  001006                            BNE     5$              ;NO
(2)  006522  013715  006572                    MOV     2$,(R5)         ;YES STORE INFO
(2)  006526  112737  000010  001424            MOVB    #MAINT,MNTFLG   ;SET UP THE MAINTENANCE FLAG LOADER
(2)  006534  000410                            BR      7$              ;GET OUT
(2)  006536  122737  000123  007536  5$:       CMPB    #'S,INBUF       ;IS IT STAGGERED LOOP BACK ?
(2)  006544  001007                            BNE     6$              ;WHAT ?
(2)  006546  013715  006574                    MOV     3$,(R5)         ;YES STORE INFO
(2)  006552  105037  001424                    CLRB    MNTFLG          ;ZERO BITS
(2)  006556  062716  000002          7$:       ADD     #2,(SP)         ;POP AROUND
(2)  006562  000002                            RTI
(2)  006564  104404                  6$:       INSTER                  ;RETRY
(2)  006566  000733                            BR      .SETFLG         ;DITTO
(2)  006570  000200                  1$:       .WORD   200             ;EXTERNAL =  E
(2)  006572  000000                  2$:       .WORD   0               ;INTERNAL = I
(2)  006574  100000                  3$:       .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)  006576  017605  000000          .PAWCH: MOV     @(SP),R5
(2)  006602  142737  000040  007536            BICB    #40,INBUF       ;SET FOR LOWER CASE INPUT
(2)  006610  122737  000105  007536            CMPB    #'E,INBUF       ;IS IT "E" ?
(2)  006616  001002                            BNE     1$
(2)  006620  105015                            CLRB    (R5)            ;000
(2)  006622  000406                            BR      2$
(2)  006624  122737  000103  007536  1$:       CMPB    #'C,INBUF       ;IS IT "C" ?
(2)  006632  001005                            BNE     3$
(2)  006634  112715  177777                    MOVB    #-1,(R5)        ;3177
(2)  006640  062716  000002          2$:       ADD     #2,(SP)
(2)  006644  000002                            RTI
(2)  006646  104404                  3$:       INSTER                  ;RETRY
(2)  006650  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)  006652  013737  001374  007070  SET:    MOV     SAVLIN,NUMLIN   ;SAVE SAVLIN
(2)  006660  013700  001374                   MOV     SAVLIN,R0       ;COPY THE LINE NUMBER FOR LOOP CONTROL
(2)  006664  005037  007072                   CLR     NUMTCR          ;SET A DEFAULT OF LINE 0 OR NO LINES
(2)  006670  012702  000001                   MOV     #1,R2           ;SET A BIT POINTER TO THE FIRST LINE
(2)  006674  005300                    XTCR1: DEC     R0              ;REDUCE THE INDICATOR.IS IT MINUS YET?
(2)  006676  100402                           BMI     SET1            ;IF SO, R2 POINTS TO THE RIGHT LINE
(2)  006700  006302                           ASL     R2              ;IF NOT, MOVE THE POINTER TO THE NEXT LINE
(2)  006702  000774                           BR      XTCR1           ;GO SEE IF THIS LINE IS THE ONE
(2)  006704  012701  006746            SET1:  MOV     #TABLE2,R1
(2)  006710  010237  007072                   MOV     R2,NUMTCR       ;COPY THE CORRECT BIT POINTER
(2)  006714  022137  007064            1$:    CMP     (R1)+,LINESP
(2)  006720  001407                           BEQ     2$
(2)  006722  005721                           TST     (R1)+           ;IS IT THE END OF TABLE?
(2)  006724  001373                           BNE     1$              ;NO
(2)  006726  104402  007174                   TYPE    ,MINVAL         ;INVALID BAUD RATE,BEGIN AGAIN
(2)  006732  012705  002374                   MOV     #BAUD,R5        ;JUMP TO BAUD THRU R5
(2)  006736  000402                           BR      3$
(2)  006740  011137  007066            2$:    MOV     (R1),SPEED      ;SET UP BAUD RATE
(2)  006744  000205                    3$:    RTS     R5
(2)
(2)
(2)
(2)                                     ;THE FOLLOWING IS A TABLE OF LEGAL BAUD RATES (8 BITS/CHAR)
(2)  006746  000062            TABLE2: .WORD   50.             ;50 BAUD
(2)  006750  010070                    .WORD   10070           ;
(2)  006752  000113                    .WORD   75.             ;75 BAUD
(2)  006754  010470                    .WORD   10470           ;
(2)  006756  000156                    .WORD   110.            ;110 BAUD
(2)  006760  011070                    .WORD   11070           ;TWO STOP BITS
(2)  006762  000207                    .WORD   135.            ;134.5 BAUD
(2)  006764  011470                    .WORD   11470           ;TWO STOP BITS
(2)  006766  000226                    .WORD   150.            ;150 BAUD
(2)  006770  012070                    .WORD   12070           ;TWO STOP BITS
(2)  006772  000454                    .WORD   300.            ;300 BAUD
(2)  006774  012430                    .WORD   12430           ;ONE STOP BIT
(2)  006776  001130                    .WORD   600.            ;600 BAUD
(2)  007000  013030                    .WORD   13030           ;ONE STOP BIT
(2)  007002  002260                    .WORD   1200.           ;1200 BAUD
(2)  007004  013430                    .WORD   13430           ;ONE STOP BIT
(2)  007006  003410                    .WORD   1800.           ;1800 BAUD
(2)  007010  014030                    .WORD   14030           ;ONE STOP BIT
(2)  007012  003720                    .WORD   2000.           ;2000 BAUD
(2)  007014  014430                    .WORD   14430           ;ONE STOP BIT
(2)  007016  004540                    .WORD   2400.           ;2400 BAUD
(2)  007020  015030                    .WORD   15030           ;ONE STOP BIT
(2)  007022  007020                    .WORD   3600.           ;3600 BAUD
(2)  007024  015430                    .WORD   15430           ;ONE STOP BIT
(2)  007026  011300                    .WORD   4800.           ;4800 BAUD
(2)  007030  016030                    .WORD   16030           ;ONE STOP BIT
(2)  007032  016040                    .WORD   7200.           ;7200 BAUD
(2)  007034  016430                    .WORD   16430           ;ONE STOP BIT
(2)  007036  022600                    .WORD   9600.           ;9600 BAUD
```

```
(2)  007040  017030                          .WORD   17030          ;
(2)  007042  177777  000000                  .WORD   -1,0           ;TABLE TERMINATOR
(2)
(2)
(2)  007046  000000                  WCHFLG:0                       ;ECHO OR CABLE FLAG
(2)  007050  000000                  STFLG: 0                       ;PROGRAM START FLAG
(2)  007052  000000                  LOCKUP: 0                      ;TIMEOUT FLAG
(2)  007054  000000                  LAST:   0                      ;LAST ERROR PC
(2)  007056  000000                  TDATA:  0
(2)  007060  000000                  RDATA:  0
(2)  007062  000000                  BYTCNT: 0
(2)  007064  000156                  LINESP: 110.                   ;DEFAULT BAUD RATE
(2)  007066  011070                  SPEED:  11070                  ;DEFAULT 110 BAUD, 8 BITS/CHAR,
(2)                                                                 ;FDX, 2 STOP BITS
(2)  007070  000000                  NUMLIN: 0
(2)
(2)  007072  000001                  NUMTCR: 1                      ;DEFAULT VALUE,TCR BIT 0
(2)  007074  000200                  PRIO:   200                    ;DEFAULT DEVICE PRIORITY
(2)                                                                 ;MASK OUT INTERRUPTS
(2)  007076  000000                  RECDAT: 0
(2)  007100  000000                  TBUF:   0
(2)  007102  053200  041505  047524  MVECTO: .ASCIZ  <200>/VECTOR ADDRESS- /
(2)  007124  041600  047117  051124  MREGAD: .ASCIZ  <200>/CONTROL REGISTER ADDRESS- /
(2)  007160  050200  051501  020123  MPASS:  .ASCIZ  <200>/PASS DONE./
(2)  007174  044600  053116  046101  MINVAL: .ASCIZ  <200>/INVALID BAUD RATE - /
(2)  007222  046200  047111  035105  MLINE:  .ASCIZ  <200>/LINE: /
(2)  007232  041200  052501  020104  MSPEED: .ASCIZ  <200>/BAUD RATE - /
(2)  007250  052200  050131  020105  MCHAR:  .ASCIZ  <200>/TYPE A CHAR. ON DZV11 TERMINAL /
(2)  007311     200  044127  041511  MWHICH: .ASCIZ  <200>/WHICH TEST ? ECHO OR CABLE (E OR C) /
(2)  007357     200  042524  046522  MTERM:  .ASCIZ  <200>/TERMINAL ECHO TEST /
(2)  007404  041600  041101  042514  MCABLE: .ASCIZ  <200>/CABLE TEST /
(2)  007421     377  177415  005377  MQUICK: .ASCII  <377><15><377><377><12><377><377>
(2)  007430  044124  020105  052521          .ASCII  /THE QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK 0123456789/
(2)  007525     377  177415  005377          .ASCII  <377><15><377><377><12><377><377><377><0>
(2)                                  .EVEN
(2)
(2)                                          ;BUFFERS FOR INPUT-OUTPUT
(2)
(2)  007536  000000                  INBUF:  0
(2)          007600                  .=.+40
(2)  007600  000000                  TEMP:   0
(2)          007642                  .=.+40
(2)  007642  000000                  MDATA:  0
(2)          007704                  .=.+40
(2)
```

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(1)
(1)  007704  013700  002040          ;THIS UTILITY SETS UP CSR'S,SETS UP VECTORS.
(1)  007710  062700  000002  DZVLEV: MOV     DZVRIV,R0       ;PLACE THE BASE VECTOR ADDRESS IN R0
(1)  007714  010037  002042          ADD     #2,R0           ;CALCULATE THE RECEIVER INTERRUPT STATUS ADDR.
(1)  007720  062700  000002          MOV     R0,DZVRIS       ;STORE IT HERE
(1)  007724  010037  002044          ADD     #2,R0           ;CALCULATE THE TRANSMITTER INTERRUPT VECTOR
(1)  007730  062700  000002          MOV     R0,DZVTIV       ;STORE IT HERE
(1)  007734  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)  007740  013700  001174          MOV     $BASE,R0        ;COPY THE ADDRESS BEING LOADED
(1)  007744  010037  002010          MOV     R0,DZVCSR       ;XXX0
(1)  007750  005200                  INC     R0
(1)  007752  010037  002012          MOV     R0,HDZVCSR      ;XXX1
(1)  007756  005200                  INC     R0
(1)  007760  010037  002014          MOV     R0,DZVRBUF      ;XXX2
(1)  007764  010037  002020          MOV     R0,DZVLPR       ;XXX2
(1)  007770  005200                  INC     R0
(1)  007772  010037  002016          MOV     R0,HDZVRBUF     ;XXX3
(1)  007776  010037  002022          MOV     R0,HDZVLPR      ;XXX3
(1)  010002  005200                  INC     R0
(1)  010004  010037  002024          MOV     R0,DZVTCR       ;XXX4
(1)  010010  005200                  INC     R0
(1)  010012  010037  002026          MOV     R0,HDZVTCR      ;XXX5
(1)  010016  005200                  INC     R0
(1)  010020  010037  002030          MOV     R0,DZVMSR       ;XXX6
(1)  010024  010037  002034          MOV     R0,DZVTDR       ;XXX6
(1)  010030  005200                  INC     R0
(1)  010032  010037  002032          MOV     R0,HDZVMSR      ;XXX7
(1)  010036  010037  002036          MOV     R0,HDZVTDR      ;XXX7
(1)  010042  000207                  RTS     PC
```

```
 7827
 7828                                          ;**********   ECHO TEST   **********
 7829                                          ;*THIS TEST WILL ACCEPT 1 CHARACTER AT A TIME
 7830                                          ;*(IN INTERRUPT MODE) AND TRANSMIT THAT SAME CHARACTER,
 7831                                          ;*ONE LINE AT A TIME, ANY LINE 0 THRU 7 (OCTAL)
 7832
 7833  010044  104413                 TST1:   DEVICE.CLR              ;CLEAR DZV11
 7834  010046  012737  000001  001246         MOV     #1,$TSTNM
 7835  010054  013777  007072  171742         MOV     NUMTCR,@DZVTCR  ;SET TCR BIT
 7836  010062  013737  007070  001370         MOV     NUMLIN,PAR      ;SET PARAMETERS
 7837  010070  053737  007066  001370         BIS     SPEED,PAR       ;SET BAUD RATE
 7838  010076  013777  001370  171714         MOV     PAR,@DZVLPR     ;LOAD PARAM.
 7839  010104  012777  000040  171676         MOV     #MSENAB,@DZVCSR ;SET SCANN ENABLE
 7840  010112  005004                         CLR     R4
 7841  010114  012705  007421          4$:    MOV     #MQUICK,R5      ;SET MESSAGE BUFFER
 7842  010120  005777  171664          3$:    TST     @DZVCSR         ;TRDY?
 7843  010124  100404                         BMI     2$              ;BR IF YES
 7844  010126  104414                         DELAY                   ;WAIT
 7845  010130  005304                         DEC     R4              ;
 7846  010132  001372                         BNE     3$              ;
 7847  010134  104003                         ERROR   3               ;NO TRDY SET! WHY?
 7848  010136  005004                 2$:     CLR     R4              ;RESET COUNTER TO 0
 7849  010140  112577  171670                 MOVB    (R5)+,@DZVTDR   ;LOAD CHAR
 7850  010144  001365                         BNE     3$              ;
 7851  010146  004737  005356                 JSR     PC,SERV.G       ;<^G>?
 7852  010152  122777  000377  171124         CMPB    #377,@SWR       ;SWR SET TO 377?
 7853  010160  001755                         BEQ     4$              ;IF YES LOOP ON QUICK MESSAGE
 7854  010162  012737  002542  001362         MOV     #$EOP,NEXT
 7855  010170  012777  010244  171642         MOV     #INTSVC,@DZVRIV ;SET UP INTERRUPT SERVICE
 7856  010176  012777  000200  171636         MOV     #MASK,@DZVRIS   ;AND LEVEL
 7857  010204  106427  000000                 MTPS    #CLEAR          ;ALLOW INTERRUPTS
 7858  010210  012777  000140  171572         MOV     #RIE!MSENAB,@DZVCSR ;SET RECEIVER INTERRUPT ENABLE
 7859  010216  104402  007250                 TYPE    ,MCHAR          ;TYPE "ANY CHARACTER"
 7860  010222  105777  171062          1$:    TSTB    @$TKS           ;IF SOMBODY HITS A KEY- GET NEW LINE #
 7861  010226  100375                         BPL     1$              ;LOOP HERE
 7862  010230  106427  000200                 MTPS    #MASK           ;MASK FURTHER INTERRUPTS
 7863  010234  004737  005356                 JSR     PC,SERV.G       ;MAKE SURE IT WASN'T <^G>
 7864  010240  000137  002412                 JMP     LINEX           ;
 7865
 7866
 7867                                          ;THE FOLLOWING IS THE RECEIVER INTERRUPT SVC ROUTINE
 7868  010244  105777  171540         INTSVC: TSTB    @DZVCSR         ;TEST REC. FLAG
 7869  010250  100401                         BMI     .+4
 7870  010252  104004                         ERROR   4               ;ERROR - INTERRUPT NOT CAUSED BY FLAG
 7871  010254  017737  171534  007076         MOV     @DZVRBUF,RECDAT
 7872  010262  100401                         BMI     .+4
 7873  010264  104023                         ERROR   23              ;NON- VALID CHARACTER
 7874  010266  032737  020000  007076         BIT     #BIT13,RECDAT   ;CHECK FOR FRAMING ERROR
 7875  010274  001401                         BEQ     .+4             ;BR IF NO ERROR
 7876  010276  104025                         ERROR   25              ;EITHER SOMBODY HIT THE
 7877                                                                  ;"BREAK KEY" OR YOU HAVE AN ERROR!
 7878  010300  113737  007076  007100         MOVB    RECDAT,TBUF     ;MOVE CHARACTER TO OUTPUT AREA
 7879  010306  113737  007076  007536         MOVB    RECDAT,INBUF    ;MOVE CHARACTER TO CHECK FOR ^C
 7880  010314  042737  177600  007536         BIC     #^C<177>,INBUF  ;STRIP JUNK PLUS PARITY
 7881  010322  042737  176377  007076         BIC     #176377,RECDAT  ;SAVE ONLY LINE  NUMBER
 7882  010330  000337  007076                 SWAB    RECDAT
```

```
 7883  010334  023737  001374  007076          CMP     SAVLIN,RECDAT   ;DOES THE LINE # COMPARE?
 7884  010342  001407                          BEQ     2$
 7885  010344  013737  007076  001374          MOV     RECDAT,SAVLIN   ;ADJUST LINE NO. FOR ERROR
 7886  010352  104015                          ERROR   15              ;*WRONG LINE NUMBER
 7887  010354  013737  007070  001374          MOV     NUMLIN,SAVLIN   ;CORRECT LINE NO. INDICATOR
 7888  010362  123727  007536  000003  2$:     CMPB    INBUF,#3                ;IS IT A ^C ?
 7889  010370  001004                          BNE     1$              ;NO
 7890  010372  104413                          DEVICE.CLR
 7891  010374  012716  002542                  MOV     #$EOP,(SP)      ;CRUNCH STACK
 7892  010400  000002                          RTI
 7893  010402  005777  171402          1$:     TST     @DZVCSR         ;TRDY SET
 7894  010406  100375                          BPL     1$              ;IF NOT THEN WAIT
 7895  010410  113777  007100  171416          MOVB    TBUF,@DZVTDR    ;TRANSMIT THE CHARACTER
 7896  010416  000002                          RTI
 7897
 7898
 7899                                          ;**********   CABLE TEST   **********
 7900                                          ;*THIS TEST TRANSMITS A BINARY COUNT PATTERN
 7901                                          ;*VIA INTERRUPT MODE TO THE RECEIVER
 7902                                          ;*...THE LINE UNDER TEST MUST BE TERMINATED WITH THE TEST CONNECTOR
 7903
 7904  010420  106427  000200          TST2:   MTPS    #MASK           ;DISABLE INTERRUPTS
 7905  010424  012737  000002  001246          MOV     #2,$TSTNM
 7906  010432  012737  002542  001362          MOV     #$EOP,NEXT
 7907  010440  104413                          DEVICE.CLR              ;
 7908                                          ;*TEST TO VERIFY THAT SETTING DTR FOR A GIVEN LINE
 7909                                          ;*WILL BRING UP "CO" AND "RING" FOR THE SAME LINE
 7910                                          ;*JUMPERS W1,W2,W3 AND W4 MUST BE INSTALLED ON THE
 7911                                          ;*INTERFACE MODULE OTHERWISE AN ERROR REPORT WILL RESULT.
 7912  010442  012737  010450  001364          MOV     #1$,LOCK        ;LOOP
 7913  010450  113777  007072  171350  1$:     MOVB    NUMTCR,@HDZVTCR ;SET DTR
 7914  010456  005005                          CLR     R5              ;
 7915  010460  153705  007072                  BISB    NUMTCR,R5       ;BUILD EXPECTED
 7916  010464  000305                          SWAB    R5              ;PUT IN HIGH BYTE
 7917  010466  153705  007072                  BISB    NUMTCR,R5       ;
 7918  010472  104414                          DELAY                   ;WAIT FOR CABLE DELAY
 7919  010474  017704  171330                  MOV     @DZVMSR,R4      ;READY MODEM BITS
 7920  010500  020504                          CMP     R5,R4           ;ARE THEY OK?
 7921  010502  001401                          BEQ     2$              ;BR IF YES
 7922  010504  104022                          ERROR   22              ;IS THE TEST CONNECTOR ON?
 7923                                                                  ;HAS RIGHT LINE BEEN SELECTED?
 7924                                                                  ;IF SO- YOU HAVE A PROBLEM!
 7925                                                                  ;MODEM BITS NOT RIGHT
 7926  010506  104401                  2$:     SCOP1                   ;LOOP
 7927  010510  104413                  3$:     DEVICE.CLR              ;INIT DZV11
 7928  010512  005037  001364                  CLR     LOCK            ;CLEAR SCOP1 LOCK ADDRESS
 7929  010516  013737  007066  001370          MOV     SPEED,PAR       ;SET LINE SPEED
 7930  010524  053737  007070  001370          BIS     NUMLIN,PAR      ;SELECT LINE #
 7931  010532  052737  010000  001370          BIS     #RCVON,PAR      ;ENABLE THE RECEIVER FOR THIS LINE
 7932  010540  013777  001370  171252          MOV     PAR,@DZVLPR     ;SET THE PARAMETERS AND TURN ON RECEIVER
 7933  010546  012777  010670  171264          MOV     #INTREC,@DZVRIV ;SET UP INTR SERVICE
 7934  010554  012777  000200  171260          MOV     #MASK,@DZVRIS   ;SET UP LEVEL
 7935  010562  012777  011060  171254          MOV     #INTRAN,@DZVTIV ;SET UP INTR SERVICE
 7936  010570  012777  000200  171250          MOV     #MASK,@DZVTIS   ;SET UP LEVEL
 7937  010576  012777  040140  171204          MOV     #TIE!RIE!MSENAB,@DZVCSR ;SET TRANSMITTER INTERRUPT ENABLE
 7938  010604  105037  001425                  CLRB    DONFLG          ;INIT INTERRUPT DONE INDICATOR
```

```
 7939  010610  005001                          CLR     R1              ;RX DATA POINTER- SET TO 0
 7940  010612  005002                          CLR     R2              ;TX DATA POINTER- SET TO 0
 7941  010614  013777  007072  171202          MOV     NUMTCR,@DZVTCR  ;SET UP TCR BIT
 7942  010622  106427  000000                  MTPS    #CLEAR          ;ALLOW INTERRUPTS
 7943
 7944                                          ;YOU RETURN HERE AFTER EVERY RECEIVER INTERRUPT
 7945  010626  105777  170456          SPIN:   TSTB    @$TKS           ;IF SOMEBODY HITS A KEY- GET A NEW LINE #
 7946  010632  100004                          BPL     1$              ;BRANCH IF NO KEY HIT
 7947  010634  004737  005356                  JSR     PC,SERV.G       ;MAKE SURE IT WASN'T <^G>
 7948  010640  000137  002412                  JMP     LINEX           ;SW02=1
 7949  010644  105737  001425          1$:     TSTB    DONFLG          ;ARE ALL RECEIVER INTER. DONE
 7950  010650  001004                          BNE     QUITS           ;IF YES GET OUT OF TIMING LOOP
 7951  010652  005237  007052                  INC     LOCKUP          ;INC TIMEOUT FLAG
 7952  010656  001363                          BNE     SPIN            ;IF NOT 0  RETURN SPINNING
 7953  010660  104011                          ERROR   11              ;*RECEIVER FAILED TO INTERRUPT  CHECK CABLE/TERMINATOR
 7954  010662  104413          QUITS:  DEVICE.CLR
 7955  010664  000137  002542                  JMP     $EOP            ;CALL FOR END OF PASS
 7956  010670  005037  007052          INTREC: CLR     LOCKUP           CLEAR TIMEOUT FLAG
 7957  010674  105777  171110                  TSTB    @DZVCSR         ;TEST REC DONE
 7958  010700  100401                          BMI     .+4             ;YES
 7959  010702  104004                          ERROR   4               ;*FALSE INTERRUPT
 7960  010704  017737  171104  007076          MOV     @DZVRBUF,RECDAT ;SAVE WORD
 7961  010712  100401                          BMI     .+4
 7962  010714  104023                          ERROR   23              ;*NON VALID CHARACTER
 7963  010716  032737  040000  007076          BIT     #BIT14,RECDAT   ;DATA OVERRUN ?
 7964  010724  001401                          BEQ     .+4             ;NO
 7965  010726  104024                          ERROR   24              ;*YES
 7966  010730  032737  020000  007076          BIT     #BIT13,RECDAT   ;FRAMING ERROR ?
 7967  010736  001401                          BEQ     .+4             ;NO
 7968  010740  104025                          ERROR   25              ;*YES
 7969  010742  032737  010000  007076          BIT     #BIT12,RECDAT   ;PARITY ERROR ?
 7970  010750  001401                          BEQ     .+4             ;NO
 7971  010752  104026                          ERROR   26              ;*YES
 7972  010754  110105                          MOVB    R1,R5           ;SET EXPECTED
 7973  010756  113704  007076                  MOVB    RECDAT,R4       ;GET FOUND
 7974  010762  042704  177400                  BIC     #^C<377>,R4     ;CLEAR HIGH BYTE
 7975  010766  042705  177400                  BIC     #^C<377>,R5     ;CLEAR HIGH BYTE
 7976  010772  020504                          CMP     R5,R4           ;OK?
 7977  010774  001401                          BEQ     .+4
 7978  010776  104005                          ERROR   5               ;DATA ERROR
 7979  011000  042737  176377  007076          BIC     #176377,RECDAT  ;SAVE ONLY LINE NUMBER
 7980  011006  000337  007076                  SWAB    RECDAT
 7981  011012  023737  001374  007076          CMP     SAVLIN,RECDAT   ;DOES THE LINE # COMPARE ?
 7982  011020  001407                          BEQ     4$              ;YES
 7983  011022  013737  007076  001374          MOV     RECDAT,SAVLIN   ;ADJUST LINE NO. FOR ERROR
 7984  011030  104015                          ERROR   15              ;*WRONG LINE #
 7985  011032  013737  007070  001374          MOV     NUMLIN,SAVLIN   ;READJUST LINE NO.
 7986  011040  120127  000377          4$:     CMPB    R1,#377         ;LAST CHARACTER ?
 7987  011044  001003                          BNE     1$              ;NO
 7988  011046  105237  001425                  INCB    DONFLG          ;INDICATE RECEIVER INTERRUPTS DONE
 7989  011052  000401                          BR      2$
 7990  011054  105201                  1$:     INCB    R1              ;UPDATE EXPECTED DATA
 7991  011056  000002                  2$:     RTI
 7992
 7993  011060  005777  170724          INTRAN: TST     @DZVCSR ;TEST TRANSMIT FLAG
 7994  011064  100401                          BMI     .+4
```

```
 7995  011066  104003                          ERROR   3               ;*FALSE INTERRUPT
 7996  011070  110277  170740                  MOVB    R2,@DZVTDR      ;TRANSMIT A CHARACTER
 7997  011074  105202                          INCB    R2              ;UPDATE TX DATA
 7998  011076  001003                          BNE     1$              ;BIT PATTERN DONE?
 7999  011100  042777  040000  170702          BIC     #TIE,@DZVCSR    ;IF YES THEN CLEAR TIE
 8000  011106  000002                  1$:     RTI                     ;IF NOT THEN RETURN
```

```
                                        ;ERROR TABLE
011110  000000                .ERRTAB:        0       ;ERROR 0
011112  000000                                0
011114  000000                                0

011116  011336                                EM1     ;ERROR
011120  012666                                DH1
011122  013066                                DT1

011124  011411                                EM2     ;ERROR 2
011126  012712                                DH2
011130  013100                                DT2

011132  011437                                EM3     ;ERROR 3
011134  012745                                DH3
011136  013116                                DT3

011140  011476                                EM4     ;ERROR 4
011142  012745                                DH3
011144  013116                                DT3

011146  011525                                EM5     ;ERROR 5
011150  012757                                DH4
011152  013124                                DT4

011154  011554                                EM6     ;ERROR 6
011156  012757                                DH4
011160  013124                                DT4

011162  011613                                EM7     ;ERROR 7
011164  012745                                DH3
011166  013116                                DT3

011170  011654                                EM8     ;ERROR 10
011172  012745                                DH3
011174  013116                                DT3

011176  011716                                EM9     ;ERROR 11
011200  012745                                DH3
011202  013116                                DT3

011204  011754                                EM10    ;ERROR 12
011206  012745                                DH3
011210  013116                                DT3

011212  012013                                EM13    ;ERROR 13
011214  012745                                DH3
011216  013116                                DT3

011220  012044                                EM14    ;ERROR 14
011222  012745                                DH3
011224  013116                                DT3

011226  012076                                EM15    ;ERROR 15
011230  000000                                0
011232  000000                                0
```

```
 8058
 8059  011234  012140                          EM16
 8060  011236  012745                          DH3
 8061  011240  013116                          DT3
 8062
 8063  011242  012212                          EM17    ;ERROR 17
 8064  011244  012745                          DH3
 8065  011246  013116                          DT3
 8066
 8067  011250  012250                          EM20
 8068  011252  012745                          DH3
 8069  011254  013116                          DT3
 8070
 8071  011256  012311                          EM21    ;ERROR 21
 8072  011260  013006                          DH5
 8073  011262  013142                          DT5
 8074
 8075  011264  012341                          EM22    ;ERROR 22
 8076  011266  012757                          DH4
 8077  011270  013124                          DT4
 8078
 8079  011272  012403                          EM23    ;ERROR 23
 8080  011274  012745                          DH3
 8081  011276  013116                          DT3
 8082
 8083  011300  012433                          EM24
 8084  011302  012745                          DH3
 8085  011304  013116                          DT3
 8086
 8087  011306  012461                          EM25
 8088  011310  012745                          DH3
 8089  011312  013116                          DT3
 8090
 8091  011314  012511                          EM26
 8092  011316  012745                          DH3
 8093  011320  013116                          DT3
 8094
 8095  011322  012540                          EM27
 8096  011324  012745                          DH3
 8097  011326  013116                          DT3
 8098
 8099  011330  012606                          EM30
 8100  011332  012745                          DH3
 8101  011334  013116                          DT3
```

```
 8103                                                ;ERROR MESSAGES
 8107  011336  047200  020117  052502  EM1:    .ASCIZ  <200>/NO BUS REPLY RESPONSE FROM DZV11 REGISTER/
 8108  011411    200   042522  044507  EM2:    .ASCIZ  <200>?REGISTER R/W FAILURE?
 8109  011437    200   051124  047101  EM3:    .ASCIZ  <200>/TRANSMIT READY (TRDY) NOT SET/
 8110  011476  051200  041505  044505  EM4:    .ASCIZ  <200>/RECEIVER DONE NOT SET/
 8111  011525    200   040504  040524  EM5:    .ASCIZ  <200>/DATA COMPARISON ERROR/
 8112  011554  042200  053132  030461  EM6:    .ASCIZ  <200>/DZV11 *RECEIVER BUFFER* ERROR/
 8113  011613    200   051124  047101  EM7:    .ASCIZ  <200>/TRANSMITTER FAILED TO INTERRUPT/
 8114  011654  052600  042516  050130  EM8:    .ASCIZ  <200>/UNEXPECTED TRANSMITTER INTERRUPT/
 8115  011716  051200  041505  044505  EM9:    .ASCIZ  <200>/RECEIVER FAILED TO INTERRUPT/
 8116  011754  052600  042516  050130  EM10:   .ASCIZ  <200>/UNEXPECTED RECEIVER INTERRUPT/
 8117  012013    200   044523  047514  EM13:   .ASCIZ  <200>/SILO ALARM SET TOO SOON/
 8118  012044  051600  046111  020117  EM14:   .ASCIZ  <200>/SILO ALARM FAILED TO SET/
 8119  012076  040600  052103  047511  EM15:   .ASCIZ  <200>/ACTION DETECTED ON INVALID LINE./
 8120  012140  051200  040505  044504  EM16:   .ASCIZ  <200>/READING DZVRBUF DID NOT CLEAR SILO ALARM/
 8121  012212  042200  052101  020101  EM17:   .ASCIZ  <200>/DATA VALID SHOULD NOT BE SET/
 8122  012250  051200  041505  044505  EM20:   .ASCIZ  <200>/RECEIVER DONE SHOULD NOT BE SET/
 8123  012311    200   042522  040514  EM21:   .ASCIZ  <200>/RELATIVE TIMING ERROR./
 8124  012341    200   047515  042504  EM22:   .ASCIZ  <200>/MODEM SIGNAL ERROR ON CABLE TEST/
 8125  012403    200   040504  040524  EM23:   .ASCIZ  <200>/DATA VALID IS NOT SET!/
 8126  012433    200   040504  040524  EM24:   .ASCIZ  <200>/DATA OVERRUN IS SET!/
 8127  012461    200   051106  046501  EM25:   .ASCIZ  <200>/FRAMING ERROR OCCURRED/
 8128  012511    200   040520  044522  EM26:   .ASCIZ  <200>/PARITY ERROR OCCURRED/
 8129  012540  051600  046111  020117  EM27:   .ASCIZ  <200>/SILO ALARM FAILED TO CAUSE INTERRUPT/
 8130  012606  046200  047111  020105  EM30:   .ASCIZ  <200>/LINE DID NOT RECEIVE FULL BINARY COUNT PATTERN/
 8131
 8132  012666  052200  040522  020120  DH1:    .ASCIZ  <200>/TRAP PC  DZV11 REG/
 8133  012712  042600  050130  041505  DH2:    .ASCIZ  <200>/EXPECTED  FOUND  REGISTER/
 8134  012745    200   044514  042516  DH3:    .ASCIZ  <200>/LINE NO./
 8135  012757    200   054105  042520  DH4:    .ASCIZ  <200>/EXPECTED  FOUND  LINE/
 8136  013006  052200  020130  044514  DH5:    .ASCIZ  <200>/TX LINE PREVIOUS TIME  ACTUAL TIME  PARAMETER/
 8137
 8138          013066                  .EVEN
 8142                                                ;DATA TABLES FOR ERROR MESSAGES
 8143  013066  000002                  DT1:    2
 8144  013070    006     003                     .BYTE   6,3
 8145  013072  001330                          $REG1
 8146  013074    006     001                     .BYTE   6,1
 8147  013076  001326                          $REG0
 8148
 8149  013100  000003                  DT2:    3
 8150  013102    006     004                     .BYTE   6,4
 8151  013104  001340                          $REG5
 8152  013106    006     001                     .BYTE   6,1
 8153  013110  001336                          $REG4
 8154  013112    006     001                     .BYTE   6,1
 8155  013114  001326                          $REG0
 8156
 8157  013116  000001                  DT3:    1
 8158  013120    003     001                     .BYTE   3,1
 8159  013122  001374                          SAVLIN
 8160
 8161  013124  000003                  DT4:    3
 8162  013126    006     004                     .BYTE   6,4
 8163  013130  001340                          $REG5
 8164  013132    006     001                     .BYTE   6,1
```

```
 8165  013134  001336                      $REG4
 8166  013136     003     001              .BYTE   3,1
 8167  013140  001374                      SAVLIN
 8168
 8169  013142  000004              DT5:    4
 8170  013144     003     005              .BYTE   3,5
 8171  013146  001374                      SAVLIN
 8172  013150     006     011              .BYTE   6,9.
 8173  013152  001340                      $REG5
 8174  013154     006     007              .BYTE   6,7
 8175  013156  001344                      $TMP1
 8176  013160     006     001              .BYTE   6,1
 8177  013162  001402                      REGIST
 8178                                      ;TABLE OF DELAY TIMES FOR INDIVIDUAL BAUD RATES
 8179                                      ;---------------------------------------------
 8180
 8181  013164  002450              DLYTBL: 2450                    ;TIME FOR   50 BAUD
 8182  013166  001560                      1560                    ;TIME FOR   75 BAUD
 8183  013170  001120                      1120                    ;TIME FOR  110 BAUD
 8184  013172  000750                       750                    ;TIME FOR  134 BAUD
 8185  013174  000660                       660                    ;TIME FOR  150 BAUD
 8186  013176  000330                       330                    ;TIME FOR  300 BAUD
 8187  013200  000150                       150                    ;TIME FOR  600 BAUD
 8188  013202  000060                        60                    ;TIME FOR 1200 BAUD
 8189  013204  000040                        40                    ;TIME FOR 1800 BAUD
 8190  013206  000030                        30                    ;TIME FOR 2000 BAUD
 8191  013210  000020                        20                    ;TIME FOR 2400 BAUD
 8192  013212  000010                        10                    ;TIME FOR 3600 BAUD
 8193  013214  000001                         1                    ;TIME FOR 4800 BAUD
 8194  013216  000001                         1                    ;TIME FOR 7200 BAUD
 8195  013220  000001                         1                    ;TIME FOR 9600 BAUD
 8196  013222  000001                         1                    ;TIME OF DELAY FOR 19200 BAUD
 8197
 8198                                      ;DELAYS WERE COMPUTED TO ALLOW MAXIMUM TIME AT EACH BAUD RATE
 8199                                      ;FOR ALL TESTS TO FUNCTION CORRECTLY ON A LSI11.
```

```
8277                                    ; INIT $BASE AND $VECT1 AND TWEAK THE "$GETPAR" CALLING
8278                                    ; SEQUENCE TO ACCEPT THE VALID FALCON RANGE.
8279                                    ;
8280  013224  023727  001174  160010  FALCINI: CMP    $BASE,#ABASE    ; IS $BASE VIRGIN ??              ;;GPA
8281  013232  001003                          BNE    1$              ; SKIP NEXT IF NOT                ;;GPA
8282  013234  012737  174040  001174          MOV    #174040,$BASE   ; YES, SET ENGINEERING DEFAULT    ;;GPA
8283  013242  023727  001170  000000  1$:     CMP    $VECT1,#AVECT1  ; IS $VECT1 VIRGIN ??            ;;GPA
8284  013250  001003                          BNE    2$              ; SKIP NEXT IF NOT                ;;GPA
8285  013252  012737  000370  001170          MOV    #370,$VECT1     ; YES, SET ENGINEERING DEFAULT    ;;GPA
8286  013260  012737  013324  002326  2$:     MOV    #3$,GETCSR+2    ; SUBSTITUE CSR TEXT...           ;;GPA
8287  013266  012737  174000  002332          MOV    #174000,GETCSR+6                                  ;;GPA
8288  013274  012737  177770  002334          MOV    #177770,GETCSR+10 ;...AND VALID RANGE.            ;;GPA
8289  013302  012737  013366  002344          MOV    #4$,GETVEC+2    ; SUBSTITUTE VECTOR TEXT...       ;;GPA
8290  013310  005037  002350                  CLR    GETVEC+6                                          ;;GPA
8291  013314  012737  000370  002352          MOV    #370,GETVEC+10  ;...AND VALID RANGE.              ;;GPA
8292  013322  000207                          RETURN                 ; RETURN TO CALLER.               ;;GPA
8293
8294  013324  030600  052123  041440  3$:     .ASCIZ  <200>'1ST CSR ADDRESS (174000:177770) '          ;;GPA
      013332  051123  040440  042104
      013340  042522  051523  024040
      013346  033461  030064  030060
      013354  030472  033467  033467
      013362  024460  000040
8295  013366  030600  052123  053040  4$:     .ASCIZ  <200>'1ST VECTOR ADDRESS (000:370)    '          ;;GPA
      013374  041505  047524  020122
      013402  042101  051104  051505
      013410  020123  030050  030060
      013416  031472  030067  020051
      013424  020040  000040
8296                                    .EVEN                                                           ;;GPA
8297
8298                                    ;$FREE= <1000-.>/2              ; FREE WORDS LEFT.              ;;GPA
8299                                    ;       .IF LT $FREE                                            ;;GPA
8300                                    ;       .ERROR ; VECTOR OVERLAY EXCEEDED                        ;;GPA
8301                                    ;       .ENDC                                                   ;;GPA
8302                                    ;
8303                                    ;       .=$SVPC                                                 ;;GPA
8304  013430                            CORMAX:
8308                                    ;;THE FOLLOWING CALL TO CNMAC2.SML WAS ADDED TO INIT BRKVEC AND LKVEC
8309          013430                    POINT=.                 ;SAVE POINTER
 (1)          000100                    .=100
 (1)  000100  013430                    $CLKVEC                 ;LKVEC  HANDLER
 (1)  000102  000300                    300                     ;INTERRUPT HANDLER PRI
 (1)          000140                    .=140                   ;BRKVEC
 (1)  000140  170000                    170000                  ;ODT START ADDRESS
 (1)  000142  000300                    300                     ;PRIORITY
 (1)          013430                    .=POINT                 ;RESTORE POINTER
 (1)  013430  104402  013436            $CLKVEC:        TYPE,CLKMES
 (1)  013434  000000                                    HALT
 (1)  013436  005015  045514  042526    CLKMES:  .ASCIZ <15><12>/LKVEC INTERRUPT - DISCONNECT LTC /
 (1)  013444  020103  047111  042524
 (1)  013452  051122  050125  020124
 (1)  013460  020055  044504  041523
 (1)  013466  047117  042516  052103
 (1)  013474  046040  041524  000040
8310  013502  000001                    KXTFLAG:1
```

```
 8311          000001                    .END
```

```
ABASE = 160010           7810#   7821    8280
ACDW1 = 000000           7821
ACDW2 = 000000           7821
ACPUOP= 000000           7821
ACTIVE  001420           7821#
ADDW0 = 000000           7821
ADDW1 = 000000           7821
ADDW10= 000000           7821
ADDW11= 000000           7821
ADDW12= 000000           7821
ADDW13= 000000           7821
ADDW14= 000000           7821
ADDW15= 000000           7821
ADDW2 = 000000           7821
ADDW3 = 000000           7821
ADDW4 = 000000           7821
ADDW5 = 000000           7821
ADDW6 = 000000           7821
ADDW7 = 000000           7821
ADDW8 = 000000           7821
ADDW9 = 000000           7821
ADEVCT= 000000           7821
ADEVM = 000000           7821
ADRCNT  004245           7823#*
ADVANC= 104400           7821#   7823
AENV  = 000000           7821
AENVM = 000000           7821
AFATAL= 000000           7821
AMADR1= 000000           7821
AMADR2= 000000           7821
AMADR3= 000000           7821
AMADR4= 000000           7821
AMAMS1= 000000           7821
AMAMS2= 000000           7821
AMAMS3= 000000           7821
AMAMS4= 000000           7821
AMSGAD= 000000           7821
AMSGLG= 000000           7821
AMSGTY= 000000           7821
AMTYP1= 000000           7821
AMTYP2= 000000           7821
AMTYP3= 000000           7821
AMTYP4= 000000           7821
APASS = 000000           7821
APRIOR= 000000           7821
APTCSU= 000040           7823#
APTENV= 000001           7823#
APTSIZ= 000200           7823#
APTSPO= 000100           7823#
ASWREG= 000000           7821
ATESTN= 000000           7821
AUNIT = 000000           7821
AUSWR = 000000           7821
AVECT = 000300           7811#
AVECT1= 000000           7821    8283
AVECT2= 000000           7821
```

```
BAUD    002374            7821#   7823
BINWRD  004520            7823#
BIT0  = 000001            7821#
BIT00 = 000001            7821#
BIT01 = 000002            7821#
BIT02 = 000004            7821#
BIT03 = 000010            7821#
BIT04 = 000020            7821#
BIT05 = 000040            7821#
BIT06 = 000100            7821#
BIT07 = 000200            7821#
BIT08 = 000400            7821#
BIT09 = 001000            7821#
BIT1  = 000002            7821#
BIT10 = 002000            7821#
BIT11 = 004000            7821#
BIT12 = 010000            7821#   7969
BIT13 = 020000            7821#   7874    7966
BIT14 = 040000            7821#   7963
BIT15 = 100000            7821#
BIT2  = 000004            7821#
BIT3  = 000010            7821#
BIT4  = 000020            7821#   7823
BIT5  = 000040            7821#
BIT6  = 000100            7821#
BIT7  = 000200            7821#   7823
BIT8  = 000400            7821#
BIT9  = 001000            7821#
BPTVEC= 000014            7821#
BRKVEC= 000140            7821#
BRK0  = 000400            7821#
BRK1  = 001000            7821#
BRK2  = 002000            7821#
BRK3  = 004000            7821#
BUFSET= 104422            7821#
BYTCNT  007062            7823#
CHRCNT  004516            7823#*
CLEAR = 000000            7821#   7857*   7942*
CLKMES  013436            8309#
CNVRT = 104412            7821#   7823
CONVRT= 104411            7821#   7823
CORMAX  013430            8304#   8305
CO0   = 000400            7821#
CO1   = 001000            7821#
CO2   = 002000            7821#
CO3   = 004000            7821#
CR    = 000015            7821#   7823
CRLF  = 000200            7821#   7823
DATABP  005212            7823#*
DATAHD  005200            7823#*
DCLASM= 104417            7821#
DCLR  = 000020            7821#   7823
DDISP = 177570            7821#
DELAY = 104414            7821#   7844    7918
DEVADR  004242            7823#*
DEVICE= 104413            7821#   7823    7833    7890    7907    7927    7954
```

```
DH1      012666            8008    8132#
DH2      012712            8012    8133#
DH3      012745            8016    8020    8032    8036    8040    8044    8048    8052    8060    8064    8068    8080    8084
                           8088    8092    8096    8100    8134#
DH4      012757            8024    8028    8076    8135#
DH5      013006            8072    8136#
DISPLA   001306            7821#*  7823*
DISPRE   000174            7821#
DLYCNT   004614            7823#
DLYTBL   013164            8181#
DONFLG   001425            7821#   7938*   7949    7988*
DSWR   = 177570            7821#
DTR0   = 000400            7821#
DTR1   = 001000            7821#
DTR2   = 002000            7821#
DTR3   = 004000            7821#
DT1      013066            8009    8143#
DT2      013100            8013    8149#
DT3      013116            8017    8021    8033    8037    8041    8045    8049    8053    8061    8065    8069    8081    8085
                           8089    8093    8097    8101    8157#
DT4      013124            8025    8029    8077    8161#
DT5      013142            8073    8169#
DVALID=  100000            7821#
DZCR0    001500            7821#
DZCR1    001512            7821#
DZCR10   001620            7821#
DZCR11   001632            7821#
DZCR12   001644            7821#
DZCR13   001656            7821#
DZCR14   001670            7821#
DZCR15   001702            7821#
DZCR16   001714            7821#
DZCR17   001726            7821#
DZCR2    001524            7821#
DZCR3    001536            7821#
DZCR4    001550            7821#
DZCR5    001562            7821#
DZCR6    001574            7821#
DZCR7    001606            7821#
DZVACT   001406            7821#
DZVCSR   002010            7821#   7823*   7839*   7842    7858*   7868    7893    7937*   7957    7993    7999*
DZVC0    001502            7821#
DZVC1    001514            7821#
DZVC10   001622            7821#
DZVC11   001634            7821#
DZVC12   001646            7821#
DZVC13   001660            7821#
DZVC14   001672            7821#
DZVC15   001704            7821#
DZVC16   001716            7821#
DZVC17   001730            7821#
DZVC2    001526            7821#
DZVC3    001540            7821#
DZVC4    001552            7821#
DZVC5    001564            7821#
DZVC6    001576            7821#
```

```
DZVC7   001610           7821#
DZVLEV  007704           7821    7823#
DZVLPR  002020           7821#   7823*   7838*   7932*
DZVMSR  002030           7821#   7823*   7919
DZVNUM  001414           7821#
DZVRBU  002014           7821#   7823*   7871    7960
DZVRIS  002042           7821#   7823*   7856*   7934*
DZVRIV  002040           7821#   7823    7855*   7933*
DZVTCR  002024           7821#   7823*   7835*   7941*
DZVTDR  002034           7821#   7823*   7849*   7895*   7996*
DZVTIS  002046           7821#   7823*   7936*
DZVTIV  002044           7821#   7823*   7935*
DZV.EN  001740           7821#
DZV.MA  001500           7821#
EIGHT =  000030          7821#
EIGHTS=  000070          7821#
EMTVEC=  000030          7821#
EM1     011336           8007    8107#
EM10    011754           8043    8116#
EM13    012013           8047    8117#
EM14    012044           8051    8118#
EM15    012076           8055    8119#
EM16    012140           8059    8120#
EM17    012212           8063    8121#
EM2     011411           8011    8108#
EM20    012250           8067    8122#
EM21    012311           8071    8123#
EM22    012341           8075    8124#
EM23    012403           8079    8125#
EM24    012433           8083    8126#
EM25    012461           8087    8127#
EM26    012511           8091    8128#
EM27    012540           8095    8129#
EM3     011437           8015    8109#
EM30    012606           8099    8130#
EM4     011476           8019    8110#
EM5     011525           8023    8111#
EM6     011554           8027    8112#
EM7     011613           8031    8113#
EM8     011654           8035    8114#
EM9     011716           8039    8115#
ERRMSG  005166           7823#*
ERRVEC=  000004          7821#
ERTABO  005342           7823#
EVEPAR=  000000          7821#
EXITER  005272           7823#
FALCIN  013224           7821*   8280#
FIVE  =  000000          7821#
FIVES =  000040          7821#
FRMERR=  020000          7821#
GETCSR=  002324          7821#   8286*   8287*   8288*
GETSWR=  005404          7821*   7823#
GETVEC=  002342          7821#   8289*   8290*   8291*
HALTS   005216           7823#
HDRFLG  001423           7821#
HDZVCS  002012           7821#   7823*
```

```
HDZVLP  002022            7821#   7823*
HDZVMS  002032            7821#   7823*
HDZVRB  002016            7821#   7823*
HDZVTC  002026            7821#   7823*   7913*
HDZVTD  002036            7821#   7823*
H%LIM   004240            7823#*
HT    = 000011            7821#   7823
INBUF   007536            7823#*  7879*   7880*   7888
INIFLG  001422            7821#*
INSTER= 104404            7821#   7823
INSTR = 104403            7821#
INSTR2  004040            7823#
INTRAN  011060            7935    7993#
INTREC  010670            7933    7956#
INTSVC  010244            7855    7868#
IOTVEC= 000020            7821#
KXTFLA  013502            7821    8310#
LAST    007054            7821*   7823#
LF    = 000012            7821#   7823
LIMITS  004166            7823#
LINE    001366            7821#
LINESP  007064            7821    7823#
LINEX   002412            7821#   7864    7948
LINE0   001504            7821#
LINE1   001516            7821#
LINE10  001624            7821#
LINE11  001636            7821#
LINE12  001650            7821#
LINE13  001662            7821#
LINE14  001674            7821#
LINE15  001706            7821#
LINE16  001720            7821#
LINE17  001732            7821#
LINE2   001530            7821#
LINE3   001542            7821#
LINE4   001554            7821#
LINE5   001566            7821#
LINE6   001600            7821#
LINE7   001612            7821#
LKVEC = 000100            7821#
LOBITS  004244            7823#*
LOCK    001364            7821#   7823*   7912*   7928*
LOCKUP  007052            7821*   7823#   7951*   7956*
LOLIM   004236            7823#*
LPRSET= 104421            7821#
LP0   = 000000            7821#
LP1   = 000001            7821#
LP2   = 000002            7821#
LP3   = 000003            7821#
MAINT = 000010            7821#   7823
MANT0   001510            7821#
MANT1   001522            7821#
MANT10  001630            7821#
MANT11  001642            7821#
MANT12  001654            7821#
MANT13  001666            7821#
```

```
MANT14  001700            7821#
MANT15  001712            7821#
MANT16  001724            7821#
MANT17  001736            7821#
MANT2   001534            7821#
MANT3   001546            7821#
MANT4   001560            7821#
MANT5   001572            7821#
MANT6   001604            7821#
MANT7   001616            7821#
MASK  = 000200            7821#*  7856    7862*   7904*   7934    7936
MASTEK  006271            7823#
MBADLN  006402            7823#
MCABLE  007404            7821    7823#
MCHAR   007250            7823#   7859
MCSRX   006221            7823#
MDATA   007642            7823#
MEPASS  006037            7823#
MERRPC  006347            7823#
MERRX   006246            7823#
MERR2   006077            7823#
MERR3   006146            7823#
MINVAL  007174            7823#
MLINE   007222            7821    7823#
MLOCK   006172            7823#
MNEW    006274            7823#
MNTFLG  001424            7821#   7823*
MODE    001372            7821#
MPASS   007160            7823#
MPASSX  006235            7823#
MPFAIL  005774            7823#
MQUICK  007421            7823#   7841
MR      006063            7823#
MREGAD  007124            7821    7823#
MSENAB= 000040            7821#   7839    7858    7937
MSPEED  007232            7821    7823#
MTERM   007357            7821    7823#
MTITLE  001000            7821#
MTSTN   006257            7823#
MVECTO  007102            7821    7823#
MVECX   006227            7823#
MWHICH  007311            7821    7823#
NEXT    001362            7821#   7823    7854*   7906*
NOLIST= ****** U          7816
NUMLIN  007070            7823#*  7836    7887    7930    7985
NUMTCR  007072            7823#*  7835    7913    7915    7917    7941
ODDPAR= 000200            7821#
ODTST = 170000            7821#
ONESTO= 000000            7821#
OVRRUN= 040000            7821#
PAR     001370            7821#   7823    7836*   7837*   7838    7929*   7930*   7931*   7932
PARAM = 104405            7821#
PARAM1  004106            7823#
PARER = 010000            7821#
PARERR  004162            7823#
PARITY= 000100            7821#
```

```
PARMD = 104415           7821#
PAR0    001506           7821#
PAR1    001520           7821#
PAR10   001626           7821#
PAR11   001640           7821#
PAR12   001652           7821#
PAR13   001664           7821#
PAR14   001676           7821#
PAR15   001710           7821#
PAR16   001722           7821#
PAR17   001734           7821#
PAR2    001532           7821#
PAR3    001544           7821#
PAR4    001556           7821#
PAR5    001570           7821#
PAR6    001602           7821#
PAR7    001614           7821#
PAWCH = 104416           7821#
PIRQ  = 177772           7821#
PIRQVE= 000240           7821#
POINT = 013430           8309#
POPR0 = 012600           7821#
POP1SP= 005726           7821#
POP2SP= 022626           7821#   7823
PRIO    007074           7823#
PR0   = 000000           7821#
PR1   = 000040           7821#
PR2   = 000100           7821#
PR3   = 000140           7821#
PR4   = 000200           7821#
PR5   = 000240           7821#
PR6   = 000300           7821#   7823
PR7   = 000340           7821#
PS    = 177776           7821#
PSW   = 177776           7821#
PUSHR0= 010046           7821#
PUSH1S= 005746           7821#
PUSH2S= 024646           7821#
PWRVEC= 000024           7821#   7823*
QUITS   010662           7950    7954#
RCVON = 010000           7821#   7931
RDATA   007060           7823#
RDONE = 000200           7821#
RECDAT  007076           7823#   7871*   7874    7878    7879    7881*   7882*   7883    7885    7960*   7963    7966    7969
                         7973    7979*   7980*   7981    7983
REGIST  001402           7821#   8177
RESREG  005214           7823#
RESTAR  002536           7821#   7823
RESVEC= 000010           7821#
RESO5 = 104410           7821#   7823
RIE   = 000100           7821#   7858    7937
RING0 = 000001           7821#
RING1 = 000002           7821#
RING2 = 000004           7821#
RING3 = 000010           7821#
RL0   = 000000           7821#
```

```
RL1    = 000400            7821#
RL2    = 001000            7821#
RL3    = 001400            7821#
RUN      001412            7821#
SAVACT   001410            7821#
SAVLIN   001374            7821#   7823    7883    7885*   7887*   7981    7983*   7985*   8159    8167    8171
SAVNO    001416            7821#
SAVNUM   001415            7821#
SAVPC    001404            7821#   7823*
SAV05  = 104407            7821#   7823
SCOP1  = 104401            7821#   7926
SERV.G   005356            7823#   7851    7863    7947
SET      006652            7821    7823#
SETFLG=  104406            7821#
SET1     006704            7823#
SEVEN  = 000020            7821#
SEVENS=  000060            7821#
SHIFT  = 104420            7821#
SILOAL=  020000            7821#
SILOEN=  010000            7821#
SIX    = 000010            7821#
SIXS   = 000050            7821#
SPACNT   004517            7823#
SPEED    007066            7823#*  7837    7929
SPIN     010626            7945#   7952
STACK  = 001120            7821#   7823
STFLG    007050            7821*   7823#
STKLMT=  177774            7821#
STOP     001446            7821#   7823
SV05     004254            7823#
SWR      001304            7821#*  7823*   7852
SWREG    000176            7821#
SW0    = 000001            7821#
SW00   = 000001            7821#
SW01   = 000002            7821#
SW02   = 000004            7821#
SW03   = 000010            7821#
SW04   = 000020            7821#
SW05   = 000040            7821#
SW06   = 000100            7821#
SW07   = 000200            7821#
SW08   = 000400            7821#   7823
SW09   = 001000            7821#   7823
SW1    = 000002            7821#
SW10   = 002000            7821#   7823
SW11   = 004000            7821#
SW12   = 010000            7821#   7823
SW13   = 020000            7821#   7823
SW14   = 040000            7821#
SW15   = 100000            7821#
SW2    = 000004            7821#
SW3    = 000010            7821#
SW4    = 000020            7821#
SW5    = 000040            7821#
SW6    = 000100            7821#
SW7    = 000200            7821#
```

```
SW8    = 000400            7821#
SW9    = 001000            7821#
S110   = 001000            7821#
S1200  = 003400            7821#
S134   = 001400            7821#
S150   = 002000            7821#
S1800  = 004000            7821#
S19200= 007400             7821#
S2000  = 004400            7821#
S2400  = 005000            7821#
S300   = 002400            7821#
S3600  = 005400            7821#
S4800  = 006000            7821#
S50    = 000000            7821#
S600   = 003000            7821#
S7200  = 006400            7821#
S75    = 000400            7821#
S9600  = 007000            7821#
TABLE2  006746             7823#
TBITVE= 000014             7821#
TBUF    007100             7823#   7878*   7895
TCR0   = 000001            7821#
TCR1   = 000002            7821#
TCR2   = 000004            7821#
TCR3   = 000010            7821#
TDATA   007056             7823#
TD0     001426             7821#   7823
TD1     001430             7821#
TD2     001432             7821#
TD3     001434             7821#
TEIGHT  002106             7821#
TEMP    007600             7823#
TFIVE   002114             7821#
TIE    = 040000            7821#   7937    7999
TKVEC  = 000060            7821#
TL0    = 000000            7821#
TL1    = 000400            7821#
TL2    = 001000            7821#
TL3    = 001400            7821#
TMTBL   002050             7821#
TPVEC  = 000064            7821#
TRAPVE= 000034             7821#
TRDY   = 100000            7821#
TRTVEC= 000014             7821#
TR0     001436             7821#
TR1     001440             7821#
TR2     001442             7821#
TR3     001444             7821#
TSEVEN  002110             7821#
TSIX    002112             7821#
TST1    010044             7821    7833#
TST2    010420             7821    7904#
TWOSTO= 000040             7821#
TYPDAT  005202             7823#
TYPE   = 104402            7821#   7823    7859    8309
TYPMSG  005072             7823#
```

```
T110     002054            7821#
T1200    002066            7821#
T134     002056            7821#
T150     002060            7821#
T1800    002070            7821#
T2000    002072            7821#
T2400    002074            7821#
T300     002062            7821#
T3600    002076            7821#
T4800    002100            7821#
T50      002050            7821#
T600     002064            7821#
T7200    002102            7821#
T75      002052            7821#
T9600    002104            7821#
VEC1     002264            7821#
WCHFLG   007046            7821    7823#
WRDCNT   004514            7823#*
WTBS.F   005170            7823#
XBEGIN   002442            7821#   7823
XBX      004760            7823#
XCSR     002704            7823#
XERR     002726            7823#
XHEAD    006354            7823#
XMTCNT   001400            7821#
XMTLIN   001376            7821#
XPASS    002720            7823#
XSTATQ   006444            7823#
XTCR1    006674            7823#
XTSTN    005350            7823#
XVEC     002712            7823#
XX     = 160210            7821#
YY     = 000500            7821#
ZZ     = 000020            7821#
$APTHD   001446            7821#
$ASTAT=  ****** U          7823
$ATYC    003500            7823#
$ATY1    003454            7823#
$ATY3    003462            7823#
$ATY4    003472            7823#
$AUTOB   001300            7821#
$BASE    001174            7821#   7823    8280    8282*
$BDADR   001266            7821#
$BDDAT   001272            7821#
$CDW1    001200            7821#
$CDW2    001202            7821#
$CHARC   003450            7823#*
$CLKVE   013430            8309#
$CMTAG   001244            7821#
$CM1   = 000006            7821#
$CM2   = 000014            7821#
$CM3   = 000006            7821#
$CM4   = 000005            7821#
$CPUOP   001146            7821#
$CRLF    001357            7821#   7823
$DDWO    001204            7821#
```

```
$DDW1   001206            7821#
$DDW10  001230            7821#
$DDW11  001232            7821#
$DDW12  001234            7821#
$DDW13  001236            7821#
$DDW14  001240            7821#
$DDW15  001242            7821#
$DDW2   001210            7821#
$DDW3   001212            7821#
$DDW4   001214            7821#
$DDW5   001216            7821#
$DDW6   001220            7821#
$DDW7   001222            7821#
$DDW8   001224            7821#
$DDW9   001226            7821#
$DEVCT  001130            7821#
$DEVM   001176            7821#
$DOAGN  002700            7823#
$E    = 000002            6667#
$ENDAD  002670            7821    7823#
$ENDCT  002654            7823#
$ENV    001140            7821#   7823
$ENVM   001141            7821#   7823
$EOP    002542            7823#   7854    7891    7906    7955
$EOPCT  002646            7823#
$ERFLG  001247            7821#*  7823*
$ERMAX  001261            7821#
$ERROR  004730            7821    7823#
$ERRPC  001262            7821#   7823*
$ERRTB  001362            7821#
$ERTTL  001256            7821#*  7823*
$ETABL  001140            7821#
$ETEND  001244            7821#
$FATAL  001122            7821#   7823*
$FFLG   003720            7823#*
$FILLC  001322            7821#   7823
$FILLS  001321            7821#   7823
$FLIP = 177777            5676#
$GDADR  001264            7821#
$GDDAT  001270            7821#
$GET42  002660            7823#
$HD   = 000001            7821
$HIBTS  001446            7821#
$ICNT   001250            7821#
$ILLUP  005766            7823#
$INTAG  001301            7821#
$ITEMB  001260            7821#   7823*
$LF     001360            7821#   7823
$LFLG   003717            7823#*
$LPADR  001252            7821#*  7823*
$LPERR  001254            7821#
$MADR1  001152            7821#
$MADR2  001156            7821#
$MADR3  001162            7821#
$MADR4  001166            7821#
$MAIL   001120            7821#   7823
```

```
$MAMS1  001150           7821#
$MAMS2  001154           7821#
$MAMS3  001160           7821#
$MAMS4  001164           7821#
$MBADR  001450           7821#
$MFLG   003716           7823#*
$MSGAD  001134           7821#   7823*
$MSGLG  001136           7821#   7823*
$MSGTY  001120           7821#   7823*
$MTYP1  001151           7821#
$MTYP2  001155           7821#
$MTYP3  001161           7821#
$MTYP4  001165           7821#
$N    = 000001           6666#
$NULL   001320           7821#   7823
$PASS   001126           7821#*  7823*
$PASTM  001454           7821#
$PWRAD  005762           7823#
$PWRDN  005622           7821    7823#
$PWRMG  005756           7823#
$PWRUP  005674           7823#
$QUES   001356           7821#   7823
$REGAD  001324           7821#
$REG0   001326           7821#   7823*   8147    8155
$REG1   001330           7821#   7823*   8145
$REG2   001332           7821#   7823*
$REG3   001334           7821#   7823*
$REG4   001336           7821#   7823*   8153    8165
$REG5   001340           7821#   7823*   8151    8163    8173
$RTNAD  002702           7823#
$SAVR6  005772           7823#*
$SETUP= 000000           7823
$SVPC = 000040           7821#
$SWR  = 164000           5683#   7821    7823
$SWREG  001142           7821#
$TESTN  001124           7821#
$TIMES  001354           7821#   7823*
$TKB    001312           7821#   7823
$TKS    001310           7821#   7823    7860    7945
$TMP0   001342           7821#
$TMP1   001344           7821#   7823    8175
$TMP2   001346           7821#   7823
$TMP3   001350           7821#
$TMP4   001352           7821#
$TN   = 000001           7821#
$TPB    001316           7821#   7823*
$TPFLG  001323           7821#   7823
$TPS    001314           7821#   7823
$TSTM   001452           7821#
$TSTNM  001246           7821#*  7823    7834*   7905*
$TYPE   003172           7823#
$TYPEC  003404           7823#
$TYPEX  003452           7823#
$UNIT   001132           7821#
$UNITM  001456           7821#
$USWR   001144           7821#
```

```
$VECT1  001170           7821#   8283    8285*
$VECT2  001172           7821#
$Y    = 000023           7821#
$$GET4= 000000           7823#
.     = 013504           7821#   7823#   7869    7872    7875    7958    7961    7964    7967    7970    7977    7994    8138#
                         8309#
.ADVAN  004616           7821    7823#
.BUFSE  004706           7821    7823#
.CNVRT  004344           7821    7823#
.CONVR  004340           7821    7823#
.DCLAS  004564           7821    7823#
.DELAY  004576           7821    7823#
.DEVIC  004544           7821    7823#
.ERRTA  011110           7823    8003#
.INSTE  004026           7821    7823#
.INSTR  003722           7821    7823#
.INST1  003742           7823#
.LPRSE  004646           7821    7823#
.MSG    003744           7823#*
.PARAM  004046           7821    7823#
.PARMD  002734           7821    7823#
.PAWCH  006576           7821    7823#
.RESO5  004306           7821    7823#
.SAVO5  004246           7821    7823#
.SCOP1  003130           7821    7823#
.SETFL  006456           7821    7823#
.SHIFT  004630           7821    7823#
.START  002116           7821#
.TRPSR  004522           7821    7823#
.TRPTA  001742           7821#   7823
.TYPE   003154           7821    7823#
.$ASTA= ****** U         7823
.$X   = 001446           7821#
```

```
COMMEN   1566#   7821#
ENDCOM   1578#   7821#
ERROR    7821#   7847    7870    7873    7876    7886    7922    7953    7959    7962    7965    7968    7971    7978    7984
         7995
ESCAPE   1698#   7821#
GETPRI   1312#   7821#
GETSWR   1771#   7821#
MULT     4484#   7821#
NEWTST   1626#   7821#
PASEND   6697#   7823
POP      2153#   7821#   7823
PRGEND   7303#   7823
PRGFRT   6839#   7821
PUSH     2145#   7821#   7823
REPORT   5463#   5682#   7821#
SCOPE    7821#
SETPRI   1279#   7821#
SETUP    1337#   7821#
SKIP     1733#   7821#
SLASH    1517#   7821#
SPACE    7821#
STARS    1485#   7821#   7823
SWRSU    1453#   7821#
TYPBIN   2088#   7821#
TYPDEC   2058#   7821#
TYPNAM   1826#   7821#
TYPNUM   2025#   7821#
TYPOCS   1978#   7821#
TYPOCT   1941#   7821#
TYPTXT   1894#   7821#
$BUFFE   6770#   7823
$EOP     6712#   7823
$GETFL   6512#
$GETPA   6502#
$HEADE   6235#   7821
$INTSE   6816#
$JUNK    6802#   7821
$MRESE   6493#
$MSG     6737#   7823
$SETFL   6518#   7823
$STAG    6823#
$STAGF   6810#
$TRPDE   6288#   7821
$TSTN    6669#
$VARIA   6300#   7821
$XZ      7285#
$$CMRE   7821#
$$CMTM   7821#
$$ESCA   1711#   7821#
$$NEWT   1662#   7821#
$$SKIP   1746#   7821#
.EQUAT    189#   5681#   7821
.HEADE     61#   5680#   7821
.INIT    5658#   7821#   8309
.SETUP   1213#   5680#
.SWRHI    104#
```

```
.$ACT1    5064#    5682#    7821
.$APTB    5109#    5682#    7821#
.$APTH    5370#    5682#    7821
.$APTY    5547#    5682#    7823
.$ASTA    5417#
.$CATC     932#    5680#
.$CMTA    1047#    7821#
.$DB2D    4686#
.$DB2O    4812#
.$DIV     4587#
.$EOP     2214#    5680#    7823
.$ERRO    2700#    5681#
.$ERRT    2896#
.$MULT    4523#
.$POWE    4229#    5681#    7823
.$RAND    4307#
.$RDDE    3891#
.$RDOC    3797#
.$READ    3395#
.$R2AZ    4958#
.$SAVE    3969#
.$SB2D    4771#
.$SB2O    4874#
.$SCOP    2454#
.$SIZE    4361#
.$SUPR    4913#
.$TRAP    4073#    5681#
.$TYPB    3287#
.$TYPD    3209#
.$TYPE    2985#    5680#    7823
.$TYPO    3112#
.$40CA     972#


. ABS.  013504     000


 ERRORS DETECTED:  0

 CNDZCA,CNDZCA/CRF/NL:TOC=CNMAC2.SML,CNDZCA.P11
 RUN-TIME: 13 13 1 SECONDS
 RUN-TIME RATIO: 83/28=2.9
 CORE USED:  50K  (100 PAGES)
```