VT62

VT62/DUP11 SELF-TEST/LOOPBACKEP-DZDPG-A-DL

MD-11-DZDPG-A

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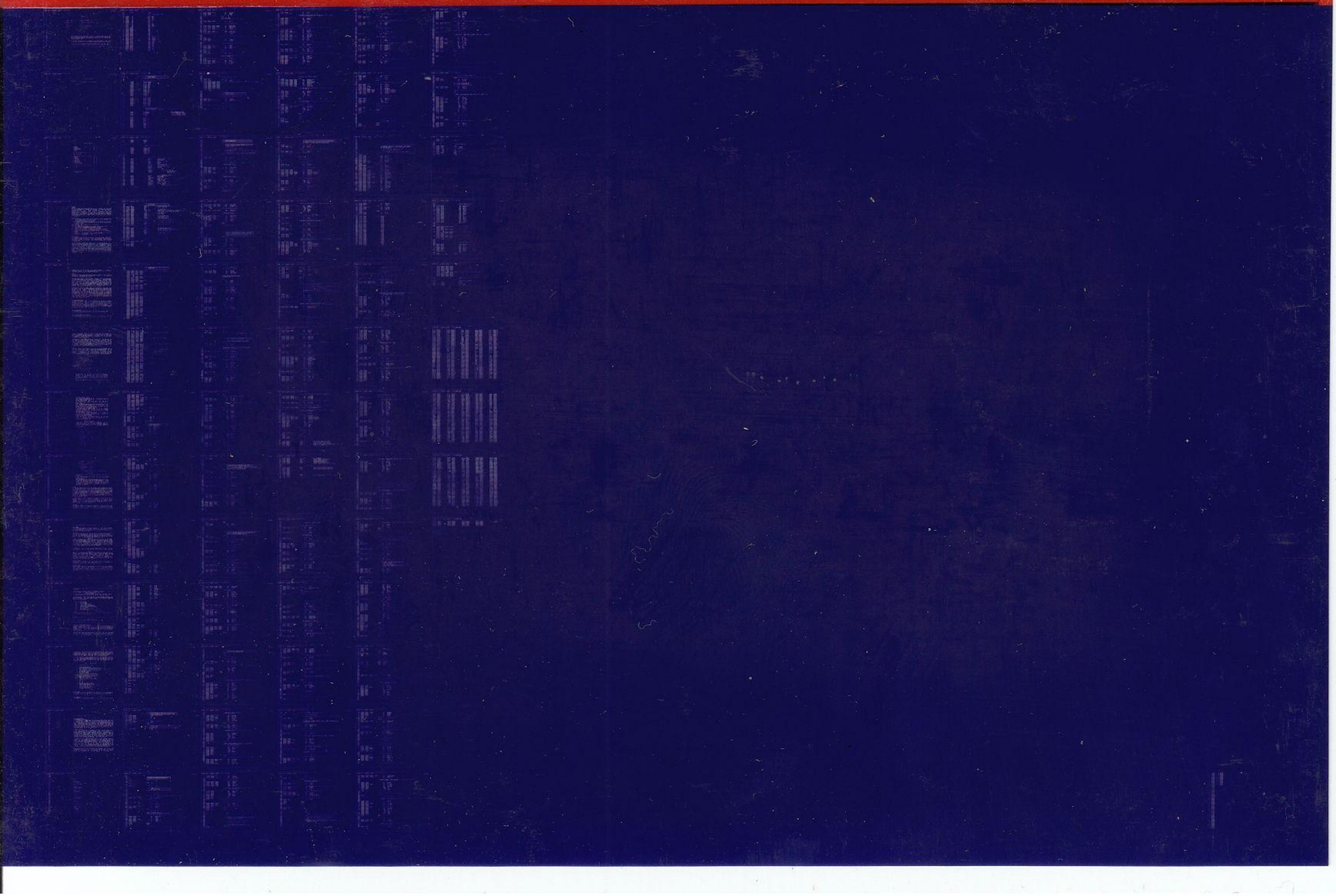
MADE IN USA



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                                IDENTIFICATION


                        PRODUCT CODE            MAINDEC-11-DZDPG-A-D

                        PRODUCT NAME            VT62/DUP11 SELFTEST/LOOPBACK

                        DATE                    1-SEP-77

                        MAINTAINER              DIAGNOSTIC ENGINEERING

                        AUTHOR                  MICHAEL DENSMORE
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REVISION HISTORY

PEVISION	BY	
A	M DENSMORE	ORIGINAL RELEASE

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1 0 GENERAL

1 1 ABSTRACT

MAINDEC-11-DZDPG RUNS THE SELFTEST FOR THE VT62 TERMINAL AND EXERCISES THE LINK BETWEEN THE TERMINAL AND THE HOST THIS PARTICULAR VERSION SUPPORTS MULTIDROP, FULL DUPLEX COMMUNICATION VIA THE DUP-11 COMMUNICATION INTERFACE. OTHER VERSIONS (MAINDEC-11-DZDZC AND MAINDEC-11-DZDVP) SUPPORT THE DZ-11 AND DV-11 COMMUNICATION INTERFACES RESPECTIVELY. THE PROGRAM IS XXDP COMPATIBLE AND SUPPORTS SEQUENTIAL TESTING OF UP TO 8 VT62'S. PLEASE READ ALL SECTIONS OF THIS DOCUMENT CAREFULLY BEFORE USING THE PROGRAM PAY PARTICULAR ATTENTION TO SECTIONS 3 0 THROUGH 6 0

1 2 DEFINITIONS

MODEM - EQUIPMENT, ALSO KNOWN AS A "DATASET", WHICH PERFORMS THE MODULATION/DEMODULATION OF DATA SIGNALS THIS UNIT PROVIDES TIMING FOR SYNCHRONOUS COMMUNICATION DEVICES

MODEM ELIMINATOR - EQUIPMENT WHICH CONNECTS TWO SYNCHRONOUS DEVICES USING A CABLE RATHER THAN TELEPHONE VOICE LINES THE ELIMINATOR HAS A CLOCK FOR TIMING.

DDCMP PROTOCOL - DEC'S COMMUNICATION LINE PROTOCOL

UUT - UNIT UNDER TEST

PTABLE - A TABLE OF INFORMATION, WITH ENTRIES FOR EACH UNIT UNDER TEST, THAT DESCRIBES THE HARDWARE (BUS ADDRESS, VECTOR, ETC.)

DUP - SINGLE LINE, SYNCHRONOUS COMMUNICATION INTERFACE

DZ - EIGHT LINE, MULTIPLEXED, SYNCHRONOUS COMMUNICATION INTERFACE

DV - SIXTEEN LINE, MULTIPLEXED, SYNCHRONOUS COMMUNICATION INTERFACE.

CRC CHECKSUM - CHECKSUM USED IN DEC NETWORK PROTOCOL (CYCLIC REDUNDANCY CHECK)

MICRODIAGNOSTIC - THE MICROCODE IN THE VT62 THAT PERFORMS THE DIAGNOSTIC CHECKOUT OF THE HARDWARE (ALSO KNOWN AS "SELF TEST)

SELF TEST - SEE "MICRODIAGNOSTIC"

1 3 DESIGN NOTES

THIS PROGRAM WAS DESIGNED AND IMPLEMENTED USING STRUCTURED TECHNIQUES. THE PROCEDURE CAUSED THE PROGRAM TO HAVE SOME OPERATIONAL CHARACTERISTICS WHICH ARE OF INTEREST TO THE USER THESE CHARACTERISTICS ARE DISCUSSED IN THIS SECTION THIS DISCUSSION IS NOT VITAL TO LEARNING HOW TO OPERATE THE PROGRAM HOWEVER

THE MOST IMPORTANT OPERATIONAL CHARACTERISTIC OF STRUCTURED DESIGN , AS IT AFFECTS THE USER, IS HOW ERRORS ARE REPORTED THE TOP-DOWN DESIGN OF THE PROGRAM RESULTS IN A BOTTOM-UP REPORT OF ERROR INFORMATION. SEVERAL LINES OF ERROR INFORMATION ARE PRINTED AS EACH PROGRAM SECTION REPORTS ITS LEVEL OF INFORMATION AN EXAMPLE OF THIS TYPE OF ERROR LOG WOULD BE A DUP ERROR THE FIRST ERROR MESSAGE WOULD GIVE SPECIFIC DEVICE INFORMATION SUCH AS REGISTER CONTENTS AND THEN RETURN CONTROL TO THE NEXT LEVEL AT THE NEXT LEVEL, THE LOGICAL DEVICE NUMBER OR DEVICE SERIAL NUMBER WOULD BE REPORTED AT THE LEVEL ABOVE THAT, STILL MORE GENERAL INFORMATION WOULD BE GIVEN THE REPORTS CONTINUE UNTIL THE HIGHEST LEVEL IS REACHED

COMMENT FIELDS IN THE LISTING WITH SQUARE BRACKETS [ ] REFER TO FUNCTIONAL BLOCKS IN THE DESIGN AND HAVE NO SIGNIFICANCE TO THE USER THEY ARE RETAINED FOR USE BY PROGRAM MAINTAINERS.

1 4 DDCMP

THIS SECTION GIVES A VERY BRIEF DESCRIPTION OF DDCMP AS USED BY THIS DIAGNOSTIC. THE DESCRIPTION IS BY NO MEANS COMPLETE; IT IS INTENDED TO HELP THE USER UNDERSTAND ERROR REPORTS.

THERE ARE THREE TYPES OF DDCMP MESSAGES: CONTROL, DATA AND BOOTSTRAP THE BOOTSTRAP MESSAGE IS NOT USED BY THIS DIAGNOSTIC. THE DATA MESSAGES CONSIST OF A 6-BYTE HEADER, A 2-BYTE CRC FOR THE HEADER, THE DATA ITSELF AND A 2-BYTE CRC FOR THE DATA. CONTROL MESSAGES CONSIST OF THE HEADER (AND ITS CRC) ONLY. ALL CONTROL MESSAGES HAVE AN "ENQ" CHARACTER AS THE FIRST BYTE ALL DATA MESSAGES ARE NUMBERED SO THAT EACH STATION ON THE LINK CAN KEEP TRACK OF WHICH MESSAGES ARE TRANSMITTED PROPERLY. ALL MESSAGES HAVE A STATION ADDRESS IN THE HEADER SO THAT MESSAGES ARE DIRECTED TO AND FROM THE PROPER STATIONS ON A MULTIDROP LINE.

THERE ARE FOUR CONTROL MESSAGES USED BY THIS DIAGNOSTIC: ACK, NAK, STRT AND STACK ACK IS AN ACKNOWLEDGEMENT THAT THE LAST MESSAGE SENT WAS PROPERLY RECEIVED NORMALLY, MESSAGES ARE ACKNOWLEDGED BY SENDING A DATA MESSAGE WITH THE NUMBER OF THE LAST MESSAGE IN THE HEADER. ACK'S ARE USED WHEN THERE IS NO DATA MESSAGE TO SEND BACK. NAK IS A NEGATIVE ACKNOWLEDGEMENT FOR THE LAST MESSAGE SENT AND INDICATES THE REASON FOR THE ERROR. STRT IS USED TO INITIATE COMMUNICATION BETWEEN TWO STATIONS. THE RECEIVING STATION SETS ITSELF UP AND ACKNOWLEDGES THE STRT WITH A STACK, OR START ACKNOWLEDGE THE STRT-STACK SEQUENCE IS USED BEFORE AND AFTER EACH TEST ALL MESSAGES ARE REQUIRED TO BE ACKNOWLEDGED WITH EITHER A DATA MESSAGE OR AN ACK

2 0 EQUIPMENT REQUIREMENTS

THIS PROGRAM REQUIRES A PDP-11 WITH A MINIMUM OF 16K CORE AND A CONSOLE TERMINAL. A CLOCK OPTION IS NOT REQUIRED, BUT ONLY ROUGH TIMING IS AVAILABLE WITHOUT ONE THE PDP-11 CONSOLE SWITCH REGISTER IS NOT USED ONE OR MORE DUP-11'S MUST BE CONNECTED TO THE TERMINALS UNDER TEST VIA COMMUNICATION LINES THROUGH EITHER MODEM'S OR MODEM ELIMINATORS THE VT62'S MUST BE IN SYNCHRONOUS MODE AND ON-LINE THE TERMINAL ADDRESS SWITCHES ON THE CONTROL BOARD MUST BE SET TO MATCH THE TERMINAL ADDRESS ASSIGNED TO THE LOGICAL UNIT (SEE SECTION 4 0)

3 0 LOADING PROCEDURE

THIS PROGRAM MAY BE LOADED FROM PAPER TAPE USING THE ABSOLUTE LOADER IT MAY ALSO BE LOADED FROM PAPER TAPE OR DISK USING XXDP PROCEDURES

4 0 STARTING AND RUNNING THE PROGRAM

THE STARTING ADDRESS FOR THE PROGRAM IS 200 THE PROGRAM WILL FIRST ASK IF A CLOCK (KW11-L OR KW11-P) IS AVAILABLE IT WILL THEN ASK IF A LINE

PRINTER IS AVAILABLE. IF A LINE PRINTER IS SPECIFIED, THE PROGRAM WILL ASK FOR ITS ADDRESS (DEFAULT = 177514). THE PROGRAM ALSO ASKS FOR MEMORY SIZE, Q-BUS OPTION AND LINE FREQUENCY. IF NEITHER CLOCK IS SPECIFIED, THE PROGRAM WILL ASK THE USER TO TYPE TWO CHARACTERS, FIVE SECONDS APART, IN ORDER TO PROVIDE ROUGH TIMING.

THE PROGRAM WILL THEN PROMPT THE USER BY TYPING A ">". NOW THE USER MAY TYPE ONE OF SEVEN COMMANDS STA(RT), RES(TART), CON(TINUE), ZFL(AG), ADD, DRO(P) OR DIS(PLAY), WHERE THE LETTERS IN PARENTHESIS NEED NOT BE TYPED IF A TYPING MISTAKE IS MADE, THE RUBOUT KEY IS USED TO DELETE THE LAST CHARACTER(S) TYPED THE PROGRAM WILL TYPE A MESSAGE IF THE COMMAND IS INVALID EACH OF THESE COMMANDS IS EXPLAINED IN THE SECTIONS BELOW. SWITCHES ARE USED TO SET SOFTWARE FLAGS SUCH AS "LOOP ON ERROR" THE FLAGS USED BY THIS PROGRAM ARE DESCRIBED IN SECTION 4 8

4 1 START

THE START COMMAND (STA) ZEROS ALL FLAGS (PRINT ALL ERROR MESSAGES AND DO NOT LOOP WITHIN TESTS) AND INITIATES THE OPERATOR DIALOGUE AT THIS POINT, THE DEVICE TABLE (PTABLE) IS EMPTY AND THE OPERATOR MUST USE THE DIALOGUE TO DESCRIBE ALL UUT'S AS SHOWN BELOW THE NUMBERS IN SQUARE BRACKETS, , RELATE THE TYPEOUT TO THE EXPLANATION BELOW AND ARE NOT TYPED IN ACTUAL OPERATION THE PROCEDURES FOR HANDLING TYPING ERRORS ARE ALSO DESCRIBED BELOW CR REFERS TO THE RETURN KEY (CARRIAGE RETURN).

DIALOGUE

```
# UNITS ? (DECIMAL)          1

DUP ADDRESS  ? (OCTAL) NNNNNN          2

DUP VECTOR  ? (OCTAL) NNN        3

DUP BUS PRIORITY  ? (OCTAL) N        4

TERMINAL ADDRESS  ? (OCTAL) N        5
  CHANGE S W  ? (Y OR N)        6

HOW MANY INITIATE TRIES BEFORE ABORT ? (OCTAL) 10     7

USE ALL ZERO'S FOR LOOPBACK DATA ? (Y OR N) Y      8
```

EXPLANATION

1 TYPE THE TOTAL NO OF UUT'S IN DECIMAL QUESTIONS 2 THROUGH 5 WILL BE REPEATED UNTIL ALL UUT'S HAVE BEEN DESCRIBED. THE USER DOES NOT HAVE TO ANSWER THESE QUESTIONS FOR EACH DUP HOWEVER, IF THERE ARE MULTIPLE UUT'S PER DUP. THE EXPLANATION FOR QUESTION 5 SHOWS HOW TO ENTER MULTIPLE UUT'S

2 TYPE THE BUS ADDRESS OF THE DUP THIS MUST BE AN EVEN OCTAL NUMBER NOT GREATER THAN 177776 THE USER MAY TYPE CR TO USE

THE DEFAULT VALUE: NNNNNN.

3 TYPE THE VECTOR ADDRESS FOR THE DUP THIS MUST BE AN EVEN OCTAL NUMBER NOT GREATER THAN 376. THE USER MAY TYPE CR TO USE THE DEFAULT VALUE: NNN.

4 TYPE THE BUS PRIORITY LEVEL OF THE DUP THIS MUST BE A DIGIT FROM 0 TO 7. AGAIN, THE USER MAY TYPE CR TO GET THE DEFAULT VALUE: N.

5 TYPE THE TERMINAL ADDRESS FOR EACH TERMINAL ATTACHED TO THE DUP SEPARATE EACH ADDRESS WITH A COMMA THIS IS THE ADDRESS SELECTED BY THE SWITCHES ON THE I/O BOARD IN THE TERMINAL AND IS AN OCTAL NUMBER BETWEEN 0 AND 377 THE USER MAY TYPE CR TO GET THE DEFAULT VALUE. N.

6 IF THE USER WISHES TO CHANGE EITHER OF THE TWO SOFTWARE PARAMETERS DESCRIBED FOR QUESTIONS 7 OR 8, HE MUST ANSWER THIS QUESTION BY TYPING "Y". IF THE USER WISHES TO BYPASS QUESTIONS 7 AND 8, HE TYPES "N".

7 TYPE THE NUMBER OF TIMES THE PROGRAM IS TO ATTEMPT TO INITIALIZE A DUP BEFORE ABORTING THE UNIT THE USER MAY TYPE ANY OCTAL NUMBER BETWEEN 0 AND 177777 TYPE CR TO DEFAULT TO 10 (OCTAL) ATTEMPTS

8 IF THE USER TYPES "Y", THE LOOPBACK DATA WILL BE 255 ZERO BYTES. IF THE USER TYPES "N", THE LOOPBACK DATA WILL BE A PATTERN OF ALTERNATING 1 AND 0 BITS SEE SECTION 8 2 FOR DETAILS ON THE LOOPBACK TEST

EXAMPLE OF DIALOGUE

ASSUME THE FOLLOWING HARDWARE CONFIGURATION A DUP (160000,300,3) WITH TWO TERMINALS (ADDRESSES 0 AND 1), A SECOND DUP (160010,320,3) WITH A SINGLE TERMINAL (ADDRESS 5) AND A THIRD DUP (170000,340,4) WITH TWO TERMINALS (ADDRESSES 1 AND 2) THE USER WOULD USE THE FOLLOWING DIALOGUE TO SET UP THE PROGRAM

```
     >STA

     # UNITS ? (DECIMAL) 5

     DUP ADDRESS. ? (OCTAL) 160000

     DUP VECTOR. ? (OCTAL) 310   300

     DUP BUS PRIORITY. ? (OCTAL) 4 3

     TERMINAL ADDRESS ? (OCTAL) 0  0,1

     DUP ADDRESS. ? (OCTAL) 160000   160010

     DUP VECTOR ? (OCTAL) 300    320

     DUP BUS PRIORITY ? (OCTAL) 3

     TERMINAL ADDRESS ? (OCTAL  1   5
```

```
                        DUP ADDRESS ? (OCTAL) 160010   170000

                        DUP VECTOR ? (OCTAL) 320   340

                        DUP BUS PRIORITY ? (OCTAL) 3  5

                        TERMINAL ADDRESS ? (OCTAL) 5   1,2

                           CHANGE S W. ? (Y OR N) N

                               (NOTE WHERE CR WAS USED TO ACCEPT THE DEFAULT)

                                     TYPING ERRORS

                (1)  THE RUBOUT KEY IS USED TO DELETE ANY CHARACTERS WHICH ARE IN
                     ERROR
                (2)  IF THE RESPONSE IS NOT WITHIN LIMITS OR IS IN THE WRONG
                     FORMAT, THE PROGRAM WILL NOTIFY THE USER AND ASK THE
                     QUESTION AGAIN
                (3)  WHEN ENTERING MULTIPLE TERMINAL ADDRESSES FOR A SINGLE DUP,
                     THE USER MAY NEGLECT TO TYPE ONE OR MORE ADDRESSES IN SUCH
                     A CASE, THE USER MERELY ENTERS THE SAME DUP ADDRESS, VECTOR
                     AND PRIORITY IN THE NEXT SERIES OF QUESTIONS AND THEN ENTERS
                     THE REMAINING TERMINAL ADDRESSES REMEMBER, THE SERIES OF
                     QUESTIONS (2 THROUGH 5) WILL BE RE-ASKED UNTIL ALL UUT'S
                     HAVE BEEN ACCOUNTED FOR

          4 2        RESTART
                     THE RESTART COMMAND (RES) STARTS THE PROGRAM WITHOUT CLEARING THE PTABLE
                     ALL FLAGS REVERT TO THEIR INITIAL STATE UNLESS THE FLAG SWITCH IS USED TO
                     CHANGE THEM (SECTION 4 8) THE OPERATOR DIALOGUE DESCRIBED IN 4 1 DOES
                     NOT TAKE PLACE UNLESS REQUESTED WHEN THIS COMMAND IS USED, THE PROGRAM
                     WILL ASK IF THE USER WISHES TO CHANGE THE HARDWARE TABLE AND IF HE WISHES
                     TO CHANGE THE SOFTWARE TABLE IF THE USER ANSWERS YES (BY TYPING "Y") TO
                     THE HARDWARE TABLE QUESTION, THAT PORTION OF THE DIALOGUE DESCRIBED IN
                     SECTION 4.1 BEGINNING WITH QUESTION 1 ENDING WITH QUESTION 5 WILL TAKE
                     PLACE IF THE USER ANSWERS YES TO THE SOFTWARE TABLE QUESTION, HE WILL
                     BE ASKED QUESTIONS 7 AND 8

                     THE MOST COMMON USE OF THIS COMMAND IS TO CHANGE RUN-TIME FLAGS OR TO
                     ADD/DROP UNITS THESE FLAGS ARE DESCRIBED IN SECTION 4 8 - SWITCH
                     OPTIONS TYPING A " C" WILL FORCE THE SUPERVISOR TO ISSUE A PROMPT
                     CHARACTER (">") SO THAT THE USER MAY USE THE RESTART COMMAND FOR THIS
                     PURPOSE NOTE IF THE USER USES THE START COMMAND AFTER A C, HE WILL
                     HAVE TO REENTER ALL DEVICE INFORMATION!

          4 3        CONTINUE
                     THE CONTINUE COMMAND WILL RESTART THE PROGRAM AT THE TEST WHICH WAS
                     INTERRUPTED UNLIKE THE RESTART COMMAND, THIS COMMAND DOES NOT FORCE
                     FLAGS BACK TO THE INITIAL STATE THE FLAGS WILL REMAIN AS SET UP DURING
                     THE LAST START OR RESTART THE USER HAS THE SAME DIALOGUE AND FLAG
```

OPTIONS AS DESCRIBED FOR THE RESTART COMMAND.

4 4 ZERO FLAGS

THIS COMMAND WILL ZERO ALL FLAGS (SECTION 4.8) AND TYPE A PROMPT SECTION 4.8 DESCRIBES THE EFFECTS OF CLEARING ALL FLAGS, BUT ESSENTIALLY, ALL LOOPING AND HALTS WILL BE DISABLED AND ALL ERROR INFORMATION WILL BE PRINTED IN THE EVENT OF AN ERROR.

4 5 ADD UNITS

WHILE TESTING MULTIPLE UNITS, THE USER MAY WISH TO DROP A PARTICULAR UNIT FROM THE TEST PROCEDURE AND, LATER ON, BEGIN TESTING THAT UNIT AGAIN. IN THIS CASE, THE USER NEED NOT STOP THE DIAGNOSTIC AND REBUILD THE PTABLE. AFTER A UNIT HAS BEEN DROPPED (SEE SECTION 4.6), THE USER MAY ADD THE UNIT BY TYPING " C" AND USING THE ADD COMMAND AS FOLLOWS.

ADD/UNI.N

WHERE N IS A DECIMAL UNIT NUMBER THAT SPECIFIES THE UNIT TO BE ADDED UNITS ARE NUMBERED FROM 1 TO 32 ACCORDING TO THE ORDER IN WHICH THEY WERE SPECIFIED FOR THE HARDWARE TABLE MULTIPLE UNITS MAY BE ADDED BY TYPING EACH UNIT NUMBER SEPARATED BY COLONS (I.E., ADD/UNI 2 4 22) OR BY TYPING THE FIRST AND LAST UNIT NUMBERS OF A CONTIGUOUS GROUP OF UNITS SEPARATED BY A DASH (I E., ADD/UNI 1-10 WILL ADD THE FIRST TEN UNITS). NOTE AFTER A START COMMAND, ALL UNITS ARE CONSIDERED ADDED THERE IS NO NEED TO USE THE ADD COMMAND UNLESS THE UNIT WAS DROPPED

4 6 DROP UNITS

TO REMOVE A UNIT FROM TESTING, THE DROP COMMAND (DRO) IS USED TO USE THIS COMMAND, TYPE C" AND DROP THE UNIT(S) USING THE DROP COMMAND AS FOLLOWS

DRO/UNI N

WHERE "N" IS A DECIMAL UNIT NUMBER WHICH SPECIFIES THE UNIT TO BE DROPPED UNITS ARE NUMBERED FROM 1 TO 32 ACCORDING TO THE ORDER IN WHICH THEY WERE SPECIFIED FOR THE HARDWARE TABLE MULTIPLE UNITS MAY BE DROPPED BY TYPING EACH UNIT NUMBER SEPARATED BY COLONS (I E., DRO/UNI 1 3 7) OR BY TYPING THE FIRST AND LAST UNIT NUMBERS OF A CONTIGUOUS GROUP SEPARATED BY A DASH (I E., DRO/UNI 1-9 CAUSES THE FIRST NINE UNITS TO BE DROPPED) AFTER THE PROGRAM IS RESTARTED, THE SPECIFIED UNIT(S) WILL NOT BE INCLUDED FOR TESTING

4 7 DISPLAY PTABLE

WHEN THE DISPLAY COMMAND IS TYPED, THE ENTIRE CONTENTS OF THE PTABLE WILL BE PRINTED UNITS THAT HAVE BEEN DROPPED WILL BE SO MARKED THIS COMMAND IS USEFUL FOR VERIFYING THE PTABLE CONTENTS

4 8 SWITCH OPTIONS

THERE ARE THREE SWITCH OPTIONS AVAILABLE FOR USE WITH THE COMMANDS /TES, /PAS AND /FLA THE TEST SWITCH, /TES, IS USED ONLY WITH THE START COMMAND AND THE RESTART COMMAND IT IS USED TO SPECIFY THE INDIVIDUAL TEST(S) TO BE RUN IN CASES WHERE ALL TESTS ARE NOT TO BE RUN FOR EXAMPLE, IF THE USER WISHED TO RUN THE LOOPBACK TEST ONLY, HE WOULD TYPE

>STA/TES 2

IF THIS SWITCH IS NOT USED, ALL TESTS WILL BE RUN AS THE DEFAULT CONDITION.

THE PASS SWITCH IS USED TO SPECIFY THE NUMBER OF PASSES TO BE RUN TO RUN THE LOOPBACK TEST TWENTY TIMES, THE USER WOULD TYPE

```
>STA/TES 2/PAS:20
```

THIS SWITCH MAY BE USED WITH THE START, RESTART AND CONTINUE COMMANDS THE DEFAULT CONDITION IS ESSENTIALLY AN INFINITE NUMBER OF PASSES

THE FLAG SWITCH IS USED TO SET FLAGS WHICH CONTROL PROGRAM OPERATION AND ERROR PRINTOUTS THIS SWITCH MAY BE USED WITH THE CONTINUE COMMAND AS WELL AS THE START COMMAND AND RESTART COMMAND THE AVAILABLE FLAGS ARE SHOWN IN THE TABLE BELOW

FLAG	EFFECT IF SET
LOE	LOOP ON ERROR
HLT	HALT ON ERROR
IER	INHIBIT ERROR REPORTS
IBE	INHIBIT BASIC ERROR REPORT*
IXE	INHIBIT EXTENDED ERROR REPORT*
PRI	SEND ALL TYPEOUTS TO THE PRINTER
BOE	BELL ON ERROR
UAM	UNATTENDED MODE (NO MANUAL INTERVENTION)
PNT	PRINT TEST NUMBER

*SEE SECTION 5.0

EXAMPLE
IF THE USER WISHES TO RUN THE PROGRAM WITHOUT ERROR MESSAGES AND HAVE IT LOOP ON ERROR, HE WOULD TYPE

```
>RES/FLA LOE IER
```

EXAMPLE
IF THE USER LATER WANTED TO STOP THE LOOP ON ERROR FEATURE, HE WOULD TYPE

```
>CON/FLA LOE=0
```

NOTE THE ERROR REPORTS WOULD STILL BE INHIBITED

ALL FLAGS ARE DEFAULTED TO ZERO (NOT SET)

5.0 ERROR AND INFORMATIONAL MESSAGES

AS NOTED IN THE DESIGN NOTES (SECTION 1.3), A SINGLE ERROR MAY RESULT IN SEVERAL MESSAGES BEING TYPED. THIS IS DUE TO THE STRUCTURE OF THE PROGRAM EACH SECTION, IN THE EVENT OF AN ERROR, REPORTS THE INFORMATION AVAILABLE TO IT. THE FINAL MESSAGE FOR EACH ERROR CONTAINS THE UNIT NUMBER (DECIMAL - 1 TO 32 - SEE SECTIONS 4.5 AND 4.6) AND THE PHRASE "END OF ERROR REPORT"

THERE ARE THREE LEVELS OF ERROR REPORTS BY USING THE FLAG SWITCHES (SECTION 4.8), ONE OR MORE LEVELS OF REPORT MAY BE INHIBITED THE FIRST LEVEL CONSISTS OF AN ERROR NUMBER, PC CONTENTS AND ERROR TYPE (HARD, SOFT OR FATAL) THE ERROR NUMBER CAN BE RELATED TO THE TABLE AT THE END OF

THIS SECTION. THE PC CONTENTS GIVE THE ADDRESS WHERE THE ERROR REPORT MECHANISM WAS INVOKED. THE NEXT LEVEL (BASIC ERROR REPORT) GIVES AN ENGLISH DESCRIPTION OF THE ERROR. AN EXAMPLE OF THIS TYPE OF MESSAGE IS "HEADER HAS CRC ERROR". THE FINAL LEVEL (EXTENDED ERROR REPORT) GIVES ADDITIONAL DATA CONCERNING THE ERROR, SUCH AS REGISTER CONTENTS.

TO INHIBIT SOME OR ALL ERROR MESSAGES, USE THE FLAGS DESCRIBED IN SECTION 4 8 THE INHIBIT-EXTENDED-ERROR-REPORT FLAG (IXE) INHIBITS THAT LEVEL ONLY THE INHIBIT-BASIC-ERROR-REPORT FLAG (IBE) INHIBITS BOTH BASIC AND EXTENDED ERROR REPORTS. FINALLY, THE INHIBIT-ERROR-REPORT FLAG (IER)) INHIBITS ALL TYPEOUTS

TABLE OF ERROR NUMBERS

NO	ERROR DESCRIPTION
00	CANNOT INITIALIZE DUP
01	REPLY MESSAGE FROM TERM. WAS NOT AN ENQ
02	REPLY FROM TERM. WAS NOT EXPECTED TYPE OF CONTROL MESSAGE
03	TERM. ADDRESS IN RESPONSE WAS NOT CORRECT
04	RESPONSE HAD CRC ERROR IN THE HEADER
20	DUP TRANSMIT ERROR
21	DUP RECEIVE ERROR
22	MESSAGE TO TERMINAL WAS NOT ACK'ED
23	ERROR OCCURED WHILE INITIATING DUP
24	ERROR OCCURED DURING TRANSMISSION
25	DDCMP STRT MESSAGE DID NOT GET A STACK
26	ERROR DURING RECEPTION
30	CANNOT GET CLEAR TO SEND SIGNAL
31	TIMEOUT WHILE WAITING FOR RESPONSE
40	SEE 21
41	SEE 04
42	SEE 03
43	MESSAGE DATA HAD CRC ERROR
50	ERROR OCCURED DURING SELFTEST (TEST #1)
51	ERROR OCCURED DURING LOOPBACK (TEST #2)
52	ERROR IN RECEIVED DATA
70	SELFTEST RESPONSE IN ERROR (NOT RECOGNIZED)
71	TERMINAL MEMORY ERROR
72	TERMINAL CONTROL-ROM ERROP

6 0 RESTRICTIONS

THIS DIAGNOSTIC DOES NOT ATTEMPT TO TEST THE DUP11 IF A LARGE NUMBER OF COMM ERRORS OCCUR, OR IF ATTEMPTS TO SEND OR RECIEVE DATA TO AND FROM THE TERMINAL FAIL, USE THE SPECIFIC DUP11 DIAGNOSTICS TO VERIFY THE DUP11

7 0 MISCELLANEOUS

PLEASE REPORT ALL PROGRAM PROBLEMS VIA THE AIDS REPORTING SYSTEM. REFER ALL COMMENTS REGARDING DOCUMENTATION TO THE DIAGNOSTIC ENGINEERING

TERMINAL GROUP IN MAYNARD, MASS.

8 0 TEST DESCRIPTIONS

8 1 MICRODIAGNOSTIC (TEST #1)

THE MICRODIAGNOSTIC, OR SELFTEST, IS ROM RESIDENT CODE IN THE VT62 THAT IS EXECUTED UPON COMMAND FROM THE HOST COMPUTER OR DURING POWER UP. A FULL DESCRIPTION OF THE TEST IS AVAILABLE IN THE HARDWARE MANUAL FOR THE VT62 ESSENTIALLY, THE TEST VERIFIES THE MICROPROCESSOR, CHECKS ROM MEMORY, EXERCISES RAM MEMORY AND EXERCISES THE SCREEN. THE HOST MAY REQUEST THE RESULTS OF THE TEST. IN ANY CASE, THE RESULTS ARE ALWAYS DISPLAYED ON THE LAST LINE OF THE SCREEN. THE FIRST CHARACTERS ARE A CODED ERROR REPORT FOR THE HOST COMPUTER AND THE REMAINDER OF THE LINE IS AN ENGLISH DESCRIPTION OF THE ERROR STATUS.

8 2 LOOPBACK (TEST #2)

IN THIS TEST, THE TERMINAL IS COMMANDED TO ENTER LOOPBACK MODE AND A SINGLE, 256(DECIMAL) BYTE DATA MESSAGE IS SENT TO THE TERMINAL. THIS DATA MESSAGE WILL HAVE A DDCMP PROTOCOL ENVELOPE LOOPBACK DATA IS DISPLAYED ON THE VT62'S SCREEN. WHEN THE DATA IS RETURNED, THE TERMINAL IS TAKEN OUT OF LOOPBACK MODE USING A DDCMP "STRT" SEQUENCE. THE CRC CHECKSUMS ARE VALIDATED FOR BOTH THE MESSAGE HEADER AND THE MESSAGE DATA. THE DATA IS THEN CHECKED, BYTE BY BYTE. THUS THERE ARE THREE POSSIBLE ERRORS DETECTED. NO TERMINAL RESPONSE, BAD CRC OR BAD DATA.

INTERPRETATION OF ANY ERROR MESSAGES REQUIRES SOME EDUCATED GUESSWORK BECAUSE OF THE NUMBER OF COMPONENTS IN THE COMMUNICATION LINK INTERMITTENT ERRORS WOULD GENERALLY INDICATE LINE PROBLEMS UNLESS THE LINE IS PHYSICALLY SHORT OR THE ENVIRONMENT IS RELATIVELY NOISE FREE. IF EITHER OF THESE CONDITIONS IS THE CASE OR IF THE ERROR IS NOT INTERMITTENT, THEN THE TERMINAL I/O BOARD, THE MODEM AND THE DUP ARE SUSPECT. IF THERE IS NO TERMINAL RESPONSE, RUN THE TERMINAL SELF TEST OFF-LINE THIS WILL SHOW WHETHER THE TERMINAL IS COMPLETELY "DEAD" OR THE PORTIONS OF THE COMMUNICATION LINK MENTIONED ABOVE ARE BROKEN

THERE ARE TWO DATA PATTERNS AVAILABLE FOR LOOPBACK: ALL ZERO'S AND ALTERNATING 1/0 BITS (I E , BYTES OF 252,125,252,125,.) THE ZERO PATTERN IS NOISE-SUSCEPTIBLE, BUT APPEARS ON THE SCREEN AS NULLS HOWEVER THE ALTERNATING BITS PATTERN EXERCISES THE DATA PATHS BETTER SECTION 4 0 SPECIFIES HOW TO SELECT THE PATTERN

9 0 INDEX

ENDR

```
 5712            002000                          =2000
 5713                                    ;
 5714                                    ;       HEADER - VT62 HCCEPTANCE TEST
 5715                                    ;
 5725  002000      104                           .ASCII  ∂D∂
  (5)  002001      132                            ASCII  ∂Z∂
  (5)  002002      104                           .ASCII  ∂D∂
  (5)  002003      120                           .ASCII  ∂P∂
  (5)  002004      107                            ASCII  ∂G∂
  (6)  002005      000                           .BYTE   0
  (6)  002006      000                           .BYTE   0
  (5)  002007      000                            BYTE   0
  (4)  002010      101                            ASCII  ∂A∂
  (4)  002011      060                            ASCII  ∂0∂
  (4)  002012      001                            BYTE   C$REVISION
  (3)  002013      006                            BYTE   C$EDIT
  (4)  002014  000000                             WORD   0
  (4)  002016  000000                             WORD   0
  (4)  002020  000000                            .WORD   0
  (4)  002022  000000                             WORD   0
  (4)  002024  000000                             WORD   0
  (5)  002026  000000                             WORD   0
  (4)  002030  000000                             WORD   0
  (4)  002032  000000                             WORD   0
  (4)  002034  000000                             WORD   0
  (4)  002036  000000                             WORD   0
  (4)  002040  011450                             WORD   L$DISPATCH
  (4)  002042  011462                             WORD   L$INIT
  (4)  002044  012026                             WORD   L$CLEAN
  (4)  002046  021472                             WORD   L$HARD
  (4)  002050  021642                             WORD   L$SOFT
  (4)  002052  002202                             WORD   L$DVTYP
  (4)  002054  011454                             WORD   L$RPT
  (4)  002056  011430                             WORD   L$HW
  (4)  002060  011442                             WORD   L$SW
  (4)  002062  002220                             WORD   L$DR
  (4)  002064  002224                             WORD   L$DRST
  (4)  002066  000000                             WORD   0
  (4)  002070  011456                             WORD   L$AU
  (4)  002072  011460                             WORD   L$DU
  (4)  002074  000000                             WORD   0
  (4)  002076  021774                             WORD   L$LAST
```

```
                                ;**************************************************
                                ;       GLOBAL EQUATES                           *
                                ;**************************************************
                                ,
                                ; BIT DIFINITIONS
                                ;
          100000                BIT15== 100000
          040000                BIT14== 40000
          020000                BIT13== 20000
          010000                BIT12== 10000
          004000                BIT11== 4000
          002000                BIT10== 2000
          001000                BIT09== 1000
          000400                BIT08== 400
          000200                BIT07== 200
          000100                BIT06== 100
          000040                BIT05== 40
          000020                BIT04== 20
          000010                BIT03== 10
          000004                BIT02== 4
          000002                BIT01== 2
          000001                BIT00== 1
                                ,
          001000                BIT9==  BIT09
          000400                BIT8==  BIT08
          000200                BIT7==  BIT07
          000100                BIT6==  BIT06
          000040                BIT5==  BIT05
          000020                BIT4==  BIT04
          000010                BIT3==  BIT03
          000004                BIT2==  BIT02
          000002                BIT1==  BIT01
          000001                BIT0==  BIT00
                                ,
                                , EVENT FLAG DEFINITIONS
                                ,   EF32 EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
                                ,   EF16 EF01 AVAILABLE FOR PROGRAM USE
                                ,
          000040                EF START==      32                        , START COMMAND WAS ISSUED
          000037                EF RESTART==    31                        , RESTART COMMAND WAS ISSUED
          000036                EF CONTINUE==   30                        , CONTINUE COMMAND WAS ISSUED
          000035                EF NEW==        29                        , A NEW PASS HAS BEEN STARTED
          000034                EF PWR==        28                        , A POWER-FAIL/POWER-UP OCCURRED
                                .
          000020                EF16==  16
          000017                EF15==  15
          000016                EF14==  14
          000015                EF13==  13
          000014                EF12==  12
          000013                EF11==  11
          000012                EF10==  10
          000011                EF09==  9
          000010                EF08==  8
          000007                EF07==  7
          000006                EF06==  6
          000005                EF05==  5
```

```
(1)          000004                  EF04==  4
(1)          000003                  EF03==  3
(1)          000002                  EF02==  2
(1)          000001                  EF01==  1
(1)                                  ;
(1)
(1)                                  ; PRIORITY LEVEL DEFINITIONS
(1)                                  ,
(1)          000340                  PR107== 340
(1)          000300                  PR106== 300
(1)          000240                  PR105== 240
(1)          000200                  PR104== 200
(1)          000140                  PR103== 140
(1)          000100                  PR102== 100
(1)          000040                  PR101== 40
(1)          000000                  PR100== 0
 5749
 5750                                ,
 5751                                ,       VT62 DIAGNOSTIC EQUATES
 5752                                ,
 5753          000201                        SOH=201           ,START OF HEADER    (DDCMP)
 5754          000001                        ACK=1             ,ACKNOWLEDGE          "
 5755          000002                        NAK=2             ;NEGATIVE ACKNOWLEDGE "
 5756          000003                        REP=3             ,REPLY
 5757          000005                        ENQ=5             ,ENQUIRY              "
 5758          000006                        STRT=6            ,START                "
 5759          000007                        STACK=7           ,START ACKNOWLEDGE    "
 5761          000226                        SYNC=226          ;SYNCHRONIZATION CHARACTEP
 5766          000220                        DLE=220           ;DATA LINK ESCAPE
 5767          000024                        OSOP=24           ,LOOPBACK.
 5768          000200                        PARITY=200        ,PARITY BIT
 5776          000002                        TSTS=2            ,NO  OF TESTS
 5782          000000                        RCVCSR=0                ,OFFSETS  RECEIVER CSR
 5783          000002                        RCVBUF=2                ,         RECEIVER BUFFER REG
 5784          000004                        XMTCSR=4                ,         TRANSMITTER CSR
 5785          000006                        XMTBUF=6                ,         TRANSMITTER BUFFER REG
 5787
 5789                                                                ,HARDWARE REGISTER BIT DEFINITIONS
 5790          000400                        TSOM=400          ,TRANSMIT, START OF MESSAGE
 5791          000002                        DTR=2             ,DATA TERMINAL READY
 5792          000400                        MASCLR=400        ,MASTER CLEAR
 5793          101226                        PARAM=101226      ,PARAM. REG. - DEC MODE, AUTO-CRC INHIB  AND SYNC
 5794          000004                        RTS=4             ,REQUEST TO SEND
 5795          020000                        CTS=20000         ,CLEAR TO SEND
 5796          000100                        TXINTE=100        ,TRANSMIT INTERRUPT ENABLE
 5797          000020                        SENDFD=20         ,SEND -- FULL DUX
 5798          000120                        RXINTE=120        ,RECEIVE INTERRUPT ENABLE
 5799          000020                        RCENBL=20         ,RECEIVER ENABLE
 5865          177400                        HYBYTE=177400           ,MASK FOR HIGH BYTE OF A WORD
 5866          000377                        LOBYTE=377              ,MASK FOR LOW BYTE OF A WORD
```

```
5887                                    ;*************************************************
5888                                    ;       GLOBAL DATA                             *
5889                                    ;*************************************************
5890  002100  000000                    R5STCK  0               ;FLAG TO INDICATE IF R5 STACK IS SET UP
5891  002102  000000                    SCRTCH  0               ;SCRATCH LOCATIONS
5892  002104  000000                    TEMP    0
5893  002106  000000                    ABORT   0               ;TEST ABORT FLAG
5894  002110  020000                    TIMLIM  20000           ;TIMEOUT LIMIT (IN 100 MICROSEC  INCREMENTS)
5895  00211_  000000                    STIME   0               ;SHORT TIMEOUT LIMIT (APPROX  20 MICROSEC  INCREM )
5896  002114  000010                    ILIMIT  10              ;LIMIT ON DEVICE INITIALIZATION ATTEMPTS
5897  002116  000000                    INERR   0               ;INPUT ERROR
5898  002120  000000                    OUTERR  0               ;OUTPUT ERROR
5899  002122  000001                    PASCNT  1
5900  002124  000000                    EOMSG   0               ;END_OF_MESSAGES FLAG
5901  002126  000000                    LOGDEV  0               ;LOGICAL DEVICE NUMBER
5905  002130  000000                    EXPINP  0               ;EXPECT_INPUT FLAG
5906  002132  000000                    OUTMSG  0               ;OUTPUT MESSAGE POINTER AND SIZE
5907  002134  000000                            0
5908  002136  000000                    INMSG   0               ;INPUT MESSAGE POINTER AND SIZE
5909  002140  000000                            0
5910  002142  000000                    OUTBUF  0               ;OUTPUT BUFFER POINTER AND SIZE
5911  002144  000000                    OU SIZ  0
5912  002146  000000                    INBUF   0               ;INPUT BUFFER POINTER AND SIZE
5913  002150  000000                    INSIZ   0
5914
5915  002152                            MSGAP
5916  002152  000000                    OUT     0               ;TEST MESSAGE AREA POINTER
5917  002154  000000                    INITMA  0               ;TEMPORARY MESSAGE POINTER AND SIZE
5918  002156  000000                    INITMS  0               ;USED FOR INITIALIZATION OF OUTPUT ROUTINES
5919  002160  000000                    BAPNT   0               ;GENERAL BUFFER AREA POINTER AND SIZE
5920  002162  000000                    BASIZE  0
5921  002164  000000                    MSGNO   0               ;MESSAGE NUMBER (DDCMP)
5922  002166  000000                    RMSGNO  0
5929  002170  000000                    PTABLE  0               ;PRESENT UNIT PTABLE DATA
5930  002172  000000                            0
5931  002174  000000                            0
5932  002176  000000                            0
5936  002200                            PTEND
5937  002200  000000                    DEVPRI  0               ;DEVICE PRIORITY
5949
5951 -002202  052126  031066  042054            .ASCIZ  @VT62,DUP11@
 (3)  002210  050125  030461  000
 (2)          002216                            .EVEN
5952  002216  000001                            WORD    1
 (6)  002220  000017                            WORD    17
 (4)  002222  000004                            WORD    4
 (2)  002224  000004                            BLKW    4
```

```
                                        ;*************************************************
                                        ;       GLOBAL TEXT                             *
                                        ;*************************************************

5967  002234  040503  020116  047516  MSG00   .ASCIZ /CAN NOT INITIALIZE COMM DEVICE/
      002242  020124  047111  052111
      002250  040511  044514  042532
      002256  041440  046517  020115
      002264  042504  044526  042503
      002272     000
5968  002273     122  050105  054514  MSG01    ASCIZ /REPLY WAS NOT AN ENQ/
      002300  053440  051501  047040
      002306  052117  040440  020116
      002314  047105  000121
5969  002320  047111  047503  051122  MSG02    ASCIZ /INCORRECT REPLY TYPE/
      002326  041505  020124  042522
      002334  046120  020131  054524
      002342  042520     000
5970  002345                         MSG42
5971  002345     122  050105  054514  MSG03    ASCIZ /REPLY HAS INCORRECT STATION ADDRESS/
      002352  044040  051501  044440
      002360  041516  051117  042522
      002366  052103  051440  040524
      002374  044524  047117  040440
      002402  042104  042522  051523
      002410     000
5972  002411                         MSG41
5973  002411     110  040505  042504  MSG04    ASCIZ  HEADER HAS CRC ERROR/
      002416  020122  040510  020123
      002424  051103  020103  051105
      002432  047522  000122
5974  002436  051105  047522  020122  MSG10    ASCIZ  ERROR DURING KEYBOARD TEST  ** END OF REPORT **/
      002444  052504  044522  043516
      002452  045440  054505  047502
      002460  051101  020104  042524
      002466  052123  020040  025052
      002474  042440  042116  047440
      002502  020106  042522  047520
      002510  052122  025040  000052
5975  002516  040502  020104  042522  MSG11    ASCIZ /BAD RESPONSE FROM KEYBOARD
      002524  050123  047117  042523
      002532  043040  047522  020115
      002540  042513  041131  040517
      002546  042122     000
5976  002551     124  047517  046440  MSG12    ASCIZ  TOO MANY CHARACTERS SENT FROM KEYBOARD
      002556  047101  020131  044103
      002564  051101  041501  042524
      002572  051522  051440  047105
      002600  020124  051106  046517
      002606  045440  054505  047502
      002614  051101  000104
5977  002620  051124  047101  046523  MSG20    ASCIZ /TRANSMIT ERROR
      002626  052111  042440  051122
      002634  051117     000
5978  002637                         MSG40
5979  002637     122  041505  050105  MSG21    ASCIZ /RECEPTION ERROR
```

```
        002644  044524  047117  042440
        002652  051122  051117     000
 5980   002657     116  020117  041501  MSG22   ASCIZ /NO ACK RECEIVED AFTER TRANSMISSION/
        002664  020113  042522  042503
        002672  053111  042105  040440
        002700  052106  051105  052040
        002706  040522  051516  044515
        002714  051523  047511  000116
 5981   002722  051105  047522  020122  MSG23   ASCIZ /ERROR WHILE INITIALIZING DEVICE/
        002730  044127  046111  020105
        002736  047111  052111  040511
        002744  044514  044532  043516
        002752  042040  053105  041511
        002760  000105
 5982   002762  051105  047522  020122  MSG24   ASCIZ /ERROR OCCURRED DURING TRANSMISSION/
        002770  041517  052503  051122
        002776  042105  042040  051125
        003004  047111  020107  051124
        003012  047101  046523  051511
        003020  044523  047117     000
 5983   003025     116  020117  052123  MSG25.  ASCIZ /NO STACK IN RESPONSE TO STRT/
        003032  041501  020113  047111
        003040  051040  051505  047520
        003046  051516  020105  047524
        003054  051440  051124  000124
 5984   003062  051105  047522  020122  MSG26   ASCIZ /EPPOR WHILE RECEIVING BUFFER/
        003070  044127  046111  020105
        003076  042522  042503  053111
        003104  047111  020107  052502
        003112  043106  051105     000
 5985   003117     103  047101  052047  MSG30   ASCIZ /CAN'T GET CLEAR TO SEND
        003124  043440  052105  041440
        003132  042514  051101  052040
        003140  020117  042523  042116
        003146     000
 5986   003147     124  046511  020105  MSG31   ASCIZ  TIME OUT WHILE WAITING FOR TERMINAL RESPONSE/
        003154  052517  020124  044127
        003162  046111  020105  040527
        003170  052111  047111  020107
        003176  047506  020122  042524
        003204  046522  047111  046101
        003212  051040  051505  047520
        003220  051516  000105
 5987   003224  040504  040524  041440  MSG43   ASCIZ /DATA CRC ERROR/
        003232  041522  042440  051122
        003240  051117     000
 5988   003243     116  044517  042523  MSG45   ASCIZ /NOISE PATTERN SUBTEST
        003250  050040  052101  042524
        003256  047122  051440  041125
        003264  042524  052123     000
 5989   003271     105  051122  051117  MSG50   ASCIZ /ERROR DURING MICRODIAGNOSTIC
        003276  042040  051125  047111
        003304  020107  044515  051103
        003312  042117  040511  047107
        003320  051517  044524  000103
 5990   003326  051105  047522  020122  MSG51   ASCIZ /ERROR DUPING LOOPBACK
```

```
                003334  052504  044522  043516
                003342  046040  047517  041120
                003350  041501  000113
 5991   003354  040504  040524  042440  MSG52   ASCIZ /DATA ERROR/
                003362  051122  051117     000
 5992   003367     111  046114  043505  MSG70   ASCIZ /ILLEGAL SELF TEST RESPONSE/
                003374  046101  051440  046105
                003402  020106  042524  052123
                003410  051040  051505  047520
                003416  051516  000105
 5993   003422  042515  047515  054522  MSG71   ASCII /MEMORY ERROR   TYPE /
                003430  042440  051122  051117
                003436  020040  052040  050131
                003444  020105
 5994   003446     000     000          MTY     BYTE 0,0
 5995   003450  020115  020055  040502          ASCII /M - BANK #/
                003456  045516  021440
 5996   003462     000     000          BNO     BYTE 0,0
 5997                                    EVEN
 5998   003464  051103  046517  042440  MSG72   ASCIZ /CROM ERROR/
                003472  051122  051117     000
 5999           003500                          EVEN
 6000
 6001   003500     005                  STRTB   BYTE ENQ
 6002   003501     006                          BYTE STRT
 6003   003502     300                          BYTE 300
 6004   003503     000                          BYTE 0
 6005   003504     000                          BYTE 0
 6006   003505     000                  STRTSA  BYTE 0
 6007   003506  000000                  STRTC   WORD 0
 6008
 6009                                    ;*****************************************
 6010                                            GLOBAL ERROR REPORT             *
 6011                                    ;*****************************************
 6013   003510  016746  176400                  MOV     !LIMIT,-(SP)
  (7)   003514  012746  003536                  MOV     #FORM00,-(SP)
  (6)   003520  012746  000002                  MOV     #2,-(SP)
  (3)   003524  010600                          MOV     SP,R0
  (4)   003526  104015                          EMT     C$PNTX
  (4)   003530  062706  000006                  ADD     #6,SP
 6014   003534                          L10000
  (3)   003534  104023                          EMT     C$MSG
 6015   003536  040445  043101  042524  FORM00   ASCIZ  %AAFTER %06%A ATTEMPTS%N
                003544  020122  047445  022466
                003552  020101  052101  042524
                003560  050115  051524  047045
                003566     000
 6016           003570                          EVEN
 6017
 6019   003570                          L10301
  (3)   003570  104023                          EMT     C$MSG
 6020
 6022   003572  016746  000030                  MOV     A02B,-(SP)
  (8)   003576  016746  000022                  MOV     A02A,-(SP)
  (7)   003602  012746  003630                  MOV     #FORM02 -(SP)
  (6)   003606  012746  000003                  MOV     #3,-(SP)
```

```
  (3)  003612  010600                          MOV     SP,R0
  (4)  003614  104015                          EMT     C$PNTX
  (4)  003616  062706  000010                  ADD     #10,SP
 6023  003622                        L10002
  (3)  003622  104023                          EMT     C$MSG
 6024  003624  000000                A02A    0
 6025  003626  000000                A02B    0
 6026  003630  040445  042522  042503 FORM02   ASCIZ /%ARECEIVED %03%A -- EXPECTED %03%N/
       003636  053111  042105  022440
       003644  031517  040445  026440
       003652  020055  054105  042520
       003660  052103  042105  022440
       003666  031517  047045     000
 6027          003674                          EVEN
 6028
 6030  003674                        AREA42
 6031  003674  016746  176202                  MOV     SCRTCH,-(SP)
  (8)  003700  016746  176200                  MOV     TEMP,-(SP)
  (7)  003704  012746  003630                  MOV     #FORM02,-(SP)
  (6)  003710  012746  000003                  MOV     #3,-(SP)
  (3)  003714  010600                          MOV     SP,R0
  (4)  003716  104015                          EMT     C$PNTX
  (4)  003720  062706  000010                  ADD     #10,SP
 6032  003724                        L10003
  (3)  003724  104023                          EMT     C$MSG
 6033
 6035  003726                        AREA41
 6036  003726                        AREA43
 6037  003726  016746  000030                  MOV     A04EX -(SP)
  (8)  003732  016746  000022                  MOV     A04RC,-(SP)
  (7)  003736  012746  003764                  MOV     #FORM04,-(SP)
  (6)  003742  012746  000003                  MOV     #3,-(SP)
  (3)  003746  010600                          MOV     SP,R0
  (4)  003750  104015                          EMT     C$PNTX
  (4)  003752  062706  000010                  ADD     #10,SP
 6038  003756                        L10004
  (3)  003756  104023                          EMT     C$MSG
 6039  003760  000000                A04RC   0
 6040  003762  000000                A04EX   0
 6041  003764  040445  042522  042503 FORM04   ASCIZ /%ARECEIVED %06%A -- EXPECTED %06%N/
       003772  053111  042105  022440
       004000  033117  040445  026440
       004006  020055  054105  042520
       004014  052103  042105  022440
       004022  033117  047045     000
 6042          004030                          EVEN
 6043
 6045  004030  016746  000030                  MOV     KEX,-(SP)
  (8)  004034  016746  000022                  MOV     KRC,-(SP)
  (7)  004040  012746  003764                  MOV     #FORM04,-(SP)
  (6)  004044  012746  000003                  MOV     #3,-(SP)
  (3)  004050  010600                          MOV     SP,R0
  (4)  004052  104015                          EMT     C$PNTX
  (4)  004054  062706  000010                  ADD     #10,SP
 6046  004060                        L10005.
  (3)  004060  104023                          EMT     C$MSG
```

```
 6047  004062  000000                    KRC     0
 6048  004064  000000                    KEX     0
 6050  004066                            L10006
  (3)  004066  104023                            EMT     C$MSG
 6052  004070                            L10007
  (3)  004070  104023                            EMT     C$MSG
 6054  004072                            AREA24
 6055  004072                            AREA40
 6056  004072  016767  176030  000064            MOV     LOGDEV,TEMP2
 6057  004100  005767  000060                    TST     TEMP2
  (9)  004104  002002                            BGE     50000$
 6058  004106  005067  000052                    CLR     TEMP2
 6059  004112                            50000$
 6060  004112  005267  000046                    INC     TEMP2
 6061  004116  016746  000042                    MOV     TEMP2,-(SP)
  (7)  004122  012746  004166                    MOV     #FORM23,-(SP)
  (6)  004126  012746  000002                    MOV     #2,-(SP)
  (3)  004132  010600                            MOV     SP,R0
  (4)  004134  104015                            EMT     C$PNTX
  (4)  004136  062706  000006                    ADD     #6,SP
 6062  004142  012746  004206                    MOV     #FORM40,-(SP
  (6)  004146  012746  000001                    MOV     #1,-(SP)
  (3)  004152  010600                            MOV     SP,R0
  (4)  004154  104015                            EMT     C$PNTX
  (4)  004156  062706  000004                    ADD     #4,SP
 6063  004162                            L10010
  (3)  004162  104023                            EMT     C$MSG
 6064  004164  000000                    TEMP2   0
 6065  004166  040445  042504  044526  FORM23    ASCIZ   /%ADEVICE  %D3%N/
       004174  042503  020072  042045
       004202  022463  000116
 6066  004206  040445  020040  020040  FORM40    ASCIZ   /A         ***** END OF ERROR REPORT *****%N/
       004214  020040  020040  025040
       004222  025052  025052  042440
       004230  042116  047440  020106
       004236  051105  047522  020122
       004244  042522  047520  052122
       004252  025040  025052  025052
       004260  047045     000
 6067          004264                            ELEN
 6068
 6070  004264                            L10011
  (3)  004264  104023                            EMT     C$MSG
 6071
 6074  004266                            AREA31
 6075  004266  010146                            MOV     R1 -(SP)
 6076  004270  012701  002224                    MOV     #DUPREG,R1
 6077  004274  016146  000000                    MOV     RCVCSR(R1),-(SP)
  (7)  004300  012746  004420                    MOV     #FORM30,-(SP)
  (6)  004304  012746  000002                    MOV     #2,-(SP)
  (3)  004310  010600                            MOV     SP,R0
  (4)  004312  104015                            EMT     C$PNTX
  (4)  004314  062706  000006                    ADD     #6,SP
 6078  004320  016146  000002                    MOV     RCVBUF(R1),-(SP)
  (7)  004324  012746  004442                    MOV     #FRM30A,-(SP)
  (6)  004330  012746  000002                    MOV     #2,-(SP)
```

```
   (3)  004334  010600                              MOV     SP,R0
   (4)  004336  104015                              EMT     C$PNTX
   (4)  004340  062706  000006                      ADD     #6,SP
 6079   004344  016146  000004                      MOV     XMTCSR(R1),-(SP)
   (7)  004350  012746  004465                      MOV     #FRM30B,-(SP)
   (6)  004354  012746  000002                      MOV     #2,-(SP)
   (3)  004360  010600                              MOV     SP,R0
   (4)  004362  104015                              EMT     C$PNTX
   (4)  004364  062706  000006                      ADD     #6,SP
 6080   004370  016146  000006                      MOV     XMTBUF(R1),-(SP)
   (7)  004374  012746  004507                      MOV     #FRM30C,-(SP)
   (6)  004400  012746  000002                      MOV     #2,-(SP)
   (3   004404  010600                              MOV     SP,R0
   (4)  004406  104015                              EMT     C$PNTX
   (4)  004410  062706  000006                      ADD     #6,SP
 6081   004414  012601                              MOV     (SP)+,R1
 6082   004416                             L10012:
   3)   004416  104023                              EMT     C$MSG
 6083   004420  040445  052504  020120  FORM30:     .ASCIZ  /%ADUP RCSR  %06%N/
        004426  041522  051123  020072
        004434  047445  022466  000116
 6084   004442  040445  052504  020120  FRM30A:     .ASCIZ  /%ADUP RBUFF  %06%N/
        004450  041122  043125  035106
        004456  022440  033117  047045
        004464     000
 6085   004465     045  042101  050125  FRM30B:     .ASCIZ  /%ADUP TCSR  %06%N/
        004472  052040  051503  035122
        004500  022440  033117  047045
        004506     000
 6086   004507     045  042101  050125  FRM30C:     .ASCIZ  /%ADUP TBUFF  %06%N
        004514  052040  052502  043106
        004522  020072  047445  022466
        004530  000116
 6087                                               .EVEN
 6127
 6129   004532  012746  004554                      MOV     #FORM60,-(SP)
   (6)  004536  012746  000001                      MOV     #1,-(SP)
   (3)  004542  010600                              MOV     SP,R0
   4)   004544  104015                              EMT     C$PNTX
   4)   004546  062706  000004                      ADD     #4,SP
 6130   004552                             L10013:
   (3)  004552  104023                              EMT     C$MSG
 6131   004554  040445  040503  023516  FORM60:     .ASCIZ  %%CAN'T GET INTO LOOPBACK%N
        004562  020124  042507  020124
        004570  047111  047524  046040
        004576  047517  041120  041501
        004604  022513  000116
 6132                                               .EVEN
 6134   004610  012746  004702                      MOV     #FORM61,-(SP)
   (6)  004614  012746  000001                      MOV     #1,-(SP)
   (3)  004620  010600                              MOV     SP,R0
   (4)  004622  104015                              EMT     C$PNTX
   (4)  004624  062706  000004                      ADD     #4,SP
 6135   004630  016767  175272  177526              MOV     LOGDEV,TEMP2
 6136   004636  005767  177322                      TST     TEMP2
   (9)  004642  002002                              BGE     5$0015
```

```
 6137  004644  005067  177314                 CLR     TEMP2
 6138  004650                          50001$
 6139  004650  005267  177310                 INC     TEMP2
 6140  004654  016746  177304                 MOV     TEMP2,-(SP)
  (7)  004660  012746  004166                 MOV     #FORM23,-(SP)
  (6)  004664  012746  000002                 MOV     #2,-(SP)
  (3)  004670  010600                         MOV     SP,R0
  (4)  004672  104015                         EMT     C$PNTX
  (4)  004674  062706  000006                 ADD     #6,SP
 6141  004700                          L10014
  (3)  004700  104023                         EMT     C$MSG
 6142  004702  040445  040503  023516  FORM61  .ASCIZ /%ACAN'T GET OUT OF LOOPBACK%N/
       004710  020124  042507  020124
       004716  052517  020124  043117
       004724  046040  047517  041120
       004732  041501  022513  000116
 6143                                         .EVEN
 6145  004740  016746  000074                 MOV     A52B,-(SP)
  (8)  004744  016746  000066                 MOV     A52A,-(SP)
  (7)  004750  012746  004772                 MOV     #FORM52,-(SP)
  (6)  004754  012746  000003                 MOV     #3,-(SP)
  (3)  004760  010600                         MOV     SP,R0
  (4)  004762  104015                         EMT     C$PNTX
  (4)  004764  062706  000010                 ADD     #10,SP
 6146  004770                          L10015
  (3)  004770  104023                         EMT     C$MSG
 6147  004772  040445  054105  042520  FORM52  .ASCIZ /%AEXPECTED  %03%A  -RECEIVED  %03%N/
       005000  052103  042105  020072
       005006  047445  022463  020101
       005014  026440  042522  042503
       005022  053111  042105  020072
       005030  047445  022463  000116
 6148                                         .EVEN
 6149  005036  000000                  A52A    0
 6150  005040  000000                  A52B    0
 6151
 6153  005042                          L10016
  (3)  005042  104023                         EMT     C$MSG
 6154
 6156  005044                          L10017
  (3)  005044  104023                         EMT     C$MSG
 6157
 6158  005046                          TEMBUF
 6159  005046  001452                         .BLKW   810
 6160  010172                          TMPBUF
 6161  010172  000416                         .BLKW   270
 6162  011226  000100                         .BLKW   100
 6163  011426                          SSTACK                  ;STACK FOR SUBROUTINE LINKAGE
 6164
```

```
 6173                                ;*****************************************************************
 6174                                ;       DEFAULT HARDWARE P-TABLE AND SOFTWARE P-TABLE    *
 6175                                ;*****************************************************************
 6176  011426  000004                        WORD   L10020-L$HW/2
 6177  011430  160010                       160010
 6178  011432  000320                       320
 6179  011434  000140                       140
 6180  011436  000000                       0
 6184  011440                        L10020
 6185  011440  000002                        WORD   L10021-L$SW/2
 6186  011442  000010                       000010
 6187  011444  000001                PATTERN 000001
 6191  011446                        L10021
 6192
 6193                                ;*****************************************************************
 6194                                ;       DISPATCH TABLE                                          *
 6195                                ;*****************************************************************
 6196  011446  000002                        WORD   TSTS
  (6)  011450  017174                        WORD   T1
  (6)  011452  020200                        WORD   T2
```

```
                                ;*********************************************
                                ;STUB AREAS FOR SUPERVISOR COMPATIBILITY    *
                                ;*********************************************
011454                          L10022:
(3) 011454  104025                      EMT     C$RPT
                                L10023
011456                          
(3) 011456  104054                      EMT     C$AU
                                L10024:
011460                          
(3) 011460  104055                      EMT     C$DU
                                ;*********************************************
                                ;       INITIALIZE CODING                   *
                                ;*********************************************
                                ;
                                ;SAVE R1
                                ;
011462  010146                          MOV     R1,-(SP)
                                ;
                                ;CHECK START EVENT FLAG TO SEE IF WE GOT HERE BECAUSE OF A START
                                ;
011464  012700  000040                  MOV     #EF.START,R0
(3) 011470  104050                      EMT     C$REFG
                                ;
                                ;IF A START, THEN...
                                ;
011472  103005                          BCC     50002$
                                ;
                                ;INITIALIZE THE SUBROUTINE LINKAGE STACK
                                ;
011474  012705  011426                  MOV     #SSTACK,R5
011500  005267  170374                  INC     R5STCK
011504  000414                          BR      50003$
(3) 011506                      50002$:
                                ;
                                ;IF NOT START THEN.
                                ;
                                ;CHECK FOR RESTART  AND IF IT IS.
                                ;UPDATE LOGICAL DEVICE AND STAT  TABLE ENTRY POINTER,
                                ;BUT DON'T EXCEED THE NUMBER OF UNITS SPECIFIED
                                ;
011506  012700  000037                  MOV     #EF.RESTART,R0
(3) 011512  104050                      EMT     C$REFG
011514  103410                          BCS     50004$
011516  005267  170404                  INC     LOGDEV
011522  026767  170400  170264          CMP     LOGDEV,L$UNIT
(9) 011530  001002                      BNE     50005$
011532  005067  170370                  CLR     LOGDEV
011536                          50005$:
011536                          50004$:
011536                          50003$:
                                ;
                                ;CHECK FOR NEW PASS  . IF IT IS, FORCE LOGICAL UNIT TO ZERO
                                ;
```

```
 6475  011536  012700  000035                MOV     #EF.NEW,R0
  (3)  011542  104050                        EMT     C$REFG
 6476  011544  103002                        BCC     50006$
 6477  011546  005067  170354                CLR     LOGDEV
 6481  011552                            50006$:
 6482                                      ;
 6483                                      ;END OF START CODE
 6484                                      ;FORCE THE COMM DEVICE TO BE INITIALIZED
 6485                                      ;
 6486  011552  005067  003640                CLR     INIT
 6487  011556  005067  170324                CLR     ABORT
 6488                                      ;
 6489                                      ;SET UP THE INPUT BUFFERS QUEUE
 6490                                      ;
 6491  011562  012767  015442  003650        MOV     #RQUET,RQUE
 6492  011570  016767  003644  003640        MOV     RQUE,RQUEUE
 6493  011576  012767  015460  003652        MOV     #RBQUET,RBQUE
 6494  011604  016701  003646                MOV     RBQUE,R1
 6495  011610  012767  005046  170264        MOV     #TEMBUF,SCRTCH
 6496  011616                            50007$:
 6497  011616  016721  170260                MOV     SCRTCH,(R1)+
 6498  011622  062767  000416  170252        ADD     #270.,SCRTCH
 6499  011630  020127  015464                CMP     R1,#RBQUEB
  (6)  011634  003770                        BLE     50007$
 6516                                      ;
 6517                                      ;GET THE PTABLE ENTRY FOR THIS LOGICAL DEVICE
 6518                                      ;
 6519  011636                            50010$:
 6520  011636  005201                        INC     R1
 6521  011640  016700  170262                MOV     LOGDEV,R0
  (3)  011644  104042                        EMT     C$GPHRD
  (3)  011646  010067  170230                MOV     R0,SCRTCH
 6522                                      ;
 6523                                      ;IF UNIT HAS BEEN DROPPED, UPDATE POINTERS ETC  AND TRY AGAIN
 6524                                      ;
 6525  011652  103411                        BCS     50011$
 6526  011654  005267  170246                INC     LOGDEV
 6530  011660  026767  170242  170126        CMP     LOGDEV,L$UNIT
  (9)  011666  001002                        BNE     50012$
 6531  011670  005067  170232                CLR     LOGDEV
 6535  011674                            50012$:
 6536  011674  005001                        CLR     R1
 6537  011676                            50011$:
 6538  011676  005701                        TST     R1
  (6)  011700  001756                        BEQ     50010$
 6551                                      ;
 6552                                      ;NOW GET THE PTABLE DATA FROM THE SUPERVISOR AND STOPE WITHIN THE
 6553                                      ;DIAGNOSTIC PROGRAM
 6554                                      ;
 6555  011702  012701  002170                MOV     #PTABLE,R1
 6556  011706                            50013$:
 6557  011706  017711  170170                MOV     @SCRTCH,(R1)
 6558  011712  062701  000002                ADD     #2,R1
 6559  011716  062767  000002  170156        ADD     #2,SCRTCH
 6560  011724  020127  002200                CMP     R1,#PTEND
  (6)  011730  001366                        BNE     50013$
```

```
 6579                                   ;
 6580                                   ;RESTORE R1 AND EXIT INIT CODE
 6581                                   ;
 6582  011732  012601                          MOV     (SP)+,R1
 6583  011734                           L10025
  (3)  011734  104011                          EMT     C$INIT
 6588  011736  047045  040445  052126  VMSG    .ASCIZ /%N%AVT62 ACCEPTANCE TEST   --   VERSION 10 TERMINALS%N/
       011744  031066  040440  041503
       011752  050105  040524  041516
       011760  020105  042524  052123
       011766  020040  026440  020055
       011774  020040  042526  051522
       012002  047511  020116  030061
       012010  052040  051105  044515
       012016  040516  051514  047045
       012024     000
 6589          012026                           EVEN
 6590
 6591                                   ;**************************************************
 6592                                   ;       CLEAN-UP CODING                          *
 6593                                   ;**************************************************
 6595                                   ;
 6596                                   ;MAKE SURE DEVICE IS SHUT DOWN
 6597                                   ;
 6599  012026  010146                          MOV     R1,-(SP)
 6600  012030  016701  170134                  MOV     PTABLE,R1
 6601  012034  052761  000400  000004         BIS     #MASCLR,XMTCSP(R1)
 6602  012042  012601                          MOV     (SP)+,R1
 6611                                   ;
 6612                                   ;UPDATE PASS COUNT
 6613                                   ;
 6614  012044  005267  170052                  INC     PASCNT
 6629                                   ;
 6630                                   ;EXIT CLEAN-UP CODE
 6631                                   ;
 6632  012050                           L10026
  (3)  012050  104012                          EMT     C$CLEAN
```

```
                                ;*************************************************************
                                ;       GLOBAL SUBROUTINES                                  *
                                ;*************************************************************
                                ;
                                ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                                ;       ROUTINE TO PROCESS TERMINAL MESSAGES FOR ALL TESTS    +
                                ;       RETURNS POINTER TO MESSAGE ("OUTMSG") AND ITS SIZE    +
                                ;       IN BYTES ("OUTSIZ")                                   +
                                ;                                                             +
                                ;       SIZE MAY BE ANY NUMBER OF BYTES                       +
                                ;                                                             +
                                ;       SETS A FLAG ("EXPINP") IF RESPONSE OTHER THAN "ACK" IS +
                                ;       TO BE EXPECTED                                        +
                                ;                                                             +
                                ;       SETS ANOTHER FLAG ("EOMSG") IF THIS IS THE LAST MESSAGE +
                                ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
012052                          MSG:
012052  010446                          MOV     R4,-(SP)
012054  010604                          MOV     SP,R4
012056  162706  000002                  SUB     #2,SP
                                ;
                                ;GET MESSAGE POINTER
                                ;
012062  017764  170064  177776          MOV     @MSGAP,A(R4)
                                ;
                                ;IF MESSAGE POINTER IS ODD,
                                ;SET END_OF_MESSAGE INDICATOR
                                ;
012070  016467  177776  170004          MOV     A(R4),SCRTCH
012076  016746  170000                  MOV     SCRTCH,-(SP)
012102  042716  000001                  BIC     #1,(SP)
012106  042667  167770                  BIC     (SP)+,SCRTCH
012112  005767  167764                  TST     SCRTCH
012116  001405                          BEQ     50002$
012120  005267  170000                  INC     EOMSG
012124  042764  000001  177776          BIC     #1,A(R4)
012132                          50002$:
                                ;
                                ;IF MESSAGE_POINTER IS NEGATIVE,
                                ;SET EXPECT_INPUT INDICATOR
                                ;
012132  005764  177776                  TST     A(R4)
012136  002006                          BGE     50003$
012140  005267  167764                  INC     EXPINP
012144  042764  100000  177776          BIC     #100000,A(R4)
                                ;
                                ;OTHERWISE, CLEAR EXPECT_INPUT
                                ;
012152  000402                          BR      50004$
012154                          50003$:
012154  005067  167750                  CLR     EXPINP
012160                          50004$:
                                ;
                                ; SET MESSAGE_ADDRESS AND
                                ;MESSAGE_SIZE
```

```
 6686                                           ;
 6687  012160  016467  177776  167744           MOV     A(R4),OUTMSG
 6688  012166  062767  000002  167756           ADD     #2,MSGAP
 6689  012174  017767  167752  167732           MOV     @MSGAP,OUTMSG+2
 6690                                           ;
 6691                                           ;UPDATE MESSAGE_AREA_POINTER
 6692                                           ;
 6693  012202  067767  167744  167742           ADD     @MSGAP,MSGAP
 6694  012210  062767  000002  167734           ADD     #2,MSGAP
 6695                                           ;
 6696                                           ;IF MESSAGE_AREA_POINTER IS ODD
 6697                                           ;ADD 1 TO MAKE IT EVEN
 6698                                           ;
 6699  012216  016767  167730  167656           MOV     MSGAP,SCRTCH
  (6)  012224  016746  167652                   MOV     SCRTCH,-(SP)
  (6)  012230  042716  000001                   BIC     #1,(SP)
  (6)  012234  042667  167642                   BIC     (SP)+,SCRTCH
 6700  012240  005767  167636                   TST     SCRTCH
  (9)  012244  001402                           BEQ     50005$
 6701  012246  005267  167700                   INC     MSGAP
 6702  012252                                 50005$:
 6703  012252                                 50000$:
  (3)  012252                                 50001$:
  (3)  012252  010406                           MOV     R4,SP
  (3)  012254  012604                           MOV     (SP)+,R4
  (2)  012256  000207                           RTS     PC
 6704
 6705
 6706
 6707
 6708                                           ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 6709                                           ;       ROUTINE TO HANDLE OUTPUT OF MESSAGES TO THE TERMINAL      +
 6710                                           ;       UNDER TEST   MESSAGES MAY BE OF ANY LENGTH SINCE          +
 6711                                           ;       ROUTINES USED BY THIS ROUTINE SPLIT THE MESSAGES INTO     +
 6712                                           ;       BUFFERS OF APPROPRIATE LENGTH FOR DDCMP                   +
 6713                                           ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 6714  012260                                   TEPOUT:
 6715  012260  005767  003132                   TST     INIT
  (9)  012264  001011                           BNE     50002$
 6716  012266  004767  000222                   JSR     PC,XSTRT
 6717  012272  103002                           BCC     50003$
 6718  012274  000261                           SEC
  (4)  012276  000504                           BR      50001$
 6719  012300                                 50003$:
 6720  012300  005067  167660                   CLR     MSGNO
 6721  012304  005067  167656                   CLR     RMSGNO
 6722  012310                                 50002$:
 6723                                           ;
 6724                                           ;INITIALIZE THE BUFFER ROUTINES  3.2.20.4
 6725                                           ;
 6726  012310  016767  167616  167636           MOV     OUTMSG,INITMA
 6727  012316  012767  002132  167556           MOV     #OUTMSG,SCRTCH
  (6)  012324  062767  000002  167550           ADD     #2,SCRTCH
 6728  012332  017767  167544  167616           MOV     @SCRTCH,INITMS
 6729                                           BUFFER #1,BAPNT
 6730  012340  012767  010172  167612           MOV     #TMPBUF,BAPNT
```

```
 6731  012346  012767  000412  167606          MOV     #266.,BASIZE
 6732                                ;
 6733                                ;GET A BUFFER OF THE MESSAGE
 6734                                ;
 6735  012354  162705  000004                  SUB     #2*2,R5
  (3)  012360  004767  000410                  JSR     PC,GETOB
  (4)  012364  012567  167552                  MOV     (R5)+,OUTBUF
  (4)  012370  012567  167550                  MOV     (R5)+,OUTSIZ
 6736                                ;
 6737                                ;PERFORM THE FOLLOWING LOOP WHILE
 6738                                ;A AND ABORT ARE CLEAR AND OUTSIZ
 6739                                ;IS GREATER THAN 0
 6740                                ;
 6741  012374                        50004$
  (6)  012374  005767  167544                  TST     OUTSIZ
  (9)  012400  003442                          BLE     50005$
  (6)  012402  005767  167500                  TST     ABORT
  (9)  012406  001037                          BNE     50005$
 6742                                ;
 6743                                ;ADD PROTOCOL ENVELOPE AND TRANSMIT
 6744                                ;
 6745  012410  162705  000004                  SUB     #2*2,R5
  (3)  012414  010546                          MOV     R5,-(SP)
  (5)  012416  016745  167522                  MOV     OUTSIZ,-(R5)
  (4)  012422  016745  167514                  MOV     OUTBUF,-(R5)
  (3)  012426  004767  000470                  JSR     PC,PROBUF
  (3)  012432  012605                          MOV     (SP)+,R5
  (4)  012434  012567  002762                  MOV     (R5)+,XBUFFER
  (4)  012440  012567  002760                  MOV     (R5)+,XSIZE
 6746  012444  004767  001756                  JSR     PC,XMIT
 6747                                ;
 6748                                ;IF TRANSMIT ERROR, REPORT IT AND SET ERRXMT
 6749                                ;
 6750  012450  103005                          BCC     50006$
 6751  012452  104423                          TRAP    T$ERCODE
  (5)  012454  000024                           WORD   20
  (5)  012456  002620                           WORD   MSG20
 6752  012460  000261                          SEC
  (4)  012462  000412                          BR      50001$
 6753  012464                        50006$
 6754                                ;
 6755                                ;GET THE NEXT BUFFER
 6756                                ;
 6757  012464  162705  000004                  SUB     #2*2,R5
  (3)  012470  004767  000300                  JSR     PC,GETOB
  (4)  012474  012567  167442                  MOV     (R5)+,OUTBUF
  (4)  012500  012567  167440                  MOV     (R5)+,OUTSIZ
 6758                                ;
 6759                                ;END OF LOOP
 6760                                ;
 6761  012504  000733                          BR      50004$
  (3)  012506                        50005$
 6762                                ;
 6763                                ;IF ERROR OCCURRED  DO AN ERRCP RETURN
 6764                                ;
 6765  012506                        50000$
```

```
 (2) 012506 000241                      CLC
 (3) 012510                      50001$
 (2) 012510 000207                      RTS     PC
6766 012512 000000              TYPE    0               ;TYPE OF MESSAGE EXPECTED
6767
6768
6769
6770
6771                            ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
6772                            ;       ROUTINE TO SEND A "STRT" MESSAGE TO THE TERMINAL     +
6773                            ;                                                            +
6774                            ;       A "STACK" MUST BE RETURNED BY THE TERMINAL           +
6775                            ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
6776 012514                    XSTRT
6779 012514 010446                      MOV     R4,-(SP)
 (2) 012516 010604                      MOV     SP,R4
 (3) 012520 162706 000002               SUB     #2,SP
6780                            ;
6781                            ;THE DDCMP STRT MESSAGE IS 10 BYTES LONG (INCLUDING CRC) AND IS IN
6782                            ;A BUFFER STARTING AT "STRTB"  -- PUT THIS INFORMATION
6783                            ;IN THE TRANSMIT ROUTINE'S POINTERS
6784
6785 012524 012767 000010 002672        MOV     #10,XSIZE
6786 012532 012767 002500 002662        MOV     #STRTB,XBUFFER
6787
6788                            ;GET THE TERMINAL ADDRESS AND PUT INTO THE STRT MESSAGE
6789
6790 012540 012764 002170 177776        MOV     #PTABLE,A(R4)
 (6) 012546 062764 000005 177776        ADD     #5,A(R4)
6791 012554 117467 177776 170723        MOVB    @A(R4),STRTSA
6792
6793                            ;COMPUTE THE CRC FOR THE STRT MESSAGE AND PUT IN THE LAST TWO BYTES
6794                            ;OF THE BUFFER ("STRTC")
6795
6796 012562 162705 000002               SUB     #1*2,R5
 (3) 012566 010546                      MOV     R5,-(SP)
 (5) 012570 012745 000006               MOV     #6,-(R5)
 (4) 012574 016745 002622               MOV     XBUFFER,-(R5)
 (3) 012600 004767 004014               JSR     PC,CRC
 (3) 012604 012605                      MOV     (SP)+,R5
 (4) 012606 012567 170674               MOV     (R5)+,STRTC
6797
6798                            ;TRANSMIT THE MESSAGE
6799
6800 012612 005067 000154               CLR     DDSTRY
6801 012616                     50002$
6802 012616 004767 001604               JSR     PC,XMIT
6803
6804                            ;IF AN ERROR OCCURS, REPORT IT AND EXIT WITH THE ERROR FLAG SET
6805
6806 012622 103005                      BCC     50003$
6807 012624 104423                      TRAP    T$ERCODE
 (5) 012626 000024                       WORD   20
 (5) 012630 002620                       WORD   MSG20
6808 012632 000261                      SEC
 (4) 012634 000453                      BR      5C001$
```

```
 6809  012636                          50003$
 6810                                  ;
 6811                                  ;OTHERWISE, GET THE TERMINAL'S RESPONSE
 6812                                  ;
 6813  012636  010546                          MOV     R5,-(SP)
  (4)  012640  012745  000001                  MOV     #1,-(R5)
  (3)  012644  004767  003456                  JSR     PC,RCVE
  (3)  012650  012605                          MOV     (SP)+,R5
 6814                                  ;
 6815                                  ;IF RECEPTION ERROR, REPORT IT AND EXIT WITH THE ERROR FLAG SET
 6816                                  ;
 6817  012652  103003                          BCC     50004$
 6818  012654  005267  000112                  INC     DDSTRY
 6819  012660  000402                          BR      50005$
  (3)  012662                          50004$
 6820  012662  005067  000104                  CLR     DDSTRY
 6821  012666                          50005$
 6822  012666  005767  000100                  TST     DDSTRY
  (6)  012672  001404                          BEQ     50006$
  (4)  012674  026727  000C72  000003          CMP     DDSTRY,#3
  (7)  012702  001345                          BNE     50002$
  (4)  012704                          50006$
 6823  012704  005767  000062                  TST     DDSTRY
  (9)  012710  001405                          BEQ     50007$
 6824  012712  104423                          TRAP    T$EPCODE
  (5)  012714  000025                           WORD   21
  (5)  012716  002637                          .WORD   MSG21
 6825  012720  000261                          SEC
  (4)  012722  000420                          BR      50001$
 6826  012724                          50007$
 6827
 6828                                  ;OTHERWISE, SET TYPE TO "STACK" AND CHECK TO SEE THAT IT WAS THE REPLY
 6829                                  ;
 6830  012724  012767  000007  177560          MOV     #STACK,TYPE
 6831  012732  010546                          MOV     R5,-(SP)
  (4)  012734  016745  177552                  MOV     TYPE,-(R5)
  (3)  012740  004767  001072                  JSR     PC,CHKREP
  (3)  012744  012605                          MOV     (SP)+,R5
 6832                                  ;
 6833                                  ;IF REPLY WASN'T A "STACK", REPORT THE ERROR AND EXIT WITH THE ERROR FLAG SET
 6834                                  ;
 6835  012746  103005                          BCC     50010$
 6836  012750  104423                          TRAP    T$EPCODE
  (5)  012752  000031                           WORD   25
  (5)  012754  003025                           WORD   MSG25
 6837  012756  000261                          SEC
  (4)  012760  000401                          BR      50001$
 6838  012762                          50010$
 6839
 6840                                  ;END OF XSTRT ROUTINE
 6841                                  ;
 6842  012762                          50000$:
  (2)  012762  000241                          CLC
  (3)  012764                          50001$
  (2)  012764  010406                          MOV     R4,SP
  (3)  012766  012604                          MOV     (SP)+,R4
```

```
 (2) 012770 000207                          RTS     PC
6843 012772 000000                  DDSTRY  0
6844
6845
6846
6847
6848
6849                                ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
6850                                ;       THIS ROUTINE SPLITS A MESSAGE OF ANY LENGTH INTO              +
6851                                ;       SEGMENTS OF A SIZE SUITABLE FOR TRANSMISSION OVER A DATA      +
6852                                ;       LINK -- RETURNS BUFFER ADDRESS, BUFFER SIZE AND END_OF_MESSAGE+
6853                                ;       (BUFFER SIZE = 0 IS END_OF_MESSAGE)                           +
6854                                ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
6855 012774                         GETCB
6856 012774 010446                          MOV     R4,-(SP)
 (2) 012776 010604                          MOV     SP,R4
 (3) 013000 162706 000002                   SUB     #2,SP
6859                                ;
6860                                ;LEAVE ENOUGH ROOM FOR A DDCMP HEADER
6861                                ;
6862 013004 016765 167150 000000            MOV     BAPNT,A(R5)
 (6) 013012 062765 000010 000000            ADD     #10,A(R5)
6863
6864                                ; INIT SIZE TO ZERO
6865                                ;
6866 013020 005065 000002                   CLR     B(R5)
6867
6868                                ; SCRTCH HAS MAXIMUM DDCMP MESSAGE SIZE
6869
6870 013024 016767 167132 167050            MOV     BASIZE,SCRTCH
 (6) 013032 162767 000012 167042            SUB     #12,SCRTCH
6871
6872                                ;GET A COPY OF THE BUFFER POINTER
6873                                ;
6874 013040 016564 000000 177776            MOV     A(R5),C(R4)
6875                                ;
6876                                ;                               REPEAT LOOP UNTIL MAX SIZE OR END OF DATA
6877                                ;
6878 013046                         50002$
 (6) 013046 026567 000002 167026            CMP     B(R5),SCRTCH
 (9) 013054 002017                          BGE     50003$
 (6) 013056 005767 167074                   TST     INITMS
 (9) 013062 003414                          BLE     50003$
6879
6880                                ; MOVE DATA INTO MESSAGE BUFFER
6881
6882 013064 117774 167064 177776            MOVB    @INITMA,@C(R4)
6883 013072 005367 167060                   DEC     INITMS
6884 013076 005267 167052                   INC     INITMA
6885 013102 005265 000002                   INC     B(R5)
6886 013106 005264 177776                   INC     C(R4)
6887 013112 000755                          BR      50002$
 (3) 013114                         50003$
6888                                ;
6889                                ;                               END OF LOOP
6890
```

```
 6891  013114                          50000$
  (3)  013114                          50001$
  (3)  013114  010406                          MOV     R4,SP
  (3)  013116  012604                          MOV     (SP)+,R4
  (2)  013120  000207                          RTS     PC
 6892
 6893
 6894
 6895
 6896
 6897                                 ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 6898                                 ;       ROUTINE TO PROVIDE LINE PROTOCOL HEADER AND CHECKSUMS     +
 6899                                 ;       CALL WITH DATA AREA ADDRESS AND SIZE (IN BYTES)           +
 6900                                 ;       RETURN WITH MODIFIED ADDRESS AND SIZE                     +
 6901                                 ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 6902  013122                         PROBUF
 6903  013122  010146                          MOV     R1,-(SP)
 6904  013124  010246                          MOV     R2,-(SP)
 6905                                 ;
 6906                                 ;CHANGE POINTER TO INCLUDE DDCMP HEADER
 6907                                 ;
 6908  013126  016502  000000                  MOV     A(R5),R2
  (6)  013132  162702  000010                  SUB     #10,R2
 6909                                 ;
 6910                                 ;FIRST BYTE IS SOH (START OF HEADER)
 6911                                 ;
 6912  013136  112722  000201                  MOVB    #SOH,(R2)+
 6913                                 ;
 6914                                 ;NEXT TWO BYTES GET MESSAGE SIZE
 6915                                 ;
 6916  013142  016501  000002                  MOV     B(R5),R1
 6917  013146  110122                          MOVB    R1,(R2)+
 6918  013150  000301                          SWAB    R1
 6919  013152  110112                          MOVB    R1,(R2)
 6920                                 ;
 6921                                 ;SET SELECT BIT
 6922                                 ;
 6923  013154  152712  000200                  BISB    #200,(R2)
 6924  013160  005202                          INC     R2
 6925                                 ;
 6926                                 ;NEXT BYTE IS LAST GOOD RESPONSE
 6927                                 ;
 6928  013162  116722  167000                  MOVB    RMSGNO,(R2)+
 6929                                 ;
 6930                                 ;NEXT BYTE GETS MESSAGE NUMBER --- POP NUMBER FOR NEXT MESSAGE (IF ANY)
 6931                                 ;
 6932  013166  005267  166772                  INC     MSGNO
 6933  013172  116722  166766                  MOVB    MSGNO,(R2)+
 6934                                 ;
 6935                                 ;GET THE TERMINAL ADDRESS FOR THE NEXT HEADER BYTE
 6936                                 ;
 6937  013176  012701  002170                  MOV     #PTABLE,R1
  (6)  013202  062701  000005                  ADD     #5,R1
 6938  013206  111122                          MOVB    (R1),(R2)+
 6939
 6940                                 ;GET HEADER START ADDRESS AND SIZE IN BYTES
```

```
 6941
 6942  013210  016567  000000  166664          ;
  (6)  013216  162767  000010  166656                  MOV     A(R5),SCRTCH
 6943  013224  012767  000006  166652                  SUB     #10,SCRTCH
 6944                                                  MOV     #6,TEMP
 6945                                          ;
 6946                                          ;COMPUTE HEADER CRC
 6947  013232  162705  000002                ;
  (3)  013236  010546                                 SUB     #1*2,R5
  (5)  013240  016745  166640                         MOV     R5,-(SP)
  (4)  013244  016745  166632                         MOV     TEMP,-(R5)
  (3)  013250  004767  003344                         MOV     SCRTCH,-(R5)
  (3)  013254  012605                                 JSR     PC,CRC
  (4)  013256  012567  166622                         MOV     (SP)+,R5
 6948                                                 MOV     (R5)+,TEMP
 6949                                          ;
 6950                                          ;PUT CRC INTO BUFFER
 6951  013262  016712  166616                ;
 6952                                                  MOV     TEMP,(R2)
 6953                                          ;
 6954                                          ;GET ADDRESS OF MESSAGE AND MESSAGE SIZE IN BYTES
 6955  013266  016567  000000  166606          ;
 6956  013274  016567  000002  166602                  MOV     A(R5),SCRTCH
 6957                                                  MOV     B(R5),TEMP
 6958                                          ;
 6959                                          ;COMPUTE DATA CRC
 6960  013302  162705  000002                ;
  (3)  013306  010546                                 SUB     #1*2,R5
  (5)  013310  016745  166570                         MOV     R5,-(SP)
  (4)  013314  016745  166562                         MOV     TEMP,-(R5)
  (3)  013320  004767  003274                         MOV     SCRTCH,-(R5)
  (3)  013324  012605                                 JSR     PC,CRC
  (4)  013326  012567  166552                         MOV     (SP)+,R5
 6961                                                 MOV     (R5)+,TEMP
 6962                                          ;
 6963                                          ;PUT DATA CRC IN LAST TWO BYTES OF BUFFER
 6964  013332  016502  000000                ;
  (6)  013336  066502  000002                         MOV     A(R5),R2
 6965  013342  116722  166536                         ADD     B(R5),R2
 6966  013346  000367  166532                         MOVB    TEMP,(R2)+
 6967  013352  116712  166526                         SWAB    TEMP
 6968                                                 MOVB    TEMP,(R2)
 6969                                          ;
 6970                                          ;RETURN WITH MODIFIED ADDRESS AND SIZE
 6971  013356  016565  000002  000006          ;
  (6)  013364  062765  000012  000006                MOV     B(R5),D(R5)
 6972  013372  016565  000000  000004                ADD     #12,D(R5)
  (6)  013400  162765  000010  000004                MOV     A(R5),C(R5)
 6973  013406  012602                                 SUB     #10,C(R5)
 6974  013410  012601                                 MOV     (SP)+,R2
 6975  013412                                        MOV     (SP)+,R1
  (3)  013412                                  500005
  (2)  013412  000207                         500015
 6976                                                 RTS     PC
 6977
 6978
```

```
 6979
 6980
 6981                                   ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 6982                                   ;       ROUTINE TO GET TERMINAL INPUT                        +
 6983                                   ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 6984  013414                           TERIN:
 6985                                   ;
 6986                                   ;SAVE R1
 6987                                   ;
 6988  013414  010146                           MOV     R1,-(SP)
 6989                                   ;
 6990                                   ;GET TERMINAL RESPONSE
 6991                                   ;
 6992  013416  010546                           MOV     R5,-(SP)
  (4)  013420  012745  000000                   MOV     #0,-(R5)
  (3)  013424  004767  002676                   JSR     PC,RCVE
  (3)  013430  012605                           MOV     (SP)+,R5
 6993                                   ;
 6994                                   ;IF RECEIVE ERROR, REPORT IT AND EXIT WITH THE ERROR FLAG SET
 6995                                   ;
 6996  013432  103007                           BCC     50002$
 6997  013434  104463                           TRAP    T$ERCODE
  (5)  013436  000050                            WORD   40
  (5)  013440  002637                            WORD   MSG40
  (5)  013442  004072                           .WORD   AREA40
 6998                                   ;
 6999                                   ;    RESTORE R1 FIRST
 7000                                   ;
 7001  013444  012601                           MOV     (SP)+,R1
 7002  013446  000261                           SEC
  (4)  013450  000571                           BR      50001$
 7003  013452                           50002$
 7004                                   ;
 7005                                   ;IF MESSAGE IS ONLY 10 BYTES, SEE IF IT IS AN ACK
 7006                                   ;IT'S OK TO BE AN ACK, BUT RECEPTION IS INCOMPLETE (CLEAR FLAG).
 7007                                   ;
 7008  013452  026727  166472  000010           CMP     INSIZ,#10
  (9)  013460  001027                           BNE     50003$
 7009  013462  005065  000000                   CLR     A(R5)
 7010  013466  012767  000001  177016           MOV     #ACK,TYPE
 7011  013474  010546                           MOV     R5,-(SP)
  (4)  013476  016745  177010                   MOV     TYPE,-(R5)
  (3)  013502  004767  000330                   JSR     PC,CHKREP
  (3)  013506  012605                           MOV     (SP)+,R5
 7012  013510  103003                           BCC     50004$
 7013  013512  012601                           MOV     (SP)+,R1
 7014  013514  000261                           SEC
  (4)  013516  000546                           BR      50001$
 7015  013520                           50004$
 7016  013520  016701  166422                   MOV     INBUF,R1
  (6)  013524  062701  000004                   ADD     #4,R1
 7017  013530  111167  166432                   MOVB    (R1),RMSGNO
 7018  013534  012601                           MOV     (SP)+,R1
 7019  013536  000535                           BR      50000$
 7020  013540                           50003$
 7021
```

```
                                        ;IF RECEIVE OK, CHECK THE HEADER CRC
                                        ;COMPUTE EXPECTED CRC
                                        ;
7025  013540  162705  000002                    SUB     #1*2,R5
 (3)  013544  010546                            MOV     R5,-(SP)
 (5)  013546  012745  000006                    MOV     #6,-(R5)
 (4)  013552  016745  166370                    MOV     INBUF,-(R5)
 (3)  013556  004767  003036                    JSR     PC,CRC
 (3)  013562  012605                            MOV     (SP)+,R5
 (4)  013564  012567  170172                    MOV     (R5)+,A04EX
                                        ,
                                        ,GET THE CRC RECEIVED
                                        ,
7029  013570  016701  166352                    MOV     INBUF,R1
 (6)  013574  062701  000010                    ADD     #10,R1
7030  013600  114167  170154                    MOVB    -(R1),A04RC
7031  013604  000367  170150                    SWAB    A04RC
7032  013610  114167  170144                    MOVB    -(R1),A04RC
                                        ,
                                        ;IF THEY AREN'T THE SAME, REPORT THE ERROR, RESTORE R1 AND EXIT WITH
                                        ,THE ERROR FLAG SET
                                        ,
7037  013614  026767  170142  170136            CMP     A04EX,A04RC
 (9)  013622  001407                            BEQ     50005$
7038  013624  104463                            TRAP    T$EPCODE
 (5)  013626  000051                             WORD   41
 (5)  013630  002411                             WORD   MSG41
 (5)  013632  003726                             WORD   AREA41
7039  013634  012601                            MOV     (SP)+,R1
7040  013636  000261                            SEC
 (4)  013640  000475                            BR      50001$
7041  013642                            50005$
                                        ,
                                        ,COMPARE TERMINAL ADDRESS RECEIVED WITH THAT EXPECTED
                                        ,AND IF THEY AREN'T THE SAME, REPORT THE ERROR, RESTORE R1 AND
                                        ,EXIT WITH THE ERRROR FLAG SET
                                        ,
7047  013642  124167  167637                    CMPB    -(R1),STRTSA
 (9)  013646  001407                            BEQ     50006$
7048  013650  104463                            TRAP    T$ERCODE
 (5)  013652  000052                            .WORD   42
 (5)  013654  002345                             WORD   MSG42
 (5)  013656  003674                             WORD   AREA42
7049  013660  012601                            MOV     (SP)+,R1
7050  013662  000261                            SEC
 (4)  013664  000463                            BR      50001$
7051  013666                            50006$
                                        ,
                                        ;MOVE THE POINTERS PAST THE HEADER AND COMPUTE THE DATA CRC
                                        ,
7055  013666  062767  000010  166252            ADD     #10,INBUF
7056  013674  162767  000012  166246            SUB     #12,INSIZ
7057  013702  162705  000002                    SUB     #1*2,R5
 (3)  013706  010546                            MOV     R5,-(SP)
 (5)  013710  016745  166234                    MOV     INSIZ,-(R5)
 (4)  013714  016745  166226                    MOV     INBUF,-(R5)
```

```
  (3)  013720  004767  002674                JSR     PC,CRC
  (3)  013724  012605                        MOV     (SP)+,R5
  (4)  013726  012567  170030                MOV     (R5)+,A04EX
 7058                                ;
 7059                                ;GET THE DATA CRC RECEIVED
 7060                                ;
 7061  013732  016701  166210                MOV     INBUF,R1
  (6)  013736  066701  166206                ADD     INSIZ,R1
 7062  013742  062701  000002                ADD     #2,R1
 7063  013746  114167  170006                MOVB    -(R1),A04RC
 7064  013752  000367  170002                SWAB    A04RC
 7065  013756  114167  167776                MOVB    -(R1),A04RC
 7066                                ;
 7067                                ;IF THEY AREN'T THE SAME; REPORT THE ERROR, RESTORE R1 AND
 7068                                ;EXIT WITH THE ERROR FLAG SET
 7069                                ;
 7070  013762  026767  167772  167772        CMP     A04RC,A04EX
  (9)  013770  001407                        BEQ     50007$
 7071  013772  104463                        TRAP    T$ERCODE
  (5)  013774  000053                        .WORD   43
  (5)  013776  003224                         WORD   MSG43
  (5)  014000  003726                        .WORD   AREA43
 7072  014002  012601                        MOV     (SP)+,R1
 7073  014004  000261                        SEC
  (4)  014006  000412                        BR      50001$
 7074  014010                          50007$
 7075                                ;
 7076                                ;OTHERWISE, SET COMPLETE FLAG, RESTORE R1 AND EXIT NORMALLY
 7077                                ;
 7078  014010  005265  000000                INC     A(R5)
 7079  014014  016701  166126                MOV     INBUF,R1
  (6)  014020  162701  000004                SUB     #4,R1
 7080  014024  111167  166136                MOVB    (R1),RMSGNO
 7081  014030  012601                        MOV     (SP)+,R1
 7082  014032                          50000$
  (2)  014032  000241                        CLC
  (3)  014034                     50001$
  (2)  014034  000207                        RTS     PC
 7083
 7084
 7085
 7086
 7087
 7088
 7089                                ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 7090                                ;       ROUTINE TO CHECK AN INPUT BUFFER FOR A STANDARD         +
 7091                                ;       RESPONSE ("ACK" OR "STACK")                             +
 7092                                ;                                                               +
 7093                                ;       LOCATION "TYPE" CONTAINS THE RESPONSE CODE EXPECTED     +
 7094                                ;                                                               +
 7095                                ;       INPUT BUFFER POINTER IS IN "INBUF"                      +
 7096                                ;                                                               +
 7097                                ;       INPUT BUFFER SIZE (IN BYTES) IS IN "INSIZ"              +
 7098                                ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 7099  014036                          CHKREP
 7102  014036  010446                        MOV     R4,-(SP)
```

```
  (2)  014040  010604                        MOV     SP,R4
  (3)  014042  162706  000002                SUB     #2,SP
 7103                                ;
 7104                                ;IF MESSAGE IS NOT 10 BYTES LONG, IT CAN'T BE A CONTROL MESSAGE
 7105                                ;TYPE AN ERROR MESSAGE AND EXIT WITH ERROR SET
 7106                                ;
 7107  014046  026727  166076  000010        CMP     INSIZ,#10
  (9)  014054  001406                        BEQ     50002$
 7108  014056  104463                        TRAP    T$ERCODE
  (5)  014060  000001                         WORD   1
  (5)  014062  002273                         WORD   MSG01
  (5)  014064  003570                         WORD   AREA01
 7109  014066  000261                        SEC
  (4)  014070  000553                        BR      50001$
 7110  014072                        50002$:
 7111                                ;
 7112                                ;OTHERWISE, COMPUTE THE CRC AND CHECK IT AGAINST THAT SENT
 7113                                ;
 7114  014072  162705  000002                SUB     #1*2,R5
  (3)  014076  010546                        MOV     R5,-(SP)
  (5)  014100  012745  000006                MOV     #6,-(R5)
  (4)  014104  016745  166036                MOV     INBUF,-(R5)
  (3)  014110  004767  002504                JSR     PC,CRC
  (3)  014114  012605                        MOV     (SP)+,R5
  (4)  014116  012567  165762                MOV     (R5)+,TEMP
 7115  014122  016764  166020  177776        MOV     INBUF,A(R4)
  (6)  014130  062764  000007  177776        ADD     #7,A(R4)
 7116  014136  117467  177776  165736        MOVB    @A(R4),SCRTCH
 7117  014144  000367  165732                SWAB    SCRTCH
 7118  014150  005364  177776                DEC     A(R4)
 7119  014154  117467  177776  165720        MOVB    @A(R4),SCRTCH
 7120                                ;
 7121                                ;IF CRC'S MATCH GO ON . OTHERWISE SKIP FOLLOWING CODE
 7122                                ;
 7123  014162  026767  165716  165712        CMP     TEMP,SCRTCH
  (9)  014170  001076                        BNE     50004$
 7124                                ;
 7125                                ;COMPARE CONTROL MESSAGE TYPE WITH THAT PASSED AS AN ARGUEMENT
 7126                                ;
 7127  014172  016764  165750  177776        MOV     INBUF,A(R4)
  (6)  014200  005264  177776                INC     A(R4)
 7128  014204  117464  177776  177776        MOVB    @A(R4),A(R4)
 7129  014212  042764  177400  177776        BIC     #HYBYTE,A(R4)
 7130                                ;
 7131                                ;IF NOT THE EXPECTED TYPE, PRINT ERROR MESSAGE AND EXIT WITH ERROR SET
 7132                                ;
 7133  014220  026465  177776  000000        CMP     A(R4),B(R5)
  (9)  014226  001414                        BEQ     50005$
 7134  014230  016467  177776  167366        MOV     A(R4),A02A
 7135  014236  016567  000000  167362        MOV     B(R5),A02B
 7136  014244  104463                        TRAP    T$ERCODE
  (5)  014246  000002                         WORD   2
  (5)  014250  002320                         WORD   MSG02
  (5)  014252  003572                         WORD   AREA02
 7137  014254  000261                        SEC
  (4)  014256  000460                        BR      50001$
```

```
7138                                    ;
7139                                    ;OTHERWISE, CHECK TERMINAL ADDRESS
7140                                    ;
7141  014260                            50005$:
7142  014260  012767  002170  165614            MOV     #PTABLE,SCRTCH
 (6)  014266  062767  000005  165606            ADD     #5,SCRTCH
7143  014274  117767  165602  165600            MOVB    @SCRTCH,SCRTCH
7144  014302  042767  177400  165572            BIC     #HYBYTE,SCRTCH
7145  014310  016767  165632  165566            MOV     INBUF,TEMP
 (6)  014316  062767  000005  165560            ADD     #5,TEMP
7146  014324  117767  165554  165552            MOVB    @TEMP,TEMP
7147  014332  042767  177400  165544            BIC     #HYBYTE,TEMP
7148                                    ;
7149                                    ;IF NOT THE EXPECTED TERMINAL ADDRESS, THEN REPORT THE ERROR AND
7150                                    ;EXIT WITH ERROR SET
7151                                    ;
7152  014340  026767  165540  165534            CMP     TEMP,SCRTCH
 (9)  014346  001406                            BEQ     50007$
7153  014350  104463                            TRAP    T$ERCODE
 (5)  014352  000003                             WORD   3
 (5)  014354  002345                             WORD   MSG03
 (5)  014356  003674                             WORD   AREA03
7154  014360  000261                            SEC
 (4)  014362  000416                            BR      50001$
7155  014364                            50007$:
7156  014364                            50006$:
7157
7158                                    ;IF CRC WAS IN ERROR, SKIP ABOVE CODE, COME TO HERE, REPORT ERROR AND
7159                                    ;EXIT WITH ERROR SET
7160                                    ;
7161  014364  000414                            BR      50010$
 (3)  014366                            50004$:
7162  014366  016767  165510  167364            MOV     SCRTCH,A04RC
7163  014374  016767  165504  167360            MOV     TEMP,A04EX
7164  014402  104463                            TRAP    T$ERCODE
 (5)  014404  000004                             WORD   4
 (5)  014406  002411                             WORD   MSG04
 (5)  014410  003726                             WORD   AREA04
7165  014412  000261                            SEC
 (4)  014414  000401                            BR      50001$
7166  014416                            50010$:
7167  014416                            50003$:
7168
7169                                    ;NORMAL RETURN
7170                                    ;
7171  014416                            50000$:
 (2)  014416  000241                            CLC
 (3)  014420                            50001$:
 (3)  014420  010406                            MOV     R4,SP
 (3)  014422  012604                            MOV     (SP)+,R4
 (2)  014424  000207                            RTS     PC
7172
7173
7174
7175
7176
```

```
                                        ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                                        ;       THIS ROUTINE SETS UP AND CHECKS FOR COMPLETE TRANSMISSION      +
                                        ;       RETURNS AN ERROR FLAG IF ANY ERROR OCCURS DURING TRANSMISSION  +
                                        ;       SET "ABORT" IF INITIALIZATION OF THE DEVICE FAILS               +
                                        ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
014426                                  XMIT:
014426  010446                                  MOV     R4,-(SP)
(2) 014430  010604                              MOV     SP,R4
(3) 014432  162706  000002                      SUB     #2,SP
                                        ;
                                        ;CLEAR ERROR COUNT, TRANSMIT DONE FLAG AND RECEIVE DONE FLAG
                                        ;
014436  005064  177776                          CLR     B(R4)
014442  005067  000270                          CLR     XDONE
014446  005067  000266                          CLR     RDONE
                                        ;
                                        ;                       START OF LOOP
                                        ;
014452                                  50002$:
                                        ;
                                        ;TRY TO INIT DEVICE
                                        ;
014452  004767  000264                          JSR     PC,DEVINIT
                                        ;
                                        ;IF ERROR OCCURRED. .
                                        ;
014456  103033                                 BCC     50003$
014460  010146                                 MOV     R1,-(SP)
014462  010246                                 MOV     R2,-(SP)
                                        ;
                                        ;GET A COPY OF THE DEVICE REGISTERS
                                        ;
014464  016701  165500                          MOV     PTABLE,R1
014470  012702  002224                          MOV     #DUPREG,R2
014474  016162  000000  000000                 MOV     RCVCSR(R1),RCVCSR(R2)
014502  016162  000002  000002                 MOV     RCVBUF(R1),RCVBUF(R2)
014510  016162  000004  000004                 MOV     XMTCSR(R1),XMTCSR(R2)
014516  016162  000006  000006                 MOV     XMTBUF(R1),XMTBUF(R2)
014524  012602                                  MOV     (SP)+,R2
014526  012601                                  MOV     (SP)+,R1
                                        ;
                                        ;REPORT THE ERROR AND UPDATE THE ERROR COUNT
                                        ;
014530  104463                                 TRAP    T$ERCODE
(5) 014532  000027                              .WORD   23
(5) 014534  002722                              .WORD   MSG23
(5) 014536  004072                              .WORD   AREA23
014540  005264  177776                          INC     B(R4)
                                        ;
                                        ;OTHERWISE, CLEAR THE ERROR COUNT
                                        ;
014544  000402                                  BR      50004$
(3) 014546                              50003$:
014546  005064  177776                          CLR     B(R4)
014552                                  50004$:
                                        ;
```

```
 7245                                   ;IF ERROR COUNT HAS EXCEEDED LIMITS, ABORT AND NEGATE THE COUNT
 7246                                   ;
 7247  014552  026467  177776  165334           CMP     B(R4),ILIMIT
  (9)  014560  001010                           BNE     50005$
 7248  014562  104462                           TRAP    T$ERCODE
  (5)  014564  000000                           .WORD   0
  (5)  014566  002234                           .WORD   MSG00
  (5)  014570  003510                           .WORD   AREA00
 7249  014572  005267  165310                   INC     ABORT
 7250  014576  005464  177776                   NEG     B(R4)
 7251  014602                         50005$:
 7252                                   ;
 7253                                   ;                       END OF LOOP
 7254                                   ;EXIT LOOP WHEN ERROR COUNT IS ZERO OR NEGATIVE (ABORT)
 7255                                   ;
 7256  014602  005764  177776                   TST     B(R4)
  (6)  014606  003321                           BGT     50002$
 7257                                   ;
 7258                                   ;IF NOT ABORT THEN EXECUTE THE FOLLOWING CODE
 7259                                   ;OTHERWISE SKIP AND RETURN WITH ERROR SET
 7260                                   ;
 7261  014610  005764  177776                   TST     B(R4)
  (9)  014614  001042                           BNE     50006$
 7262                                   ;
 7263                                   ;WAIT FOR TRANSMIT DONE FLAG TO SET
 7264                                   ;
 7265  014616                         50007$:
 7266  014616  104022                           EMT     C$BRK
 7267  014620  005767  000112                   TST     XDONE
  (6)  014624  001774                           BEQ     50007$
 7268                                   ;
 7269                                   ;IF TRANSMIT FLAG IS NEGATIVE, AN ERROR OCCURRED
 7270                                   ;
 7271  014626  005767  000104                   TST     XDONE
  (9)  014632  002032                           BGE     50010$
 7272  014634  010146                           MOV     R1,-(SP)
 7273  014636  010246                           MOV     R2,-(SP)
 7274                                   ;
 7275                                   ;IF ERROR, GET COPY OF DEVICE REGISTERS, PRINT MESSAGE AND EXIT WITH ERROR SET
 7276                                   ;OTHERWISE DO A NORMAL EXIT
 7277                                   ;
 7278  014640  016701  165324                   MOV     PTABLE,R1
 7280  014644  012702  002224                   MOV     #DUPREG,R2
 7286  014650  016162  000000  000000           MOV     RCVCSR(R1),RCVCSR(R2)
 7287  014656  016162  000002  000002           MOV     RCVBUF(R1),RCVBUF(R2)
 7288  014664  016162  000004  000004           MOV     XMTCSR(R1),XMTCSR(R2)
 7289  014672  016162  000006  000006           MOV     XMTBUF(R1),XMTBUF(R2)
 7300  014700  012602                           MOV     (SP)+,R2
 7301  014702  012601                           MOV     (SP)+,R1
 7302  014704  104463                           TRAP    T$ERCODE
  (5)  014706  000030                            WORD   24
  (5)  014710  002762                            WORD   MSG24
  (5)  014712  004072                            WORD   AREA24
 7303  014714  000261                           SEC
  (4)  014716  000404                           BR      50001$
 7304  014720                         50010$:
```

```
 7305  014720  000402                          BR      50011$
  (3)  014722                          50006$:
 7306  014722  000261                          SEC
  (4)  014724  000401                          BR      50001$
 7307  014726                          50011$
 7308  014726                          50000$
  (2)  014726  000241                          CLC
  (3)  014730                          50001$:
  (3)  014730  010406                          MOV     R4,SP
  (3)  014732  012604                          MOV     (SP)+,R4
  (2)  014734  000207                          RTS     PC
 7309  014736  000000                  XDONE   0
 7310  014740  000000                  RDONE   0
 7311
 7312
 7313
 7314
 7315
 7316                          ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 7317                          ;       ROUTINE TO INITIALIZE A DEVICE                                        +
 7318                          ;                                                                             +
 7319                          ;       IF "INIT" IS NON-ZERO, THE ROUTINE WILL EXECUTE AND SET IT            +
 7320                          ;                                                                             +
 7321                          ;       RETURNS WITH AN ERROR IF CTS CANNOT BE SET                            +
 7322                          ;                                                                             +
 7323                          ;       RETURNS WITH ERROR AND "ABORT" SET IF THE DEVICE DOES                 +
 7324                          ;       NOT EXIST                                                             +
 7325                          ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 7327
 7328  014742                  DEVINIT
 7331  014742  010446                          MOV     R4,-(SP)
  (2)  014744  010604                          MOV     SP,R4
  (3)  014746  162706  000002                  SUB     #2,SP
 7332  014752  010146                          MOV     R1,-(SP)
 7333                          ;
 7334                          ;GET THE DEVICE ADDRESS
 7335                          ;
 7336  014754  016701  165210                  MOV     PTABLE,R1
 7337                          ;
 7338                          ;DO MASTER CLEAR, SET DATA TERMINAL READY, AND SET
 7339                          ;PARAMETER REGISTER (DEC MODE, AUTO-CRC INHIBIT, SYNC CHARACTAR
 7340                          ;
 7341  014760  052761  000400  000004          BIS     #MASCLR,XMTCSR(R1)
 7342  014766  052761  000002  000000          BIS     #DTR,RCVCSR(R1)
 7343  014774  052761  101226  000002          BIS     #PARAM,RCVBUF(R1)
 7344                          ;
 7345                          ;SET TIMER TO ZERO
 7346                          ;
 7347  015002  005067  000402                  CLR     TIMER
 7348                          ;
 7349                          ;                                       LOOP
 7350
 7351  015006                  50002$
 7352                          ;
 7353                          ;SET REQUEST TO SEND AND WAIT 10000 MICROSECS
 7354
```

```
 7355  015006  052711  000004                 BIS     #RTS,(R1)
 7356  015012  012700  000100                 MOV     #100,R0
  (3)  015016  104027                         EMT     C$WTU
 7357                                 ;
 7358                                 ;GET THE C  R TO SEND BIT AND UPDATE THE TIMER
 7359                                 ,
 7360  015020  011164  177776                 MOV     (R1),A(R4)
  (6)  015024  016446  177776                 MOV     A(R4),-(SP)
  (6)  015030  042716  020000                 BIC     #CTS,(SP)
  (6)  015034  042664  177776                 BIC     (SP)+,A(R4)
 7361  015040  005267  000344                 INC     TIMER
 7362                                 ;
 7363                                 ,                                   END LOOP
 7364                                 ,   LOOP ENDS WHEN TIMER EXCEEDS LIMIT OR CLEAR TO SEND IS UP
 7365                                 ,
 736t  015044  026767  000340  165036         CMP     TIMER,TIMLIM
  (6)  015052  001403                         BEQ     50003$
  (4)  015054  005764  177776                 TST     A(R4)
  (7)  015060  001752                         BEQ     50002$
  (4)  015062                         50003$
 7367                                 ,
 7368                                 ;IF TIME LIMIT NOT EXCEEDED
 7369                                 ,
 7370  015062  026767  000322  165020         CMP     TIMER,TIMLIM
  (9)  015070  001507                         BEQ     50004$
 7371                                 ;
 7372                                 ;GET THE DEVICE PRIORITY AND SET UP THE PECEIVE INTERRUPT HANCLER
 7373                                 ,
 7374  015072  012767  002170  165100         MOV     #PTABLE,DEVPRI
  (6)  015100  062767  000004  165072         ADD     #4,DEVPRI
 7375  015106  117767  165066  165064         MOVB    @DEVPRI,DEVPRI
 7376  015114  042767  177400  165056         BIC     #HYBYTE,DEVPRI
 7377  015122  012764  002170  177776         MOV     #PTABLE,A(R4)
  (6)  015130  062764  000002  177776         ADD     #2,A(R4)
 7378  015136  016746  165036                 MOV     DEVPRI,-(SP)
  (6)  015142  012746  015634                 MOV     #RINT,-(SP)
  (5)  015146  017446  177776                 MOV     @A(R4),-(SP)
  (4)  015152  012746  000003                 MOV     #3,-(SP)
  (3)  015156  104037                         EMT     C$SVEC
  (2)  015160  062706  000010                 ADD     #10,SP
 7379                                 ,
 7380                                 ;CLEAR THE NEW MESSAGE FLAG
 7381                                 ,
 7382  015164  005067  000236                 CLR     NMSG
 7383  015170  017464  177776  177776         MOV     @A(R4),A(R4)
  (6)  015176  062764  000004  177776         ADD     #4,A(R4)
 7384                                 ,
 7385                                 ;SET UP THE TRANSMIT INTERRUPT HANDLER
 7386                                 ,
 7387  015204  016746  164770                 MOV     DEVPRI,-(SP)
  (6)  015210  012746  015466                 MOV     #XINT,-(SP)
  (5)  015214  016446  177776                 MOV     A(R4),-(SP)
  (4)  015220  012746  000003                 MOV     #3,-(SP)
  (3)  015224  104037                         EMT     C$SVEC
  (2)  015226  062706  000010                 ADD     #10,SP
 7388                                 ,
```

```
                                        ;SET UP COPIES OF THE DEVICE BUFFER REGISTER ADDRESSES
                                        ;
7391  015232  010167  000146            MOV     R1,XMTADD
 (6)  015236  062767  000006  000140    ADD     #6,XMTADD
7392  015244  010167  000136            MOV     R1,RCVADD
 (6)  015250  062767  000002  000130    ADD     #2,RCVADD
                                        ;
                                        ;SET COUNTERS FOR FOUR SYNC'S AND FOUR FILL CHARACTERS
                                        ;
7396  015256  012767  000004  000126    MOV     #4,SYNCNT
7397  015264  012767  000004  000122    MOV     #4,FLLCNT
                                        ;
                                        ;ENABLE TRANSMIT AND RECEIVE INTERRUPTS.  SET TO FULL DUPLEX
                                        ;
7401  015272  052761  000120  000004    BIS     #TXINTE!SENDFD,XMTCSR(R1)
7402  015300  052761  000120  000000    BIS     #RXINTE,RCVCSR(R1)
                                        ;
                                        ;IF TIME LIMIT WAS EXCEEDED, GET REGISTER CONTENTS, PRINT MESSAGE,
                                        ;AND RETURN WITH ERROR SET
                                        ;
7407  015306  000427                    BR      50005$
 (3)  015310                            50004$
7408  015310  010246                    MOV     R2,-(SP)
7409  015312  012702  002224            MOV     #DUPREG,R2
7410  015316  016162  000000  000000    MOV     RCVCSR(R1),RCVCSR(R2)
7411  015324  016162  000002  000002    MOV     RCVBUF(R1),RCVBUF(R2)
7412  015332  016162  000004  000004    MOV     XMTCSR(R1),XMTCSR(R2)
7413  015340  016162  000006  000006    MOV     XMTBUF(R1),XMTBUF(R2)
7414  015346  012602                    MOV     (SP)+,R2
7415  015350  012601                    MOV     (SP)+,R1
7416  015352  104463                    TRAP    T$ERCODE
 (5)  015354  000036                     WORD   30
 (5)  015356  003117                     WORD   MSG30
 (5)  015360  004266                     WORD   AREA30
7417  015362  000261                    SEC
 (4)  015364  000404                    BR      50001$
7418  015366                            50005$
                                        ;
                                        ;IF NO ERROR, DO NORMAL EXIT
                                        ;
7422  015366  012601                    MOV     (SP)+,R1
7423  015370  005267  000022            INC     INIT
7424  015374                            50000$
 (2)  015374  000241                    CLC
 (3)  015376                            50001$
 (3)  015376  010406                    MOV     R4,SP
 (3)  015400  012604                    MOV     (SP)+,R4
 (2)  015402  000207                    RTS     PC
7571                                    ;
7572                                    ;
7573  015404  000000                    XMTADD  0               ;TRANSMIT BUFFER REGISTER ADDRESS
7574  015406  000000                    RCVADD  0               ;RECEIVE BUFFER REGISTER ADDRESS
7575  015410  000000                    TIMER   0               ;TIMER FOR CLEAR TO SEND OPERATION
7576  015412  000000                    SYNCNT  0               ;NUMBER OF SYNC CHARACTERS INSERTED BEFORE DDCMP MESSAGE
7577  015414  000000                    FLLCNT  0               ;NUMBER OF FILL CHARACTERS AFTER MESSAGE
7578  015416  000000                    INIT    0               ;INITIALIZE COMPLETE FLAG
```

```
015420  000377          FIL      377            ;FILL CHARACTER
015422  000000          XBUFFER. 0              ;CURRENT TRANSMIT BUFFER POINTER
015424  000000          XSIZE    0              ;CURRENT TRANSMIT BUFFER SIZE
015426  000000          NMSG     0              ;NEW MESSAGE EXPECTED FLAG
015430  000000          RTEMP1   0              ;CURRENT RECE'VE BUFFER POINTER
015432  000000          RTEMP2   0              ;CURRENT RECEIVE BUFFER SIZE
015434  000000          CNTFLG   0              ,CONTROL FLAG FOR INPUTTING DDCMP MESSAGES
                        ,
                        ,        RECEIVER QUEUES
                        ,
015436  000000          RQUEUE   0              ,QUEUE POINTER FOR BUFFER PROCESSING
015440  000000          RQUE     0              ,QUEUE POINTER FOR NEXT AVAILABLE BUFFER
015442  000000          RQUET    0              ,QUEUE OF BUFFER ADDRESSES AND SIZES
015444  000000                   0
015446  000000                   0
015450  000000                   0
015452  000000                   0
015454  000000          RQUEB    0
015456  000000          RBQUE    0              ,QUEUE POINTER FOR NEXT AVAILABLE BUFFER APEA
015460  000000          RBQUET   0              ,QUEUE OF BUFFER AREAS
015462  000000                   0
015464  000000          RBQUEB   0
```

```
 7602                                   ;
 7603                                   ;       TRANSMISSION INTERRUPT HANDLER
 7604                                   ;
 7607                                   ;
 7608                                   ;SET PROCESSOR PRIORITY LEVEL
 7609                                   ;
 7610  015466  016700  164506                  MOV     DEVPRI,R0
  (3)  015472  104041                        EMT     C$SPRI
 7611                                   ;
 7612                                   ;IF SYNC COUNT EQUAL TO ZERO
 7613                                   ;
 7614  015474  005767  177712                  TST     SYNCNT
  (9)  015500  001047                        BNE     50006$
 7615                                   ;
 7616                                   ;   CHECK BUFFER SIZE
 7617                                   ;   IF GREATER THAN ZERO, THEN
 7618                                   ;
 7619  015502  010146                        MOV     R1,-(SP)
 7620  015504  005767  177714                  TST     XSIZE
  (9)  015510  003416                        BLE     50007$
 7621                                   ;
 7622                                   ;       SEND THE NEXT CHARACTER AND UPDATE POINTER AND COUNT
 7623                                   ;
 7624  015512  117701  177704                  MOVB    @XBUFFER,R1
 7625  015516  042701  177400                  BIC     #HYBYTE,R1
 7628  015522  042777  000400  177654         BIC     #TSOM,@XMTADD
 7631  015530  110177  177650                  MOVB    R1,@XMTADD
 7632  015534  005267  177662                  INC     XBUFFER
 7633  015540  005367  177660                  DEC     XSIZE
 7634                                   ;
 7635                                   ;    IF ALL CHARACTERS SENT, CHECK FILL COUNT
 7636                                   ;
 7637  015544  000423                        BR      50010$
  (3)  015546                           50007$
 7638  015546  005767  177642                  TST     FLLCNT
  (9)  015552  001406                        BEQ     50011$
 7639                                   ;
 7640                                   ;       IF FILL COUNT ISN'T ZERO SEND A FILL CHAR  AND DECREMENT COUNT
 7641                                   ;
 7642  015554  056777  177640  177622         BIS     FIL,@XMTADD
 7643  015562  005367  177626                  DEC     FLLCNT
 7644  015566  000412                        BR      50012$
  (3)  015570                           50011$
 7645
 7646                                   ;       IF ALL TRANSMIT DONE, DISABLE TRANSMISSION AND SET DONE FLAG
 7647                                   ;
 7648  015570  016701  177610                  MOV     XMTADD,R1
  (6)  015574  162701  000006                  SUB     #6,R1
 7649  015600  005267  177132                  INC     XDONE
 7650  015604  104021                        EMT     C$ABRT
 7657  015606  042761  000120  000004         BIC     #TXINTE!SENDFD,XMTCSR(R1)
 7660  015614                           50012$
 7661  015614                           50010$:
 7662  015614  012601                        MOV     (SP)+,R1
 7663
 7664                                       OTHERWISE, SEND A SYNC AND DECREMENT THE SYNC COUNT
```

```
                                        ;
015616  000405                          BR      50013$
(3)     015620                  50006$
015620  052777  000626  177566          BIS     #SYNC!TSOM,@XMTADD
015626  005367  177560                  DEC     SYNCNT
015632                          50013$
                                        ;
                                        ;DO A SUPERVISOR-TYPE RTI
                                        ;
015632                          L10027
(2)     015632  000002                  RTI


                                        ;
                                        ;       RECEPTION INTERRUPT ROUTINE
                                        ;
                                        ;
                                        ;SET PROCESSOR PRIORITY
                                        ;
015634  016700  164340                  MOV     DEVPRI,R0
(3)     015640  104041                  EMT     C$SPRI
015642  010146                          MOV     R1,-(SP)
                                        ;
                                        ;IF NEW MESSAGE FLAG IS RESET
                                        ;
015644  005767  177556                  TST     NMSG
(9)     015650  001111                  BNE     50014$
                                        ;
                                        ;   OBTAIN A BUFFER FROM THE QUEUE AND GET THE RECEIVED BYTE
                                        ;
015652  017767  177600  177550          MOV     @RBQUE,RTEMP1
015660  016777  177544  177552          MOV     RTEMP1,@RQUE
015666  117777  177514  177534          MOVB    @RCVADD,@RTEMP1
015674  117701  177530                  MOVB    @RTEMP1,R1
                                        ;
                                        ;   CHECK FOR SYNC/FILL CHARACTER
                                        ;   (LOOKING FOR FIRST NON-SYNC/NON-FILL)
                                        ;
015700  120127  000226                  CMPB    R1,#SYNC
(9)     015704  001472                  BEQ     50015$
(6)     015706  120167  177506          CMPB    R1,FIL
(9)     015712  001467                  BEQ     50015$
                                        ;
                                        ;   NOT FILL OR SYNC. CHECK FOR ENQ (DDCMP CONTROL MESSAGE)
                                        ;
015714  120127  000005                  CMPB    R1,#ENQ
(9)     015720  001027                  BNE     50016$
                                        ;
                                        ;   IF IT IS AN ENQ, SET EXPECTED BYTE COUNT TO 7. SET MESSAGE SIZE
                                        ;   TO 10 (OCTAL) AND UPDATE THE BUFFER QUEUES
                                        ;
015722  012767  000007  177502          MOV     #7,RTEMP2
015730  062767  000002  177502          ADD     #2,RQUE
```

```
 7722  015736  012777  000010  177474          MOV     #10,@RQUE
 7723  015744  062767  000002  177466          ADD     #2,RQUE
 7724  015752  026727  177462  015454          CMP     RQUE,#RQUEB
  (9)  015760  003403                          BLE     50017$
 7725  015762  012767  015442  177450          MOV     #RQUET,RQUE
 7726  015770                                50017$:
 7727                                        ;
 7728                                        ;   SET COUNTER FLAG TO -1 (MESSAGE SIZE COUNT COMPLETE)
 7729                                        ,
 7730  015770  012767  177777  177436          MOV     #-1,CNTFLG
 7731  015776  000417                          BR      50020$
  (3)  016000                                50016$
 7732                                        ;
 7733                                        ,   NOT FILL, SYNC OR ENQ  CHECK FOR SOH OR DLE (DDCMP DATA MESSAGE)
 7734                                        ,
 7735  016000  120127  000201                  CMPB    R1,#SOH
  (8)  016004  001403                          BEQ     50021$
  (6)  016006  120127  000220                  CMPB    R1,#DLE
  (9)  016012  001007                          BNE     50022$
  (6)  016014                                50021$
 7736                                        ,
 7737                                        ,   MOVE QUEUE POINTER TO SIZE ENTRY AND SET COUNTER FLAG TO 1 (EXPECT
 7738                                        ,   FIRST COUNT BYTE)
 7739                                        ;
 7740  016014  062767  000002  177416          ADD     #2,PQUE
 7741  016022  012767  000001  177404          MOV     #1,CNTFLG
 7742  016030  000402                          BR      50023$
  (3)  016032                                50022$
 7743                                        ,
 7744                                        ;   BYTE WASN'T ANY OF THE LEGAL CHARACTERS    FORCE
 7745                                        ,   A RESTART BY FORCING THE NEW MESSAGE FLAG TO RESET ON EXIT
 7746                                        ,
 7747  016032  005367  177370                    DEC     NMSG
 7748  016036                                50023$:
 7749  016036                                50020$
 7750                                        ,
 7751                                        ,   COUNT THE CHARACTER AND UPDATE THE FREE BUFFER QUEUE
 7752                                        ;
 7753  016036  005267  177366                    INC     RTEMP1
 7754  016042  062767  000002  177406          ADD     #2,RBQUE
 7755  016050  026727  177402  015464          CMP     RBQUE,#RBQUEB
  (9)  016056  003403                          BLE     50024$
 7756  016060  012767  015460  177370          MOV     #RBQUET,RBQUE
 7757  016066                                50024$:
 7758                                        ,
 7759                                        ,   SET THE NEW MESSAGE FLAG
 7760                                        ,      EXIT ROUTINE
 7761                                        ;
 7762  016066  005267  177334                    INC     NMSG
 7763  016072                                50015$:
 7764                                        ,
 7765                                        ,NEW MESSAGE FLAG IS SET .  CONTINUE BUILDING MESSAGE
 7766                                        ,
 7767  016072  000513                          BR      50025$
  (3)  016074                                50014$:
 7768                                        ,
```

```
 7769                                           ;NOT A NEW MESSAGE...GET BYTE AND STORE IT
 7770                                           ;
 7771  016074  117777  177306  177326           MOVB    @RCVADD,@RTEMP1
 7772                                           ;
 7773                                           ;    IF COUNTER FLAG IS GREATER THAN ZERO, BYTE IS ALSO THE FIRST COUNT BYTE
 7774                                           ;
 7775  016102  005767  177326                   TST     CNTFLG
  (9)  016106  003413                           BLE     50026$
 7776                                           ;
 7777                                           ;    PUT THE BYTE IN RTEMP2 (EXPECTED COUNT), UPDATE THE BUFFER POINTER
 7778                                           ;    DECREMENT THE COUNTER FLAG (SET TO GET SECOND COUNT BYTE) AND
 7779                                           ;    GO DO AN RTI
 7780                                           ;
 7781  016110  117767  177314  177314           MOVB    @RTEMP1,RTEMP2
 7782  016116  042767  177400  177306           BIC     #HYBYTE,RTEMP2
 7783  016124  005267  177300                   INC     RTEMP1
 7784  016130  005367  177300                   DEC     CNTFLG
 7785  016134  000472                           BR      50027$
  (3)  016136                                50026$
 7786                                           ;
 7787                                           ;    COUNTER FLAG NOT GREATER THAN ZERO, IS IT ZERO?
 7788                                           ;
 7789  016136  005767  177272                   TST     CNTFLG
  (9)  016142  001041                           BNE     50030$
 7790                                           ;
 7791                                           ;    IF ZERO, BYTE IS ALSO SECOND BYTE OF COUNT (6 HIGH ORDER BITS)
 7792                                           ;    GET IT, MASK IT AND PUT IT INTO RTEMP2 (EXPECTED COUNT)
 7793
 7794  016144  010146                           MOV     R1,-(SP)
 7795  016146  117701  177256                   MOVB    @RTEMP1,R1
 7796  016152  005267  177252                   INC     RTEMP1
 7797  016156  000301                           SWAB    R1
 7798  016160  042701  140377                   BIC     #140377,R1
 7799  016164  060167  177242                   ADD     R1,RTEMP2
 7800  016170  012601                           MOV     (SP)+,R1
 7801                                           ;
 7802                                           ;    PUT THE COMPLETE SIZE IN THE QUEUE (EXPECTED COUNT +
 7803                                           ;    12 (OCTAL) BYTES OF HEADER AND CRC)
 7804                                           ;
 7805  016172  016777  177234  177240           MOV     RTEMP2,@RQUE
 7806  016200  062777  000012  177232           ADD     #12,@RQUE
 7807                                           ;
 7808                                           ;    ADJUST EXPECTED COUNT TO INCLUDE THE REMAINDER OF THE HEADER AND
 7809                                           ;    THE DATA CRC
 7810                                           ;
 7811  016206  062767  000007  177216           ADD     #7,RTEMP2
 7812                                           ;
 7813                                           ;    UPDATE THE QUEUE AND DECREMENT THE COUNTER FLAG (COUNT COMPLETE)
 7814                                           ;
 7815  016214  062767  000002  177216           ADD     #2,RQUE
 7816  016222  026727  177212  015454           CMP     RQUE,#RQUEB
  (9)  016230  003403                           BLE     50031$
 7817  016232  012767  015442  177200           MOV     #RQUET,RQUE
 7818  016240                                 50031$
 7819  016240  005367  177170                   DEC     CNTFLG
 7820                                           ;
```

```
                                        ;    GO DO AN RTI
                                        ;
7823  016244  000426                          BR      50032$
 (3)  016246                           50030$
                                        ;
                                        ;    COUNTER FLAG IS LESS THAN ZERO    THIS IS A DATA BYTE
                                        ;     UPDATE POINTER AND COUNT
                                        ;
7828  016246  005267  177156                INC     RTEMP1
7829  016252  005367  177154                DEC     RTEMP2
                                        ;
                                        ;    IF COUNT HAS REACHED ZERO, END OF MESSAGE   SET DONE FLAG
7832  016256  005767  177150                TST     RTEMP2
 (9)  016262  001017                       BNE     50033$
7833  016264  005267  176450                INC     RDONE
                                        ;
                                        ;    FORCE DUP TO RESTART RECEPTION
                                        ;
7838  016270  016701  177112                MOV     RCVADD,R1
 (6)  016274  162701  000002                SUB     #2,R1
7839  016300  042761  000020  000000       BIC     #RCENBL,RCVCSR(R1)
7840  016306  052761  000020  000000       BIS     #RCENBL,RCVCSR(R1)
                                        ;
                                        ;    ABORT ANY WAITS AND RESET NEW MESSAGE FLAG
                                        ;
7845  016314  104021                       EMT     C$ABRT
7846  016316  005067  177104               CLR     NMSG
7847  016322                           50033$
7848  016322                           50032$
7849  016322                           50027$
7850  016322                           50025$
                                        ;
                                        ;DO RTI
                                        ;
7854  016322  012601                       MOV     (SP)+,R1
7855  016324                           L10030
 (2)  016324  000002                       RTI
7856
7857
7858
7859
7860                                    ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
7861                                    ;                                                                              +
7862                                    ;       ROUTINE TO GET AN INPUT BUFFER FROM THE INPUT QUEUES                   +
7863                                    ;                                                                              +
7864                                    ;       WILL RETURN AN ERROR IF TERMINAL DOES NOT RESPOND                      +
7865                                    ;                                                                              +
7866                                    ;       ARGUEMENT (IF SET) INHIBITS ERROR PRINTOUT  THIS ALLOWS                +
7867                                    ;       THE PROGRAM TO RETRY THE STRT-STACK SEQUENCE WITHOUT HAVING             +
7868                                    ;       AN ERROR MESSAGE EACH TIME                                             +
7869                                    ;                                                                              +
7870                                    ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
7871  016326                            RCVE
7872                                    ;
7873                                    ;RESET TIMER
7874                                    ;
```

```
 7875  016326  016767  161446  177054          MOV     0,TIMER
 7876                                  ;
 7877                                  ;GO TO SUPERVISOR FOR AWHILE AND INCREMENT TIMER
 7878                                  ,
 7879  016334                          50002$:
 7880  016334  012700  000100                 MOV     #100,R0
  (3)  016340  104027                         EMT     C$WTU
 7881  016342  005267  177042                 INC     TIMER
 7882                                  ;
 7883                                  ;LOOP UNTIL TIME LIMIT EXCEEDED OR RECEIVER DONE FLAG IS SET
 7884                                  ,
 7885  016346  026767  177036  163534          CMP     TIMER,TIMLIM
  (6)  016354  003003                         BGT     50003$
  (4)  016356  005767  176356                 TST     RDONE
  (7)  016362  001764                         BEQ     50002$
  (4)  016364                          50003$:
 7886                                  ;
 7887                                  ;RESET THE NEW MESSAGE FLAG
 7888                                  ,
 7889  016364  005067  177036                 CLR     NMSG
 7890                                  ,
 7891                                  ;IF THE TIME LIMIT WASN'T EXCEEDED
 7892                                  ,
 7893  016370  026767  177014  163512          CMP     TIMER,TIMLIM
  (9)  016376  002044                         BGE     50004$
 7894                                  ,
 7895                                  ;RESET THE TIMER
 7896                                  ;CHECK FOR ERROR (RDONE LESS THAN ZERO)
 7897                                  ,
 7898  016400  005067  177004                 CLR     TIMER
 7899  016404  005767  176330                 TST     RDONE
  (9)  016410  003426                         BLE     50005$
 7900                                  ,
 7901                                  ;   NOT ERRROR, GET BUFFER ADDRESS AND SIZE FROM QUEUE AND UPDATE QUEUE
 7902                                  ,
 7903  016412  017767  177020  163526          MOV     @RQUEUE,INBUF
 7904  016420  062767  000002  177010          ADD     #2,RQUEUE
 7905  016426  017767  177004  163514          MOV     @RQUEUE,INSIZ
 7906  016434  062767  000002  176774          ADD     #2,RQUEUE
 7907  016442  026727  176770  015454          CMP     RQUEUE,#RQUEB
  (9)  016450  003403                         BLE     50006$
 7908  016452  012767  015442  176756          MOV     #RQUET,RQUEUE
 7909  016460                          50006$:
 7910                                  ;
 7911                                  ;RESET DONE FLAG AND LEAVE
 7912                                  ,
 7913  016460  005067  176254                 CLR     RDONE
 7914  016464  000410                         BR      50007$
  (3)  016466                          50005$:
 7915                                  ,
 7916                                  ;ERROR DID OCCUR.. RESET THE DONE FLAG, REPORT ERROR, RETURN WITH ERROR
 7917                                  ,
 7918  016466  005067  176246                 CLR     RDONE
 7919  016472  104463                         TRAP    T$ERCODE
  (5)  016474  000032                          WORD   26
  (5)  016476  003062                          WORD   MSG26
```

```
  (5)  016500  004264                        .WORD   AREA26
7920   016502  000261                        SEC
  (4)  016504  000443                        BR      50001$
7921   016506                          50007$:
7922   016506  000441                        BR      50010$
  (3)  016510                          50004$:
7923                                    ;
7924                                    ;TIME LIMIT EXCEEDED...RESET TIMER, GET REGISTER CONTENTS
7925                                    ;
7926   016510  005067  176674                CLR     TIMER
7927   016514  010146                        MOV     R1,-(SP)
7928   016516  016701  176664                MOV     RCVADD,R1
  (6)  016522  162701  000002                SUB     #2,R1
7929   016526  010246                        MOV     R2,-(SP)
7931   016530  012702  002224                MOV     #DUPREG,R2
7936   016534  016162  000000  000000        MOV     RCVCSR(R1),RCVCSR(R2)
7937   016542  016162  000002  000002        MOV     RCVBUF(R1),RCVBUF(R2)
7938   016550  016162  000004  000004        MOV     XMTCSR(R1),XMTCSR(R2)
7939   016556  016162  000006  000006        MOV     XMTBUF(R1),XMTBUF(R2)
7940   016564  012602                        MOV     (SP)+,R2
7941   016566  012601                        MOV     (SP)+,R1
7942                                    ;
7943                                    ;IF NOT INHIBITED, PRINT ERROR MESSAGE
7944                                    ;
7945   016570  005765  000000                TST     DDSTRT(R5)
  (9)  016574  001004                        BNE     50011$
7946   016576  104463                        TRAP    T$ERCODE
  (5)  016600  000037                         WORD   31
  (5)  016602  003147                        .WORD   MSG31
  (5)  016604  004266                         WORD   AREA31
7947   016606                          50011$:
7948                                    ;
7949                                    ;RETURN WITH ERROR IN ANY CASE
7950                                    ;
7951   016606  000261                        SEC
  (4)  016610  000401                        BR      50001$
7952   016612                          50010$:
7953   016612                          50000$:
  (2)  016612  000241                        CLC
  (3)  016614                          50001$:
  (2)  016614  000207                        RTS     PC
7954
7955
7956
7957
7958
7960                                    ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
7961                                    ;                                                                      +
7962                                    ;       DUMMY ROUTINE FOR COMPATIBILITY                                +
7963                                    ;                                                                      +
7964                                    ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
7965   016616                           INSERR::
7966   016616                          50000$:
  (3)  016616                          50001$:
  (2)  016616  000207                        RTS     PC
8029
```

```
 8030
 8031
 8032
 8033
 8034
 8035                           ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 8036                           ;                                                                     +
 8037                           ;       THIS ROUTINE COMPUTES CRC-16 AND REQUIRES THREE ARGUMENTS     +
 8038                           ;       DATA ADDRESS, DATA SIZE (IN BYTES) AND A WORD LOCATION        +
 8039                           ;       FOR THE COMPUTED CRC                                          +
 8040                           ;        3 2 1 2.1, 3.2.1 2 4, 3 2.20 1 2, 3 2 20 3 1,                +
 8041                           ;       3 2.20 6 2, 3.2.20 6 4 AND 3 2 20 10.1                        +
 8042                           ;                                                                     +
 8043                           ;       THIS IS A STANDARD ROUTINE FROM DEC'S NETWORK GROUP            +
 8044                           ;                                                                     +
 8045                           ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 8046  016620                   CRC
 8049  016620  010446                   MOV     R4,-(SP)
  (2)  016622  010604                   MOV     SP,R4
  (3)  016624  162706  000004           SUB     #4,SP
 8050  016630  010146                   MOV     R1,-(SP)
 8051  016632  010246                   MOV     R2,-(SP)
 8052  016634  010346                   MOV     R3,-(SP)
 8053  016636  016501  000000           MOV     A(R5),R1
 8054  016642  016502  000002           MOV     B(R5),R2
 8055  016646  005003                   CLR     R3
 8056  016650                   50002$
  (6)  016650  005702                   TST     R2
  (9)  016652  003500                   BLE     50003$
 8057  016654  112164  177776           MOVB    (R1)+,D(R4)
 8058  016660  042764  177400  177776   BIC     #HYBYTE,D(R4)
 8059  016666  005302                   DEC     R2
 8060  016670  010346                   MOV     R3,-(SP)
  (6)  016672  046416  177776           BIC     D(R4),(SP)
  (6)  016676  040364  177776           BIC     R3,D(R4)
  (6)  016702  052664  177776           BIS     (SP)+,D(R4)
 8061  016706  016464  177776  177774   MOV     D(R4),E(R4)
 8062  016714  042764  177760  177776   BIC     #177760,D(R4)
 8063  016722  006364  177776           ASL     D(R4)
 8064  016726  062764  017074  177776   ADD     #CRCTAB,D(R4)
 8065  016734  017464  177776  177776   MOV     @D(R4),D(R4)
 8066  016742  042764  177417  177774   BIC     #177417,E(R4)
 8067  016750  006264  177774           ASR     E(R4)
  (7)  016754  006264  177774           ASR     E(R4)
  (7)  016760  006264  177774           ASR     E(R4)
 8068  016764  062764  017074  177774   ADD     #CRCTAB,E(R4)
 8069  016772  062764  000040  177774   ADD     #32 ,E(R4)
 8070  017000  017464  177774  177774   MOV     @E(R4),E(R4)
 8071  017006  016446  177774           MOV     E(R4),-(SP)
  (6)  017012  046416  177776           BIC     D(R4),(SP)
  (6)  017016  046464  177774  177776   BIC     E(R4),D(R4)
  (6)  017024  052664  177776           BIS     (SP)+,D(R4)
 8072  017030  042703  000377           BIC     #LOBYTE,R3
 8073  017034  000303                   SWAB    R3
 8074  017036  016446  177776           MOV     D(R4),-(SP)
  (6)  017042  040316                   BIC     R3,(SP)
```

```
   (6)  017044  046403  177776                BIC     D(R4),R3
   (6)  017050  052603                        BIS     (SP)+,R3
  8075  017052  000676                        BR      50002$
   (3)  017054                        50003$
  8076  017054  010365  000004                MOV     R3,C(R5)
  8077  017060  012603                        MOV     (SP)+,R3
  8078  017062  012602                        MOV     (SP)+,R2
  8079  017064  012601                        MOV     (SP)+,R1
  8080  017066                        50000$:
   (3)  017066                        50001$.
   (3)  017066  010406                        MOV     R4,SP
   (3)  017070  012604                        MOV     (SP)+,R4
   (2)  017072  000207                        RTS     PC
  8081
  8082  017074  000000                CRCTAB: 000000
  8083  017076  140301                        140301
  8084  017100  140601                        140601
  8085  017102  000500                        000500
  8086  017104  141401                        141401
  8087  017106  001700                        001700
  8088  017110  001200                        001200
  8089  017112  141101                        141101
  8090  017114  143001                        143001
  8091  017116  003300                        003300
  8092  017120  003600                        003600
  8093  017122  143501                        143501
  8094  017124  002400                        002400
  8095  017126  142701                        142701
  8096  017130  142201                        142201
  8097  017132  002100                        002100
  8098  017134  000000                        000000
  8099  017136  146001                        146001
  8100  017140  154001                        154001
  8101  017142  012000                        012000
  8102  017144  170001                        170001
  8103  017146  036000                        036000
  8104  017150  024000                        024000
  8105  017152  162001                        162001
  8106  017154  120001                        120001
  8107  017156  066000                        066000
  8108  017160  074000                        074000
  8109  017162  132001                        132001
  8110  017164  050000                        050000
  8111  017166  116001                        116001
  8112  017170  104001                        104001
  8113  017172  042000                        042000
```

```
                                        ;
                                        ;       HARDWARE TESTS  3 2
                                        ;

                                        ;<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>
                                        ;                                                                       <>
                                        ;       SELF TEST  3.2C                                                 <>
                                        ;                                                                       <>
                                        ;<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>
                                        ;
                                        ;FORCE INIT OF COMM DEVICE AND LINK
                                        ;
     017174  005067  176216                     CLR     INIT
                                        ;
                                        ;GET MESSAGE ADDRESS AND SIZE
                                        ;
     017200  016767  000744  162724             MOV     MDMSG,OUTMSG
 (6) 017206  042767  100001  162716             BIC     #100001,OUTMSG
     017214  016767  000732  162712             MOV     MDMSG+2,OUTMSG+2
                                        ;
                                        ;SEND THE MESSAGE
                                        ;
     017222  004767  173032                     JSR     PC,TEROUT
                                        ;
                                        ;IF ERROR
                                        ;
     017226  103015                             BCC     50004$
                                        ;
                                        ;       INSERT ERROR INTO STATISTICS TABLE (MANUFACTURING VERSIONS ONLY),
                                        ;       REPORT THE ERROR, REQUEST SUPERVISOR TO LOOP
                                        ;       IF LOOPING ENABLED (EXIT TEST IF NO LOOPING)
                                        ;
     017230  010546                             MOV     R5,-(SP)
 (4) 017232  012745  000000                     MOV     #0,-(R5)
 (3) 017236  004767  177354                     JSR     PC,INSERR
 (3) 017242  012605                             MOV     (SP)+,R5
     017244  104463                             TRAP    T$ERCODE
 (5) 017246  000062                              WORD   50
 (5) 017250  003271                              WORD   MSG50
 (5) 017252  004072                              WORD   AREA40
     017254  104006                             EMT     C$CLP1
     017256  104032                             EMT     C$EXIT
 (3) 017260  000364                              WORD   L10031-
     017262                             50004$
                                        ;
                                        ;LOOK FOR ACK
                                        ;
     017262  162705  000002                     SUB     #1*2,R5
 (3) 017266  004767  174122                     JSR     PC,TERIN
 (4) 017272  012567  000650                     MOV     (R5)+,MCOMP
                                        ;
                                        ;IF ERROR   INSERT ERROR INTO TABLE (MANUFACTURING TEST ONLY)
                                        ;           REPORT THE ERROR, REQUEST LOOP IF ENABLED (EXIT TEST
                                        ;           IF NO LOOPING)
                                        ;
     017276  103015                             BCC     50005$
```

```
 8165  017300  010546                          MOV     R5,-(SP)
  (4)  017302  012745  000000                  MOV     #0,-(R5)
  (3)  017306  004767  177304                  JSR     PC,INSERR
  (3)  017312  012605                          MOV     (SP)+,R5
 8166  017314  104463                          TRAP    T$ERCODE
  (5)  017316  000062                          .WORD   50
  (5)  017320  003271                          .WORD   MSG50
  (5)  017322  004072                          .WORD   AREA40
 8167  017324  104006                          EMT     C$CLP1
 8168  017326  104032                          EMT     C$EXIT
  (3)  017330  000314                          .WORD   L10031-
 8169  017332                        50005$
 8170                                ;
 8171                                ;IF MESSAGE WAS NOT AN ACK..ERROR
 8172                                ;       REPORT ERROR, LOOP IF ENABLED, EXIT TEST IF NOT
 8173                                ;
 8174  017332  005767  000610                  TST     MCOMP
  (9)  017336  001407                          BEQ     50006$
 8175  017340  104463                          TRAP    T$ERCODE
  (5)  017342  000062                          WORD    50
  (5)  017344  003271                          .WORD   MSG50
  (5)  017346  004072                          WORD    AREA40
 8176  017350  104006                          EMT     C$CLP1
 8177  017352  104032                          EMT     C$EXIT
  (3)  017354  000270                          .WORD   L10031-.
 8178  017356                        50006$
 8179                                ;
 8180                                ;FORCE A RESTART ON THE LINK AND WAIT FOR SELFTEST TO COMPLETE
 8181                                ;
 8182  017356  005067  176034                  CLR     INIT
 8183  017362  012700  000400                  MOV     #400,R0
  (3)  017366  104026                          EMT     C$WTM
 8184                                ;
 8185                                ;SET UP MESSAGE ASKING FOR RESULTS AND SEND IT
 8186                                ;
 8187  017370  016767  000564  162534          MOV     MDMSG1,OUTMSG
  (6)  017376  042767  100001  162526          BIC     #100001,OUTMSG
 8188  017404  016767  000552  162522          MOV     MDMSG1+2,OUTMSG+2
 8189  017412  004767  172642                  JSR     PC,TEROUT
 8190                                ;
 8191                                ;IF ERROR    INSERT ERROR IN TABLE (MANUF. TESTS ONLY), REPORT ERROR,
 8192                                ;       LOOP IF ENABLED, EXIT TEST IF NO LOOPING
 8193
 8194  017416  103015                          BCC     50007$
 8195  017420  010546                          MOV     R5,-(SP)
  (4)  017422  012745  000000                  MOV     #0,-(R5)
  (3)  017426  004767  177164                  JSR     PC,INSERR
  (3)  017432  012605                          MOV     (SP)+,R5
 8196  017434  104463                          TRAP    T$ERCODE
  (5)  017436  000062                          WORD    50
  (5)  017440  003271                          WORD    MSG50
  (5)  017442  004072                          WORD    AREA40
 8197  017444  104006                          EMT     C$CLP1
 8198  017446  104032                          EMT     C$EXIT
  (3)  017450  000174                          WORD    L10031-
 8199  017452                        50007$
```

```
 8200                                   ;
 8201                                   ;ACK TERMINAL AND GET ITS RESPONSE
 8202                                   ;
 8203  017452                           50010$:
 8204  017452  004767  000170                   JSR     PC,OUTREP
 8205                                   ;
 8206                                   ;       HANDLE ERROR IF ONE OCCURED WHILE ACK'ING
 8207                                   ;
 8208  017456  103023                           BCC     50011$
 8209  017460  010546                           MOV     R5,-(SP)
  (4)  017462  012745  000000                   MOV     #0,-(R5)
  (3)  017466  004767  177124                   JSR     PC,INSERR
  (3)  017472  012605                           MOV     (SP)+,R5
 8210  017474  010546                           MOV     R5,-(SP)
  (4)  017476  012745  000001                   MOV     #1,-(R5)
  (3)  017502  004767  177110                   JSR     PC,INSERR
  (3)  017506  012605                           MOV     (SP)+,R5
 8211  017510  104463                           TRAP    T$ERCODE
  (5)  017512  000062                           .WORD   50
  (5)  017514  003271                            WORD   MSG50
  (5)  017516  004072                            WORD   AREA40
 8212  017520  104006                           EMT     C$CLP1
 8213  017522  104032                           EMT     C$EXIT
  (3)  017524  000120                            WORD   L10031-
 8214  017526                           50011$:
 8215                                   ;
 8216                                   ;GET THE RESPONSE
 8217                                   ;
 8218  017526  162705  000002                   SUB     #1*2,R5
  (3)  017532  004767  173656                   JSR     PC,TERIN
  (4)  017536  012567  000404                   MOV     (R5)+,MCOMP
 8219
 8220                                           HANDLE ERROR IF ONE OCCURED
 8221                                   ;
 8222  017542  103015                           BCC     50012$
 8223  017544  010546                           MOV     R5,-(SP)
  (4)  017546  012745  000000                   MOV     #0,-(R5)
  (3)  017552  004767  177040                   JSR     PC,INSERR
  (3)  017556  012605                           MOV     (SP)+,R5
 8224  017560  104463                           TRAP    T$ERCODE
  (5)  017562  000062                            WORD   50
  (5)  017564  003271                            WORD   MSG50
  (5)  017566  004072                            WORD   AREA40
 8225  017570  104006                           EMT     C$CLP1
 8226  017572  104032                           EMT     C$EXIT
  (3)  017574  000050                            WORD   L10031-
 8227  017576                           50012$:
 8228                                   ;
 8229                                   ;REPEAT THE LOOP UNTIL A MESSAGE IS RECEIVED
 8230                                   ;
 8231  017576  005767  000344                   TST     MCOMP
  (6)  017602  001723                           BEQ     50010$
 8232
 8233                                   ;PROCESS THE MESSAGE RECEIVED
 8234                                   ;
 8235  017604  004767  000146                   JSP     PC,STINPT
```

```
8236                                    ;
8237                                    ;IF IN ERROR...INSERT ERROR INTO TABLE (MANUF TESTS ONLY, REPORT
8238                                    ;ERROR, LOOP IF ENABLED, EXIT TEST IF NOT
8239                                    ;
8240  017610  103015                           BCC     500139$
8241  017612  010546                           MOV     R5,-(SP)
 (4)  017614  012745  000001                   MOV     #1,-(R5)
 (3)  017620  004767  176772                   JSR     PC,INSERR
 (3)  017624  012605                           MOV     (SP)+,R5
8242  017626  104463                           TRAP    T$ERCODE
 (5)  017630  000062                            WORD   50
 (5)  017632  003271                            WORD   MSG50
 (5)  017634  004072                            WORD   AREA40
8243  017636  104006                           EMT     C$CLP1
8244  017640  104032                           EMT     C$EXIT
 (3)  017642  000002                            WORD   L10031-
8245  017644                          500139$
8246                                    ;
8247                                    ;END OF TEST
8248                                    ;
8249  017644                          L10031
 (3)  017644  104001                           EMT     C$ETST
8250
8251
8252
8253
8254
8255                                    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
8256                                    +                                                                    +
8257                                    +       ROUTINE TO SEND AND ACK IN ORDER TO POLL A TERMINAL          +
8258                                    +                                                                    +
8259                                    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
8260  017646                          OUTREP
8261                                    ;
8262                                    ;INSERT MESSAGE NUMBER (LAST MESSAGE SENT) AND RESPONSE NUMBER
8263                                    ;(LAST MESSAGE RECEIVED)     INSERT STATION ADDRESS
8264                                    ;
8265  017646  116767  162312  000320            MOVB    MSGNO,MSGN
8266  017654  116767  162306  000311            MOVB    RMSGNO,REPN
8267  017662  116767  163617  000305            MOVB    STRTSA,REPA
8268                                    ;
8269                                    ;COMPUTE AND INSEPT CRC
8270                                    ;
8271  017670  162705  000002                   SUB     #1*2,R5
 (3)  017674  010546                           MOV     R5,-(SP)
 (5)  017676  012745  000006                   MOV     #6,-(R5)
 (4)  017702  012745  020170                   MOV     #REPM,-(R5)
 (3)  017706  004767  176706                   JSR     PC,CRC
 (3)  017712  012605                           MOV     (SP)+,R5
 (4)  017714  012567  000256                   MOV     (R5)+,REPCRC
8272
8273                                    SET UP BUFFER POINTER AND SIZE AND SEND THE MESSAGE
8274                                    ;
8275  017720  012767  020170  175474           MOV     #REPM,XBUFFER
8276  017726  012767  000010  175470           MOV     #10,XSIZE
8277  017734  004767  174466                   JSR     PC,XMIT
```

```
 8278                                ;
 8279                                ;IF AN ERROR OCCURRED, RETURN W'TH ERROR.  OTHERWISE RETURN NORMALLY
 8280                                ;
 8281  017740  103004                        BCC     50002$
 8282  017742  005267  162152                INC     OUTERR
 8283  017746  000261                        SEC
  (4)  017750  000401                        BR      50001$
 8284  017752                        50002$
 8285  017752                        50000$
  (2)  017752  000241                        CLC
  (3)  017754                        50001$
  (2)  017754  000207                        RTS     PC
 8286
 8287
 8288
 8289
 8290
 8291                                ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 8292                                ;                                                                      +
 8293                                ;       ROUTINE TO PROCESS TERMINAL SELFTEST PESULTS                   +
 8294                                ;                                                                      +
 8295                                ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 8296  017756                        STINPT
 8297  017756  010146                        MOV     R1 -(SP)
 8298  017760  010246                        MOV     R2,-(SP)
 8299  017762  010346                        MOV     R3,-(SP)
 8300                                ;
 8301                                ; SKIP RESPONSE HEADER AND CHECK FIPST DATA BITE
 8302
 8303  017764  016701  162156                MOV     INBUF,R1
  (6)  017770  062701  000004                ADD     #4,R1
 8304
 8305                                ;IF IT IS "A", GOOD RESPONSE  OTHEPWISE
 8306                                ;
 8307  017774  121127  000101                CMPB    (R1),#101
  (9)  020000  001455                        BEQ     50002$
 8308                                ;
 8309                                ;  GET THE BYTE AND CHECK TO SEE  F  T IS "M" (MEMORY ERROR)
 8310
 8311  020002  112103                        MOVB    (R1)+,R3
 8312  020004  120327  000115                CMPB    R3,#115
  (9)  020010  001026                        BNE     50003$
 8313
 8314                                ; MEMORY ERROR   GET THE TYPE AND BANK NUMBER
 8315                                ;      INSERT INTO ERROR MESSAGE, REPORT THE ERROR AND
 8316                                ;      RETURN WITH ERROR
 8317                                ;      (NOTE: ERROR REPORTING PROTOCOL DELIMITERS ARE
 8318                                ;      IGNORED  THIS PROGRAM WILL NOT ACCEPT INPUT FROM
 8319                                ;      ANY OTHER INTELLIGENT TERMINAL PROPERLY )
 8320
 8321  020012  062701  000002                ADD     #2,R1
 8322  020016  012702  003446                MOV     #MTY,R2
 8323  020022  112122                        MOVB    (R1)+,(R2)+
 8324  020024  112122                        MOVB    (R1)+,(R2)+
 8325  020026  012702  003462                MOV     #BNO,R2
 8326  020032  062701  000003                ADD     #3,R1
```

```
  8327  020036  111103                        MOVB    (R1),R3
  8328  020040  062703  000060                ADD     #60,R3
  8329  020044  110312                        MOVB    R3,(R2)
  8330  020046  104423                        TRAP    T$ERCODE
   (5)  020050  000107                         WORD   71
   (5)  020052  003422                         WORD   MSG71
  8331  020054  012603                        MOV     (SP)+,R3
  8332  020056  012602                        MOV     (SP)+,R2
  8333  020060  012601                        MOV     (SP)+,R1
  8334  020062  000261                        SEC
   (4)  020064  000427                        BR      50001$
  8335  020066                          50003$
  8336                                  ;
  8337                                  ;    NOT A MEMORY ERROR OR PASS   CHECK FOR "P" (PROCESSOR ERROR)
  8338                                  ;
  8339  020066  120327  000120                CMPB    R3,#120
   (9)  020072  001010                        BNE     50005$
  8340                                  ;
  8341                                  ;    PROCESSOR ERROR   REPORT IT AND EXIT WITH ERROR
  8342                                  ;
  8343  020074  104423                        TRAP    T$ERCODE
   (5)  020076  000110                         WORD   72
   (5)  020100  003464                         WORD   MSG72
  8344  020102  012603                        MOV     (SP)+,R3
  8345  020104  012602                        MOV     (SP)+,R2
  8346  020106  012601                        MOV     (SP)+,R1
  8347  020110  000261                        SEC
   (4)  020112  000414                        BR      50001$
  8348  020114                          50005$
  8349
  8350                                   RESPONSE WAS NOT LEGAL   REPORT IT AND RETURN WITH ERROR
  8351
  8352  020114  104423                        TRAP    T$ERCODE
   (5)  020116  000106                         WORD   70
   (5)  020120  003367                         WORD   MSG70
  8353  020122  012603                        MOV     (SP)+,R3
  8354  020124  012602                        MOV     (SP)+,R2
  8355  020126  012601                        MOV     (SP)+,R1
  8356  020130  000261                        SEC
   (4)  020132  000404                        BR      50001$
  8357  020134                          50006$
  8358  020134                          50004$
  8359  020134                          50002$
  8360  020134  012603                        MOV     (SP)+,R3
  8361  020136  012602                        MOV     (SP)+,R2
  8362  020140  012601                        MOV     (SP)+,R1
  8363  020142                          50000$
   (2)  020142  000241                        CLC
   (3)  020144                          50001$
   (2)  020144  000207                        RTS     PC
  8364
  8365
  8366                                   MESSAGE AREA FOR SELFTEST
  8367                                  ;
  8368  020146  000000                MCOMP   0
  8369  020150  020154                MDMSG    +4
```

```
 8370  020152  000004                          EMDMG1-2-.
 8371  020154     040      002      050          BYTE 40,2,50,0
       020157     000
 8372  020160                          EMDMG1
 8373                                            EVEN
 8374  020160  120165                  MDMSG1  .+100005
 8375  020162  000004                          EMDMG2-2-.
 8376  020164     040      002      051          BYTE 40,2,51,0
       020167     000
 8377  020170                          EMDMG2:
 8378                                            EVEN
 8379                                  ;
 8380                                  ;ACK MESSAGE AREA
 8381                                  ;
 8382  020170     005      001      200 REPM    .BYTE ENQ,ACK,200
 8383  020173     000                  REPN    .BYTE 0
 8384  020174     000                  MSGN     BYTE 0
 8385  020175     000                  REPA.    BYTE 0
 8386  020176  000000                  REPCRC. .WORD 0
 8414
 8415                                  ;<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>
 8416                                  ;                                                                     <>
 8417                                          LOOPBACK TEST                                                 <>
 8418                                  ;                                                                     <>
 8419                                  ;<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>
 8421                                  ;
 8422                                  ;CLEAR ALL FLAGS
 8423                                  ;
 8424  020200  016767  157574  161700          MOV     0,ABORT
 8425  020206  016767  157566  161710          MOV     0,EOMSG
 8426  020214  016767  157560  161706          MOV     0,EXPINP
 8427                                  ;
 8428                                  ;START THE LINK (INIT DEVICE, DO DDCMP STRT)
 8429                                  ;
 8430  020222  004767  172266                  JSR     PC,XSTRT
 8431                                  ;
 8432                                  ;IF ERROR DURING START-UP   INSERT INTO TABLE (MANUF  TESTS ONLY, REPORT
 8433                                  ;IT. LOOP IF ENABLED--EXIT IF NOT
 8434                                  ;
 8435  020226  103015                          BCC     50007$
 8436  020230  010546                          MOV     R5,-(SP)
  (4)  020232  012745  000000                  MOV     #0,-(R5)
  (3)  020236  004767  176354                  JSR     PC,INSERP
  (3)  020242  012605                          MOV     (SP)+,R5
 8437  020244  104463                          TRAP    T$ERCODE
  (5)  020246  000063                           WORD   51
  (5)  020250  003326                           WORD   MSG51
  (5)  020252  004072                           WORD   AREA40
 8438  020254  104006                          EMT     C$CLP1
 8439  020256  104032                          EMT     C$EXIT
  (3)  020260  000446                           WORD   L10032-
 8440  020262                          50007$
 8441
 8442                                  ;FILL MESSAGE AREA WITH 256 BYTES OF SELECTED PATTERN
 8443
 8444  020262  010146                          MOV     R1,-(SP)
```

```
 8445  020264  012701  021066                  MOV     #LOOPB,R1
 8446  020270  005767  171150                  TST     PATTERN
  (9)  020274  001403                          BEQ     50010$
 8447  020276  005067  161600                  CLR     SCRTCH
 8448  020302  000403                          BR      50011$
  (3)  020304                          50010$
 8449  020304  012767  125125  161570          MOV     #125125,SCRTCH
 8450  020312                       50011$:
 8451  020312                       50012$:
 8452  020312  016721  161564                  MOV     SCRTCH,(R1)+
 8453  020316  020127  021466                  CMP     R1,#ELOOPB
  (6)  020322  001373                          BNE     50012$
 8454                                ;
 8455                                ;PUT A 1 AT THE END TO ASSURE THAT THE FINAL BYTE IS NOT NULL (0)
 8456                                ;
 8457  020324  012701  021466                  MOV     #ELOOPB,R1
  (6)  020330  005301                          DEC     R1
 8458  020332  112711  000001                  MOVB    #1,(R1)
 8459                                ;
 8460                                ;GET THE STATION ADDRESS AND INSERT IT IN THE HEADER
 8461                                ;
 8462  020336  012701  002170                  MOV     #PTABLE,R1
  (6)  020342  062701  000005                  ADD     #5,R1
 8463  020346  111167  000511                  MOVB    (R1),LOOSTA
 8464  020352  012601                          MOV     (SP)+,R1
 8465                                ;
 8466                                ;INSERT LOOP DATA TYPE
 8467                                ;
 8468  020354  112767  000024  000504          MOVB    #OSOP,LOOPB
 8469                                ;
 8470                                ;SET MESSAGE NUMBER
 8471                                ;
 8472  020362  112767  000001  000472          MOVB    #1,LOOPN
 8473                                ;
 8474                                ;COMPUTE AND INSERT HEADER CRC
 8475                                ;
 8476  020370  162705  000002                  SUB     #1*2,R5
  (3)  020374  010546                          MOV     R5,-(SP)
  (5)  020376  012745  000006                  MOV     #6,-(R5)
  (4)  020402  012745  021056                  MOV     #LOOPH,-(R5)
  (3)  020406  004767  176206                  JSR     PC,CRC
  (3)  020412  012605                          MOV     (SP)+,R5
  (4)  020414  012567  000444                  MOV     (R5)+,LCRCH
 8477
 8478                                ;COMPUTE AND INSERT DATA CRC
 8479
 8480  020420  162705  000002                  SUB     #1*2,R5
  (3)  020424  010546                          MOV     R5,-(SP)
  (5)  020426  012745  000400                  MOV     #256.,-(R5)
  (4)  020432  012745  021066                  MOV     #LOOPB,-(R5)
  (3)  020436  004767  176156                  JSR     PC,CRC
  (3)  020442  012605                          MOV     (SP)+,R5
  (4)  020444  012567  001016                  MOV     (R5)+,LCRCD
 8481                                ;
 8482                                ;SET UP BUFFER POINTER AND SIZE    SEND MESSAGE
 8483                                ;
```

```
 8484  020450  012767  021056  174744          MOV     #LOOPH,XBUFFER
 8485  020456  012767  000412  174740          MOV     #266.,XSIZE
 8486  020464  004767  173736                  JSR     PC,XMIT
 8487                                ;
 8488                                ;IF ERROR OCCURRED...INSERT THE ERROR INTO TABLE (MANUF  TESTS ONLY),
 8489                                ;REPORT THE ERROR, LOOP IF ENABLED
 8490                                ;
 8491  020470  103012                          BCC     50013$
 8492  020472  010546                          MOV     R5,-(SP)
  (4)  020474  012745  000000                  MOV     #0,-(R5)
  (3)  020500  004767  176112                  JSR     PC,INSERR
  (3)  020504  012605                          MOV     (SP)+,R5
 8493  020506  104463                          TRAP    T$ERCODE
  (5)  020510  000063                          .WORD   51
  (5)  020512  003326                           WORD   MSG51
  (5)  020514  004072                           WORD   AREA40
 8494  020516                      50013$:
 8495  020516  104006                          EMT     C$CLP1
 8496                                ;
 8497                                ;SEND ACK'S TO TERMINAL UNTIL IT RESPONDS
 8498                                ;
 8499  020520                      50014$:
 8500  020520  004767  177122                  JSR     PC,OUTREP
 8501                                ;
 8502                                ;IF AN ERROR OCCURS   INSERT IN TABLE (MAN  ONLY), REPORT IT, LOOP
 8503                                ;IF ENABLED - EXIT TEST IF NOT
 8504                                ;
 8505  020524  103023                          BCC     50015$
 8506  020526  010546                          MOV     R5,-(SP)
  (4)  020530  012745  000000                  MOV     #0,-(R5)
  (3)  020534  004767  176056                  JSR     PC,INSERR
  (3)  020540  012605                          MOV     (SP)+,R5
 8507  020542  010546                          MOV     R5,-(SP)
  (4)  020544  012745  000002                  MOV     #2,-(R5)
  (3)  020550  004767  176042                  JSR     PC,INSERR
  (3)  020554  012605                          MOV     (SP)+,R5
 8508  020556  104463                          TRAP    T$ERCODE
  (5)  020560  000063                          .WORD   51
  (5)  020562  003326                          .WORD   MSG51
  (5)  020564  004072                          .WORD   AREA40
 8509  020566  104006                          EMT     C$CLP1
 8510  020570  104032                          EMT     C$EXIT
  (3)  020572  000134                          .WORD   L10032-
 8511  020574                      50015$:
 8512                                ;
 8513                                ;GET RESPONSE
 8514                                ;
 8515  020574  162705  000002                  SUB     #1*2,R5
  (3)  020600  004767  172610                  JSR     PC,TERIN
  (4)  020604  012567  000240                  MOV     (R5)+,LCOMP
 8516                                ;
 8517                                ;IF ERROR OCCURS...INSERT IN TABLE (MAN  ONLY), REPORT IT, LOOP IF
 8518                                ;ENABLED, EXIT TEST IF NOT
 8519                                ;
 8520  020610  103012                          BCC     50016$
 8521  020612  010546                          MOV     R5,-(SP)
```

```
   (4)  020614  012745  000000                    MOV     #0,-(R5)
   (3)  020620  004767  175772                    JSR     PC,INSERR
   (3)  020624  012605                            MOV     (SP)+,R5
  8522  020626  104463                            TRAP    T$ERCODE
   (5)  020630  000063                            .WORD   51
   (5)  020632  003326                            .WORD   MSG51
   (5)  020634  004072                            .WORD   AREA40
  8523  020636                          50016$:
  8524  020636  104006                            EMT     C$CLP1
  8525                                ;
  8526                                ;REPEAT LOOP UNTIL TERMINAL SENDS LOOPBACK DATA
  8527                                ;
  8528  020640  005767  000204                    TST     LCOMP
   (6)  020644  001725                            BEQ     50014$
  8529                                ;
  8530                                ;PROCESS THE LOOPBACK DATA
  8531                                ;
  8532  020646  004767  000056                    JSR     PC,PROLOP
  8533  020652  104004                            EMT     C$BSEG
  8534                                ;
  8535                                ;REINIT THE LINK
  8536                                ;
  8537  020654  004767  171634                    JSR     PC,XSTRT
  8538                                ;
  8539                                ;IF ERROR OCCURS, INSERT ERROR INTO TABLE (MANUF  ONLY), REPORT ERROR,
  8540                                ;LOOP ON REINIT IF ERROR LOOPING ENABLED   EXIT TEST IF NO LOOPING
  8541                                ;
  8542  020660  103020                            BCC     50017$
  8543  020662  010546                            MOV     R5,-(SP)
   (4)  020664  012745  000000                    MOV     #0,-(R5)
   (3)  020670  004767  175722                    JSR     PC,INSERR
   (3)  020674  012605                            MOV     (SP)+,R5
  8544  020676  010546                            MOV     R5,-(SP)
   (4)  020700  012745  000002                    MOV     #2,-(R5)
   (3)  020704  004767  175706                    JSR     PC,INSERR
   (3)  020710  012605                            MOV     (SP)+,R5
  8545  020712  104463                            TRAP    T$ERCODE
   (5)  020714  000063                             WORD   51
   (5)  020716  003326                             WORD   MSG51
   (5)  020720  004610                            .WORD   AREA61
  8546  020722                          50017$
  8547  020722  104006                            EMT     C$CLP1
  8548  020724                          10000$:
   (3)  020724  104005                            EMT     C$ESEG
  8549                                ;
  8550                                ;END OF TEST
  8551                                ;
  8552  020726                          L10032
   (3)  020726  104001                            EMT     C$ETST
  8553
  8554
  8555
  8556
  8557
  8558                                ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
  8559                                +
```

```
 8560                                   ;       ROUTINE TO PROCESS LOOPBACK DATA                                +
 8561                                   ;                                                                       +
 8562                                   ;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 8563  020730                           PROLOP:
 8564  020730  010146                           MOV     R1,-(SP)
 8565  020732  010246                           MOV     R2,-(SP)
 8566  020734  010346                           MOV     R3,-(SP)
 8567                                   ;
 8568                                   ;R1 = POINTER TO EXPECTED DATA
 8569                                   ;R2 = COUNT OF DATA EXPECTED
 8570                                   ;R3 = POINTER TO DATA FROM TERMINAL
 8571                                   ;
 8572  020736  012701  021066                   MOV     #LOOPB,R1
 8573  020742  012702  000200                   MOV     #128.,R2
 8574  020746  016703  161174                   MOV     INBUF,R3
 8575                                   ;
 8576                                   ;CHECK DATA BYTE-BY-BYTE
 8577                                   ;
 8578  020752                           50002$:
 8579                                   ;
 8580                                   ;IF ERROR.  INSERT ERROR INTO TABLE (MANUF  ONLY), REPORT ERROR
 8581                                   ;(INCLUDING RECEIVED/EXPECTED BYTES), RETURN WITH ERROR
 8582                                   ;
 8583  020752  121113                           CMPB    (R1),(R3)
  (9)  020754  001423                           BEQ     50003$
 8584  020756  011167  164054                   MOV     (R1),A52A
 8585  020762  011367  164052                   MOV     (R3),A52B
 8586  020766  010546                           MOV     R5,-(SP)
  (4)  020770  012745  000002                   MOV     #2,-(R5)
  (3)  020774  004767  175616                   JSR     PC,INSERR
  (3)  021000  012605                           MOV     (SP)+,R5
 8587  021002  104464                           TRAP    T$ERCODE
  (5)  021004  000064                            WORD   52
  (5)  021006  003354                            WORD   MSG52
  (5)  021010  004740                            WORD   AREA52
 8588  021012  012603                           MOV     (SP)+,R3
 8589  021014  012602                           MOV     (SP)+,R2
 8590  021016  012601                           MOV     (SP)+,R1
 8591  021020  000261                           SEC
  (4)  021022  000411                           BR      50001$
 8592  021024                           50003$:
 8593                                   ;
 8594                                   ;UPDATE COUNT AND POINTERS
 8595                                   ;
 8596  021024  005201                           INC     R1
 8597  021026  005302                           DEC     R2
 8598  021030  005203                           INC     R3
 8599
 8600                                   ;REPEAT UNTIL ALL DATA HAS BEEN CHECKED
 8601
 8602  021032  005702                           TST     R2
  (6)  021034  001346                           BNE     50002$
 8603  021036  012603                           MOV     (SP)+,R3
 8604  021040  012602                           MOV     (SP)+,R2
 8605  021042  012601                           MOV     (SP)+,R1
 8606  021044                           50000$:
```

```
   (2)  021044  000241                          CLC
   (3)  021046                          500015$:
   (2)  021046  000207                          RTS     PC
  8607
  8608                                 ;
  8609                                 ;LOOPBACK MESSAGE AREA
  8610                                 ;
  8611  021050  000000                 LCOMP:  0
  8612  021052  121057                 LOOPMG: .+100005
  8613  021054  000410                         ELOOPB-2-.
  8614  021056     220      000      201  LOOPH    BYTE DLE,0,201,0
        021061     000
  8615  021062     000                  LOOPN   .BYTE 0
  8616  021063     000                  LOOSTA   BYTE   0
  8617  021064  000000                 LCRCH   0
  8618  021066  000200                 LOOPB    BLKW   128.
  8619  021466                         ELOOPP:
  8620  021466  000000                 LCRCD   0
  8622
```

```
 8877                                   ;
 8878                                   ;       HARDWARE PARAMETER CODING
 8879                                   ;
 8880  021470  000022                           .WORD L10033-L$HARD/2
 8881  021472  000031                            WORD   T$CODE
  (4)  021474  021536                           .WORD   DEVICE
  (4)  021476  000000                           .WORD   T$LOLIM
  (4)  021500  177776                            WORD   T$HILIM
 8882  021502  001031                            WORD   T$CODE
  (4)  021504  021554                           .WORD   VECTOR
  (4)  021506  000000                           .WORD   T$LOLIM
  (4)  021510  000400                           .WORD   T$HILIM
 8883  021512  002032                            WORD   T$CODE
  (4)  021514  021571                            WORD   PRIOR
  (4)  021516  000340                            WORD   340
  (4)  021520  000000                            WORD   T$LOLIM
  (4)  021522  000007                            WORD   T$HILIM
 8884  021524  002032                            WORD   T$CODE
  (4)  021526  021614                           .WORD   STATION
  (4)  021530  177400                            WORD   177400
  (4)  021532  000000                            WORD   T$LOLIM
  (4)  021534  000377                            WORD   T$HILIM
 8895                                            EVEN
  (3)  021536                           L10033
 8896
 8898  021536  052504  020120  042101  DEVICE   .ASCIZ /DUP ADDRESS  /
       021544  051104  051505  035123
       021552  000040
 8899  021554  052504  020120  042526  VECTOR    ASCIZ /DUP VECTOR  /
       021562  052103  051117  020072
       021570     000
 8900  021571     104  050125  041040  PRIOR     ASCIZ /DUP BUS PRIORITY. /
       021576  051525  050040  044522
       021604  051117  052111  035131
       021612  000040
 8913  021614  042524  046522  047111  STATION   ASCIZ /TERMINAL ADDRESS  /
       021622  046101  040440  042104
       021630  042522  051523  020072
       021636     000
 8955          021640                          .EVEN
 8956
 8957                                   ;
 8958                                   ;       SOFTWARE PARAMETER CODING
 8959                                   ;
 8960  021640  003010                            WORD L10034-L$SOFT/2
 8961  021642  000032                            WORD   T$CODE
  (4)  021644  021662                            WORD   ALIMIT
  (4)  021646  177777                           .WORD   177777
  (4)  021650  000000                           .WORD   T$LOLIM
  (4)  021652  077777                           .WORD   T$HILIM
 8962  021654  001130                            WORD   T$CODE
  (4)  021656  021731                            WORD   PATTRN
  (4)  021660  177777                            WORD   177777
 8966                                            EVEN
  (3)  021662                           L10034
 8967  021662  047510  020127  040515  ALIMIT    ASCIZ /HOW MANY INITIATE TRIES BEFORE ABORT
```

```
        021670  054516  044440  044516
        021676  044524  052101  020105
        021704  051124  042511  020123
        021712  042502  047506  042522
        021720  040440  047502  052122
        021726  020077     000
 8968   021731     125  042523  040440  PATTRN  .ASCIZ /USE ALL ZERO'S FOR LOOPBACK DATA? /
        021736  046114  055040  051105
        021744  023517  020123  047506
        021752  020122  047514  050117
        021760  040502  045503  042040
        021766  052101  037501  000040
 8972                                            EVEN
 8974                                           .EVEN
 (3)    021774                          L$LAST
 8975                                            REQ DOCTOR P11 400,1066
 8976                                            TITLE  PDP-11 DIAGNOSTIC SUPERVISOR
20272           052674                         END.SUPV=.+2
20274           071776                          =71776
20275   071776  000000                          WORD   0
20277           072000                         >1X1=
20278           000200                          END 200
```

```
A      = 000000
ABOFLA  022246 G
ABOPAS  022160 G
ABORT   002106
ABO FM  025122
ACK    = 000001
ALIMIT  021662
ALLOC   042712
AREA00  003510 G
AREA01  003570 G
AREA02  003572 G
AREA03  003674 G
AREA04  003726 G
AREA11  004030 G
AREA21  004066 G
AREA22  004070 G
AREA23  004072 G
AREA24  004072
AREA26  004264 G
AREA30  004266 G
AREA31  004266
AREA40  004072
AREA41  003726
AREA42  003674
AREA43  003726
AREA52  004740 G
AREA60  004532 G
AREA61  004610 G
AREA70  005042 G
AREA71  005044 G
A$AAW   027032
A$AAX   027046
A$AAY   027054
A$AAZ   027070
A$ABA   027100
A02A    003624
A02B    003626
A04EX   003762
A04RC   003760
A52A    005036
A52B    005040
B      = 000002
BAPNT   002160
BASIZE  002162
BGN SU= 021774
BINMSG  041222
BIT0   = 000001 G
BIT00  = 000001 G
BIT01  = 000002 G
BIT02  = 000004 G
BIT03  = 000010 G
BIT04  = 000020 G
BIT05  = 000040 G
BIT06  = 000100 G
BIT07  = 000200 G
BIT08  = 000400 G
BIT09  = 001000 G
BIT1   = 000002 G
BIT10  = 002000 G
BIT11  = 004000 G
BIT12  = 010000 G
BIT13  = 020000 G
BIT14  = 040000 G
BIT15  = 100000 G
BIT2   = 000004 G
BIT3   = 000010 G
BIT4   = 000020 G
BIT5   = 000040 G
BIT6   = 000100 G
BIT7   = 000200 G
BIT8   = 000400 G
BIT9   = 001000 G
BLD HW  027712
BLOCK   045046
BNC     003462
B$AAB   031314
B$AAF   031226
C      = 000004
CALLPC= 000022
CALLPS= 000024
CALLSP= 000026
CALLTC= 000030
CAL CL  047430
CAL TI  047466 G
CHKLUP  031330
CHKREP  014036
CHKSTR  043254
CHKTTY  041342
CHK FO  023540
CHK MA  027470
CHK.PC  034556
CHK SW  023262
CHRCNT  042574
CH FLA  027172
CH PAS  027214
CLEAR   030612
CLKACC  022156 G
CLKBFR  047432
CLKCNT  022154 G
CLKRES  051030 G
CLKSER  051330 G
CLKSON  022220 G
CLK SE  027272
CLR MA  027546
CNTFLG  015434
CNVT    045506
CODE    011454 G
COMMTA  045326
CONTCL  051110 G
CRC     016620
CRCTAB  017074
CRLF    041424
CTS    = 020000
CURR.T  022174 G
C$AAD   034530
C$AAE   034542
C$AAK   035360
C$AAL   035470
C$ABRT= 000021
C$ADR = 000020
C$AU  = 000054
C$BRK = 000022
C$BSEG= 000004
C$BSUB= 000002
C$BUFF= 000030
C$CEFG= 000046
C$CLEA= 000012
C$CLP1= 000006
C$CVEC= 000036
C$DCLN= 000044
C$DODU= 000053
C$DRPT= 000024
C$DU  = 000055
C$EDIT= 000006
C$ERDF= 000002
C$ERHR= 000003
C$ERSF= 000001
C$ERSO= 000004
C$ESCA= 000010
C$ESEG= 000005
C$ESUB= 000003
C$ETST= 000001
C$EXIT= 000032
C$GMAN= 000043
C$GPHR= 000042
C$GPRI= 000040
C$GTIM= 000052
C$INIT= 000011
C$INLP= 000020
C$KWOF= 000035
C$KWON= 000034
C$LOOP= 000100
C$MANI= 000051
C$MSG = 000023
C$PNTB= 000014
C$PNTF= 000017
C$PNTS= 000016
C$PNTX= 000015
C$POIN= 000040
C$QIO = 000377
C$RDBU= 000007
C$REFG= 000050
C$REQT= 000045
C$RESE= 000033
C$REVI= 000001
C$RPT = 000025
C$SEFG= 000047
C$SPRI= 000041
C$SVEC= 000037
C$TPRI= 000013
C$UNBU= 000031
C$WTM = 000026
C$WTU = 000027
D      = 177776
DDSTRT= 000000
DDSTRY  012772
DECMSG  041236
DEVICE  021536
DEVIN   014742
DEVPRI  002200
DIAG.T  022254 G
DLE    = 000220
DPDVD   052040 G
DPMUL   051726 G
DTR    = 000002
DUNIT.  022164 G
DUPMSK  002220 G
DUPREG  002224 G
DUP$   = 000001
DVC FT  035330
D$AAG   036200
D$AAH   036216
D$AAI   040770
D$AAJ   040774
D$AAK   041012
D$AAL   041030
D$AAM   041040
E      = 177774
EF CON= 000036 G
EF NEW= 000035 G
EF PWR= 000034 G
EF RES= 000037 G
EF STA= 000040 G
EF01   = 000001 G
EF02   = 000002 G
EF03   = 000003 G
EF04   = 000004 G
EF05   = 000005 G
EF06   = 000006 G
EF07   = 000007 G
EF08   = 000010 G
EF09   = 000011 G
EF10   = 000012 G
EF11   = 000013 G
EF12   = 000014 G
EF13   = 000015 G
EF14   = 000016 G
EF15   = 000017 G
EF16   = 000020 G
ELOOPB  021466
EMDMG1  020160
EMDMG2  020170
EMT.TR  022252 G
END OF  030600
END SU= 052674
ENQ    = 000005
EOMSG   002124
EOP CH  051352 G
EOP.FM  025136
EOP IN  027210
ERRFOR  035546
ERRHAN  034562
ERR HR  035340
ERR SF  035344
ERR1FO  035632
ESC PC  034554
EXPINP  002130
FIL     015420
FILL    042072
FILL C  000204 G
FLAGS   022216 G
FLAGTA  045244
FLAG.I  027256
FLA.SE  045212
FLG MA  027216
FLLCNT  015414
FORM.T  035642
FORM00  003536
FORM02  003630
FORM04  003764
FORM23  004166
FORM30  004420
FORM40  004206
FORM52  004772
FORM60  004554
FORM61  004702
FREE    043150
FRM30A  004442
FRM30B  004465
FRM30C  004507
FS$    = 000001
F$AU   = 000015
F$BGN  = 000040
F$CLEA= 000007
F$DU   = 000016
```

```
F$END = 000041          ININIT  022176 G      LUP     047334          L10007  004070          MSG24   002762
F$HARD= 000004          INIT    015416        LUP.AD  034560          L10010  004162          MSG25   003025
F$HW  = 000013          INITIA  041252        L$AU    011456 G        L10011  004264          MSG26   003062
F$INIT= 000006          INITMA  002154        L$AUT   002070 G        L10012  004416          MSG30   003117
F$JMP = 000050          INITMS  002156        L$CCP   002044 G        L10013  004552          MSG31   003147
F$MOD = 000000          INIT.M  027614        L$CLEA  012026 G        L10014  004700          MSG40   002637
F$MSG = 000011          INIT.R  022010 G      L$DEPO  002011 G        L10015  004770          MSG41   002411
F$PWR = 000017          INMSG   002136        L$DEVP  002052 G        L10016  005042          MSG42   002345
F$RPT = 000012          INPUTA  042200        L$DISP  011450 G        L10017  005044          MSG43   003224
F$SEG = 000003          INSERR  016616        L$DR    002220 G        L10020  011440          MSG45   003243
F$SOFT= 000005          INSIZ   002150        L$DRCT  002062 G        L10021  011446          MSG50   003271
F$SRV = 000010          INTFOR  035476        L$DRS   002064 G        L10022  011454          MSG51   003326
F$SUB = 000002          INVAL.  026722        L$DRST  002224 G        L10023  011456          MSG52   003354
F$SW  = 000014          INVINT  035370        L$DTP   002040 G        L10024  011460          MSG70   003367
F$TEST= 000001          INV SW  023216        L$DU    011460 G        L10025  011734          MSG71   003422
GARBAG  042576          IN SUF  030564        L$DUT   002072 G        L10026  012050          MSG72   003464
GETCHR  041302          I$AU  = 000041        L$DVTY  002202 G        L10027  015632          MTY     003446
GETCHN  044666          I$CLN = 000041        L$EF    002024 G        L10030  016324          MUL     051574 G
GETOB   012774          I$DU  = 000041        L$EXP1  002032 G        L10031  017644          NAK   = 000002
GETPAR  036360          I$HRD = 000041        L$EXP2  002034 G        L10032  020726          NEWPRI  051320 G
GETSWI  043662          I$INIT= 000041        L$EXP3  002036 G        L10033  021536          NEXTAR  045430
GET.TW  043432          I$MOD = 000041        L$HARD  021472 G        L10034  021662          NMSG    015426
GLOB    002100 G        I$MSG = 000041        L$HPCP  002046 G        MAJ IN  022000 G        NO.CLK  024332
GSUB    012052 G        I$PWR = 000041        L$HPTP  002056 G        MAJ LO  047434          NO FLA  045224
G$EXCP= 000400          $RPT  = 000041        L$HW    011430 G        MAJ US  022002 G        NO LPT  042542
G$HILI= 000002          I$SEG = 000041        L$ICP   002042 G        MAN TI  024302          NO PTA  027022
G$LOLI= 000001          $SFT  = 000041        L$INIT  011462 G        MAP16   052276 G        NR    = 000001
G$NO  = 000000          I$SRV = 000041        L$LADP  002076 G        MASCLR= 000400          NUMBIN  035666
G$OFFS= 000400          I$SUB = 000041        L$LAST  021774 G        MASK B  031326          NUM.LA  036034
G$OFSI= 000376          I$TST = 000041        L$MREV  002012 G        MASK W  031324          NUM UN  022372
G$PRMA= 000001          J$JMP = 000167        L$NAME  002000 G        MCOMP   020146          NUNITS  031302
G$PRMD= 000002          KBPTR   022026 G      L$REPP  002054 G        MDMSG   020150          NXTFOR  045500
G$PRML= 000000          KBUF    022030 G      L$REV   002010 G        MDMSG1  020160          OCTMSG  041230
G$RADA= 000140          KEX     004064        L$RPT   011454 G        MEM SI  026622          OSOP  = 000024
G$RADB= 000000          KRC     004062        L$SOFT  021642 G        MIN IN  021774 G        OUT     002152
G$RADD= 000040          LCOMP   021050        L$SPC   002030 G        MIN US  021776 G        OUTBUF  002142
G$RADF= 000200          LCRCD   021466        L$SPCP  002050 G        MODR    051640 G        OUTERR  002120
G$RADL= 000120          LCRCH   021064        L$SPTP  002060 G        MSG     012052          OUTMSG  002132
G$RADO= 000020          LINE F  022250 G      L$STA   002066 G        MSGAP   002152          OUTREP  017646
G$RADT= 000100          LOAD F  027212        L$SW    011442 G        MSGN    020174          OUTSIZ  002144
G$XFER= 000004          LOBYTE= 000377        L$TIML  002022 G        MSGNO   002164          O$APTS= 000001
G$YES = 000010          LOGDEV  002126        L$TIMU  002020 G        MSGOO   002234          O$AU  = 000001
HCORED  026754          LOGMSG  041244        L$TIM1  002016 G        MSG01   002273          O$BGNR= 000001
HCOREQ  026634          LOOPB   021066        L$TSTI  002074 G        MSG02   002320          O$BGNS= 000001
HCORET  022206 G        LOOPH   021056        L$UNIT  002014 G        MSG03   002345          O$DU  = 000001
HEAD    002000 G        LOOPMG  021052        L CLK   026560          MSG04   002411          O$GNSW= 000001
HERTZ   026574          LOOPN   021062        L10000  003534          MSG10   002436          O$POIN= 000001
HOLDSP= 000020          LOOSTA  021063        L10001  003570          MSG11   002516          O$PWR = 000001
HYBYTE= 177400          LPBFR   022024 G      L10002  003622          MSG12   002551          PARAM = 101226
H$AAB   046034          LPCNTR  022022 G      L10003  003724          MSG20   002620          PARITY= 000200
ILIMIT  002114          LPT AD  026612        L10004  003756          MSG21   002637          PARSES  044740
INBUF   002146          LPT RE  026606        L10005  004060          MSG22   002657          PAR LA  040732
 NERR   002116          LSI RE  026602        L10006  004066          MSG23   002722          PASCNT  002122
```

```
PATTER  011444          RQUEUE  015436          SYS FT  035320          T$TAGN= 010035          X$OFFS= 000400
PATTRN  021731          RSTACK  051522 G        S$LSYM= 010000          T$TEMP= 000000          X$TRUE= 000020
PRINTC  042552          RSX.FL  027206          TABLE   011426 G        T$TEST= 000002          X1X1  = 072000
PRINTF  046054          RTEMP1  015430          TEMBUF  005046          T$TSTM= 177777          $BGNLE= 177777
PRIOR   021571          RTEMP2  015432          TEMP    002104          T$TSTS= 000001          $BREG   027270
PRIO0 = 000000 G        RTS   = 000004          TEMP2   004164          T$$AU = 010023          $ENDAD  051360 G
PRIO1 = 000040 G        RXINTE= 000120          TERIN   013414          T$$CLE= 010026          $ERFLG= 000400
PRIO2 = 000100 G        R5STCK  002100          TERMI   047424          T$$DU = 010024          $F$AND= 000310
PRIO3 = 000140 G        SCRTCH  002102          TERMLI  045232          T$$HAR= 010033          $F$BAD= 000401
PRIO4 = 000200 G        SEARCH  043400          TERMTA  041214          T$$HW = 010020          $F$BLA= 000170
PRIO5 = 000240 G        SEGSTA  022222 G        TEROUT  012260          T$$INI= 010025          $F$CAS= 000150
PRIO6 = 000300 G        SENDFD= 000020          TESTS   017174 G        T$$MSG= 010017          $F$DEC= 000220
PRIO7 = 000340 G        SET MA  027402          TEST.M  027124          T$$RPT= 010022          $F$DO = 000340
PRNTST  042442          SHIFT   052360 G        TIMER   015410          T$$SEG= 010000          $F$FAL= 000405
PROBUF  013122          SIZE.C  051236 G        TIMFLG  022152 G        T$$SOF= 010034          $F$GOO= 000400
PROLOP  020730          SIZE M  051154 G        TIMLIM  002110          T$$SRV= 010030          $F$IF = 000110
PRO CM  027164          SIZ TR  051314          TIM CO  022004 G        T$$SW = 010021          $F$INC= 000210
PTABLE  002170          SOH   = 000201          TIM OP  035640          T$$TES= 010032          $F$LOO= 000200
PTAB S  022204 G        SPEC U  027112          TMPBUF  010172          T1      017174 G        $F$NAM= 000160
PTCODE  021470 G        SPV SE  023614          TOO MA  041174          T2      020200 G        $F$NO = 000403
PTEND   002200          SSTACK  011426          TSOM  = 000400          UNI MA  027114          $F$OR = 000320
PUTCHR  041256          STACK = 000007          TSTS  = 000002          USER P  022200 G        $F$RTN= 000300
PWR FA  052532 G        STARTC  051104 G        TST AB  031440          USER T  022202 G        $F$SEL= 000140
PWR FL  022006 G        STATIO  021614          TST TO  023244          VALID.  022442          $F$THE= 000330
PWR MS  052660          STIME   002112          TXINTE= 000100          VAL LA  023172          $F$TRU= 000404
PWR SA  052654          STINPT  017756          TYPE    012512          VAL SW  027230          $F$UNT= 000130
PWR UP  052656          STRCHR  042132          TYPEC   041570          VECTOR  021554          $F$WHI= 000120
P CLK   026566          STREQ   026734          TYPEPC  035464          VMSG    011736          $F$YES= 000402
RBQUE   015456          STRT  = 000006          TYPFLA  045106          WIDTH   036234          $IFLEV= 177777
RBQUEB  015464          STRTB   003500          TYPLIN  041466          XBUFFE  015422          $ISK0 = 000001
RBQUET  015460          STRTC   003506          TYPNUM  041054          XDONE   014736          $ISK1 = 000001
RCENBL= 000020          STRTSA  003505          TYPSTR  041506          XEQDIA  051406 G        $ISK2 = 000001
RCVADD  015406          STRT T  027170          TYP ER  035350          XEQSUB  051374 G        $ISK3 = 000001
RCVBUF= 000002          ST REQ  027110          TY UNI  030604          XEQ CL  031244          $LOCTA= 177777
RCVCSR= 000000          ST SET  023434          T$ARGC= 000003          XEQ CM  026552          $LSTCN= 177777
RCVE    016326          SUNIT   027176          T$CODE= 001130          XEQ IN  030726          $LSTIN= 000000
RDONE   014740          SUPERV  025154          T$ERCO= 000064          XEQ LA  025110          $LSTST= 177777
READ P  047436 G        SUPFLA  022162 G        T$ERRN= 000064          XEQ OP  031020          $LSTTA= 000000
REGBAC  052262 G        SUPV T  022340 G        T$EXCP= 000000          XEQ PP  024342          $MCALL= 000000
REGSAV  052246 G        SUP PR  023206          T$FLAG= 000040          XEQ TE  031064          $NESTL= 177777
REP   = 000003          SVCCNT= 177777          T$HILI= 077777          XINT    015466 G        $NSK0 = 000300
REPA    020175          SVCGBL= 000000          T$LOLI= 000000          XMIT    014426          $NSK1 = 000130
REPCPC  020176          SVCHAN  031506          T$LSYM= 010000          XMTADD  015404          $NSK2 = 000110
REPM    020170          SVCINS= 000000          T$MCAL= 177777          XMTBUF= 000006          $NSK3 = 000110
REPN    020173          SVCSTK= 177777          T$NEST= 177777          XMTCSR= 000004          $NSK4 = 000110
REQN P  027174          SVCSUB= 177777          T$NSK0= 000000          XSIZE   015424          $SAVLE= 177777
REQN T  027166          SVCTAG= 000000          T$NSK1= 000005          XSTRT   012514          $SAV2   052424 G
RE SET  023364          SVCTST= 177777          T$NSK2= 000003          XTIME   050114 G        $SAV3   052440 G
RINT    015634 G        SWCHAN  027014          T$SAVL= 177777          XTIMEN  050740          $SAV4   052456 G
RMSGNO  002166          SWITCH  045404          T$SEGL= 177777          XTIMST  050136          $SAV5   052476 G
RQUE    015440          SW PTA  027000          T$SEK0= 010000          XXDP D  026762          $SSK0 = 050003
RQUEB   015454          SYNC  = 000226          T$SUBN= 000000          X$ALWA= 000000          $TAGLE= 177777
RQUET   015442          SYNCNT  015412          T$TAGL= 177777          X$FALS= 000040          $TAGNU= 050004
```

```
:UTERR  MACY11 30(1046)  22-NOV-77  08 02  PAGE 189-3
DOCTOR P11    07-OCT-77 13 48          SYMBOL TABLE                                                    SEQ 0074

$TEMP = 000300          $$BYTE= 000402          $$FROM= 000000          $$RTN2= 050001          $$$TAG= 050000
$TSK0 = 050002          $$CASE= 000000          $$LOC = 021034          $$SRC = 000064                .  = 072000
$TSK1 = 050003          $$DST = 000003          $$LOCN= 000000          $$TGSV= 000000
$TSK2 = 050006          $$ELOC= 000402          $$REG = 177777          $$TGS1= 000000
$TSK3 = 050033          $$ERFL= 000000          $$RETU= 000001          $$TGS2= 000000
$$ARGC= 000000          $$FLAG= 000001          $$RTN1= 050000          $$TO  = 000001

  ABS    072000      000


 ERRORS DETECTED    0

  DZDPGA=DZDPGA
 RUN-TIME  93 95  9 SECONDS
 RUN-TIME PAT 0  1402 190=7 3
  PE  EFC   75  169 PAGES)
```