

VT62, DUP11

DIAG
CZDPGB0

AH-A887B-MC

MAY 1979

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FICHE 1 OF 1

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IDENTIFICATION

PRODUCT CODE: AC-A886B-MC
PRODUCT NAME: CZDPGB0 VT62/DUP11 DIAG
DATE: 1-JAN-79
MAINTAINER: DIAGNOSTIC ENGINEERING
AUTHOR: MICHAEL DENSMORE

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REVISION HISTORY

REVISION
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BY:
M. DENSMORE ORIGINAL RELEASE

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GENERAL
ABSTRACT

ZZ-CZDPC 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/DEMULATION 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.

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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

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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

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- 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
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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

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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

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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

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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 ERROR

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

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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.

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9.0

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.ENDR

600 000000*

PRINT ;SPMAC: VERSION 1.1

601 002000
602
603
604
605 002000
606 002000
607 002000
608 002000 103
609 002001 132
610 002002 104
611 002003 120
612 002004 107
613 002005 000
614 002006 000
615 002007 000
616 002010 102
617 002011 060
618 002012 000000
619 002014 000000
620 002016 022016
621 002020 022166
622 002022 011656
623 002024 011670
624 002026 022424
625 002030 000000
626 002032 000000
627 002034 000000
628 002036 000000
629 002040 011700
630 002042 000000
631 002044 000000
632 002046 000000
633 002050 002
634 002051 002
635 002052 000000
636 002054 000000
637 002056 000000
638 002060 000000
639 002062 000000
640 002064 002212
641 002066 011704
642 002070 002230
643 002072 002234
644 002074 011706
645 002076 011710
646 002100 000000
647 002102 000000
648 002104 011712
649 002106 012256
650 002110

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⋮
⋮

.=2000
HEADER - VT62 ACCEPTANCE TEST
POINTER ALL
BGNMOD HEAD
HEADER CZDPG,B,0,0,0,0

.ASCII /C/
.ASCII /Z/
.ASCII /D/
.ASCII /P/
.ASCII /G/
.BYTE 0
.BYTE 0
.BYTE 0
.ASCII /B/
.ASCII /O/
.WORD 0
.WORD 0
.WORD L\$HARD
.WORD L\$SOFT
.WORD L\$HW
.WORD L\$SW
.WORD L\$LAST
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD L\$DISPATCH
.WORD 0
.WORD 0
.WORD 0
.BYTE C\$REVISION
.BYTE C\$EDIT
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD L\$DVTYP
.WORD L\$RPT
.WORD L\$DR
.WORD L\$DRST
.WORD L\$AU
.WORD L\$DU
.WORD 0
.WORD 0
.WORD L\$INIT
.WORD L\$CLEAN

ENDMOD


```
651 002110          BGNMOD GLOB
652                :*****
653                :GLOBAL EQUATES
654                :*****
655 002110          EQUALS
656
657                :
658                :
659                :
660                :VT62 DIAGNOSTIC EQUATES
661                :SOH=201          ;START OF HEADER (DDCMP)
662                :ACK=1           ;ACKNOWLEDGE
663                :NAK=2           ;NEGATIVE ACKNOWLEDGE
664                :REP=3           ;REPLY
665                :ENQ=5           ;ENQUIRY
666                :STRT=6          ;START
667                :STACK=7         ;START ACKNOWLEDGE
668                :SYNC=226        ;SYNCHRONIZATION CHARACTER
669                :DLE=220         ;DATA LINK ESCAPE.
670                :OSOP=24         ;LOOPBACK.
671                :PARITY=200      ;PARITY BIT.
672                :TSTS=2          ;NO. OF TESTS
673                :RCVCSR=0        ;OFFSETS: RECEIVER CSR
674                :RCVBUF=2        ;RECEIVER BUFFER REG.
675                :XMTCSR=4        ;TRANSMITTER CSR
676                :XMTBUF=6        ;TRANSMITTER BUFFER REG.
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693 002110 000000
694 002112 000000
695 002114 000000
696 002116 000000
697 002120 002000
698 002122 000000
699 002124 000010
700 002126 000000
701 002130 000000
702 002132 000001
703 002134 000000
704 002136 000000
705 002140 000000
706 002142 000000
707 002144 000000
708 002146 000000
709 002150 000000
710 002152 000000
711 002154 000000
712 002156 000000
713 002160 000000
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715 002162
716 002162 000000
717 002164 000000
718 002166 000000
719 002170 000000
720 002172 000000
721 002174 000000
722 002176 000000
723 002200 000000
724 002202 000000
725 002204 000000
726 002206 000000
727 002210
728 002210 000000
729
730 002212
731 002212 052126 031066 042054
732 002220 050125 030461 000
733
734 002226
735 002226 000001
736 002230 000017
737 002232 000004
738 002234 000004
```

```
*****
: GLOBAL DATA
*****
RSSTCK: 0 ;FLAG TO INDICATE IF R5 STACK IS SET UP
SCRATCH: 0 ;SCRATCH LOCATIONS
TEMP: 0
ABORT: 0 ;TEST ABORT FLAG
TIMLIM: 2000 ;TIMEOUT LIMIT (IN 100 MICROSEC. INCREMENTS)
STIME: 0 ;SHORT TIMEOUT LIMIT (APPROX. 20 MICROSEC. INCREM.)
ILIMIT: 10 ;LIMIT ON DEVICE INITIALIZATION ATTEMPTS
INERR: 0 ;INPUT ERROR
OUTERR: 0 ;OUTPUT ERROR
PASCNT: 1
EOMSG: 0 ;END OF MESSAGES FLAG
LOGDEV: 0 ;LOGICAL DEVICE NUMBER
EXPINP: 0 ;EXPECT INPUT FLAG
OUTMSG: 0 ;OUTPUT MESSAGE POINTER AND SIZE
INMSG: 0 ;INPUT MESSAGE POINTER AND SIZE
OUTBUF: 0 ;OUTPUT BUFFER POINTER AND SIZE
OUTSIZ: 0
INBUF: 0 ;INPUT BUFFER POINTER AND SIZE
INSIZ: 0
MSGAP:
OUT: 0 ;TEST MESSAGE AREA POINTER
INITMA: 0 ;TEMPORARY MESSAGE POINTER AND SIZE
INITMS: 0 ;USED FOR INITIALIZATION OF OUTPUT ROUTINES
BAPNT: 0 ;GENERAL BUFFER AREA POINTER AND SIZE
BASIZE: 0
MSGNO: 0 ;MESSAGE NUMBER (DDCMP)
RMSGNO: 0
PTABLE: 0 ;PRESENT UNIT PTABLE DATA
0
0
0
PTEND:
DEVPRI: 0 ;DEVICE PRIORITY
DEVTYP <VT62,DUP11>
DEVREG 4,17,DUPREG,DUPMSK
```

```
.ASCIZ /VT62,DUP11/
.EVEN
.WORD 1
.WORD 17
.WORD 4
.BLKW 4
```

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739
740
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742
743 002244 040503 020116 047516 MSG00: .ASCIZ /CAN NOT INITIALIZE COMM DEVICE/
744 002252 020124 047111 052111
745 002260 040511 044514 042532
746 002266 041440 046517 020115
747 002274 042504 044526 042503
748 002302 000
749 002303 122 050105 054514 MSG01: .ASCIZ /REPLY WAS NOT AN ENQ/
750 002310 053440 051501 047040
751 002316 052117 040440 020116
752 002324 047105 000121
753 002330 047111 047503 051122 MSG02: .ASCIZ /INCORRECT REPLY TYPE/
754 002336 041505 020124 042522
755 002344 046120 020131 054524
756 002352 042520 000
757 002355 103 051101 044522 MSG05: .ASCIZ /CARRIER NOT DETECTED AFTER 10MSEC/
758 002362 051105 047040 052117
759 002370 042040 052105 041505
760 002376 042524 020104 043101
761 002404 042524 020122 030061
762 002412 051515 041505 000
763 002417
764 002417 122 050105 054514 MSG42:
MSG03: .ASCIZ /REPLY HAS INCORRECT STATION ADDRESS/
765 002424 044040 051501 044440
766 002432 041516 051117 042522
767 002440 052103 051440 040524
768 002446 044524 047117 040440
769 002454 042104 042522 051523
770 002462 000
771 002463
MSG41:
MSG04: .ASCIZ /HEADER HAS CRC ERROR/
772 002463 110 040505 042504
773 002470 020122 040510 020123
774 002476 051103 020103 051105
775 002504 047522 000122
776 002510 051105 047522 020122 MSG10: .ASCIZ /ERROR DURING KEYBOARD TEST ** END OF REPORT **/
777 002516 052504 044522 043516
778 002524 045440 054505 047502
779 002532 051101 020104 042524
780 002540 052123 020040 025052
781 002546 042440 042116 047440
782 002554 020106 042522 047520
783 002562 052122 025040 000052
784 002570 040502 020104 042522 MSG11: .ASCIZ /BAD RESPONSE FROM KEYBOARD/
785 002576 050123 047117 042523
786 002604 043040 047522 020115
787 002612 042513 041131 040517
788 002620 042122 000
789 002623 124 047517 046440 MSG12: .ASCIZ /TOO MANY CHARACTERS SENT FROM KEYBOARD/
790 002630 047101 020131 044103
791 002636 051101 041501 042524
792 002644 051522 051440 047105
793 002652 020124 051106 046517
794 002660 045440 054505 047502

```

795	002666	051101	000104		
796	002672	051124	047101	046523	MSG20: .ASCIZ /TRANSMIT ERROR: NO TRANSMIT INTERRUPTS/
797	002700	052111	042440	051122	
798	002706	051117	020072	047516	
799	002714	052040	040522	051516	
800	002722	044515	020124	047111	
801	002730	042524	051122	050125	
802	002736	051524	000		
803	002741				MSG40:
804	002741	122	041505	050105	MSG21: .ASCIZ /RECEPTION ERROR/
805	002746	044524	047117	042440	
806	002754	051122	051117	000	
807	002761	116	020117	041501	MSG22: .ASCIZ /NO ACK RECEIVED AFTER TRANSMISSION/
808	002766	020113	042522	042503	
809	002774	053111	042105	040440	
810	003002	052106	051105	052040	
811	003010	040522	051516	044515	
812	003016	051523	047511	000116	
813	003024	051105	047522	020122	MSG23: .ASCIZ /ERROR WHILE INITIALIZING COMM DEVICE/
814	003032	044127	046111	020105	
815	003040	047111	052111	040511	
816	003046	044514	044532	043516	
817	003054	041440	046517	020115	
818	003062	042504	044526	042503	
819	003070	000			
820	003071	105	051122	051117	MSG24: .ASCIZ /ERROR DURING COMM DEVICE TRANSMIT/
821	003076	042040	051125	047111	
822	003104	020107	047503	046515	
823	003112	042040	053105	041511	
824	003120	020105	051124	047101	
825	003126	046523	052111	000	
826	003133	116	020117	052123	MSG25: .ASCIZ /NO STACK IN RESPONSE TO STRT/
827	003140	041501	020113	047111	
828	003146	051040	051505	047520	
829	003154	051516	020105	047524	
830	003162	051440	051124	000124	
831	003170	051105	047522	020122	MSG26: .ASCIZ /ERROR DURING COMM DEVICE RECEIVE/
832	003176	052504	044522	043516	
833	003204	041440	046517	020115	
834	003212	042504	044526	042503	
835	003220	051040	041505	044505	
836	003226	042526	000		
837	003231	103	047101	052047	MSG30: .ASCIZ /CAN'T GET CLEAR TO SEND/
838	003236	043440	052105	041440	
839	003244	042514	051101	052040	
840	003252	020117	042523	042116	
841	003260	000			
842	003261	124	046511	020105	MSG31: .ASCIZ /TIME OUT: NO CHARACTERS FROM TERMINAL/
843	003266	052517	035124	047040	
844	003274	020117	044103	051101	
845	003302	041501	042524	051522	
846	003310	043040	047522	020115	
847	003316	042524	046522	047111	
848	003324	046101	000		
849	003327	124	046511	020105	MSG32: .ASCIZ /TIME OUT: MESSAGE FROM TERMINAL INCOMPLETE/
850	003334	052517	035124	046440	

```

851 003342 051505 040523 042507
852 003350 043040 047522 020115
853 003356 042524 046522 047111
854 003364 046101 044440 041516
855 003372 046517 046120 052105
856 003400 000105
857 003402 040504 040524 041440
858 003410 041522 042440 051122
859 003416 051117 000
860 003421 116 044517 042523
861 003426 050040 052101 042524
862 003434 047122 051440 041125
863 003442 042524 052123 000
864 003447 105 051122 051117
865 003454 042040 051125 047111
866 003462 020107 042523 043114
867 003470 042524 052123 000
868 003475 105 051122 051117
869 003502 042040 051125 047111
870 003510 020107 047514 050117
871 003516 040502 045503 000
872 003523 104 052101 020101
873 003530 051105 047522 000122
874 003536 046111 042514 040507
875 003544 020114 042523 043114
876 003552 052040 051505 020124
877 003560 042522 050123 047117
878 003566 042523 000
879 003571 115 046505 051117
880 003576 020131 051105 047522
881 003604 020122 020040 054524
882 003612 042520 040
883 003615 000 000
884 003617 115 026440 041040
885 003624 047101 020113 043
886 003631 000 000
887 003634 003634
888 003634 051103 046517 042440
889 003642 051122 051117 000
890 003650
891
892 003650 005
893 003651 006
894 003652 300
895 003653 000
896 003654 000
897 003655 000
898 003656 000000
899
900
901
902
903 003660
904 003660
905 003660 016746 176240
906 003664 012746 003706

```

```

MSG43: .ASCIZ /DATA CRC ERROR/
MSG45: .ASCIZ /NOISE PATTERN SUBTEST/
MSG50: .ASCIZ /ERROR DURING SELFTEST/
MSG51: .ASCIZ /ERROR DURING LOOPBACK/
MSG52: .ASCIZ /DATA ERROR/
MSG70: .ASCIZ /ILLEGAL SELF TEST RESPONSE/
MSG71: .ASCII /MEMORY ERROR TYPE /
MTY: .BYTE 0,0
      .ASCII /M - BANK #/
BNO: .BYTE 0,0
      .EVEN
MSG72: .ASCIZ /CROM ERROR/
      .EVEN

```

```

STRTB: .BYTE ENQ
        .BYTE STRT
        .BYTE 300
        .BYTE 0
        .BYTE 0
STRTSA: .BYTE 0
STRTC: .WORD 0

```

```

:*****
: GLOBAL ERROR REPORT *
:*****
BGNMSG AREA00
PRINTX #FORM00,ILIMIT

```

```

MOV ILIMIT, -(SP)
MOV #FORM00, -(SP)

```

907 003670 012746 000002
908 003674 010600
909 003676 104015
910 003700 062706 000006

MOV #2,-(SP)
MOV SP,RO
EMT C\$PNTX
ADD #6,SP

L10000:

911 003704
912 003704
913 003704 104023
914 003706 040445 043101 042524 FORM00: .ASCIZ /%AFTER %06% ATTEMPTS%N/
915 003714 020122 047445 022466
916 003722 020101 052101 042524
917 003730 050115 051524 047045
918 003736 000

EMT C\$MSG

919 003740

.EVEN

921 003740
922 003740
923 003740
924 003740 104023
925

BGNMSG AREA01
ENDMSG

L10001:

EMT C\$MSG

926 003742
927 003742
928 003742 016746 000030
929 003746 016746 000022
930 003752 012746 004000
931 003756 012746 000003
932 003762 010600
933 003764 104015
934 003766 062706 000010
935 003772
936 003772

BGNMSG AREA02
PRINTX #FORM02,A02A,A02B

MOV A02B,-(SP)
MOV A02A,-(SP)
MOV #FORM02,-(SP)
MOV #3,-(SP)
MOV SP,RO
EMT C\$PNTX
ADD #10,SP

L10002:

EMT C\$MSG

937 003772 104023
938 003774 000000
939 003776 000000
940 004000 040445 042522 042503 A02A: 0
941 004006 053111 042105 022440 A02B: 0
942 004014 031517 040445 026440 FORM02: .ASCIZ /%ARECEIVED %03% -- EXPECTED %03%N/
943 004022 020055 054105 042520
944 004030 052103 042105 022440
945 004036 031517 047045 000
946 004044

ENDMSG

.EVEN

948 004044
949 004044
950 004044
951 004044 016746 176042
952 004050 016746 176040
953 004054 012746 004000
954 004060 012746 000003
955 004064 010600
956 004066 104015
957 004070 062706 000010
958 004074
959 004074
960 004074 104023
961
962 004076

BGNMSG AREA03
AREA42:
PRINTX #FORM02,TEMP,SCRATCH

MOV SCRATCH,-(SP)
MOV TEMP,-(SP)
MOV #FORM02,-(SP)
MOV #3,-(SP)
MOV SP,RO
EMT C\$PNTX
ADD #10,SP

L10003:

EMT C\$MSG

BGNMSG AREA04

963	004076				AREA41:				
964	004076				AREA43:				
965	004076				PRINTX #FORM04,A04RC,A04EX				
966	004076	016746	000030				MOV	A04EX,-(SP)	
967	004102	016746	000022				MOV	A04RC,-(SP)	
968	004106	012746	004134				MOV	#FORM04,-(SP)	
969	004112	012746	000003				MOV	#3,-(SP)	
970	004116	010600					MOV	SP,RO	
971	004120	104015					EMT	C\$PNTX	
972	004122	062706	000010				ADD	#10,SP	
973	004126				ENDMSG				
974	004126						L10004:		
975	004126	104023					EMT	C\$MSG	
976	004130	000000			A04RC: 0				
977	004132	000000			A04EX: 0				
978	004134	040445	042522	042503	FORM04: .ASCIZ /%ARECEIVED %06%A -- EXPECTED %06%N/				
979	004142	053111	042105	022440					
980	004150	033117	040445	026440					
981	004156	020055	054105	042520					
982	004164	052103	042105	022440					
983	004172	033117	047045	000					
984		004200			.EVEN				
985									
986	004200				BGNMSG AREA11				
987	004200				PRINTX #FORM04,KRC,KEX				
988	004200	016746	000030				MOV	KEX,-(SP)	
989	004204	016746	000022				MOV	KRC,-(SP)	
990	004210	012746	004134				MOV	#FORM04,-(SP)	
991	004214	012746	000003				MOV	#3,-(SP)	
992	004220	010600					MOV	SP,RO	
993	004222	104015					EMT	C\$PNTX	
994	004224	062706	000010				ADD	#10,SP	
995	004230				ENDMSG				
996	004230						L10005:		
997	004230	104023					EMT	C\$MSG	
998	004232	000000			KRC: 0				
999	004234	000000			KEX: 0				
1000	004236				BGNMSG AREA21				
1001	004236				ENDMSG				
1002	004236						L10006:		
1003	004236	104023					EMT	C\$MSG	
1004	004240				BGNMSG AREA22				
1005	004240				ENDMSG				
1006	004240						L10007:		
1007	004240	104023					EMT	C\$MSG	
1008	004242				BGNMSG AREA23				
1009	004242				AREA24:				
1010	004242				AREA40:				
1011	004242				LET TEMP2 := LOGDEV				
1012	004242	016767	175670	000064			MOV	LOGDEV,TEMP2	
1013	004250				IF TEMP2 LT #0 THEN				
1014	004250	005767	000060				TST	TEMP2	
1015	004254	002002					BGE	50000\$	
1016	004256				LET TEMP2 := #0				
1017	004256	005067	000052				CLR	TEMP2	
1018	004262				ENDIF				

1019	004262							50000\$:	
1020	004262								
1021	004262	005267	000046					INC	TEMP2
1022	004266								
1023	004266	016746	000042					MOV	TEMP2,-(SP)
1024	004272	012746	004336					MOV	#FORM23,-(SP)
1025	004276	012746	000002					MOV	#2,-(SP)
1026	004302	010600						MOV	SP,R0
1027	004304	104015						EMT	C\$PNTX
1028	004306	062706	000006					ADD	#6,SP
1029	004312								
1030	004312	012746	004356					MOV	#FORM40,-(SP)
1031	004316	012746	000001					MOV	#1,-(SP)
1032	004322	010600						MOV	SP,R0
1033	004324	104015						EMT	C\$PNTX
1034	004326	062706	000004					ADD	#4,SP
1035	004332								
1036	004332							L10010:	
1037	004332	104023						EMT	C\$MSG
1038	004334	000000							
1039	004336	040445	042504	044526					
1040	004344	042503	020072	042045					
1041	004352	022463	000116						
1042	004356	040445	020040	020040					
1043	004364	020040	020040	025040					
1044	004372	025052	025052	042440					
1045	004400	042116	047440	020106					
1046	004406	051105	047522	020122					
1047	004414	042522	047520	052122					
1048	004422	025040	025052	025052					
1049	004430	047045	000						
1050	004434								
1051									
1052	004434								
1053	004434								
1054	004434	016746	010446					MOV	RDONE,-(SP)
1055	004440	012746	004462					MOV	#FORM26,-(SP)
1056	004444	012746	000002					MOV	#2,-(SP)
1057	004450	010600						MOV	SP,R0
1058	004452	104015						EMT	C\$PNTX
1059	004454	062706	000006					ADD	#6,SP
1060	004460								
1061	004460							L10011:	
1062	004460	104023						EMT	C\$MSG
1063	004462	040445	052502	043106					
1064	004470	051105	041440	047117					
1065	004476	042524	052116	035123					
1066	004504	022440	033117	047045					
1067	004512	000							
1068	004514								
1069									
1070	004514								
1071	004514								
1072	004514								
1073	004514	010146						MOV	R1,-(SP)
1074	004516								

LET TEMP2 := TEMP2 + #1

PRINTX #FORM23,TEMP2

PRINTX #FORM40

ENDMSG

TEMP2: 0
FORM23: .ASCIZ /%ADEVICE: %D3%N/

FORM40: .ASCIZ /%A ***** END OF ERROR REPORT *****%N/

.EVEN

BGNMSG AREA26
PRINTX #FORM26,RDONE

ENDMSG

FORM26: .ASCIZ /%ABUFFER CONTENTS: %06%N/

.EVEN

BGNMSG AREA30

AREA31:

PUSH R1

LET R1 := #DUPREG

1075	004516	012701	002234					MOV	#DUPREG,R1
1076	004522			PRINTX #FORM30,RCVCSR(R1)				MOV	RCVCSR(R1),-(SP)
1077	004522	016146	000000					MOV	#FORM30,-(SP)
1078	004526	012746	004646					MOV	#2,-(SP)
1079	004532	012746	000002					MOV	SP,R0
1080	004536	010600						EMT	C\$PNTX
1081	004540	104015						ADD	#6,SP
1082	004542	062706	000006					MOV	RCVBUF(R1),-(SP)
1083	004546			PRINTX #FRM30A,RCVBUF(R1)				MOV	#FRM30A,-(SP)
1084	004546	016146	000002					MOV	#2,-(SP)
1085	004552	012746	004670					MOV	SP,R0
1086	004556	012746	000002					EMT	C\$PNTX
1087	004562	010600						ADD	#6,SP
1088	004564	104015						MOV	XMTCSR(R1),-(SP)
1089	004566	062706	000006					MOV	#FRM30B,-(SP)
1090	004572			PRINTX #FRM30B,XMTCSR(R1)				MOV	#2,-(SP)
1091	004572	016146	000004					MOV	SP,R0
1092	004576	012746	004713					EMT	C\$PNTX
1093	004602	012746	000002					ADD	#6,SP
1094	004606	010600						MOV	XMTBUF(R1),-(SP)
1095	004610	104015						MOV	#FRM30C,-(SP)
1096	004612	062706	000006					MOV	#2,-(SP)
1097	004616			PRINTX #FRM30C,XMTBUF(R1)				MOV	SP,R0
1098	004616	016146	000006					EMT	C\$PNTX
1099	004622	012746	004735					ADD	#6,SP
1100	004626	012746	000002					MOV	(SP)+,R1
1101	004632	010600		POP R1					
1102	004634	104015		ENDMSG					
1103	004636	062706	000006						
1104	004642								
1105	004642	012601							
1106	004644								
1107	004644								
1108	004644	104023							
1109	004646	040445	052504	020120	FORM30: .ASCIZ /%ADUP RCSR: %06%N/				
1110	004654	041522	051123	020072					
1111	004662	047445	022466	030116					
1112	004670	040445	052504	020120	FRM30A: .ASCIZ /%ADUP RBUF: %06%N/				
1113	004676	041122	043125	035106					
1114	004704	022440	033117	047045					
1115	004712	000							
1116	004713	045	042101	050125	FRM30B: .ASCIZ /%ADUP TCSR: %06%N/				
1117	004720	052040	051503	035122					
1118	004726	022440	033117	047045					
1119	004734	000							
1120	004735	045	042101	050125	FRM30C: .ASCIZ /%ADUP TBUF: %06%N/				
1121	004742	052040	052502	043106					
1122	004750	020072	047445	022466					
1123	004756	000116							
1124					.EVEN				
1125									
1126	004760				BGNMSG AREA60				
1127	004760				PRINTX #FORM60				
1128	004760	012746	005002					MOV	#FORM60,-(SP)
1129	004764	012746	000001					MOV	#1,-(SP)
1130	004770	010600						MOV	SP,R0

L10012:

EMT C\$MSG

1131	004772	104015					EMT	C\$PNTX
1132	004774	062706	000004				ADD	#4,SP
1133	005000			ENDMSG				
1134	005000					L10013:		
1135	005000	104023					EMT	C\$MSG
1136	005002	040445	040503	023516	FORM60: .ASCIZ /%ACAN'T GET INTO LOOPBACK%N/			
1137	005010	020124	042507	020124				
1138	005016	047111	047524	046040				
1139	005024	047517	041120	041501				
1140	005032	022513	000116					
1141				.EVEN				
1142	005036			BGNMSG AREA61				
1143	005036			PRINTX #FORM61				
1144	005036	012746	005130				MOV	#FORM61,-(SP)
1145	005042	012746	000001				MOV	#1,-(SP)
1146	005046	010600					MOV	SP,R0
1147	005050	104015					EMT	C\$PNTX
1148	005052	062706	000004				ADD	#4,SP
1149	005056			LET TEMP2 := LOGDEV				
1150	005056	016767	175054	177250			MOV	LOGDEV,TEMP2
1151	005064			IF TEMP2 LT #0 THEN				
1152	005064	005767	177244				TST	TEMP2
1153	005070	002002					BGE	50001\$
1154	005072			LET TEMP2 := #0				
1155	005072	005067	177236				CLR	TEMP2
1156	005076			ENDIF				
1157	005076					50001\$:		
1158	005076			LET TEMP2 := TEMP2 + #1				
1159	005076	005267	177232				INC	TEMP2
1160	005102			PRINTX #FORM23,TEMP2				
1161	005102	016746	177226				MOV	TEMP2,-(SP)
1162	005106	012746	004336				MOV	#FORM23,-(SP)
1163	005112	012746	000002				MOV	#2,-(SP)
1164	005116	010600					MOV	SP,R0
1165	005120	104015					EMT	C\$PNTX
1166	005122	062706	000006				ADD	#6,SP
1167	005126			ENDMSG				
1168	005126					L10014:		
1169	005126	104023					EMT	C\$MSG
1170	005130	040445	040503	023516	FORM61: .ASCIZ /%ACAN'T GET OUT OF LOOPBACK%N/			
1171	005136	020124	042507	020124				
1172	005144	052517	020124	043117				
1173	005152	046040	047517	041120				
1174	005160	041501	022513	000116				
1175				.EVEN				
1176	005166			BGNMSG AREA52				
1177	005166			PRINTX #FORM52,A52A,A52B				
1178	005166	016746	000074				MOV	A52B,-(SP)
1179	005172	016746	000066				MOV	A52A,-(SP)
1180	005176	012746	005220				MOV	#FORM52,-(SP)
1181	005202	012746	000003				MOV	#3,-(SP)
1182	005206	010600					MOV	SP,R0
1183	005210	104015					EMT	C\$PNTX
1184	005212	062706	000010				ADD	#10,SP
1185	005216			ENDMSG				
1186	005216					L10015:		

```
1187 005216 104023
1188 005220 040445 054105 042520 FORM52: .ASCIZ /%AEXPECTED: %03%A -RECEIVED: %03%N/
1189 005226 052103 042105 020072
1190 005234 047445 022463 020101
1191 005242 026440 042522 042503
1192 005250 053111 042105 020072
1193 005256 047445 022463 000116
1194
1195 005264 000000 A52A: .EVEN 0
1196 005266 000000 A52B: 0
1197
1198 005270 BGNMSG AREA70
1199 005270 ENDMSG
1200 005270
1201 005270 104023 L10016: EMT CSMSG
1202
1203 005272 BGNMSG AREA71
1204 005272 ENDMSG
1205 005272
1206 005272 104023 L10017: EMT CSMSG
1207
1208 005274
1209 005274 001452 TEMBUF:
1210 010420 .BLKW 810.
1211 010420 000416 TMPBUF:
1212 011454 000100 .BLKW 270.
1213 011654 SSTACK: .BLKW 100
1214 ;STACK FOR SUBROUTINE LINKAGE.
1215 011654 ENDMOD
```

```
1216 011654
1217
1218
1219
1220 011654
1221 011654 000004
1222 011656 160010
1223 011660 000320
1224 011662 000640
1225 011664 007030
1226 011666
1227 011666
1228 011666
1229 011666 000003
1230 011670 000010
1231 011672 000001
1232 011674 020000
1233 011676
1234 011676
1235
1236
1237
1238
1239 011676
1240 011676 000002
1241 011700 017464
1242 011702 020514
1243 011704
```

```

      BGNMOD TABLE
      .....
      : DEFAULT HARDWARE P-TABLE AND SOFTWARE P-TABLE *
      : .....
      BGNHW
      160010
      320
      640
      7030
      ENDPHW
      L10020:
      BGNSW
      000010
      PATTERN:000001
      STWAIT: 20000
      ENDSW
      L10021:
      .....
      : DISPATCH TABLE *
      : .....
      DISPATCH TSTS
      TSTS
      T1
      T2
      ENDMOD
      .WORD L10020-LSHW/2
      .WORD L10021-LSSW/2
```

```

1244 011704          BGNMOD CODE
1245
1246
1247          :*****
1248          :STUB AREAS FOR SUPERVISOR COMPATIBILITY *
1249          :*****
1249 011704          BGNRPT
1250 011704          ENDRPT
1251 011704
1252 011704 104025          L10022:      EMT      C$RPT
1253
1254 011706          BGNAU
1255 011706          ENDAU
1256 011706
1257 011706 104054          L10023:      EMT      C$AU
1258
1259 011710          BGNDU
1260 011710          ENDDU
1261 011710
1262 011710 104055          L10024:      EMT      C$DU
1263
1264          :*****
1265          :      INITIALIZE CODING
1266          :*****
1267 011712          BGNINIT
1268
1269          :SAVE R1
1270
1271          :      PUSH R1
1272 011712 010146          MOV      R1,-(SP)
1273
1274          :CHECK START EVENT FLAG TO SEE IF WE GOT HERE BECAUSE OF A START
1275          :
1276 011714          READEF #EF.START
1277 011714 012700 000040          MOV      #EF.START,R0
1278 011720 104050          EMT      C$REFG
1279
1280          :IF A START, THEN...
1281
1282 011722          IF.ERROR THEN
1283 011722 103005          BCC      50002$
1284
1285          :INITIALIZE THE SUBROUTINE LINKAGE STACK
1286          :
1287 011724          LET R5 := #SSTACK
1288 011724 012705 011654          MOV      #SSTACK,R5
1289 011730          LET R5STCK := R5STCK + #1
1290 011730 005267 170154          INC      R5STCK
1291 011734          ELSE
1292 011734 000414          BR      50003$
1293 011736          50002$:
1294
1295          :IF NOT START THEN....
1296
1297          :CHECK FOR RESTART AND IF IT IS:
1298          :UPDATE LOGICAL DEVICE AND STAT. TABLE ENTRY POINTER,
1299          :BUT DON'T EXCEED THE NUMBER OF UNITS SPECIFIED

```

```

1300
1301 011736          ;          READEF #EF.RESTART
1302 011736 012700 000037          MOV      #EF.RESTART,R0
1303 011742 104050          EMT      CSREFG
1304 011744          ;          IF.NO.ERROR THEN
1305 011744 103410          ;          BCS      50004$
1306 011746          ;          LET LOGDEV := LOGDEV + #1
1307 011746 005267 170164          ;          INC      LOGDEV
1308 011752          ;          IF LOGDEV EQ L$UNIT THEN
1309 011752 026767 170160 170032          ;          CMP      LOGDEV,L$UNIT
1310 011760 001002          ;          BNE      50005$
1311 011762          ;          LET LOGDEV := #0
1312 011762 005067 170150          ;          CLR      LOGDEV
1313 011766          ;          ENDIF
1314 011766          ;          50005$:
1315 011766          ;          ENDIF
1316 011766          ;          50004$:
1317 011766          ;          ENDIF
1318 011766          ;          50003$:
1319
1320          ;:CHECK FOR NEW PASS... IF IT IS, FORCE LOGICAL UNIT TO ZERO.
1321          ;:
1322 011766          ;          READEF #EF.NEW
1323 011766 012700 000035          ;          MOV      #EF.NEW,R0
1324 011772 104050          ;          EMT      CSREFG
1325 011774          ;          IF.ERROR THEN
1326 011774 103002          ;          BCC      50006$
1327 011776          ;          LET LOGDEV := #0
1328 011776 005067 170134          ;          CLR      LOGDEV
1329 012002          ;          ENDIF
1330 012002          ;          50006$:
1331
1332          ;:END OF START CODE
1333          ;:FORCE THE COMM DEVICE TO BE INITIALIZED
1334          ;:
1335 012002          ;          LET INIT := #0
1336 012002 005067 003556          ;          CLR      INIT
1337 012006          ;          LET ABORT := #0
1338 012006 005067 170104          ;          CLR      ABORT
1339
1340          ;:SET UP THE INPUT BUFFERS QUEUE
1341          ;:
1342 012012          ;          LET RQUE := #RQUET
1343 012012 012767 015610 003566          ;          MOV      #RQUET,RQUE
1344 012020          ;          LET RQUEUE := RQUE
1345 012020 016767 003562 003556          ;          MOV      RQUE,RQUEUE
1346 012026          ;          LET RBQUE := #RBQUET
1347 012026 012767 015626 003570          ;          MOV      #RBQUET,RBQUE
1348 012034          ;          LET R1 := RBQUE
1349 012034 016701 003564          ;          MOV      RBQUE,R1
1350 012040          ;          LET SCRATCH := #TEMBUF
1351 012040 012767 005274 170044          ;          MOV      #TEMBUF,SCRATCH
1352 012046          ;          REPEAT
1353 012046          ;          50007$:
1354 012046          ;          LET (R1)+ := SCRATCH
1355 012046 016721 170040          ;          MOV      SCRATCH,(R1)+

```

```
1356 012052          LET SCRTCH := SCRTCH + #270.
1357 012052 062767 000416 170032          ADD      #270.,SCRTCH
1358 012060          UNTIL R1 GT #RBQUEB
1359 012060 020127 015632          CMP      R1,#RBQUEB
1360 012064 003770          BLE      50007$
1361
1362          ;GET THE PTABLE ENTRY FOR THIS LOGICAL DEVICE
1363          ;
1364 012066          REPEAT
1365 012066          50010$:
1366 012066          LET R1 := R1 + #1
1367 012066 005201          INC      R1
1368 012070          GPHARD LOGDEV,SCRTCH
1369 012070 016700 170042          MOV      LOGDEV,R0
1370 012074 104042          EMT
1371 012076 010067 170010          MOV      R0,SCRTCH
1372
1373          ;IF UNIT HAS BEEN DROPPED, UPDATE POINTERS ETC. AND TRY AGAIN
1374          ;
1375 012102          IF.NO.ERROR THEN
1376 012102 103411          BCS      50011$
1377 012104          LET LOGDEV := LOGDEV + #1
1378 012104 005267 170026          INC      LOGDEV
1379 012110          IF LOGDEV EQ L$UNIT THEN
1380 012110 026767 170022 167674          CMP      LOGDEV,L$UNIT
1381 012116 001002          BNE      50012$
1382 012120          LET LOGDEV := #0
1383 012120 005067 170012          CLR      LOGDEV
1384 012124          ENDIF
1385 012124          50012$:
1386 012124          LET R1 := #0
1387 012124 005001          CLR      R1
1388 012126          ENDIF
1389 012126          50011$:
1390 012126          UNTIL R1 NE #0
1391 012126 005701          TST      R1
1392 012130 001756          BEQ      50010$
1393
1394          ;NOW GET THE PTABLE DATA FROM THE SUPERVISOR AND STORE WITHIN THE
1395          ;DIAGNOSTIC PROGRAM
1396          ;
1397 012132          LET R1 := #PTABLE
1398 012132 012701 002200          MOV      #PTABLE,R1
1399 012136          REPEAT
1400 012136          50013$:
1401 012136          LET (R1) := @SCRTCH
1402 012136 017711 167750          MOV      @SCRTCH,(R1)
1403 012142          LET R1 := R1 + #2
1404 012142 062701 000002          ADD      #2,R1
1405 012146          LET SCRTCH := SCRTCH + #2
1406 012146 062767 000002 167736          ADD      #2,SCRTCH
1407 012154          UNTIL R1 EQ #PTEND
1408 012154 020127 002210          CMP      R1,#PTEND
1409 012160 001366          BNE      50013$
1410
1411          ;RESTORE R1 AND EXIT INIT CODE
```

```
1412  
1413 012162 ; POP R1  
1414 012162 012601 MOV (SP)+,R1  
1415 012164 ENDINIT  
1416 012164 L10025:  
1417 012164 104011 EMT C$INIT  
1418 012166 047045 040445 052126 VMSG: .ASCIZ /%N%AVT62 ACCEPTANCE TEST -- VERSION 10 TERMINALS%N/  
1419 012174 031066 040440 041503  
1420 012202 050105 040524 041516  
1421 012210 020105 042524 052123  
1422 012216 020040 026440 020055  
1423 012224 020040 042526 051522  
1424 012232 047511 020116 030061  
1425 012240 052040 051105 044515  
1426 012246 040516 051514 047045  
1427 012254 000  
1428 012256 .EVEN  
1429  
1430  
1431 : .....  
1432 : CLEAN-UP CODING *  
1433 : .....  
1433 012256 BGNCLN  
1434  
1435 : MAKE SURE DEVICE IS SHUT DOWN  
1436 :  
1437 012256 PUSH R1  
1438 012256 010146 MOV R1,-(SP)  
1439 012260 LET R1 := PTABLE MOV PTABLE,R1  
1440 012260 016701 167714 LET XMTCSR(R1) := XMTCSR(R1) SET.BY #MASCLR BIS #MASCLR,XMTCSR(R)  
1441 012264 LET XMTCSR(R1) := XMTCSR(R1) SET.BY #MASCLR BIS #MASCLR,XMTCSR(R)  
1442 012264 052761 000400 000004 POP R1  
1443 012272 MOV (SP)+,R1  
1444 012272 012601  
1445  
1446 : UPDATE PASS COUNT  
1447 :  
1448 012274 LET PASCNT := PASCNT + #1  
1449 012274 005267 167632 INC PASCNT  
1450  
1451 : EXIT CLEAN-UP CODE  
1452 :  
1453 012300 ENDCLN  
1454 012300 L10026:  
1455 012300 104012 EMT C$CLEAN  
1456 012302 ENDMOD
```



```

1457 012302          BGNMOD GSUB
1458                *****
1459                GLOBAL SUBROUTINES
1460                *****
1461                :
1462                :
1463                : *****
1464                : ROUTINE TO PROCESS TERMINAL MESSAGES FOR ALL TESTS
1465                : RETURNS POINTER TO MESSAGE ('OUTMSG') AND ITS SIZE
1466                : IN BYTES ('OUTSIZ')
1467                :
1468                : SIZE MAY BE ANY NUMBER OF BYTES
1469                :
1470                : SETS A FLAG ('EXPINP') IF RESPONSE OTHER THAN "ACK" IS
1471                : TO BE EXPECTED
1472                :
1473                : SETS ANOTHER FLAG ('EOMSG') IF THIS IS THE LAST MESSAGE
1474                : *****
1474 012302          ROUTINE MSG ;[3.2.14]
1475 012302          MSG:
1476
1477 012302          DECLARE LOCALS
1478 012302          LOCAL <A>
1479 012302          ALLOCATE
1480 012302 010446          MOV R4,-(SP)
1481 012304 010604          MOV SP,R4
1482 012306 162706 000002  SUB #2,SP
1483
1484                : GET MESSAGE POINTER
1485                :
1486 012312          LET A(R4) := @MSGAP
1487 012312 017764 167644 177776  MOV @MSGAP,A(R4)
1488
1489                : IF MESSAGE POINTER IS ODD,
1490                : SET END_OF_MESSAGE INDICATOR
1491                :
1492 012320          LET SCRTCH := A(R4) AND #1
1493 012320 016467 177776 167564  MOV A(R4),SCRTCH
1494 012326 016746 167560          MOV SCRTCH,-(SP)
1495 012332 042716 000001          BIC #1,(SP)
1496 012336 042667 167550          BIC (SP)+,SCRTCH
1497 012342          IF SCRTCH NE #0 THEN
1498 012342 005767 167544          TST SCRTCH
1499 012346 001405          BEQ 50002$
1500 012350          LET EOMSG := EOMSG + #1
1501 012350 005267 167560          INC EOMSG
1502 012354          LET A(R4) := A(R4) CLR.BY #1
1503 012354 042764 000001 177776  BIC #1,A(R4)
1504 012362          ENDIF
1505 012362          50002$:
1506
1507                : IF MESSAGE_POINTER IS NEGATIVE,
1508                : SET EXPECT_INPUT INDICATOR
1509                :
1510 012362          IF A(R4) LT #0 THEN
1511 012362 005764 177776          TST A(R4)
1512 012366 002006          BGE 50003$
    
```

```

1513 012370          LET EXPINP := EXPINP + #1
1514 012370 005267 167544          INC      EXPINP
1515 012374          LET A(R4) := A(R4) CLR.BY #100000
1516 012374 042764 100000 177776  BIC      #100000,A(R4)
1517
1518      ; OTHERWISE, CLEAR EXPECT_INPUT
1519      ;
1520 012402          ELSE
1521 012402 000402          BR      50004$
1522 012404          50003$:
1523 012404          LET EXPINP := #0
1524 012404 005067 167530          CLR      EXPINP
1525 012410          ENDIF
1526 012410          50004$:
1527
1528      ; SET MESSAGE_ADDRESS AND
1529      ; MESSAGE_SIZE
1530      ;
1531 012410          LET OUTMSG := A(R4)
1532 012410 016467 177776 167524          MOV      A(R4),OUTMSG
1533 012416          LET MSGAP := MSGAP + #2
1534 012416 062767 000002 167536          ADD      #2,MSGAP
1535 012424          LET OUTMSG+2 := @MSGAP
1536 012424 017767 167532 167512          MOV      @MSGAP,OUTMSG+2
1537
1538      ; UPDATE MESSAGE_AREA_POINTER
1539      ;
1540 012432          LET MSGAP := MSGAP + @MSGAP
1541 012432 067767 167524 167522          ADD      @MSGAP,MSGAP
1542 012440          LET MSGAP := MSGAP + #2
1543 012440 062767 000002 167514          ADD      #2,MSGAP
1544
1545      ; IF MESSAGE_AREA_POINTER IS ODD
1546      ; ADD 1 TO MAKE IT EVEN
1547      ;
1548 012446          LET SCRTCH := MSGAP AND #1
1549 012446 016767 167510 167436          MOV      MSGAP,SCRTCH
1550 012454 016746 167432          MOV      SCRTCH,-(SP)
1551 012460 042716 000001          BIC      #1,(SP)
1552 012464 042667 167422          BIC      (SP)+,SCRTCH
1553 012470          IF SCRTCH NE #0 THEN
1554 012470 005767 167416          TST      SCRTCH
1555 012474 001402          BEQ      50005$
1556 012476          LET MSGAP := MSGAP + #1
1557 012476 005267 167460          INC      MSGAP
1558 012502          ENDIF
1559 012502          50005$:
1560 012502          ENDRTN
1561 012502          50000$:
1562 012502          50001$:
1563 012502 010406          MOV      R4,SP
1564 012504 012604          MOV      (SP)+,R4
1565 012506 000207          RTS      PC
1566
1567
1568

```

```

1569
1570
1571
1572
1573
1574
1575
1576 012510
1577 012510
1578 012510
1579 012510 005767 003050
1580 012514 001011
1581 012516
1582 012516 004767 000222
1583 012522
1584 012522 103002
1585 012524
1586 012524 000261
1587 012526 000504
1588 012530
1589 012530
1590 012530
1591 012530 005067 167440
1592 012534
1593 012534 005067 167436
1594 012540
1595 012540
1596
1597
1598
1599 012540
1600 012540 016767 167376 167416
1601 012546
1602 012546 012767 002142 167336
1603 012554 062767 000002 167330
1604 012562
1605 012562 017767 167324 167376
1606
1607 012570
1608 012570 012767 010420 167372
1609 012576
1610 012576 012767 000412 167366
1611
1612
1613
1614 012604
1615 012604 162705 000004
1616 012610 004767 000336
1617 012614 012567 167332
1618 012620 012567 167330
1619
1620
1621
1622
1623
1624 012624

```

```

:*****
: ROUTINE TO HANDLE OUTPUT OF MESSAGES TO THE TERMINAL
: UNDER TEST. MESSAGES MAY BE OF ANY LENGTH SINCE
: ROUTINES USED BY THIS ROUTINE SPLIT THE MESSAGES INTO
: BUFFERS OF APPROPRIATE LENGTH FOR DDCMP.
:*****
ROUTINE TEROUT ;[3.2.20]
IF INIT EQ #0 THEN
    CALL XSTRT
    IF .ERROR THEN
        RETURN ERROR
    ENDIF
    LET MSGNO := #0
    LET RMSGNO := #0
ENDIF
50003$:
CLR MSGNO
CLR RMSGNO
50002$:
: INITIALIZE THE BUFFER ROUTINES [3.2.20.4]
:
LET INITMA := OUTMSG
MOV OUTMSG,INITMA
LET SCRTCH := #OUTMSG + #2
MOV #OUTMSG,SCRTCH
ADD #2,SCRTCH
LET INITMS := @SCRTCH
MOV @SCRTCH,INITMS
:
BUFFER #1,BAPNT
LET BAPNT := #TMPBUF
MOV #TMPBUF,BAPNT
LET BASIZE := #266.
MOV #266.,BASIZE
:
: GET A BUFFER OF THE MESSAGE
:
CALL GETOB OUT <OUTBUF,OUTSIZ>
SUB #2*2,R5
JSR PC,GETOB
MOV (R5)+,OUTBUF
MOV (R5)+,OUTSIZ
:
: PERFORM THE FOLLOWING LOOP WHILE
: A AND ABORT ARE CLEAR AND OUTSIZ
: IS GREATER THAN 0
:
WHILE OUTSIZ GT #0 AND ABORT EQ #0 DO

```

1625	012624				50004\$:		
1626	012624	005767	167324			TST	OUTSIZ
1627	012630	003442				BLE	50005\$
1628	012632	005767	167260			TST	ABORT
1629	012636	001037				BNE	50005\$
1630							
1631				:ADD PROTOCOL ENVELOPE AND TRANSMIT			
1632				:			
1633	012640			CALL PROBUF IN <OUTBUF,OUTSIZ> OUT <XBUFFER,XSIZE>			
1634	012640	162705	000004			SUB	#2*2,R5
1635	012644	010546				MOV	R5,-(SP)
1636	012646	016745	167302			MOV	OUTSIZ,-(R5)
1637	012652	016745	167274			MOV	OUTBUF,-(R5)
1638	012656	004767	000416			JSR	PC,PROBUF
1639	012662	012605				MOV	(SP)+,R5
1640	012664	012567	002700			MOV	(R5)+,XBUFFER
1641	012670	012567	002676			MOV	(R5)+,XSIZE
1642	012674			CALL XMIT			
1643	012674	004767	001674			JSR	PC,XMIT
1644				:			
1645				:IF TRANSMIT ERROR, REPORT IT AND SET ERRXMT			
1646				:			
1647	012700			IF.ERROR THEN			
1648	012700	103005		ERRHRD 20,MSG20 ;[3.2.20.10]		BCC	50006\$
1649	012702						
1650	012702	104423				TRAP	T\$ERCODE
1651	012704	000024				.WORD	20
1652	012706	002672				.WORD	MSG20
1653	012710			RETURN ERROR			
1654	012710	000261				SEC	
1655	012712	000412				BR	50001\$
1656	012714			ENDIF			
1657	012714						
1658				:			
1659				:GET THE NEXT BUFFER			
1660				:			
1661	012714			CALL GETOB OUT <OUTBUF,OUTSIZ>			
1662	012714	162705	000004			SUB	#2*2,R5
1663	012720	004767	000226			JSR	PC,GETOB
1664	012724	012567	167222			MOV	(R5)+,OUTBUF
1665	012730	012567	167220			MOV	(R5)+,OUTSIZ
1666				:			
1667				:END OF LOOP			
1668				:			
1669	012734			ENDDO			
1670	012734	000733				BR	50004\$
1671	012736						
1672				:			
1673				:IF ERROR OCCURRED, DO AN ERROR RETURN			
1674				:			
1675	012736			ENDRTN			
1676	012736						
1677	012736	000241				CLC	
1678	012740						
1679	012740	000207				RTS	PC
1680	012742	000000		TYPE: 0 ;TYPE OF MESSAGE EXPECTED			

```

1681
1682
1683
1684
1685
1686
1687
1688
1689
1690 012744
1691 012744
1692 012744
1693 012744
1694 012744
1695 012744 010446
1696 012746 010604
1697 012750 162706 000002
1698
1699
1700
1701
1702
1703 012754
1704 012754 012767 000010 002610
1705 012762
1706 012762 012767 003650 002600
1707
1708
1709
1710 012770
1711 012770 012764 002200 177776
1712 012776 062764 000005 177776
1713 013004
1714 013004 117467 177776 170643
1715
1716
1717
1718
1719 013012
1720 013012 162705 000002
1721 013016 010546
1722 013020 012745 000006
1723 013024 016745 002540
1724 013030 004767 004054
1725 013034 012605
1726 013036 012567 170614
1727
1728
1729
1730 013042
1731 013042 004767 001526
1732
1733
1734
1735 013046
1736 013046 103005

```

```

*****
ROUTINE TO SEND A "STRT" MESSAGE TO THE TERMINAL
*****
A "STACK" MUST BE RETURNED BY THE TERMINAL
*****
ROUTINE XSTRT                                ;[3.2.20.1]
XSTRT:
DECLARE LOCALS
LOCAL <A>
ALLOCATE
MOV R4,-(SP)
MOV SP,R4
SUB #2,SP
;THE DDCMP STRT MESSAGE IS 10 BYTES LONG (INCLUDING CRC) AND IS IN
;A BUFFER STARTING AT "STRTB" -- PUT THIS INFORMATION
;IN THE TRANSMIT ROUTINE'S POINTERS
LET XSIZE := #10
MOV #10,XSIZE
LET XBUFFER := #STRTB
MOV #STRTB,XBUFFER
;GET THE TERMINAL ADDRESS AND PUT INTO THE STRT MESSAGE
LET A(R4) := #PTABLE + #5
MOV #PTABLE,A(R4)
ADD #5,A(R4)
LET STRTSA :B= @A(R4)
MOVB @A(R4),STRTSA
;COMPUTE THE CRC FOR THE STRT MESSAGE AND PUT IN THE LAST TWO BYTES
;OF THE BUFFER ("STRTC")
CALL CRC IN <XBUFFER,#6> OUT <STRTC> ;[3.2.20.1.2 + 3]
SUB #1*2,R5
MOV R5,-(SP)
MOV #6,-(R5)
MOV XBUFFER,-(R5)
JSR PC,CRC
MOV (SP)+,R5
MOV (R5)+,STRTC
;TRANSMIT THE MESSAGE
CALL XMIT
JSR PC,XMIT
;IF AN ERROR OCCURS, REPORT IT AND EXIT WITH THE ERROR FLAG SET.
IF.ERROR THEN
BCC 500028

```

```

1737 013050          ERRHRD 20,MSG20          ;[3.2.20.10]
1738 013050 104423
1739 013052 000024          TRAP          T$ERCODE
1740 013054 002672          .WORD          20
1741 013056          RETURN ERROR          .WORD          MSG20
1742 013056 000261          SEC
1743 013060 000430          BR          50001$
1744 013062          ENDIF
1745 013062          50002$:
1746
1747          ;:OTHERWISE, GET THE TERMINAL'S RESPONSE
1748          ;:
1749 013062          CALL RCVE
1750 013062 004767 003540          JSR          PC,RCVE
1751
1752          ;:IF RECEPTION ERROR, REPORT IT AND EXIT WITH THE ERROR FLAG SET
1753          ;:
1754 013066          IF.ERROR THEN
1755 013066 103005          ERRHRD 21,MSG21          ;[3.2.20.10]
1756 013070          TRAP          T$ERCODE
1757 013070 104423          .WORD          21
1758 013072 000025          .WORD          MSG21
1759 013074 002741          RETURN ERROR
1760 013076          SEC
1761 013076 000261          BR          50001$
1762 013100 000420          ENDIF
1763 013102          50003$:
1764 013102          ;:OTHERWISE, SET TYPE TO "STACK" AND CHECK TO SEE THAT IT WAS THE REPLY
1765          ;:
1766          ;:
1767          ;:
1768 013102          LET TYPE := #STACK
1769 013102 012767 000007 177632          MOV          #STACK,TYPE
1770 013110          CALL CHKREP IN <TYPE>
1771 013110 010546          MOV          R5,-(SP)
1772 013112 016745 177624          MOV          TYPE,-(R5)
1773 013116 004767 001062          JSR          PC,CHKREP
1774 013122 012605          MOV          (SP)+,R5
1775
1776          ;:IF REPLY WASN'T A "STACK", REPORT THE ERROR AND EXIT WITH THE ERROR FLAG SET
1777          ;:
1778 013124          IF.ERROR THEN
1779 013124 103005          ERRHRD 25,MSG25          ;[3.2.20.10]
1780 013126          TRAP          T$ERCODE
1781 013126 104423          .WORD          25
1782 013130 000031          .WORD          MSG25
1783 013132 003133          RETURN ERROR
1784 013134          SEC
1785 013134 000261          BR          50001$
1786 013136 000401          ENDIF
1787 013140          50004$:
1788 013140          ;:END OF XSTRT ROUTINE
1789          ;:
1790          ;:
1791          ;:
1792 013140          ENDRTN

```

1793 013140
 1794 013140 000241
 1795 013142
 1796 013142 010406
 1797 013144 012604
 1798 013146 000207
 1799 013150 0000C0

50000\$:
 CLC
 50001\$:
 MOV R4,SP
 MOV (SP)+,R4
 RTS PC

DDSTRY: 0

1800
 1801
 1802
 1803
 1804
 1805
 1806
 1807
 1808
 1809
 1810

```

:*****
: THIS ROUTINE SPLITS A MESSAGE OF ANY LENGTH INTO
: SEGMENTS OF A SIZE SUITABLE FOR TRANSMISSION OVER A DATA
: LINK -- RETURNS BUFFER ADDRESS, BUFFER SIZE AND END_OF_MESSAGE+
: (BUFFER SIZE = 0 IS END_OF_MESSAGE)
:*****
  
```

1811 013152
 1812 013152
 1813 013152
 1814 013152
 1815 013152
 1816 013152 010446
 1817 013154 010604
 1818 013156 162706 000002

```

ROUTINE GETOB <A,B> ;[3.2.20.5]
GETOB:
DECLARE LOCALS
LOCAL <C>
ALLOCATE
  
```

MOV R4,-(SP)
 MOV SP,R4
 SUB #2,SP

1819
 1820
 1821

```

: LEAVE ENOUGH ROOM FOR A DDCMP HEADER
:
LET A(R5) := BAPNT + #10
  
```

1822 013162
 1823 013162 016765 167002 000000
 1824 013170 062765 000010 000000

MOV BAPNT,A(R5)
 ADD #10,A(R5)

1825
 1826
 1827

```

: INIT SIZE TO ZERO
:
LET B(R5) := #0
  
```

1828 013176
 1829 013176 005065 000002

CLR B(R5)

1830
 1831
 1832

```

: SCRTCH HAS MAXIMUM DDCMP MESSAGE SIZE
:
LET SCRTCH := BASIZE - #12
  
```

1833 013202
 1834 013202 016767 166764 166702
 1835 013210 162767 000012 166674

MOV BASIZE,SCRTCH
 SUB #12,SCRTCH

1836
 1837
 1838

```

: GET A COPY OF THE BUFFER POINTER
:
LET C(R4) := A(R5)
  
```

1839 013216
 1840 013216 016564 000000 177776

MOV A(R5),C(R4)

1841
 1842
 1843

REPEAT LOOP UNTIL MAX SIZE OR END OF DATA

1844 013224
 1845 013224
 1846 013224 026567 000002 166660
 1847 013232 002017
 1848 013234 005767 166726

WHILE B(R5) LT SCRTCH AND INITMS GT #0 DO

50002\$:
 CMP B(R5),SCRTCH
 BGE 50003\$
 IST INITMS

```

1849 013240 003414                                BLE      50003$
1850
1851          :MOVE DATA INTO MESSAGE BUFFER
1852          :
1853 013242                                LET @C(R4) :B= @INITMA                ;[3.2.20.5.1 + 2]
1854 013242 117774 166716 177776                MOV      @INITMA,@C(R4)
1855 013250                                LET INITMS := INITMS - #1                ;[3.2.20.5.1]
1856 013250 005367 166712                DEC      INITMS
1857 013254                                LET INITMA := INITMA + #1
1858 013254 005267 166704                                INC      INITMA
1859 013260                                LET B(R5) := B(R5) + #1                ;[3.2.20.5.2]
1860 013260 005265 000002                INC      B(R5)
1861 013264                                LET C(R4) := C(R4) + #1
1862 013264 005264 177776                                INC      C(R4)
1863 013270                                ENDDO
1864 013270 000755                                BR       50002$
1865 013272                                50003$:
1866          :
1867          :                               END OF LOOP
1868          :
1869 013272                                ENDRTN
1870 013272                                50000$:
1871 013272                                50001$:
1872 013272 010406                                MOV      R4,SP
1873 013274 012604                                MOV      (SP)+,R4
1874 013276 000207                                RTS      PC
1875
1876
1877
1878
1879
1880          :*****
1881          :ROUTINE TO PROVIDE LINE PROTOCOL HEADER AND CHECKSUMS  +
1882          :CALL WITH DATA AREA ADDRESS AND SIZE (IN BYTES)      +
1883          :RETURN WITH MODIFIED ADDRESS AND SIZE                   +
1884          :*****
1885 013300                                ROUTINE PROBUF <A,B,C,D>                ;[3.2.20.6]
1886 013300                                PROBUF:
1887 013300                                PUSH R1
1888 013300 010146                                MOV      R1,-(SP)
1889 013302                                PUSH R2
1890 013302 010246                                MOV      R2,-(SP)
1891
1892          :CHANGE POINTER TO INCLUDE DDCMP HEADER
1893          :
1894 013304                                LET R2 := A(R5) - #10                ;[3.2.20.6.1]
1895 013304 016502 000000                                MOV      A(R5),R2
1896 013310 162702 000010                                SUB      #10,R2
1897
1898          :FIRST BYTE IS SOH (START OF HEADER)
1899          :
1900 013314                                LET (R2)+ :B= #SOH
1901 013314 112722 000201                                MOV      #SOH,(R2)+
1902
1903          :NEXT TWO BYTES GET MESSAGE SIZE
1904

```



```
1905 013320          LET R1 := B(R5)
1906 013320 016501 000002          MOV      B(R5),R1
1907 013324          LET (R2)+ :B= R1
1908 013324 110122          MOV      R1,(R2)+
1909 013326          LET R1 := SWAP R1
1910 013326 000301          SWAB    R1
1911 013330          LET (R2) :B= R1
1912 013330 110112          MOV      R1,(R2)
1913
1914      ;SET SELECT BIT
1915
1916 013332          LET (R2) :B= (R2) SET.BY #200
1917 013332 152712 000200          BISB    #200,(R2)
1918 013336          LET R2 := R2 + #1
1919 013336 005202          INC     R2
1920
1921      ;NEXT BYTE IS LAST GOOD RESPONSE
1922
1923 013340          LET (R2)+ :B= RMSGNO
1924 013340 116722 166632          MOV      RMSGNO,(R2)+
1925
1926      ;NEXT BYTE GETS MESSAGE NUMBER --- POP NUMBER FOR NEXT MESSAGE (IF ANY)
1927
1928 013344          LET MSGNO := MSGNO + #1
1929 013344 005267 166624          INC     MSGNO
1930 013350          LET (R2)+ :B= MSGNO
1931 013350 116722 166620          MOV      MSGNO,(R2)+
1932
1933      ;GET THE TERMINAL ADDRESS FOR THE NEXT HEADER BYTE
1934
1935 013354          LET R1 := #PTABLE + #5
1936 013354 012701 002200          MOV      #PTABLE,R1
1937 013360 062701 000005          ADD     #5,R1
1938 013364          LET (R2)+ :B= (R1)
1939 013364 111122          MOV      (R1),(R2)+
1940
1941      ;GET HEADER START ADDRESS AND SIZE IN BYTES
1942
1943 013366          LET SCRTCH := A(R5) - #10
1944 013366 016567 000000 166516          MOV      A(R5),SCRTCH
1945 013374 162767 000010 166510          SUB     #10,SCRTCH
1946 013402          LET TEMP := #6
1947 013402 012767 000006 166504          MOV      #6,TEMP
1948
1949      ;COMPUTE HEADER CRC
1950
1951 013410          CALL CRC IN <SCRTCH,TEMP> OUT <TEMP>          ;[3.2.20.6.2]
1952 013410 162705 000002          SUB     #1*2,R5
1953 013414 010546          MOV      R5,-(SP)
1954 013416 016745 166472          MOV      TEMP,-(R5)
1955 013422 016745 166464          MOV      SCRTCH,-(R5)
1956 013426 004767 003456          JSR     PC,CRC
1957 013432 012605          MOV      (SP)+,R5
1958 013434 012567 166454          MOV      (R5)+,TEMP
1959
1960      ;PUT CRC INTO BUFFER
```

```
1961 ;
1962 013440 ; LET (R2) := TEMP ;[3.2.20.6.3]
1963 013440 016712 166450 MOV TEMP,(R2)
1964 ;
1965 ;:GET ADDRESS OF MESSAGE AND MESSAGE SIZE IN BYTES
1966 ;
1967 013444 ; LET SCRTCH := A(R5)
1968 013444 016567 000000 166440 MOV A(R5),SCRTCH
1969 013452 ; LET TEMP := B(R5)
1970 013452 016567 000002 166434 MOV B(R5),TEMP
1971 ;
1972 ;:COMPUTE DATA CRC
1973 ;
1974 013460 ; CALL CRC IN <SCRTCH,TEMP> OUT <TEMP> ;[3.2.20.6.4]
1975 013460 162705 000002 SUB #1*2,R5
1976 013464 010546 MOV R5,-(SP)
1977 013466 016745 166422 MOV TEMP,-(R5)
1978 013472 016745 166414 MOV SCRTCH,-(R5)
1979 013476 004767 003406 JSR PC,CRC
1980 013502 012605 MOV (SP)+,R5
1981 013504 012567 166404 MOV (R5)+,TEMP
1982 ;
1983 ;:PUT DATA CRC IN LAST TWO BYTES OF BUFFER
1984 ;
1985 013510 ; LET R2 := A(R5) + B(R5) ;[3.2.20.6.5]
1986 013510 016502 000000 MOV A(R5),R2
1987 013514 066502 000002 ADD B(R5),R2
1988 013520 ; LET (R2)+ :B= TEMP
1989 013520 116722 166370 MOVB TEMP,(R2)+
1990 013524 ; LET TEMP := SWAP TEMP
1991 013524 000367 166364 SWAB TEMP
1992 013530 ; LET (R2) :B= TEMP
1993 013530 116712 166360 MOVB TEMP,(R2)
1994 ;
1995 ;:RETURN WITH MODIFIED ADDRESS AND SIZE
1996 ;
1997 013534 ; LET D(R5) := B(R5) + #12
1998 013534 016565 000002 000006 MOV B(R5),D(R5)
1999 013542 062765 000012 000006 ADD #12,D(R5)
2000 013550 ; LET C(R5) := A(R5) - #10
2001 013550 016565 000000 000004 MOV A(R5),C(R5)
2002 013556 162765 000010 000004 SUB #10,C(R5)
2003 013564 ; POP R2
2004 013564 012602 MOV (SP)+,R2
2005 013566 ; POP R1
2006 013566 012601 MOV (SP)+,R1
2007 013570 ; ENDRTN
2008 013570 ;
2009 013570 ;
2010 013570 000207 50000$: RTS PC
2011 ;
2012 ;
2013 ;
2014 ;
2015 ;
2016 ;:*****
```

```

2017          : ROUTINE TO GET TERMINAL INPUT
2018          : .....
2019 013572   : ROUTINE TERIN <A> ;[3.2.1]
2020 013572   : TERIN:
2021          :
2022          : SAVE R1
2023          :
2024 013572   : PUSH R1
2025 013572 010146 : MOV R1,-(SP)
2026          :
2027          : GET TERMINAL RESPONSE
2028          :
2029 013574   : CALL RCVE
2030 013574 004767 003026 : JSR PC,RCVE
2031          :
2032          : IF RECEIVE ERROR, REPORT IT AND EXIT WITH THE ERROR FLAG SET
2033          :
2034 013600   : IF.ERROR THEN
2035 013600 103007 : BCC 50002$
2036 013602   : ERRHRD 40,MSG40,AREA40
2037 013602 104463 : TRAP T$ERCODE
2038 013604 000050 : .WORD 40
2039 013606 002741 : .WORD MSG40
2040 013610 004242 : .WORD AREA40
2041          :
2042          : .....RESTORE R1 FIRST
2043          :
2044 013612   : POP R1
2045 013612 012601 : MOV (SP)+,R1
2046 013614   : RETURN ERROR
2047 013614 000261 : SEC
2048 013616 000571 : BR 50001$
2049 013620   :
2050 013620   : ENDIF
2051          :
2052          : 50002$:
2053          : IF MESSAGE IS ONLY 10 BYTES, SEE IF IT IS AN ACK.
2054          : IT'S OK TO BE AN ACK, BUT RECEPTION IS INCOMPLETE (CLEAR FLAG).
2055          :
2056 013620   : IF INSIZ EQ #10 THEN
2057 013620 026727 166334 000010 : CMP INSIZ,#10
2058 013626 001027 : BNE 50003$
2059 013630   : LET A(R5) := #0
2060 013630 005065 000000 : CLR A(R5)
2061 013634 012767 000001 177100 : MOV #ACK,TYPE
2062 013642   : CALL CHKREP IN <TYPE>
2063 013642 010546 : MOV R5,-(SP)
2064 013644 016745 177072 : MOV TYPE,-(R5)
2065 013650 004767 000330 : JSR PC,CHKREP
2066 013654 012605 : MOV (SP)+,R5
2067 013656   :
2068 013656 103003 : IF.ERROR THEN
2069 013660   : POP R1
2070 013660 012601 : MOV (SP)+,R1
2071 013662   : RETURN ERROR
2072 013662 000261 : SEC

```

2073	013664	000546			BR	50001\$
2074	013666			ENDIF		
2075	013666				50004\$:	
2076	013666			LET R1 := INBUF + #4		
2077	013666	016701	166264		MOV	INBUF,R1
2078	013672	062701	000004		ADD	#4,R1
2079	013676			LET RMSGNO :B= (R1)		
2080	013676	111167	166274		MOVB	(R1),RMSGNO
2081	013702			POP R1		
2082	013702	012601			MOV	(SP)+,R1
2083	013704			RETURN		
2084	013704	000535			BR	50000\$
2085	013706			ENDIF		
2086	013706				50003\$:	
2087				:		
2088				:IF RECEIVE OK, CHECK THE HEADER CRC		
2089				:COMPUTE EXPECTED CRC		
2090				:		
2091	013706			CALL CRC IN <INBUF,#6> OUT <A04EX>		
2092	013706	162705	000002		SUB	#1*2,R5
2093	013712	010546			MOV	R5,-(SP)
2094	013714	012745	000006		MOV	#6,-(R5)
2095	013720	016745	166232		MOV	INBUF,-(R5)
2096	013724	004767	003160		JSR	PC,CRC
2097	013730	012605			MOV	(SP)+,R5
2098	013732	012567	170174		MOV	(R5)+,A04EX
2099				:		
2100				:GET THE CRC RECEIVED		
2101				:		
2102	013736			LET R1 := INBUF + #10		
2103	013736	016701	166214		MOV	INBUF,R1
2104	013742	062701	000010		ADD	#10,R1
2105	013746			LET A04RC :B= -(R1)		
2106	013746	114167	170156		MOVB	-(R1),A04RC
2107	013752			LET A04RC := SWAP A04RC		
2108	013752	000367	170152		SWAB	A04RC
2109	013756			LET A04RC :B= -(R1)		
2110	013756	114167	170146		MOVB	-(R1),A04RC
2111				:		
2112				:IF THEY AREN'T THE SAME, REPORT THE ERROR, RESTORE R1 AND EXIT WITH		
2113				:THE ERROR FLAG SET		
2114				:		
2115	013762			IF A04EX NE A04RC THEN		
2116	013762	026767	170144 170140		CMP	A04EX,A04RC
2117	013770	001407			BEQ	50005\$
2118	013772			ERRHRD 41,MSG41,AREA41		
2119	013772	104463			TRAP	T\$ERCODE
2120	013774	000051			.WORD	41
2121	013776	002463			.WORD	MSG41
2122	014000	004076			.WORD	AREA41
2123	014002			POP R1		
2124	014002	012601			MOV	(SP)+,R1
2125	014004			RETURN ERROR		
2126	014004	000261			SEC	
2127	014006	000475			BR	50001\$
2128	014010			ENDIF		

```

2129 014010                                50005$:
2130
2131      ; COMPARE TERMINAL ADDRESS RECEIVED WITH THAT EXPECTED
2132      ; AND IF THEY AREN'T THE SAME, REPORT THE ERROR, RESTORE R1 AND
2133      ; EXIT WITH THE ERROR FLAG SET
2134
2135 014010                                :FB -(R1) NE STRTSA THEN
2136 014010 124167 167641                    CMPB   -(R1),STRTSA
2137 014014 001407                          BEQ    50006$
2138 014016                                ERRHRD 42,MSG42,AREA42
2139 014016 104463                          TRAP  T$ERCODE
2140 014020 000052                          .WORD 42
2141 014022 002417                          .WORD MSG42
2142 014024 004044                          .WORD AREA42
2143 014026                                POP R1
2144 014026 012601                          MOV   (SP)+,R1
2145 014030                                RETURN ERROR
2146 014030 000261                          SEC
2147 014032 000463                          BR    50001$
2148 014034                                ENDIF
2149 014034                                50006$:
2150
2151      ; MOVE THE POINTERS PAST THE HEADER AND COMPUTE THE DATA CRC
2152
2153 014034                                LET INBUF := INBUF + #10
2154 014034 062767 000010 166114             ADD   #10,INBUF
2155 014042                                LET INSIZ := INSIZ - #12
2156 014042 162767 000012 166110             SUB   #12,INSIZ
2157 014050                                CALL CRC IN <INBUF,INSIZ> OUT <A04EX>
2158 014050 162705 000002                     SUB   #1*2,R5
2159 014054 010546                          MOV   R5,-(SP)
2160 014056 016745 166076                     MOV   INSIZ,-(R5)
2161 014062 016745 166070                     MOV   INBUF,-(R5)
2162 014066 004767 003016                     JSR   PC,CRC
2163 014072 012605                          MOV   (SP)+,R5
2164 014074 012567 170032                     MOV   (R5)+,A04EX
2165
2166      ; GET THE DATA CRC RECEIVED
2167
2168 014100                                LET R1 := INBUF + INSIZ
2169 014100 016701 166052                     MOV   INBUF,R1
2170 014104 066701 166050                     ADD   INSIZ,R1
2171 014110                                LET R1 := R1 + #2
2172 014110 062701 000002                     ADD   #2,R1
2173 014114                                LET A04RC :B= -(R1)
2174 014114 114167 170010                     MOVB  -(R1),A04RC
2175 014120                                LET A04RC := SWAP A04RC
2176 014120 000367 170004                     SWAB  A04RC
2177 014124                                LET A04RC :B= -(R1)
2178 014124 114167 170000                     MOVB  -(R1),A04RC
2179
2180      ; IF THEY AREN'T THE SAME; REPORT THE ERROR, RESTORE R1 AND
2181      ; EXIT WITH THE ERROR FLAG SET
2182
2183 014130                                IF A04RC NE A04EX THEN
2184 014130 026767 167774 167774             CMP   A04RC,A04EX

```

```

2185 014136 001407                                BEQ      50007$
2186 014140                                ERRHRD 43,MSG43,AREA43
2187 014140 104463
2188 014142 000053                                TRAP    T$ERCODE
2189 014144 003402                                .WORD  43
2190 014146 004076                                .WORD  MSG43
2191 014150                                .WORD  AREA43
2192 014150 012601                                POP R1
2193 014152                                RETURN ERROR
2194 014152 000261                                MOV     (SP)+,R1
2195 014154 000412                                SEC
2196 014156                                BR      50001$
2197 014156                                ENDIF
2198
2199
2200
2201 014156
2202 014156 005265 00U00C                                OTHERWISE; SET COMPLETE FLAG, RESTORE R1 AND EXIT NORMALLY
2203 014162                                LET A(R5) := A(R5) + #1
2204 014162 016701 165770                                LET R1 := INBUF - #4
2205 014166 162701 000004                                INC     A(R5)
2206 014172                                LET RMSGNO :B= (R1)
2207 014172 111167 166000                                MOV     INBUF,R1
2208 014176                                POP R1
2209 014176 012601                                SUB     #4,R1
2210 014200                                MOV     (R1),RMSGNO
2211 014200                                ENDRTN
2212 014200 000241                                MOV     (SP)+,R1
2213 014202                                50000$:
2214 014202 000207                                CLC
2215
2216
2217
2218
2219
2220
2221
2222
2223
2224
2225
2226
2227
2228
2229
2230
2231 014204
2232 014204
2233 014204
2234 014204
2235 014204
2236 014204 010446                                ROUTINE CHKREP <B>                                ;[3.2.20.3, 3.2.20.9]
2237 014206 010604                                DECLARE LOCALS                                CHKREP:
2238 014210 162706 000002                                LOCAL <A>
2239
2240

```

```

*****
ROUTINE TO CHECK AN INPUT BUFFER FOR A STANDARD
RESPONSE ("ACK" OR "STACK")
LOCATION "TYPE" CONTAINS THE RESPONSE CODE EXPECTED
INPUT BUFFER POINTER IS IN "INBUF"
INPUT BUFFER SIZE (IN BYTES) IS IN "INSIZ"
*****

```

```

; IF MESSAGE IS NOT 10 BYTES LONG, IT CAN'T BE A CONTROL MESSAGE

```

```

2241          :TYPE AN ERROR MESSAGE AND EXIT WITH ERROR SET
2242          :
2243 014214          IF INSIZ NE #10 THEN
2244 014214 026727 165740 000010
2245 014222 001406
2246 014224          ERRHRD 01,MSG01,AREA01          ;[3.2.20.3.4, 3.2.20.9.4]
2247 014224 104463
2248 014226 000001
2249 014230 002303
2250 014232 003740
2251 014234          RETURN ERROR
2252 014234 000261
2253 014236 000553
2254 014240          ELSE
2255 014240          50002$:
2256          :
2257          :OTHERWISE, COMPUTE THE CRC AND CHECK IT AGAINST THAT SENT
2258          :
2259 014240          CALL CRC IN <INBUF,#6> OUT <TEMP> ;[3.2.20.3.1, 3.2.20.9.1]
2260 014240 162705 000002
2261 014244 010546
2262 014246 012745 000006
2263 014252 016745 165700
2264 014256 004767 002626
2265 014262 012605
2266 014264 012567 165624
2267 014270          LET A(R4) := INBUF + #7
2268 014270 016764 165662 177776
2269 014276 062764 000007 177776
2270 014304          LET SCRTCH :B= @A(R4)
2271 014304 117467 177776 165600
2272 014312          LET SCRTCH := SWAP SCRTCH
2273 014312 000367 165574
2274 014316          LET A(R4) := A(R4) - #1
2275 014316 005364 177776
2276 014322          LET SCRTCH :B= @A(R4)
2277 014322 117467 177776 165562
2278          :
2279          :IF CRC'S MATCH GO ON... OTHERWISE SKIP FOLLOWING CODE
2280          :
2281 014330          IF TEMP EQ SCRTCH THEN          ;[3.2.20.3.2, 3.2.20.9.2]
2282 014330 026767 165560 165554
2283 014336 001076
2284          :
2285          :COMPARE CONTROL MESSAGE TYPE WITH THAT PASSED AS AN ARGUMENT
2286          :
2287 014340          LET A(R4) := INBUF + #1
2288 014340 016764 165612 177776
2289 014346 005264 177776
2290 014352          LET A(R4) :B= @A(R4)
2291 014352 117464 177776 177776
2292 014360          LET A(R4) := A(R4) CLR.BY #HYBYTE
2293 014360 042764 177400 177776
2294          :
2295          :IF NOT THE EXPECTED TYPE, PRINT ERROR MESSAGE AND EXIT WITH ERROR SET
2296          :

```

```

2297 014366          IF A(R4) NE B(R5) THEN          ;[3.2.20.3.3, 3.2.20.9.3]
2298 014366 026465 177776 000000          CMP      A(R4),B(R5)
2299 014374 001414          BEQ      50005$
2300 014376          LET A02A := A(R4)
2301 014376 016467 177776 167370          MOV      A(R4),A02A
2302 014404          LET A02B := B(R5)
2303 014404 016567 000000 167364          MOV      B(R5),A02B
2304 014412          ERRHRD 02,MSG02,AREA02          ;[3.2.20.3.4, 3.2.20.9.4]
2305 014412 104463          TRAP    T$ERCODE
2306 014414 000002          .WORD   2
2307 014416 002330          .WORD   MSG02
2308 014420 003742          .WORD   AREA02
2309 014422          RETURN ERROR
2310 014422 000261          SEC
2311 014424 000460          BR      50001$
2312
2313          ; OTHERWISE, CHECK TERMINAL ADDRESS
2314          ;
2315          ELSE
2316          50005$:
2317          LET SCRTCH := #PTABLE + #5
2318          MOV      #PTABLE,SCRTCH
2319          ADD      #5,SCRTCH
2320          LET SCRTCH :B= @SCRTCH
2321          MOV      @SCRTCH,SCRTCH
2322          LET SCRTCH := SCRTCH CLR.BY #HYBYTE
2323          BIC      #HYBYTE,SCRTCH
2324          LET TEMP := INBUF + #5
2325          MOV      INBUF,TEMP
2326          ADD      #5,TEMP
2327          LET TEMP :B= @TEMP
2328          MOV      @TEMP,TEMP
2329          LET TEMP := TEMP CLR.BY #HYBYTE
2330          BIC      #HYBYTE,TEMP
2331
2332          ; IF NOT THE EXPECTED TERMINAL ADDRESS, THEN REPORT THE ERROR AND
2333          ; EXIT WITH ERROR SET
2334          ;
2335          IF TEMP NE SCRTCH THEN
2336          50007$:
2337          CMP      TEMP,SCRTCH
2338          BEQ      50007$
2339          ERRHRD 03,MSG03,AREA03          ;[3.2.20.3.4, 3.2.20.9.4]
2340          TRAP    T$ERCODE
2341          .WORD   3
2342          .WORD   MSG03
2343          .WORD   AREA03
2344          RETURN ERROR
2345          SEC
2346          BR      50001$
2347          50007$:
2348          ENDIF
2349          50006$:
2350
2351          ; IF CRC WAS IN ERROR, SKIP ABOVE CODE, COME TO HERE, REPORT ERROR AND
2352          ; EXIT WITH ERROR SET

```



```

2353
2354 014532
2355 014532 000414
2356 014534
2357 014534
2358 014534 016767 165352 167366
2359 014542
2360 014542 016767 165346 167362
2361 014550
2362 014550 104463
2363 014552 000004
2364 014554 002463
2365 014556 004076
2366 014560
2367 014560 000261
2368 014562 000401
2369 014564
2370 014564
2371 014564
2372 014564
2373
2374
2375
2376 014564
2377 014564
2378 014564 000241
2379 014566
2380 014566 010406
2381 014570 012604
2382 014572 000207
2383
2384
2385
2386
2387
2388
2389
2390
2391
2392
2393 014574
2394 014574
2395 014574
2396 014574
2397 014574
2398 014574 010446
2399 014576 010604
2400 014600 162706 000002
2401
2402
2403
2404 014604
2405 014604 005064 177776
2406 014610
2407 014610 005067 000270
2408 014614
    
```

```

ELSE
    LET A04RC := SCRCH
    LET A04EX := TEMP
    ERRHRD 04,MSG04,AREA04
    RETURN ERROR
ENDIF
ENDIF
NORMAL RETURN
ENDRTN
    
```

```

50004$:
    BR 50010$
    MOV SCRCH,A04RC
    MOV TEMP,A04EX
    TRAP T$ERCODE
    .WORD 4
    .WORD MSG04
    .WORD AREA04
    SEC
    BR 50001$
50010$:
50003$:
50000$:
50001$:
    CLC
    MOV R4,SP
    MOV (SP)+,R4
    RTS PC
    
```

```

.....
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
.....
ROUTINE XMIT
    DECLARE LOCALS
    LOCAL <B>
    ALLOCATE
    XMIT:
    MOV R4,-(SP)
    MOV SP,R4
    SUB #2,SP
    CLEAR ERROR COUNT, TRANSMIT DONE FLAG AND RECEIVE DONE FLAG
    LET B(R4) := #0
    LET XDONE := #0
    LET RDONE := #0
    
```

2409	014614	005067	000266			CLR	RDONE
2410							
2411				START OF LOOP			
2412							
2413	014620			REPEAT			
2414	014620					50002\$:	
2415							
2416				TRY TO INIT DEVICE			
2417							
2418	014620			CALL DEVINIT			
2419	014620	004767	000264			JSR	PC,DEVINIT
2420							
2421				IF ERROR OCCURRED....			
2422							
2423	014624			IF .ERROR THEN			
2424	014624	103033				BCC	50003\$
2425	014626			PUSH R1			
2426	014626	010146				MOV	R1,-(SP)
2427	014630			PUSH R2			
2428	014630	010246				MOV	R2,-(SP)
2429							
2430				GET A COPY OF THE DEVICE REGISTERS			
2431							
2432	014632			LET R1 := PTABLE			
2433	014632	016701	165342			MOV	PTABLE,R1
2434	014636			LET R2 := #DUPREG			
2435	014636	012702	002234			MOV	#DUPREG,R2
2436	014642			LET RCVCSR(R2) := RCVCSR(R1)			
2437	014642	016162	000000 000000			MOV	RCVCSR(R1),RCVCS
2438	014650			LET RCVBUF(R2) := RCVBUF(R1)			
2439	014650	016162	000002 000002			MOV	RCVBUF(R1),RCVBU
2440	014656			LET XMTCSR(R2) := XMTCSR(R1)			
2441	014656	016162	000004 000004			MOV	XMTCSR(R1),XMTCS
2442	014664			LET XMTBUF(R2) := XMTBUF(R1)			
2443	014664	016162	000006 000006			MOV	XMTBUF(R1),XMTBU
2444	014672			POP R2			
2445	014672	012602				MOV	(SP)+,R2
2446	014674			POP R1			
2447	014674	012601				MOV	(SP)+,R1
2448							
2449				REPORT THE ERROR AND UPDATE THE ERPOR COUNT			
2450							
2451	014676			ERRHRD 23,MSG23,AREA23			
2452	014676	104463				TRAP	T\$ERCODE
2453	014700	000027				.WORD	23
2454	014702	003024				.WORD	MSG23
2455	014704	004242				.WORD	AREA23
2456	014706			LET B(R4) := B(R4) + #1			
2457	014706	005264	177776			INC	B(R4)
2458							
2459				OTHERWISE, CLEAR THE ERROR COUNT			
2460							
2461	014712			ELSE			
2462	014712	000402				BR	50004\$
2463	014714					50003\$:	
2464	014714			LET B(R4) := #0			

```

2465 014714 005064 177776                                CLR      B(R4)
2466 014720                                ENDIF
2467 014720                                50004$:
2468
2469      : IF ERROR COUNT HAS EXCEEDED LIMITS, ABORT AND NEGATE THE COUNT
2470      :
2471 014720                                IF B(R4) EQ ILIMIT THEN
2472 014720 026467 177776 165176                    CMP      B(R4),ILIMIT
2473 014726 001010                                BNE     50005$
2474 014730                                ERRDF 00,MSG00,AREA00
2475 014730 104462                                TRAP    T$ERCODE
2476 014732 000000                                .WORD  0
2477 014734 002244                                .WORD  MSG00
2478 014736 003660                                .WORD  AREA00
2479 014740                                LET ABORT := ABORT + #1
2480 014740 005267 165152                                INC     ABORT
2481 014744                                LET B(R4) := NEGATE B(R4)
2482 014744 005464 177776                                NEG     B(R4)
2483 014750                                ENDIF
2484 014750                                50005$:
2485
2486      :                               END OF LOOP
2487      : EXIT LOOP WHEN ERROR COUNT IS ZERO OR NEGATIVE (ABORT)
2488      :
2489 014750                                UNTIL B(R4) LE #0
2490 014750 005764 177776                                TST     B(R4)
2491 014754 003321                                BGT    50002$
2492
2493      : IF NOT ABORT THEN EXECUTE THE FOLLOWING CODE
2494      : OTHERWISE SKIP AND RETURN WITH ERROR SET
2495      :
2496 014756                                IF B(R4) EQ #0 THEN
2497 014756 005764 177776                                TST     B(R4)
2498 014762 001042                                BNE    50006$
2499
2500      : WAIT FOR TRANSMIT DONE FLAG TO SET
2501      :
2502 014764                                REPEAT
2503 014764                                BREAK
2504 014764                                50007$:
2505 014764 104022                                EMT    C$BRK
2506 014766                                UNTIL XDONE NE #0
2507 014766 005767 000112                                TST    XDONE
2508 014772 001774                                BEQ    50007$
2509
2510      : IF TRANSMIT FLAG IS NEGATIVE, AN ERROR OCCURRED.
2511      :
2512 014774                                IF XDONE LT #0 THEN
2513 014774 005767 000104                                TST    XDONE
2514 015000 002032                                BGE    50010$
2515 015002                                PUSH R1
2516 015002 010146                                MOV    R1,-(SP)
2517 015004                                PUSH R2
2518 015004 010246                                MOV    R2,-(SP)
2519
2520      : IF ERROR, GET COPY OF DEVICE REGISTERS, PRINT MESSAGE AND EXIT WITH ERROR SET

```

```
2521 ;OTHERWISE DO A NORMAL EXIT
2522 ;
2523 015006 LET R1 := PTABLE
2524 015006 016701 165166 MOV PTABLE,R1
2525 015012 LET R2 := #DUPREG
2526 015012 012702 002234 MOV #DUPREG,R2
2527 015016 LET RCVCSR(R2) := RCVCSR(R1)
2528 015016 016162 000000 000000 MOV RCVCSR(R1),RCVCS
2529 015024 LET RCVBUF(R2) := RCVBUF(R1)
2530 015024 016162 000002 000002 MOV RCVBUF(R1),RCVBU
2531 015032 LET XMTCSR(R2) := XMTCSR(R1)
2532 015032 016162 000004 000004 MOV XMTCSR(R1),XMTCS
2533 015040 LET XMTBUF(R2) := XMTBUF(R1)
2534 015040 016162 000006 000006 MOV XMTBUF(R1),XMTBU
2535 015046 POP R2
2536 015046 012602 MOV (SP)+,R2
2537 015050 POP R1
2538 015050 012601 MOV (SP)+,R1
2539 015052 ERRHRD 24,MSG24,AREA24
2540 015052 104463 TRAP T$ERCODE
2541 015054 000030 .WORD 24
2542 015056 003071 .WORD MSG24
2543 015060 004242 .WORD AREA24
2544 015062 RETURN ERROR
2545 015062 000261 SEC
2546 015064 000404 BR 50001$
2547 015066 ENDIF
2548 015066 50010$:
2549 015066 ELSE
2550 015066 000402 BR 50011$
2551 015070 50006$:
2552 015070 RETURN ERROR
2553 015070 000261 SEC
2554 015072 000401 BR 50001$
2555 015074 ENDIF
2556 015074 50011$:
2557 015074 ENDRTN
2558 015074 50000$:
2559 015074 000241 CLC
2560 015076 50001$:
2561 015076 010406 MOV R4,SP
2562 015100 012604 MOV (SP)+,R4
2563 015102 000207 RTS PC
2564 015104 000000
2565 015106 000000
2566
2567
2568
2569
2570
2571
2572
2573
2574
2575
2576
```

XDONE: 0
RDONE: 0

```
*****
: ROUTINE TO INITIALIZE A DEVICE
:
: IF "INIT" IS NON-ZERO, THE ROUTINE WILL EXECUTE AND SET IT
:
: RETURNS WITH AN ERROR IF CTS CANNOT BE SET
: *****
```

```

2577
2578
2579
2580
2581
2582 015110
2583 015110
2584 015110
2585 015110
2586 015110
2587 015110 010446
2588 015112 010604
2589 015114 162706 000002
2590 015120
2591 015120 010146
2592
2593
2594
2595 015122
2596 015122 016701 165052
2597
2598
2599
2600
2601 015126
2602 015126 052761 000400 000004
2603 015134
2604 015134 052761 000002 000000
2605 015142
2606 015142 052761 101226 000002
2607
2608
2609
2610 015150
2611 015150 005067 000402
2612
2613
2614
2615 015154
2616 015154
2617
2618
2619
2620 015154
2621 015154 052711 000004
2622 015160
2623 015160 012700 000100
2624 015164 104027
2625
2626
2627
2628 015166
2629 015166 011164 177776
2630 015172 016446 177776
2631 015176 042716 020000
2632 015202 042664 177776

```

RETURNS WITH ERROR AND "ABORT" SET IF THE DEVICE DOES NOT EXIST

 ROUTINE DEVINIT ;[3.2.20.1.4 AND 3.2.20.7.1] DEVINIT:
 DECLARE LOCALS
 LOCAL <A>
 ALLOCATE
 MOV R4,-(SP)
 MOV SP,R4
 SUB #2,SP
 PUSH R1
 MOV R1,-(SP)
 GET THE DEVICE ADDRESS
 LET R1 := PTABLE
 MOV PTABLE,R1
 DO MASTER CLEAR, SET DATA TERMINAL READY, AND SET PARAMETER REGISTER (DEC MODE, AUTO-CRC INHIBIT, SYNC CHARACTER).
 LET XMTCSR(R1) := XMTCSR(R1) SET.BY #MASCLR
 BIS #MASCLR,XMTCSR(R1)
 LET RCVCSR(R1) := RCVCSR(R1) SET.BY #DTR
 BIS #DTR,RCVCSR(R1)
 LET RCVBUF(R1) := RCVBUF(R1) SET.BY #PARAM
 BIS #PARAM,RCVBUF(R1)
 SET TIMER TO ZERO
 LET TIMER := #0
 CLR TIMER
 LOOP
 REPEAT
 50002\$:
 SET REQUEST TO SEND AND WAIT 10000 MICROSECS
 LET (R1) := (R1) SET.BY #RTS
 BIS #RTS,(R1)
 WAITUS #100
 MOV #100,R0
 EMT C\$WTU
 GET THE CLEAR TO SEND BIT AND UPDATE THE TIMER
 LET A(R4) := (R1) AND #CTS
 MOV (R1),A(R4)
 MOV A(R4),-(SP)
 BIC #CTS,(SP)
 BIC (SP)+,A(R4)

```

2633 015206          LET TIMER := TIMER + #1
2634 015206 005267 000344          INC      TIMER
2635
2636          :
2637          :           END LOOP
2638          : LOOP ENDS WHEN TIMER EXCEEDS LIMIT OR CLEAR TO SEND IS UP
2639 015212          UNTIL TIMER EQ TIMLIM OR A(R4) NE #0
2640 015212 026767 000340 164700          CMP      TIMER,TIMLIM
2641 015220 001403          BEQ      50003$
2642 015222 005764 177776          TST     A(R4)
2643 015226 001752          BEQ      50002$
2644 015230          50003$:
2645
2646          : IF TIME LIMIT NOT EXCEEDED...
2647          :
2648 015230          IF TIMER NE TIMLIM THEN
2649 015230 026767 000322 164662          CMP      TIMER,TIMLIM
2650 015236 001507          BEQ      50004$
2651
2652          : GET THE DEVICE PRIORITY AND SET UP THE RECEIVE INTERRUPT HANDLER
2653          :
2654 015240          LET DEVPRI := #PTABLE + #4
2655 015240 012767 002200 164742          MOV     #PTABLE,DEVPRI
2656 015246 062767 000004 164734          ADD     #4,DEVPRI
2657 015254          LET DEVPRI :B= @DEVPRI
2658 015254 117767 164730 164726          MOVB  @DEVPRI,DEVPRI
2659 015262          LET DEVPRI := DEVPRI CLR.BY #HYBYTE
2660 015262 042767 177400 164720          BIC     #HYBYTE,DEVPRI
2661 015270          LET A(R4) := #PTABLE + #2
2662 015270 012764 002200 177776          MOV     #PTABLE,A(R4)
2663 015276 062764 000002 177776          ADD     #2,A(R4)
2664 015304          SETVEC @A(R4),#RINT,DEVPRI
2665 015304 016746 164700          MOV     DEVPRI,-(SP)
2666 015310 012746 016002          MOV     #RINT,-(SP)
2667 015314 017446 177776          MOV     @A(R4),-(SP)
2668 015320 012746 000003          MOV     #3,-(SP)
2669 015324 104037          EMT     C$SVEC
2670 015326 062706 000010          ADD     #10,SP
2671
2672          : CLEAR THE NEW MESSAGE FLAG
2673          :
2674 015332          LET NMSG := #0
2675 015332 005067 000236          CLR     NMSG
2676 015336          LET A(R4) := @A(R4) + #4
2677 015336 017464 177776 177776          MOV     @A(R4),A(R4)
2678 015344 062764 000004 177776          ADD     #4,A(R4)
2679
2680          : SET UP THE TRANSMIT INTERRUPT HANDLER
2681          :
2682 015352          SETVEC A(R4),#XINT,DEVPRI
2683 015352 016746 164632          MOV     DEVPRI,-(SP)
2684 015356 012746 015634          MOV     #XINT,-(SP)
2685 015362 016446 177776          MOV     A(R4),-(SP)
2686 015366 012746 000003          MOV     #3,-(SP)
2687 015372 104037          EMT     C$SVEC
2688 015374 062706 000010          ADD     #10,SP

```

```

2689
2690      ;SET UP COPIES OF THE DEVICE BUFFER REGISTER ADDRESSES
2691      ;
2692      LET XMTADD := R1 + #6
2693      MOV      R1,XMTADD
2694      ADD      #6,XMTADD
2695      LET RCVADD := R1 + #2
2696      MOV      R1,RCVADD
2697      ADD      #2,RCVADD
2698
2699      ;SET COUNTERS FOR FOUR SYNC'S AND FOUR FILL CHARACTERS
2700      ;
2701      LET SYNCNT := #4
2702      MOV      #4,SYNCNT
2703      LET FLLCNT := #4
2704      MOV      #4,FLLCNT
2705
2706      ;ENABLE TRANSMIT AND RECEIVE INTERRUPTS...SET TO FULL DUPLEX
2707      ;
2708      LET XMTCSR(R1) := XMTCSR(R1) SET.BY #TXINTE!SENDFD
2709      BIS      #TXINTE!SENDFD,X
2710      LET RCVCSR(R1) := RCVCSR(R1) SET.BY #RXINTE
2711      BIS      #RXINTE,RCVCSR(R
2712
2713      ;IF TIME LIMIT WAS EXCEEDED, GET REGISTER CONTENTS, PRINT MESSAGE,
2714      ;AND RETURN WITH ERROR SET
2715      ;
2716      ELSE
2717      BR      50005$
2718
2719      50004$:
2720      PUSH R2
2721      MOV      R2,-(SP)
2722      LET R2 := #DUPREG
2723      MOV      #DUPREG,R2
2724      LET RCVCSR(R2) := RCVCSR(R1)
2725      MOV      RCVCSR(R1),RCVCS
2726      LET RCVBUF(R2) := RCVBUF(R1)
2727      MOV      RCVBUF(R1),RCVBU
2728      LET XMTCSR(R2) := XMTCSR(R1)
2729      MOV      XMTCSR(R1),XMTCS
2730      LET XMTBUF(R2) := XMTBUF(R1)
2731      MOV      XMTBUF(R1),XMTBU
2732      POP R2
2733      MOV      (SP)+,R2
2734      POP R1
2735      MOV      (SP)+,R1
2736      ERRHRD 30,MSG30,AREA30
2737      TRAP   T$ERCODE
2738      .WORD 30
2739      .WORD MSG30
2740      .WORD AREA30
2741      RETURN ERROR
2742      SEC
2743      BR      50001$
2744
2745      ENDIF
2746      50005$:

```

```

2745
2746      ; IF NO ERROR, DO NORMAL EXIT
2747      ;
2748      POP R1
2749      015534 012601
2750      015536
2751      015536 005267 000022
2752      015542
2753      015542
2754      015542 000241
2755      015544
2756      015544 010406
2757      015546 012604
2758      015550 000207
2759
2760      ;
2761      015552 000000 XMTADD: 0 ; TRANSMIT BUFFER REGISTER ADDRESS
2762      015554 000000 RCVADD: 0 ; RECEIVE BUFFER REGISTER ADDRESS
2763      015556 000000 TIMER: 0 ; TIMER FOR CLEAR TO SEND OPERATION
2764      015560 000000 SYNCNT: 0 ; NUMBER OF SYNC CHARACTERS INSERTED BEFORE DDCMP MESSAGE
2765      015562 000000 FLLCNT: 0 ; NUMBER OF FILL CHARACTERS AFTER MESSAGE
2766      015564 000000 INIT: 0 ; INITIALIZE COMPLETE FLAG
2767      015566 000000 FIL: 0 ; FILL CHARACTER
2768      015570 000000 XBUFFER: 0 ; CURRENT TRANSMIT BUFFER POINTER
2769      015572 000000 XSIZE: 0 ; CURRENT TRANSMIT BUFFER SIZE
2770      015574 000000 NMSG: 0 ; NEW MESSAGE EXPECTED FLAG
2771      015576 000000 RTEMP1: 0 ; CURRENT RECEIVE BUFFER POINTER
2772      015600 000000 RTEMP2: 0 ; CURRENT RECEIVE BUFFER SIZE
2773      015602 000000 CNTFLG: 0 ; CONTROL FLAG FOR INPUTTING DDCMP MESSAGES
2774
2775      ;
2776      ; RECEIVER QUEUES
2777      015604 000000 RQUEUE: 0 ; QUEUE POINTER FOR BUFFER PROCESSING
2778      015606 000000 RQUE: 0 ; QUEUE POINTER FOR NEXT AVAILABLE BUFFER
2779      015610 000000 RQUET: 0 ; QUEUE OF BUFFER ADDRESSES AND SIZES
2780      015612 000000
2781      015614 000000
2782      015616 000000
2783      015620 000000
2784      015622 000000 RQUEB: 0
2785      015624 000000 RBQUE: 0 ; QUEUE POINTER FOR NEXT AVAILABLE BUFFER AREA
2786      015626 000000 RBQUET: 0 ; QUEUE OF BUFFER AREAS
2787      015630 000000
2788      015632 000000 RBQUEB: 0

```

50000\$:

50001\$:

```

MOV (SP)+,R1
INC INIT
CLC
MOV R4,SP
MOV (SP)+,R4
RTS PC

```



```

2789          ;////////////////////////////////////
2790          ; TRANSMISSION INTERRUPT HANDLER
2791          ;////////////////////////////////////
2792 015634          BGNSRV XINT                               ;[3.2.20.1.7 AND 3.2.20.7.4]
2793
2794          ; SET PROCESSOR PRIORITY LEVEL
2795
2796          ; SETPRI DEVPRI
2797 015634 016700 164350          MOV     DEVPRI,RO
2798 015640 104041          EMT     CSSPRI
2799
2800          ; IF SYNC COUNT EQUAL TO ZERO...
2801
2802          ; IF SYNCNT EQ #0 THEN
2803 015642 005767 177712          TST     SYNCNT
2804 015646 001047          BNE     50006$
2805
2806          ; CHECK BUFFER SIZE.
2807          ; IF GREATER THAN ZERO, THEN....
2808
2809          ; PUSH R1
2810 015650 010146          MOV     R1,-(SP)
2811 015652          ; IF XSIZE GT #0 THEN
2812 015652 005767 177714          TST     XSIZE
2813 015656 003416          BLE     50007$
2814
2815          ; SEND THE NEXT CHARACTER AND UPDATE POINTER AND COUNT
2816
2817 015660          LET R1 :B= @XBUFFER
2818 015660 117701 177704          MOVVB  @XBUFFER,R1
2819 015664          LET R1 := R1 CLR.BY #HYBYTE
2820 015664 042701 177400          BIC     #HYBYTE,R1
2821 015670          LET @XMTADD := @XMTADD CLR.BY #TSOM
2822 015670 042777 000400 177654          BIC     #TSOM,@XMTADD
2823 015676          LET @XMTADD :B= R1
2824 015676 110177 177650          MOVVB  R1,@XMTADD
2825 015702          LET XBUFFER := XBUFFER + #1
2826 015702 005267 177662          INC     XBUFFER
2827 015706          LET XSIZE := XSIZE - #1
2828 015706 005367 177660          DEC     XSIZE
2829
2830          ; IF ALL CHARACTERS SENT, CHECK FILL COUNT.
2831
2832          ; ELSE
2833 015712 000423          BR     50010$
2834 015714          ; IF FLLCNT NE #0 THEN
2835 015714          ; 50007$:
2836 015714 005767 177642          TST     FLLCNT
2837 015720 001406          BEQ     50011$
2838
2839          ; IF FILL COUNT ISN'T ZERO SEND A FILL CHAR. AND DECREMENT COUNT
2840
2841          ; LET @XMTADD := @XMTADD SET.BY FIL
2842 015722 056777 177640 177622          BIS     FIL,@XMTADD
2843 015730          LET FLLCNT := FLLCNT - #1
2844 015730 005367 177626          DEC     FLLCNT

```

```
2845 015734                                     ELSE
2846 015734 000412                                     BR      50012$
2847 015736                                     50011$:
2848                                     :
2849                                     : IF ALL TRANSMIT DONE, DISABLE TRANSMISSION AND SET DONE FLAG
2850                                     :
2851 015736                                     LET R1 := XMTADD - #6
2852 015736 016701 177610                                     MOV     XMTADD,R1
2853 015742 162701 000006                                     SUB     #6,R1
2854 015746                                     LET XDONE := XDONE + #1
2855 015746 005267 177132                                     INC     XDONE
2856 015752                                     ABORTWAIT
2857 015752 104021                                     EMT     C$ABRT
2858 015754                                     LET XMTCSR(R1) := XMTCSR(R1) CLR.BY #TXINTE!SENDFD
2859 015754 042761 000120 000004                                     BIC     #TXINTE!SENDFD,X
2860 015762                                     ENDIF
2861 015762                                     50012$:
2862 015762                                     ENDIF
2863 015762                                     50010$:
2864 015762                                     POP R1
2865 015762 012601                                     MOV     (SP)+,R1
2866                                     :
2867                                     : ...OTHERWISE, SEND A SYNC AND DECREMENT THE SYNC COUNT
2868                                     :
2869 015764                                     ELSE
2870 015764 000405                                     BR      50013$
2871 015766                                     50006$:
2872 015766                                     LET @XMTADD := @XMTADD SET.BY #SYNC!TSOM
2873 015766 052777 000626 177556                                     BIS     #SYNC!TSOM,@XMTA
2874 015774                                     LET SYNCNT := SYNCNT - #1
2875 015774 005367 177560                                     DEC     SYNCNT
2876 016000                                     ENDIF
2877 016000                                     50013$:
2878                                     :
2879                                     : DO A SUPERVISOR-TYPE RTI
2880                                     :
2881 016000                                     ENDSRV
2882 016000                                     L10027:
2883 016000 000002                                     RTI
2884
2885
2886
2887
2888
2889                                     ;////////////////////
2890                                     ; RECEPTION INTERRUPT ROUTINE
2891                                     ;////////////////////
2892 016002                                     BGNSRV RINT ;[3.2.1.1.1, 3.2.20.2.1 AND 3.2.20.9.1]
2893
2894                                     ; SET PROCESSOR PRIORITY
2895                                     ;
2896 016002                                     SETPRI DEVPRI
2897 016002 016700 164202                                     MOV     DEVPRI,R0
2898 016006 104041                                     EMT     C$SPRI
2899 016010                                     PUSH R1
2900 016010 010146                                     MOV     R1,-(SP)
```

```

2901
2902      : IF NEW MESSAGE FLAG IS RESET...
2903
2904
2905      : GET THE BYTE
2906
2907      :     LET R1 := @RCVADD
2908      :     MOV     @RCVADD,R1
2909
2910      : IF ERROR, REPORT IT AND EXIT IMMEDIATELY (FORCE RESTART)
2911
2912      :     IF R1 LT #0 THEN
2913      :
2914      :         TST     R1
2915      :         BGE     50014$
2916      :         LET RDONE := R1
2917      :         MOV     R1,RDONE
2918
2919      : RESTART THE LINE
2920
2921      :     LET R1 := RCVADD - #2
2922      :     MOV     RCVADD,R1
2923      :     SUB     #2,R1
2924      :     LET (R1) := (R1) CLR.BY #RCENBL
2925      :     BIC     #RCENBL,(R1)
2926      :     LET (R1) := (R1) SET.BY #RXINTE
2927      :     BIS     #RXINTE,(R1)
2928      :     LET NMSG := #0
2929      :     CLR     NMSG
2930      :     POP R1
2931      :     MOV     (SP)+,R1
2932      :     JMP REXIT
2933      :     ENDIF
2934
2935      :     LET R1 := R1 CLR.BY #HYBYTE
2936      :     BIC     #HYBYTE,R1
2937      :     IF NMSG EQ #0 THEN
2938      :
2939      :         TST     NMSG
2940      :         BNE     50015$
2941
2942      : CHECK FOR SYNC/FILL CHARACTER
2943      : (LOOKING FOR FIRST NON-SYNC/NON-FILL)
2944
2945      :     IFB R1 NE #SYNC ANDB R1 NE FIL THEN
2946      :
2947      :         CMPB   R1,#SYNC
2948      :         BEQ   50016$
2949      :         CMPB   R1,FIL
2950      :         BEQ   50016$
2951
2952      : NOT FILL OR SYNC. CHECK FOR ENQ (DDCMP CONTROL MESSAGE).
2953
2954      :     IFB R1 EQ #ENQ THEN
2955      :
2956      :         CMPB   R1,#ENQ
2957      :         BNE   50017$
2958
2959      : IF IT IS AN ENQ, SET EXPECTED BYTE COUNT TO 7, SET MESSAGE SIZE
2960      : TO 10 (OCTAL) AND UPDATE THE BUFFER QUEUES

```

2957					LET RTEMP1 := @RBQUE	
2958	016114					MOV @RBQUE,RTEMP1
2959	016114	017767	177504	177454	LET @RQUE := RTEMP1	
2960	016122					MOV RTEMP1,@RQUE
2961	016122	016777	177450	177456	LET @RTEMP1 :B= R1	
2962	016130					MOVB R1,@RTEMP1
2963	016130	110177	177442		LET RTEMP1 := RTEMP1 + #1	INC RTEMP1
2964	016134				LET RBQUE := RBQUE + #2	ADD #2,RBQUE
2965	016134	005267	177436		IF RBQUE GT #RBQUEB THEN	
2966	016140					CMP RBQUE,#RBQUEB
2967	016140	062767	000002	177456	LET RBQUE := #RBQUET	BLE 50020\$
2968	016146				ENDIF	MOV #RBQUET,RBQUE
2969	016146	026727	177452	015632		
2970	016154	003403				
2971	016156					
2972	016156	012767	015626	177440		
2973	016164					
2974	016164					
2975	016164					
2976	016164	012767	000007	177406	LET RTEMP2 := #7	50020\$: MOV #7,RTEMP2
2977	016172				LET RQUE := RQUE + #2	ADD #2,RQUE
2978	016172	062767	000002	177406	LET @RQUE := #10	MOV #10,@RQUE
2979	016200				LET RQUE := RQUE + #2	ADD #2,RQUE
2980	016200	012777	000010	177400	IF RQUE GT #RQUEB THEN	
2981	016206					CMP RQUE,#RQUEB
2982	016206	062767	000002	177372	LET RQUE := #RQUET	BLE 50021\$
2983	016214				ENDIF	MOV #RQUET,RQUE
2984	016214	026727	177366	015622		
2985	016222	003403				
2986	016224					
2987	016224	012767	015610	177354		
2988	016232					
2989	016232					
2990						
2991					SET COUNTER FLAG TO -1 (MESSAGE SIZE COUNT COMPLETE)	
2992						
2993	016232				LET CNTFLG := #-1	
2994	016232	012767	177777	177342	ELSE	MOV #-1,CNTFLG
2995	016240					
2996	016240	000453				BR 50022\$
2997	016242					
2998						
2999					NOT FILL, SYNC OR ENQ. CHECK FOR SOH OR DLE (DDCMP DATA MESSAGE)	
3000						
3001	016242				IFB R1 EQ #SOH ORB R1 EQ #DLE THEN	
3002	016242	120127	000201			CMPB R1,#SOH
3003	016246	001403				BEQ 50023\$
3004	016250	120127	000220			CMPB R1,#DLE
3005	016254	001033				BNE 50024\$
3006	016256					
3007						
3008					MOVE QUEUE POINTER TO SIZE ENTRY AND SET COUNTER FLAG TO 1 (EXPECT FIRST COUNT BYTE)	
3009						
3010						
3011	016256				LET RTEMP1 := @RBQUE	
3012	016256	017767	177342	177312		MOV @RBQUE,RTEMP1

```

3013 016264
3014 016264 016777 177306 177314
3015 016272
3016 016272 110177 177300
3017 016276
3018 016276 005267 177274
3019 016302
3020 016302 062767 000002 177314
3021 016310
3022 016310 026727 177310 015632
3023 016316 003403
3024 016320
3025 016320 012767 015626 177276
3026 016326
3027 016326
3028 016326
3029 016326 062767 000002 177252
3030 016334
3031 016334 012767 000001 177240
3032 016342
3033 016342 000412
3034 016344
3035
3036
3037
3038
3039 016344
3040 016344 005367 177224
3041
3042
3043
3044 016350
3045 016350 016701 177200
3046 016354 162701 000002
3047 016360
3048 016360 042711 000020
3049 016364
3050 016364 052711 000120
3051 016370
3052 016370
3053 016370
3054 016370
3055
3056
3057
3058
3059 016370
3060 016370 005267 177200
3061 016374
3062 016374
3063
3064
3065
3066 016374
3067 016374 000512
3068 016376

LET @RQUE := RTEMP1
LET @RTEMP1 :B= R1
LET RTEMP1 := RTEMP1 + #1
LET RBQUE := RBQUE + #2
IF RBQUE GT #RBQUEB THEN
    LET RBQUE := #RBQUET
ENDIF
LET RQUE := RQUE + #2
LET CNTFLG := #1
ELSE
    LET NMSG := NMSG - #1
LET R1 := RCVADD - #2
LET (R1) := (R1) CLR.BY #RCENBL
LET (R1) := (R1) SET.BY #RXINTE
ENDIF
ENDIF
LET NMSG := NMSG + #1
ENDIF
ELSE
    SET THE NEW MESSAGE FLAG
    EXIT ROUTINE
    NEW MESSAGE FLAG IS SET... CONTINUE BUILDING MESSAGE
    ELSE

```

```

MOV RTEMP1,@RQUE
MOVB R1,@RTEMP1
INC RTEMP1
ADD #2,RBQUE
CMP RBQUE,#RBQUEB
BLE 50025$
MOV #RBQUET,RBQUE
50025$:
ADD #2,RQUE
MOV #1,CNTFLG
BR 50026$
50024$:
DEC NMSG
MOV RCVADD,R1
SUB #2,R1
BIC #RCENBL,(R1)
BIS #RXINTE,(R1)
50026$:
50022$:
50016$:
BR 50027$
50015$:

```

```
3069
3070      :NOT A NEW MESSAGE...GET BYTE AND STORE IT
3071      :
3072 016376      LET @RTEMP1 :B= R1
3073 016376 110177 177174      MOVB R1,@RTEMP1
3074      :
3075      : IF COUNTER FLAG IS GREATER THAN ZERO, BYTE IS ALSO THE FIRST COUNT BYTE
3076      :
3077 016402      IF CNTFLG GT #0 THEN
3078 016402 005767 177174      TST CNTFLG
3079 016406 003413      BLE 50030$
3080      :
3081      : PUT THE BYTE IN RTEMP2 (EXPECTED COUNT), UPDATE THE BUFFER POINTER
3082      : DECREMENT THE COUNTER FLAG (SET TO GET SECOND COUNT BYTE) AND
3083      : GO DO AN RTI
3084      :
3085 016410      LET RTEMP2 :B= @RTEMP1
3086 016410 117767 177162 177162      MOVB @RTEMP1,RTEMP2
3087 016416      LET RTEMP2 := RTEMP2 CLR.BY #HYBYTE
3088 016416 042767 177400 177154      BIC #HYBYTE,RTEMP2
3089 016424      LET RTEMP1 := RTEMP1 + #1
3090 016424 005267 177146      INC RTEMP1
3091 016430      LET CNTFLG := CNTFLG - #1
3092 016430 005367 177146      DEC CNTFLG
3093 016434      ELSE
3094 016434 000472      BR 50031$
3095 016436      50030$:
3096      :
3097      : COUNTER FLAG NOT GREATER THAN ZERO, IS IT ZERO?
3098      :
3099 016436      IF CNTFLG EQ #0 THEN
3100 016436 005767 177140      TST CNTFLG
3101 016442 001041      BNE 50032$
3102      :
3103      : IF ZERO, BYTE IS ALSO SECOND BYTE OF COUNT (6 HIGH ORDER BITS)
3104      : GET IT, MASK IT AND PUT IT INTO RTEMP2 (EXPECTED COUNT)
3105      :
3106 016444      PUSH R1
3107 016444 010146      MOV R1,-(SP)
3108 016446      LET R1 :B= @RTEMP1
3109 016446 117701 177124      MOVB @RTEMP1,R1
3110 016452      LET RTEMP1 := RTEMP1 + #1
3111 016452 005267 177120      INC RTEMP1
3112 016456      LET R1 := SWAP R1
3113 016456 000301      SWAB R1
3114 016460      LET R1 := R1 CLR.BY #140377
3115 016460 042701 140377      BIC #140377,R1
3116 016464      LET RTEMP2 := RTEMP2 + R1
3117 016464 060167 177110      ADD R1,RTEMP2
3118 016470      POP R1
3119 016470 012601      MOV (SP)+,R1
3120      :
3121      : PUT THE COMPLETE SIZE IN THE QUEUE (EXPECTED COUNT +
3122      : 12 (OCTAL) BYTES OF HEADER AND CRC)
3123      :
3124 016472      LET @RQUE := RTEMP2
```

3125	016472	016777	177102	177106		MOV	RTEMP2,@RQUE
3126	016500				LET @RQUE := @RQUE + #12		
3127	016500	062777	000012	177100		ADD	#12,@RQUE
3128							
3129					ADJUST EXPECTED COUNT TO INCLUDE THE REMAINDER OF THE HEADER AND THE DATA CRC		
3130							
3131							
3132	016506				LET RTEMP2 := RTEMP2 + #7		
3133	016506	062767	000007	177064		ADD	#7,RTEMP2
3134							
3135					UPDATE THE QUEUE AND DECREMENT THE COUNTER FLAG (COUNT COMPLETE)		
3136							
3137	016514				LET RQUE := RQUE + #2		
3138	016514	062767	000002	177064		ADD	#2,RQUE
3139	016522				IF RQUE GT #RQUEB THEN		
3140	016522	026727	177060	015622		CMP	RQUE,#RQUEB
3141	016530	003403				BLE	50033\$
3142	016532				LET RQUE := #RQUET		
3143	016532	012767	015610	177046		MOV	#RQUET,RQUE
3144	016540				ENDIF		
3145	016540						50033\$:
3146	016540				LET CNTFLG := CNTFLG - #1		
3147	016540	005367	177036			DEC	CNTFLG
3148							
3149					GO DO AN RTI		
3150							
3151	016544				ELSE		
3152	016544	000426					
3153	016546						50032\$:
3154							
3155					COUNTER FLAG IS LESS THAN ZERO... THIS IS A DATA BYTE		
3156					UPDATE POINTER AND COUNT		
3157							
3158	016546				LET RTEMP1 := RTEMP1 + #1		
3159	016546	005267	177024			INC	RTEMP1
3160	016552				LET RTEMP2 := RTEMP2 - #1		
3161	016552	005367	177022			DEC	RTEMP2
3162							
3163					IF COUNT HAS REACHED ZERO, END OF MESSAGE. SET DONE FLAG.		
3164	016556				IF RTEMP2 EQ #0 THEN		
3165	016556	005767	177016			TST	RTEMP2
3166	016562	001017				BNE	50035\$
3167	016564				LET RDONE := RDONE + #1		
3168	016564	005267	176316			INC	RDONE
3169							
3170					FORCE DUP TO RESTART RECEPTION		
3171							
3172	016570				LET R1 := RCVADD - #2		
3173	016570	016701	176760			MOV	RCVADD,R1
3174	016574	162701	000002			SUB	#2,R1
3175	016600				LET RCVCSR(R1) := RCVCSR(R1) CLR.BY #RCENBL		
3176	016600	042761	000020	000000		BIC	#RCENBL,RCVCSR(R
3177	016606				LET RCVCSR(R1) := RCVCSR(R1) SET.BY #RCENBL		
3178	016606	052761	000020	000000		BIS	#RCENBL,RCVCSR(R
3179							
3180					ABORT ANY WAITS AND RESET NEW MESSAGE FLAG		

```
3181      :
3182 016614      :
3183 016614 104021      :
3184 016616      :
3185 016616 005067 176752      :
3186 016622      :
3187 016622      :
3188 016622      :
3189 016622      :
3190 016622      :
3191 016622      :
3192 016622      :
3193 016622      :
3194      :
3195      :
3196      :
3197 016622      :
3198 016622 012601      :
3199 016624      :
3200 016624      :
3201 016624 000002      :
3202      :
3203      :
3204      :
3205      :
3206      :
3207      :
3208      :
3209      :
3210      :
3211      :
3212      :
3213      :
3214      :
3215      :
3216      :
3217 016626      :
3218 016626      :
3219      :
3220      :
3221      :
3222 016626      :
3223 016626 005067 176724      :
3224      :
3225      :
3226      :
3227 016632      :
3228 016632      :
3229 016632      :
3230 016632 012700 000100      :
3231 016636 104027      :
3232 016640      :
3233 016640 005267 176712      :
3234      :
3235      :
3236      :
```

ABORTWAIT
LET NMSG := #0
EMT CSABRT
CLR NMSG
50035\$:
50034\$:
50031\$:
50027\$:
DO RTI
POP R1
MOV (SP)+,R1
REXIT: ENDSRV
L10030:
RTI

ROUTINE TO GET AN INPUT BUFFER FROM THE INPUT QUEUES
WILL RETURN AN ERROR IF TERMINAL DOES NOT RESPOND
ARGUMENT (IF SET) INHIBITS ERROR PRINTOUT. THIS ALLOWS
THE PROGRAM TO RETRY THE STRT-STACK SEQUENCE WITHOUT HAVING
AN ERROR MESSAGE EACH TIME

ROUTINE RCVE ;[3.2.1.1, 3.2.20.2 AND 3.2.20.8]
RCVE:

RESET TIMER
LET TIMER := #0
CLR TIMER
GO TO SUPERVISOR FOR AWHILE AND INCREMENT TIMER
REPEAT
WAITUS #100 ;[3.2.1.1.4, 3.2.20.2.4, 3.2.20.8.4]
MOV #100,R0
EMT CSWTU
LET TIMER := TIMER + #1
INC TIMER
LOOP UNTIL TIME LIMIT EXCEEDED OR RECEIVER DONE FLAG IS SET


```

3237 016644 UNTIL TIMER GT TIMLIM OR RDONE NE #0
3238 016644 026767 176706 163246 CMP TIMER,TIMLIM
3239 016652 003003 BGT 50003$
3240 016654 005767 176226 TST RDONE
3241 016660 001764 BEQ 50002$
3242 016662 50003$:
3243
3244 ;RESET THE NEW MESSAGE FLAG
3245 ;
3246 016662 LET NMSG := #0
3247 016662 005067 176706 CLR NMSG
3248
3249 ;IF THE TIME LIMIT WASN'T EXCEEDED...
3250 ;
3251 016666 IF TIMER LT TIMLIM THEN
3252 016666 026767 176664 163224 CMP TIMER,TIMLIM
3253 016674 002044 BGE 50004$
3254
3255 ;RESET THE TIMER
3256 ;CHECK FOR ERROR (RDONE LESS THAN ZERO)
3257 ;
3258 016676 LET TIMER := #0
3259 016676 005067 176654 CLR TIMER
3260 016702 IF RDONE GT #0 THEN
3261 016702 005767 176200 TST RDONE
3262 016706 003426 BLE 50005$
3263
3264 ; NOT ERROR, GET BUFFER ADDRESS AND SIZE FROM QUEUE AND UPDATE QUEUE
3265 ;
3266 016710 LET INBUF := @RQUEUE
3267 016710 017767 176670 163240 MOV @RQUEUE,INBUF
3268 016716 LET RQUEUE := RQUEUE + #2
3269 016716 062767 000002 176660 ADD #2,RQUEUE
3270 016724 LET INSIZ := @RQUEUE
3271 016724 017767 176654 163226 MOV @RQUEUE,INSIZ
3272 016732 LET RQUEUE := RQUEUE + #2
3273 016732 062767 000002 176644 ADD #2,RQUEUE
3274 016740 IF RQUEUE GT #RQUEB THEN
3275 016740 026727 176640 015622 CMP RQUEUE,#RQUEB
3276 016746 003403 BLE 50006$
3277 016750 LET RQUEUE := #RQUET
3278 016750 012767 015610 176626 MOV #RQUET,RQUEUE
3279 016756 ENDF
3280 016756 50006$:
3281
3282 ;RESET DONE FLAG AND LEAVE
3283 ;
3284 016756 LET RDONE := #0
3285 016756 005067 176124 CLR RDONE
3286 016762 ELSE
3287 016762 000410 BR 50007$
3288 016764 50005$:
3289
3290 ;ERROR DID OCCUR...RESET THE DONE FLAG, REPORT ERROR, RETURN WITH ERROR
3291 ;
3292 016764 ERRHRD 26,MSG26,AREA26

```



```
3349 017102          ENDRTN
3350 017102
3351 017102 000241          50000$: CLC
3352 017104          50001$: RTS      PC
3353 017104 000207
3354
3355
3356
3357
3358
3359
3360
3361
3362
3363
3364 017106          *****
3365 017106          DUMMY ROUTINE FOR COMPATIBILITY
3366 017106          *****
3367 017106          ROUTINE INSERR <A>
3368 017106          ENDRTN          INSERR:
3369 017106 000207          50000$:
3370                                50001$: RTS      PC
3371
3372
3373
3374
3375
3376
3377
3378
3379
3380
3381
3382
3383
3384
3385
3386
3387 017110          *****
3388 017110          THIS ROUTINE COMPUTES CRC-16 AND REQUIRES THREE ARGUMENTS:
3389 017110          DATA ADDRESS, DATA SIZE (IN BYTES) AND A WORD LOCATION
3390 017110          FOR THE COMPUTED CRC
3391 017110          [3.2.1.2.1, 3.2.1.2.4, 3.2.20.1.2, 3.2.20.3.1,
3392 017110 010446          3.2.20.6.2, 3.2.20.6.4 AND 3.2.20.10.1]
3393 017112 010604          THIS IS A STANDARD ROUTINE FROM DEC'S NETWORK GROUP
3394 017114 162706 000004          *****
3395 017120          ROUTINE CRC <A,B,C>
3396 017120 010146          DECLARE LOCALS          CRC:
3397 017122          LOCAL<D,E>
3398 017122 010246          ALLOCATE
3399 017124          PUSH R1          MOV      R4,-(SP)
3400 017124 010346          PUSH R2          MOV      SP,R4
3401 017126          PUSH R3          SUB      #4,SP
3402 017126 016501 000000          MOV      R1,-(SP)
3403 017132          LET R1 := A(R5)          MOV      R2,-(SP)
3404 017132 016502 000002          LET R2 := B(R5)          MOV      R3,-(SP)
                                    MOV      A(R5),R1
                                    MOV      B(R5),R2
```

3405	017136			LET R3 := #0			
3406	017136	005003				CLR	R3
3407	017140			WHILE R2 GT #0 DO			
3408	017140					50002\$:	
3409	017140	005702				TST	R2
3410	017142	003500				BLE	50003\$
3411	017144			LET D(R4) := B(R1)+		MOVB	(R1)+,D(R4)
3412	017144	112164	177776	LET D(R4) := D(R4) CLR.BY #HYBYTE		BIC	#HYBYTE,D(R4)
3413	017150			LET R2 := R2 - #1		DEC	R2
3414	017150	042764	177400 177776	LET D(R4) := D(R4) XOR R3		MOV	R3,-(SP)
3415	017156	005302				BIC	D(R4),(SP)
3416	017156					BIC	R3,D(R4)
3417	017160					BIS	(SP)+,D(R4)
3418	017160	010346		LET E(R4) := D(R4)		MOV	D(R4),E(R4)
3419	017162	046416	177776	LET D(R4) := D(R4) CLR.BY #177760		BIC	#177760,D(R4)
3420	017166	040364	177776	LET D(R4) := D(R4) SHIFT #1		ASL	D(R4)
3421	017172	052664	177776	LET D(R4) := D(R4) + #CRCTAB		ADD	#CRCTAB,D(R4)
3422	017176			LET D(R4) := @D(R4)		MOV	@D(R4),D(R4)
3423	017176	016464	177776 177774	LET E(R4) := E(R4) CLR.BY #177417		BIC	#177417,E(R4)
3424	017204			LET E(R4) := E(R4) SHIFT -3		ASR	E(R4)
3425	017204	042764	177760 177776			ASR	E(R4)
3426	017212					ASR	E(R4)
3427	017212	006364	177776	LET E(R4) := E(R4) + #CRCTAB		ADD	#CRCTAB,E(R4)
3428	017216			LET E(R4) := E(R4) + #32.		ADD	#32.,E(R4)
3429	017216	062764	017364 177776	LET E(R4) := @E(R4)		MOV	@E(R4),E(R4)
3430	017224			LET D(R4) := D(R4) XOR E(R4)		MOV	E(R4),-(SP)
3431	017224	017464	177776 177776			BIC	D(R4),(SP)
3432	017232					BIC	E(R4),D(R4)
3433	017232	042764	177417 177774	LET R3 := R3 CLR.BY #LOBYTE		BIS	(SP)+,D(R4)
3434	017240			LET R3 := SWAP R3		BIC	#LOBYTE,R3
3435	017240	006264	177774	LET R3 := R3 XOR D(R4)		SWAB	R3
3436	017244	006264	177774			MOV	D(R4),-(SP)
3437	017250	006264	177774			BIC	R3,(SP)
3438	017254					BIC	D(R4),R3
3439	017254	062764	017364 177774			BIS	(SP)+,R3
3440	017262			ENDDO		BR	50002\$
3441	017262	062764	000040 177774				
3442	017270						
3443	017270	017464	177774 177774				
3444	017276						
3445	017276	016446	177774				
3446	017302	046416	177776				
3447	017306	046464	177774 177776				
3448	017314	052664	177776				
3449	017320						
3450	017320	042703	000377				
3451	017324						
3452	017324	000303					
3453	017326						
3454	017326	016446	177776				
3455	017332	040316					
3456	017334	046403	177776				
3457	017340	052603					
3458	017342						
3459	017342	000676					
3460	017344						

50003\$:

3461	017344		LET C(R5) := R3		
3462	017344	010365			MOV R3,C(R5)
3463	017350		POP R3		
3464	017350	012603			MOV (SP)+,R3
3465	017352		POP R2		
3466	017352	012602			MOV (SP)+,R2
3467	017354		POP R1		
3468	017354	012601			MOV (SP)+,R1
3469	017356		ENDRTN		
3470	017356				50000\$:
3471	017356				50001\$:
3472	017356	010406			MOV R4,SP
3473	017360	012604			MOV (SP)+,R4
3474	017362	000207			RTS PC
3475					
3476	017364	000000	CRCTAB: 000000		
3477	017366	140301	140301		
3478	017370	140601	140601		
3479	017372	000500	000500		
3480	017374	141401	141401		
3481	017376	001700	001700		
3482	017400	001200	001200		
3483	017402	141101	141101		
3484	017404	143001	143001		
3485	017406	003300	003300		
3486	017410	003600	003600		
3487	017412	143501	143501		
3488	017414	002400	002400		
3489	017416	142701	142701		
3490	017420	142201	142201		
3491	017422	002100	002100		
3492	017424	000000	000000		
3493	017426	146001	146001		
3494	017430	154001	154001		
3495	017432	012000	012000		
3496	017434	170001	170001		
3497	017436	036000	036000		
3498	017440	024000	024000		
3499	017442	162001	162001		
3500	017444	120001	120001		
3501	017446	066000	066000		
3502	017450	074000	074000		
3503	017452	132001	132001		
3504	017454	050000	050000		
3505	017456	116001	116001		
3506	017460	104001	104001		
3507	017462	042000	042000		
3508	017464		ENDMOD		


```

3565
3566      ;LOOK FOR ACK
3567      ;
3568      017552      CALL TERIN OUT <MCOMP>
3569      017552      162705 000002      SUB      #1*2,R5
3570      017556      004767 174010      JSR      PC,TERIN
3571      017562      012567 000674      MOV      (R5)+,MCOMP
3572
3573      ;IF ERROR...INSERT ERROR INTO TABLE (MANUFACTURING TEST ONLY)
3574      ;REPORT THE ERROR, REQUEST LOOP IF ENABLED (EXIT TEST
3575      ;IF NO LOOPING)
3576      ;
3577      017566      IF.ERROR THEN
3578      017566      103015      BCC      50005$
3579      017570      CALL INSERR IN <#0>
3580      017570      010546      MOV      R5,-(SP)
3581      017572      012745 000000      MOV      #0,-(R5)
3582      017576      004767 177304      JSR      PC,INSERR
3583      017602      012605      MOV      (SP)+,R5
3584      017604      ERRHRD 50,MSG50,AREA40
3585      017604      104463      TRAP    T$ERCODE
3586      017606      000062      .WORD  50
3587      017610      003447      .WORD  MSG50
3588      017612      004242      .WORD  AREA40
3589      017614      CKLOOP
3590      017614      104006      EMT     C$CLP1
3591      017616      EXIT TST
3592      017616      104032      EMT     C$EXIT
3593      017620      000342      .WORD  L10031-
3594      017622      ENDIF
3595      017622      50005$:
3596
3597      ;IF MESSAGE WAS NOT AN ACK...ERROR
3598      ;REPORT ERROR, LOOP IF ENABLED, EXIT TEST IF NOT
3599      ;
3600      017622      IF MCOMP NE #0 THEN
3601      017622      005767 000634      TST     MCOMP
3602      017626      001407      BEQ     50006$
3603      017630      ERRHRD 50,MSG50,AREA40
3604      017630      104463      TRAP    T$ERCODE
3605      017632      000062      .WORD  50
3606      017634      003447      .WORD  MSG50
3607      017636      004242      .WORD  AREA40
3608      017640      CKLOOP
3609      017640      104006      EMT     C$CLP1
3610      017642      EXIT TST
3611      017642      104032      EMT     C$EXIT
3612      017644      000316      .WORD  L10031-
3613      017646      ENDIF
3614      017646      50006$:
3615
3616      ;FORCE A RESTART ON THE LINK AND WAIT FOR SELFTST TO COMPLETE
3617      ;
3618      017646      LET INIT := #0
3619      017646      005067 175712      CLR     INIT
3620      017652      LET SCRTOH := #0

```

3621	017652	005067	162234			CLR	SCRTCM
3622	017656			REPEAT			
3623	017656				50007\$:		
3624	017656			WAITUS #100			
3625	017656	012700	000100			MOV	#100,R0
3626	017662	104027				EMT	C\$WTU
3627	017664			LET SCRTCM := SCRTCM + #1			
3628	017664	005267	162222			INC	SCRTCM
3629	017670			UNTIL SCRTCM GT STWAIT			
3630	017670	026767	162216	171776		CMP	SCRTCM,STWAIT
3631	017676	003767				BLE	50007\$
3632							
3633				...SET UP MESSAGE ASKING FOR RESULTS AND SEND IT			
3634				...			
3635	017700			LET OUTMSG := MDMSG1 CLR.BY #100001			
3636	017700	016767	000570	162234		MOV	MDMSG1,OUTMSG
3637	017706	042767	100001	162226		BIC	#100001,OUTMSG
3638	017714			LET OUTMSG+2 := MDMSG1+2			
3639	017714	016767	000556	162222		MOV	MDMSG1+2,OUTMSG+
3640	017722			CALL TEROUT			
3641	017722	004767	172562			JSR	PC,TEROUT
3642							
3643				...IF ERROR....INSERT ERROR IN TABLE (MANUF. TESTS ONLY), REPORT ERROR,			
3644				...LOOP IF ENABLED, EXIT TEST IF NO LOOPING			
3645				...			
3646	017726			IF.ERROR THEN			
3647	017726	103015				BCC	50010\$
3648	017730			CALL INSERR IN <#0>			
3649	017730	010546				MOV	R5,-(SP)
3650	017732	012745	000000			MOV	#0,-(R5)
3651	017736	004767	177144			JSR	PC,INSERR
3652	017742	012605				MOV	(SP)+,R5
3653	017744			ERRHRD 50,MSG50,AREA40			
3654	017744	104463				TRAP	T\$ERCODE
3655	017746	000062				.WORD	50
3656	017750	003447				.WORD	MSG50
3657	017752	004247				.WORD	AREA40
3658	017754			CKLOOP			
3659	017754	104006				EMT	C\$CLP1
3660	017756			EXIT TST			
3661	017756	104032				EMT	C\$EXIT
3662	017760	000202				.WORD	L10031-
3663	017762			ENDIF			
3664	017762				50010\$:		
3665				...			
3666				...ACK TERMINAL AND GET ITS RESPONSE			
3667				...			
3668	017762			REPEAT			
3669	017762				50011\$:		
3670				...			
3671				...GET THE RESPONSE			
3672				...			
3673	017762			CALL TERIN OUT <MCOMP>			
3674	017762	162705	000002			SUB	#1+2,R5
3675	017766	004767	173600			JSR	PC,TERIN
3676	017772	012567	000464			MOV	(R5)+,MCOMP


```

3677
3678
3679
3680 017776
3681 017776 103015
3682 020000
3683 020000 010546
3684 020002 012745 000000
3685 020006 004767 177074
3686 020012 012605
3687 020014
3688 020014 104463
3689 020016 000062
3690 020020 003447
3691 020022 004242
3692 020024
3693 020024 104006
3694 020026
3695 020026 104032
3696 020030 000132
3697 020032
3698 020032
3699 020032
3700 020032 005767 000424
3701 020036 001026
3702 020040
3703 020040 004767 000120
3704
3705
3706
3707 020044
3708 020044 103023
3709 020046
3710 020046 010546
3711 020050 012745 000000
3712 020054 004767 177026
3713 020060 012605
3714 020062
3715 020062 010546
3716 020064 012745 000001
3717 020070 004767 177012
3718 020074 012605
3719 020076
3720 020076 104463
3721 020100 000062
3722 020102 003447
3723 020104 004242
3724 020106
3725 020106 104006
3726 020110
3727 020110 104032
3728 020112 000050
3729 020114
3730 020114
3731 020114
3732 020114

```

HANDLE ERROR IF ONE OCCURED.

IF.ERROR THEN

CALL INSERR IN <#0>

ERRHRD 50,MSG50,AREA40

CKLOOP

EXIT TST

ENDIF

IF MCOMP EQ #0 THEN

CALL OUTREP

HANDLE ERROR IF ONE OCCURED WHILE ACK'ING

IF.ERROR THEN

CALL INSERR IN <#0>

CALL INSERR IN <#1>

ERRHRD 50,MSG50,AREA40

CKLOOP

EXIT TST

ENDIF

ENDIF

```

BCC 50012$
MOV R5,-(SP)
MOV #0,-(R5)
JSR PC,INSERR
MOV (SP)+,R5
TRAP T$ERCODE
.WORD 50
.WORD MSG50
.WORD AREA40
EMT C$CLP1
EMT C$EXIT
.WORD L10031-

```

50012\$:

```

TST MCOMP
BNE 50013$
JSR PC,OUTREP

```

```

BCC 50014$
MOV R5,-(SP)
MOV #0,-(R5)
JSR PC,INSERR
MOV (SP)+,R5
MOV R5,-(SP)
MOV #1,-(R5)
JSR PC,INSERR
MOV (SP)+,R5

```

```

TRAP T$ERCODE
.WORD 50
.WORD MSG50
.WORD AREA40
EMT C$CLP1
EMT C$EXIT
.WORD L10031-

```

50014\$:

50013\$:

```
3733
3734      ; REPEAT THE LOOP UNTIL A MESSAGE IS RECEIVED
3735      ;
3736 020114      UNTIL MCOMP NE #0
3737 020114 005767 000342
3738 020120 001720
3739      ;
3740      ; PROCESS THE MESSAGE RECEIVED
3741      ;
3742 020122      CALL STINPT
3743 020122 004767 000146
3744      ;
3745      ; IF IN ERROR...INSERT ERROR INTO TABLE (MANUF.TESTS ONLY, REPORT
3746      ; ERROR, LOOP IF ENABLED, EXIT TEST IF NOT
3747      ;
3748      ; IF .ERROR THEN
3749 020126 103015
3750 020130      CALL INSERR IN <#1>
3751 020130 010546
3752 020132 012745 000001
3753 020136 004767 176744
3754 020142 012605
3755 020144      ERRHRD 50,MSG50,AREA40
3756 020144 104463
3757 020146 000062
3758 020150 003447
3759 020152 004242
3760 020154      CKLOOP
3761 020154 104006
3762 020156      EXIT TST
3763 020156 104032
3764 020160 000002
3765 020162
3766 020162      ENDIF
3767
3768      ;
3769      ; END OF TEST
3770 020162      ENDTST
3771 020162
3772 020162 104001
3773
3774
3775
3776
3777
3778
3779      ;
3780      ; *****
3781      ; ROUTINE TO SEND AND ACK IN ORDER TO POLL A TERMINAL
3782      ; *****
3783 020164      ROUTINE OUTREP
3784 020164
3785
3786      ;
3787      ; INSERT MESSAGE NUMBER (LAST MESSAGE SENT) AND RESPONSE NUMBER
3788      ; (LAST MESSAGE RECEIVED)....INSERT STATION ADDRESS
3789      ;
```

50015\$:

L10031:

OUTREP:

```

3789 020164          LET MSGN :B= MSGNO
3790 020164 116767 162004 000316          MOVB  MSGNO,MSGN
3791 020172          LET REPN :B= RMSGNO
3792 020172 116767 162000 000307          MOVB  RMSGNO,REPN
3793 020200          LET REPA :B= STRTSA
3794 020200 116767 163451 000303          MOVB  STRTSA,REPA
3795
3796          : COMPUTE AND INSERT CRC
3797          :
3798 020206          CALL CRC IN <#REPM,#6> OUT <REPCRC>
3799 020206 162705 000002          SUB   #1*2,R5
3800 020212 010546          MOV   R5,-(SP)
3801 020214 012745 000006          MOV   #6,-(R5)
3802 020220 012745 020504          MOV   #REPM,-(R5)
3803 020224 004767 176660          JSR  PC,CRC
3804 020230 012605          MOV   (SP)+,R5
3805 020232 012567 000254          MOV   (R5)+,REPCRC
3806
3807          : SET UP BUFFER POINTER AND SIZE AND SEND THE MESSAGE
3808          :
3809 020236          LET XBUFFER := #REPM
3810 020236 012767 020504 175324          MOV   #REPM,XBUFFER
3811 020244          LET XSIZE := #10
3812 020244 012767 000010 175320          MOV   #10,XSIZE
3813 020252          CALL XMIT
3814 020252 004767 174316          JSR  PC,XMIT
3815
3816          : IF AN ERROR OCCURRED, RETURN WITH ERROR. OTHERWISE RETURN NORMALLY
3817          :
3818 020256          IF.ERROR THEN
3819 020256 103004          BCC   50002$
3820 020260          LET OUTERR := OUTERR + #1
3821 020260 005267 161644          INC   OUTERR
3822 020264          RETURN ERROR
3823 020264 000261          SEC
3824 020266 000401          BR   50001$
3825 020270          ENDIF
3826 020270          50002$:
3827 020270          ENDRTN
3828 020270          50000$:
3829 020270 000241          CLC
3830 020272          50001$:
3831 020272 000207          RTS  PC
3832
3833
3834
3835
3836
3837          :
3838          : *****
3839          : ROUTINE TO PROCESS TERMINAL SELFTEST RESULTS
3840          : *****
3841          :
3842 020274          ROUTINE STINPT
3843 020274          STINPT:
3844 020274          PUSH R1

```

3845	020274	010146			MOV	R1,-(SP)
3846	020276			PUSH R2		
3847	020276	010246			MOV	R2,-(SP)
3848	020300			PUSH R3		
3849	020300	010346			MOV	R3,-(SP)
3850				:		
3851				:SKIP RESPONSE HEADER AND CHECK FIRST DATA BYTE		
3852				:		
3853	020302			LET R1 := INBUF + #4		
3854	020302	016701	161650		MOV	INBUF,R1
3855	020306	062701	000004		ADD	#4,R1
3856				:		
3857				:IF IT IS "A", GOOD RESPONSE. OTHERWISE...		
3858				:		
3859	020312			IFB (R1) NE #101 THEN		
3860	020312	121127	000101		CMPB	(R1),#101
3861	020316	001454			BEQ	50C02\$
3862				:		
3863				:GET THE BYTE AND CHECK TO SEE IF IT IS "M" (MEMORY ERROR)		
3864				:		
3865	020320			LET R3 :B= (R1)+		
3866	020320	112103			MOVB	(R1)+,R3
3867	020322			IFB R3 EQ #115 THEN		
3868	020322	120327	000115		CMPB	R3,#115
3869	020326	001025			BNE	50003\$
3870				:		
3871				:MEMORY ERROR...GET THE TYPE AND BANK NUMBER		
3872				:INSERT INTO ERROR MESSAGE, REPORT THE ERROR AND		
3873				:RETURN WITH ERROR		
3874				: (NOTE: ERROR REPORTING PROTOCOL DELIMITERS ARE		
3875				: IGNORED. THIS PROGRAM WILL NOT ACCEPT INPUT FROM		
3876				: ANY OTHER INTELLIGENT TERMINAL PROPERLY.)		
3877				:		
3878	020330			LET R1 := R1 + #2		
3879	020330	062701	000002		ADD	#2,R1
3880	020334			LET R2 := #MTY		
3881	020334	012702	003615		MOV	#MTY,R2
3882	020340			LET (R2)+ :B= (R1)+		
3883	020340	112122			MOVB	(R1)+,(R2)+
3884	020342			LET (R2)+ :B= (R1)+		
3885	020342	112122			MOVB	(R1)+,(R2)+
3886	020344			LET R2 := #BNO		
3887	020344	012702	003631		MOV	#BNO,R2
3888	020350			LET R1 := R1 + #1		
3889	020350	005201			INC	R1
3890	020352			LET R3 :B= (R1)		
3891	020352	111103			MOVB	(R1),R3
3892	020354			LET R3 := R3 + #60		
3893	020354	062703	000060		ADD	#60,R3
3894	020360			LET (R2) :B= R3		
3895	020360	110312			MOVB	R3,(R2)
3896	020362			ERRHRD 71,MSG71		
3897	020362	104423			TRAP	T\$ERCODE
3898	020364	000107			.WORD	71
3899	020366	003571			.WORD	MSG71
3900	020370			POP R3		

```

3901 020370 012603                                MOV      (SP)+,R3
3902 020372                                POP R2
3903 020372 012602                                MOV      (SP)+,R2
3904 020374                                POP R1
3905 020374 012601                                MOV      (SP)+,R1
3906 020376                                RETURN ERROR
3907 020376 000261                                SEC
3908 020400 000427                                BR      50001$
3909 020402                                ELSE
3910 020402                                50003$:
3911
3912      :
3913      : NOT A MEMORY ERROR OR PASS...CHECK FOR "P" (PROCESSOR ERROR)
3914      :
3914 020402                                IFB R3 EQ #120 THEN
3915 020402 120327 000120                                CMPB    R3,#120
3916 020406 001010                                BNE    50005$
3917
3918      :
3919      : PROCESSOR ERROR...REPORT IT AND EXIT WITH ERROR
3920      :
3920 020410                                ERRHRD 72,MSG72
3921 020410 104423                                TRAP    T$ERCODE
3922 020412 000110                                .WORD  72
3923 020414 003634                                .WORD  MSG72
3924 020416                                POP R3
3925 020416 012603                                MOV      (SP)+,R3
3926 020420                                POP R2
3927 020420 012602                                MOV      (SP)+,R2
3928 020422                                POP R1
3929 020422 012601                                MOV      (SP)+,R1
3930 020424                                RETURN ERROR
3931 020424 000261                                SEC
3932 020426 000414                                BR      50001$
3933 020430                                ELSE
3934 020430                                50005$:
3935
3936      :
3937      : RESPONSE WAS NOT LEGAL...REPORT IT AND RETURN WITH ERROR
3938      :
3938 020430                                ERRHRD 70,MSG70
3939 020430 104423                                TRAP    T$ERCODE
3940 020432 000106                                .WORD  70
3941 020434 003536                                .WORD  MSG70
3942 020436                                POP R3
3943 020436 012603                                MOV      (SP)+,R3
3944 020440                                POP R2
3945 020440 012602                                MOV      (SP)+,R2
3946 020442                                POP R1
3947 020442 012601                                MOV      (SP)+,R1
3948 020444                                RETURN ERROR
3949 020444 000261                                SEC
3950 020446 000404                                BR      50001$
3951 020450                                ENDIF
3952 020450                                50006$:
3953 020450                                ENDIF
3954 020450                                50004$:
3955 020450                                ENDIF
3956 020450                                50002$:

```


4069	020636	012701	022012			MOV	#LOOPB,R1
4070	020642	005301				DEC	R1
4071	020644			LET (R1) :B= #1			
4072	020644	112711	00000i			MOVB	#1,(R1)
4073							
4074				:GET THE STATION ADDRESS AND INSERT IT IN THE HEADER			
4075							
4076	020650			LET R1 := #PTABLE + #5			
4077	020650	012701	002200			MOV	#PTABLE,R1
4078	020654	062701	000005			ADD	#5,R1
4079	020660			LET LOOSTA :B= (R1)			
4080	020660	111167	000523			MOVB	(R1),LOOSTA
4081	020664			POP R1			
4082	020664	012601				MOV	(SP)+,R1
4083							
4084				:INSERT LOOP DATA TYPE			
4085							
4086	020666			LET LOOPB :B= #OSOP			
4087	020666	112767	000030 0005,16			MOVB	#OSOP,LOOPB
4088							
4089				:SET MESSAGE NUMBER			
4090							
4091	020674			LET LOOPN :B= #1			
4092	020674	112767	000001 000504			MOVB	#1,LOOPN
4093							
4094				:COMPUTE AND INSERT HEADER CRC			
4095							
4096	020702			CALL CRC IN <#LOOPH,#6> OUT <LCRCH>			
4097	020702	162705	000002			SUB	#1*2,R5
4098	020706	010546				MOV	R5,-(SP)
4099	020710	012745	000006			MOV	#6,-(R5)
4100	020714	012745	021402			MOV	#LOOPH,-(R5)
4101	020720	004767	176164			JSR	PC,CRC
4102	020724	012605				MOV	(SP)+,R5
4103	020726	012567	000456			MOV	(R5)+,LCRCH
4104							
4105				:COMPUTE AND INSERT DATA CRC			
4106							
4107	020732			CALL CRC IN <#LOOPB,#256.> OUT <LCRCD>			
4108	020732	162705	000002			SUB	#1*2,R5
4109	020736	010546				MOV	R5,-(SP)
4110	020740	012745	000400			MOV	#256,-(R5)
4111	020744	012745	021412			MOV	#LOOPB,-(R5)
4112	020750	004767	176134			JSR	PC,CRC
4113	020754	012605				MOV	(SP)+,R5
4114	020756	012567	001030			MOV	(R5)+,LCRCD
4115							
4116				:SET UP BUFFER POINTER AND SIZE....SEND MESSAGE			
4117							
4118	020762			LET XBUFFER := #LOOPH			
4119	020762	012767	021402 174600			MOV	#LOOPH,XBUFFER
4120	020770			LET XSIZE := #266.			
4121	020770	012767	000412 174574			MOV	#266.,XSIZ
4122	020776			CALL XMIT			
4123	020776	004767	173572			JSR	PC,XMIT
4124							


```

4125 ;IF ERROR OCCURRED...INSERT THE ERROR INTO TABLE (MANUF. TESTS ONLY),
4126 ;REPORT THE ERROR, LOOP IF ENABLED
4127 ;
4128 IF.ERROR THEN
4129     021002 103012
4130     021004          CALL INSERR IN <#0>
4131     021004 010546          MOV     R5,-(SP)
4132     021006 012745 000000          MOV     #0,-(R5)
4133     021012 004767 176070          JSR    PC,INSERR
4134     021016 012605          MOV     (SP)+,R5
4135     021020          ERRHRD 51,MSG51,AREA40
4136     021020 104463          TRAP   T$ERCODE
4137     021022 000063          .WORD  51
4138     021024 003475          .WORD  MSG51
4139     021026 004242          .WORD  AREA40
4140     021030          ENDIF
4141     021030          CKLOOP
4142     021030          50013$:
4143     021030 104006          EMT    C$CLP1
4144 ;
4145 ;SEND ACK'S TO TERMINAL UNTIL IT RESPONDS
4146 ;
4147     021032          REPEAT
4148     021032          50014$:
4149 ;
4150 ;GET RESPONSE
4151 ;
4152     021032          CALL TERIN OUT <LCOMP>
4153     021032 162705 000002          SUB     #1*2,R5
4154     021036 004767 172530          JSR    PC,TERIN
4155     021042 012567 000326          MOV     (R5)+,LCOMP
4156 ;
4157 ;IF ERROR OCCURS...INSERT IN TABLE (MAN. ONLY), REPORT IT, LOOP IF
4158 ;ENABLED, EXIT TEST IF NOT
4159 ;
4160 IF.ERROR THEN
4161     021046 103012
4162     021050          CALL INSERR IN <#0>
4163     021050 010546          MOV     R5,-(SP)
4164     021052 012745 000000          MOV     #0,-(R5)
4165     021056 004767 176024          JSR    PC,INSERR
4166     021062 012605          MOV     (SP)+,R5
4167     021064          ERRHRD 51,MSG51,AREA40
4168     021064 104463          TRAP   T$ERCODE
4169     021066 000063          .WORD  51
4170     021070 003475          .WORD  MSG51
4171     021072 004242          .WORD  AREA40
4172     021074          ENDIF
4173     021074          CKLOOP
4174     021074          50015$:
4175     021074 104006          EMT    C$CLP1
4176     021076          IF LCOMP EQ #0 THEN
4177     021076 005767 000272          TST    LCOMP
4178     021102 001026          BNE    50016$
4179     021104          CALL OUTREP
4180     021104 004767 177054          JSR    PC,OUTREP

```

```

4181
4182
4183
4184
4185 021110
4186 021110 103023
4187 021112
4188 021112 010546
4189 021114 012745 000000
4190 021120 004767 175762
4191 021124 012605
4192 021126
4193 021126 010546
4194 021130 012745 000002
4195 021134 004767 175746
4196 021140 012605
4197 021142
4198 021142 104463
4199 021144 000063
4200 021146 003475
4201 021150 004242
4202 021152
4203 021152 104006
4204 021154
4205 021154 104032
4206 021156 000074
4207 021160
4208 021160
4209 021160
4210 021160
4211
4212
4213
4214 021160
4215 021160 005767 000210
4216 021164 001722
4217
4218
4219
4220 021166
4221 021166 004767 000062
4222 021172
4223 021172 104004
4224
4225
4226
4227 021174
4228 021174 005067 174364
4229 021200
4230 021200 004767 171540
4231
4232
4233
4234
4235 021204
4236 021204 103020

```

```

: IF AN ERROR OCCURS...INSERT IN TABLE (MAN. ONLY), REPORT IT, LOOP
: IF ENABLED - EXIT TEST IF NOT
:
IF.ERROR THEN
    CALL INSERR IN <#0>
    MOV R5,-(SP)
    MOV #0,-(R5)
    JSR PC,INSERR
    MOV (SP)+,R5
    CALL INSERR IN <#2>
    MOV R5,-(SP)
    MOV #2,-(R5)
    JSR PC,INSERR
    MOV (SP)+,R5
    ERRHRD 51,MSG51,AREA40
    TRAP T$ERCODE
    .WORD 51
    .WORD MSG51
    .WORD AREA40
    CKLOOP
    EXIT TST
    EMT C$CLP1
    EMT C$EXIT
    .WORD L10032-
ENDIF
50017$:
50016$:
: REPEAT LOOP UNTIL TERMINAL SENDS LOOPBACK DATA
: UNTIL LCOMP NE #0
    TST LCOMP
    BEQ 50014$
: PROCESS THE LOOPBACK DATA
: CALL PROLOP
    JSR PC,PROLOP
    BGNSEG
    EMT C$BSEG
: REINIT THE LINK
: LET INIT := #0
    CLR INIT
    CALL XSTRT
    JSR PC,XSTRT
: IF ERROR OCCURS, INSERT ERROR INTO TABLE (MANUF. ONLY), REPORT ERROR,
: LOOP ON REINIT IF ERROR LOOPING ENABLED...EXIT TEST IF NO LOOPING
:
IF.ERROR THEN
    BCC 50020$

```

```
4237 021206          CALL INSERR IN <#0>
4238 021206 010546          MOV      R5,-(SP)
4239 021210 012745 000000    MOV      #0,-(R5)
4240 021214 004767 175666    JSR     PC,INSERR
4241 021220 012605          MOV      (SP)+,R5
4242 021222          CALL INSERR IN <#2>
4243 021222 010546          MOV      R5,-(SP)
4244 021224 012745 000002    MOV      #2,-(R5)
4245 021230 004767 175652    JSR     PC,INSERR
4246 021234 012605          MOV      (SP)+,R5
4247 021236          ERRHRD 51,MSG51,AREA61
4248 021236 104463          TRAP    T$ERCODE
4249 021240 000063          .WORD  51
4250 021242 003475          .WORD  MSG51
4251 021244 005036          .WORD  AREA61
4252 021246          ENDIF
4253 021246          CKLOOP          50020$:
4254 021246          ENDSEG          EMT      C$CLP1
4255 021246 104006          10000$:
4256 021250          EMT      C$ESEG
4257 021250          :
4258 021250 104005          :
4259          :
4260          :END OF TEST
4261          :
4262 021252          ENDTST
4263 021252          L10032:
4264 021252 104001          EMT      C$ETST
4265
4266
4267
4268
4269
4270          :
4271          :
4272          :
4273          :
4274          :
4275 021254          :
4276 021254          :
4277 021254          :
4278 021254 010146          :
4279 021256          :
4280 021256 010246          :
4281 021260          :
4282 021260 010346          :
4283          :
4284          :
4285          :
4286          :
4287          :
4288 021262          :
4289 021262 012701 021412    :
4290 021266          :
4291 021266 012702 000200    :
4292 021272          :

ROUTINE TO PROCESS LOOPBACK DATA
ROUTINE PROLOP
PUSH R1
PUSH R2
PUSH R3
LET R1 := #LOOPB
LET R2 := #128.
LET R3 := INBUF

PROLOP:
MOV      R1,-(SP)
MOV      R2,-(SP)
MOV      R3,-(SP)
MOV      #LOOPB,R1
MOV      #128.,R2
```

4293	021272	016703	160660			MOV	INBUF,R3
4294							
4295					;		
4296					;		
4297	021276				;		
4298	021276				;		
4299							
4300							
4301					;		
4302					;		
4303	021276				;		
4304	021276	121113			;		
4305	021300	001423			;		
4306	021302						
4307	021302	011167	163756				
4308	021306						
4309	021306	011367	163754				
4310	021312						
4311	021312	010546					
4312	021314	012745	000002				
4313	021320	004767	175562				
4314	021324	012605					
4315	021326						
4316	021326	104464					
4317	021330	000064					
4318	021332	003523					
4319	021334	005166					
4320	021336						
4321	021336	012603					
4322	021340						
4323	021340	012602					
4324	021342						
4325	021342	012601					
4326	021344						
4327	021344	000261					
4328	021346	000411					
4329	021350						
4330	021350						
4331							
4332					;		
4333					;		
4334	021350				;		
4335	021350	005201					
4336	021352						
4337	021352	005302					
4338	021354						
4339	021354	005203					
4340							
4341					;		
4342					;		
4343	021356				;		
4344	021356	005702					
4345	021360	001346					
4346	021362						
4347	021362	012603					
4348	021364						

4349 021364 012602
 4350 021366
 4351 021366 012601
 4352 021370
 4353 021370
 4354 021370 000241
 4355 021372
 4356 021372 000207
 4357
 4358
 4359
 4360
 4361 021374 000000
 4362 021376 121403
 4363 021400 000410
 4364 021402 220
 4365 021405 000
 4366 021406 000
 4367 021407 000
 4368 021410 000000
 4369 021412 000200
 4370 022012
 4371 022012 000000
 4372
 4373 022014

POP R1
 ENDRTN

MOV (SP)+,R2
 MOV (SP)+,R1
 50000\$:
 CLC
 50001\$:
 RTS PC

```

: LOOPBACK MESSAGE AREA
:
LCOMP: 0
LOOPMG: .+100005
ELOOPB-2-
000 201 LOOPH: .BYTE DLE,0,201,0

LOOPN: .BYTE 0
LOOSTA: .BYTE 0
LCRCH: 0
LOOPB: .BLKW 128.
ELOOPB:
LCRCD: 0

ENDMOD

```

```
4374 022014          BGNMOD PTCODE
4375                :
4376                :
4377                :
4378 022014          BGNHRD
4379 022014 000022          .WORD L10033-L$HARD/2
4380 022016          GPRMA  DEVICE,0,0,0,177776,YES
4381 022016 000031          .WORD  T$CODE
4382 022020 022062          .WORD  DEVICE
4383 022022 000000          .WORD  T$LOLIM
4384 022024 177776          .WORD  T$HILIM
4385 022026          GPRMA  VECTOR,2,0,0,400,YES
4386 022026 001031          .WORD  T$CODE
4387 022030 022100          .WORD  VECTOR
4388 022032 000000          .WORD  T$LOLIM
4389 022034 000400          .WORD  T$HILIM
4390 022036          GPRMD  PRIOR,4,0,340,0,7,YES
4391 022036 002032          .WORD  T$CODE
4392 022040 022115          .WORD  PRIOR
4393 022042 000340          .WORD  340
4394 022044 000000          .WORD  T$LOLIM
4395 022046 000007          .WORD  T$HILIM
4396 022050          GPRMD  STATION,4,0,177400,0,377,YES
4397 022050 002032          .WORD  T$CODE
4398 022052 022140          .WORD  STATION
4399 022054 177400          .WORD  177400
4400 022056 000000          .WORD  T$LOLIM
4401 022060 000377          .WORD  T$HILIM
4402 022062          ENDHRD
4403
4404 022062          .EVEN
4405                L10033:
4406 022062 052504 020120 042101  DEVICE: .ASCIZ /DUP ADDRESS: /
4407 022070 051104 051505 035123
4408 022076 000040
4409 022100 052504 020120 042526  VECTOR: .ASCIZ /DUP VECTOR: /
4410 022106 052103 051117 020072
4411 022114      000
4412 022115      104 050125 041040  PRIOR: .ASCIZ /DUP BUS PRIORITY: /
4413 022122 051525 050040 044522
4414 022130 051117 052111 035131
4415 022136 000040
4416 022140 042524 046522 047111  STATION:.ASCIZ /TERMINAL ADDRESS: /
4417 022146 046101 040440 042104
4418 022154 042522 051523 020072
4419 022162      000
4420          022164          .EVEN
4421
4422                :
4423                :
4424                :
4425 022164          BGNSFT
4426 022164 000015          .WORD L10034-L$SOFT/2
4427 022166          GPRMD  ALIMIT,0,0,177777,0,77777,YES
4428 022166 000032          .WORD  T$CODE
4429 022170 022220          .WORD  ALIMIT
```

4430 022172 177777
 4431 022174 000000
 4432 022176 077777
 4433 022200
 4434 022200 001130
 4435 022202 022267
 4436 022204 177777
 4437 022206
 4438 022206 002032
 4439 022210 022332
 4440 022212 177777
 4441 022214 000000
 4442 022216 077777
 4443 022220
 4444
 4445 022220
 4446 022220 047510 020127 040515
 4447 022226 054516 044440 044516
 4448 022234 044524 052101 020105
 4449 022242 051124 042511 020123
 4450 022250 042502 047506 042522
 4451 022256 040440 047502 052122
 4452 022264 020077 000
 4453 022267 125 042523 040440
 4454 022274 046114 055040 051105
 4455 022302 023517 020123 047506
 4456 022310 020122 047514 050117
 4457 022316 040502 045503 042040
 4458 022324 052101 037501 000040
 4459 022332 040527 052111 043040
 4460 022340 041501 047524 020122
 4461 022346 047506 020122 042523
 4462 022354 043114 042524 052123
 4463 022362 024040 030062 030060
 4464 022370 020060 020075 030461
 4465 022376 033457 020060 020055
 4466 022404 030064 030060 036440
 4467 022412 030440 027461 030061
 4468 022420 037451 000
 4469 022424
 4470 022424
 4471 022424
 4472
 4473 022424
 4474

GPRML PATRN,2,177777,YES

GPRMD SWAIT,4,0,177777,0,77777,YES

ENDSFT

ALIMIT: .ASCIZ /HOW MANY INITIATE TRIES BEFORE ABORT? /

L10034:

PATRN: .ASCIZ /USE ALL ZERO'S FOR LOOPBACK DATA? /

SWAIT: .ASCIZ @WAIT FACTOR FOR SELFTEST (20000 = 11/70 - 4000 = 11/10)?@

.EVEN
ENDMOD
LASTAD

L\$LAST::
.REQ DOCTOR.P11[400,1066]

.WORD 177777
 .WORD T\$LOLIM
 .WORD T\$HILIM
 .WORD T\$CODE
 .WORD PATRN
 .WORD 177777
 .WORD T\$CODE
 .WORD SWAIT
 .WORD 177777
 .WORD T\$LOLIM
 .WORD T\$HILIM

.EVEN

.EVEN

4475
4476 053220 000000
053222 000000
053224 000000
053226 000000
053232
000200

.SBTTL DIAGNOSTIC SUPERVISOR -- LOW CORE SET UP
.WORD 0 ;SPACE FOR USER POOL POINTER
.WORD 0 ;SIZE
.WORD 0 ;CHECKSUM (NOT CURRENTLY USED)
.WORD 0 ;SIZE OF H.W. PTAB. ALLOCATION
END.SUPV=+.2
.END 200

L\$DISP	011700	G	629	1241#		
L\$DR	002230	G	642	736#		
L\$DRCT	002070	G	642#			
L\$DRS	002072	G	643#			
L\$DRST	002234	G	643	738#		
L\$DTP	002040	G	629#			
L\$DU	011710	G	645	1260#		
L\$DUT	002076	G	645#			
L\$DVTY	002212	G	640	731#		
L\$EF	002056	G	637#			
L\$EFLG	002034	G	627#			
L\$EXP1	002042	G	630#			
L\$EXP2	002044	G	631#			
L\$EXP3	002046	G	632#			
L\$HARD	022016	G	620	4379	4380#	
L\$HPCP	002016	G	620#			
L\$HPTP	002022	G	622#			
L\$HW	011656	G	622	1221	1222#	
L\$ICP	002104	G	648#			
L\$INIT	011712	G	648	1268#		
L\$LADP	002026	G	624#			
L\$LAST	022424	G	624	4473#		
L\$MREV	002050	G	633#			
L\$NAME	002000	G	608#			
L\$REPP	002066	G	641#			
L\$REV	002010	G	616#			
L\$RPT	011704	G	641	1250#		
L\$SOFT	022166	G	621	4426	4427#	
L\$SPC	002062	G	639#			
L\$SPCP	002020	G	621#			
L\$SPTP	002024	G	623#			
L\$STA	002030	G	625#			
L\$SW	011670	G	623	1229	1230#	
L\$TIML	002014	G	619#			
L\$TIMU	002054	G	636#			
L\$TIM1	002052	G	635#			
L\$TSTI	002100	G	646#			
L\$UNIT	002012	G	618#	1309	1380	
L.CLK.	027022		4476#			
L10000	003704		912#			
L10001	003740		923#			
L10002	003772		936#			
L10003	004074		959#			
L10004	004126		974#			
L10005	004230		996#			
L10006	004236		1002#			
L10007	004240		1006#			
L10010	004332		1036#			
L10011	004460		1061#			
L10012	004644		1107#			
L10013	005000		1134#			
L10014	005126		1168#			
L10015	005216		1186#			
L10016	005270		1200#			
L10017	005272		1205#			
L10020	011666		1221	1227#		

SET.MA 027602
SHIFT 052706 G
SOM = 000201
SPEC.U 027316
SPV.SE 000400
SSTACK 011654
STACK = 000007
STARTC 051576 G
STATIO 022140
STIME 002122
STINPT 020274
STRCHR 042610
STRT = 000006
STRTB 003650
STRTC 003656
STRISA 003655
STRT.T 027374
STWAIT 011674
ST.SET 024226
SUNIT. 027400
SUPERV 025262
SUPFLA 022670 G
SUPV.T 023042 G
SUP.PR 024000
SVCGBL= 000000

4476#																				
4476#																				
660#	1901	3002																		
4476#*																				
4476#																				
1213#	1288																			
666#	1769																			
4476#																				
4398	4416#																			
698#																				
3743	3843#																			
4476#																				
665#	893																			
892#	1706																			
898#	1726*																			
897#	1714*	2136	3794																	
4476#*																				
1232#	3630																			
4476#																				
4476#*																				
4476#																				
4476#*																				
4476#																				
600#	607	608	616	617	618	619	620	621	622	623	624	625								
626	627	628	629	630	631	632	633	635	636	637	639	640								
641	642	643	644	645	646	647	648	649	652	731	736	738								
904	922	927	949	963	987	1001	1005	1009	1053	1071	1127	1143								
1177	1199	1204	1217	1222	1230	1241	1245	1250	1255	1260	1268	1434								
1458	2793	2893	3510	4375	4380	4427	4473#	4474												
4476#																				
600#	601#	608	609	610	611	612	613	614	615	616	617	618								
619	620	621	622	623	624	625	626	627	628	629	630	631								
632	633	634	635	636	637	638	639	640	641	642	643	644								
645	646	647	648	649	731	733	735	736	737	738	905	906								
907	908	909	910	913	924	928	929	930	931	932	933	934								
937	951	952	953	954	955	956	957	960	966	967	968	969								
970	971	972	975	988	989	990	991	992	993	994	997	1003								
1007	1023	1024	1025	1026	1027	1028	1030	1031	1032	1033	1034	1037								
1054	1055	1056	1057	1058	1059	1062	1077	1078	1079	1080	1081	1082								
1084	1085	1086	1087	1088	1089	1091	1092	1093	1094	1095	1096	1098								
1099	1100	1101	1102	1103	1108	1128	1129	1130	1131	1132	1135	1144								
1145	1146	1147	1148	1161	1162	1163	1164	1165	1166	1169	1178	1179								
1180	1181	1182	1183	1184	1187	1201	1206	1221	1229	1240	1241	1242								
1252	1257	1262	1277	1278	1302	1303	1323	1324	1369	1370	1371	1417								
1455	1650	1651	1652	1738	1739	1740	1757	1758	1759	1781	1782	1783								
2037	2038	2039	2040	2119	2120	2121	2122	2139	2140	2141	2142	2187								
2188	2189	2190	2247	2248	2249	2250	2305	2306	2307	2308	2339	2340								
2341	2342	2362	2363	2364	2365	2452	2453	2454	2455	2475	2476	2477								
2478	2505	2540	2541	2542	2543	2623	2624	2665	2666	2667	2668	2669								
2670	2683	2684	2685	2686	2687	2688	2736	2737	2738	2739	2797	2798								
2857	2883	2897	2898	3183	3201	3230	3231	3293	3294	3295	3296	3337								
3338	3339	3340	3554	3555	3556	3557	3559	3561	3562	3585	3586	3587								
3588	3590	3592	3593	3604	3605	3606	3607	3609	3611	3612	3625	3626								
3654	3655	3656	3657	3659	3661	3662	3688	3689	3690	3691	3693	3695								
3696	3720	3721	3722	3723	3725	3727	3728	3756	3757	3758	3759	3761								

SVCHAN 031716
SVCINS= 000001

TSSCLE=	010026	1434#	1454																	
TSSDU =	010024	1260#	1261																	
TSSHAR=	010033	4379#	4404																	
TSSHW =	010020	1221#	1227																	
TSSINI=	010025	1268#	1416																	
TSSMSG=	010017	904#	912	922#	923	927#	936	949#	959	963#	974	987#	996	1001#						
		1002	1005#	1006	1009#	1036	1053#	1061	1071#	1107	1127#	1134	1143#	1168						
		1177#	1186	1199#	1200	1204#	1205													
		1250#	1251																	
TSSRPT=	010022	4223#	4257#																	
TSSSEG=	010000	4426#	4445																	
TSSSOB=	010034	2793#	2882	2893#	3200															
TSSSRV=	010030	1229#	1234																	
TSSSW =	010021	3520#	3561	3592	3611	3661	3695	3727	3763	3771	4000#	4035	4205	4263						
TSSTES=	010032	1241	3520#																	
T1	017464	1242	4000#																	
T2	020514	4476#																		
UNIT.D	022442	4476#																		
UNI.MA	027320	4476#																		
USER.P	022704	4476#																		
USER.T	022706	4476#																		
VALID.	023144	4476#																		
VAL.LA	023764	4476#																		
VAL.SW	027430	4476#																		
VECTOR	022100	4387	4409#																	
VMSG	012166	1418#																		
WIDTH	036712	4476#																		
XBUFFE	015570	1640*	1706*	1723	2768#	2818	2826*	3810*	4119*											
XDONE	015104	2407*	2507	2513	2564#	2855*														
XEQDIA	051734	4476#																		
XEQSUB	051722	4476#																		
XEQ.CL	031444	4476#																		
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XMTADD	015552	2693*	2694*	2761#	2822*	2824*	2842*	2852	2873*											
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XSTRUF=	000020	600#																		
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1676	1678	1691	1745	1764	1788	1793	1795	1812	1845	1865	1870	1871
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2255	2316	2347	2349	2356	2370	2372	2377	2379	2394	2414	2463	2467
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\$NESTL = 177777

\$NSKO = 000300

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	1625#	1670	1736#	1745	1755#	1764	1779#	1788	1845#	1864	2035#	2050	2056#
	2086	2116#	2129	2136#	2149	2184#	2197	2244#	2255	2372	2414#	2490	2497#
	2550	2556	2616#	2640	2649#	2717	2744	2812#	2833	2863	2944#	3062	3078#
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	2424#	2462	2467	2472#	2484	2503#	2507	2513#	2548	2836#	2846	2861	2952#
	2996	3054	3100#	3152	3189	3261#	3287	3303	3708#	3730	3868#	3910	3954
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	3187	3275#	3280	3915#	3934	3952							
\$NSK4 = 000110	2336#	2347	3022#	3027									
\$SAVLE = 177777	601#	1670#	1671#	1864#	1865	3459#	3460#						
\$SAV2 = 052752 G	4476#												
\$SAV3 = 052766 G	4476#												
\$SAV4 = 053004 G	4476#												
\$SAV5 = 053024 G	4476#												
\$SSKO = 050003	1670#	1671	1864#	1865	3459#	3460							
\$TAGLE = 177777	601#	1016#	1019#	1154#	1157#	1284#	1293#	1294#	1306#	1311#	1314#	1316#	1318#
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	3191#	3193#	3229#	3238#	3254#	3263#	3277#	3280#	3288#	3289#	3303#	3306#	3307#
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	2186#	2232#	2233#	2245	2246#	2256#	2283	2284#	2299	2300#	2317#	2337	2338#
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	3681	3682#	3701	3702#	3708	3709#	3749	3750#	3784#	3785#	3819	3820#	3843#
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STEMP = 000300

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\$TSK0 = 050002

3738	3766#	3790#	3791#	3792#	3793#	3794#	3795#	3810#	3811#	3812#	3813#	3821#
3822#	3826#	3828#	3854#	3856#	3866#	3867#	3879#	3880#	3881#	3882#	3883#	3884#
3885#	3886#	3887#	3888#	3889#	3890#	3891#	3892#	3893#	3894#	3895#	3896#	3910#
3934#	3952#	3954#	3956#	3964#	4004#	4005#	4006#	4007#	4008#	4009#	4013#	4014#
4038#	4045#	4046#	4050#	4051#	4052#	4053#	4055#	4056#	4057#	4061#	4062#	4063#
4064	4069#	4071#	4072#	4073#	4077#	4079#	4080#	4081#	4087#	4088#	4092#	4093#
4119#	4120#	4121#	4122#	4141#	4173#	4208#	4210#	4215#	4216	4228#	4229#	4253#
4289#	4290#	4291#	4292#	4293#	4294#	4307#	4308#	4309#	4310#	4330#	4335#	4336#
4337#	4338#	4339#	4340#	4344#	4345	4353#						

\$TSK1 = 050003

1016#	1019	1154#	1157	1284#	1293	1294#	1318	1327#	1330	1354#	1359	1366#
1391	1401#	1408	1500#	1505	1513#	1522	1523#	1526	1556#	1559	1581#	1595
1626#	1670	1737#	1745	1756#	1764	1780#	1788	1846#	1864	2036#	2050	2058#
2086	2118#	2129	2138#	2149	2186#	2197	2246#	2255	2256#	2372	2415#	2490
2499#	2551	2552#	2556	2617#	2640	2651#	2718	2719#	2744	2805#	2871	2872#
2877	2915#	2933	2939#	3068	3069#	3193	3229#	3238	3254#	3306	3307#	3348
3409#	3459	3543#	3564	3579#	3595	3603#	3614	3624#	3630	3648#	3664	3670#
3737	3750#	3766	3820#	3826	3862#	3956	4022#	4038	4049#	4053	4054#	4057
4060#	4063	4130#	4141	4149#	4215	4237#	4253	4299#	4344			
1306#	1316	1377#	1389	1585#	1589	1630#	1670	1850#	1864	2069#	2075	2284#
2356	2357#	2370	2425#	2463	2464#	2467	2474#	2484	2504#	2507	2515#	2548
2814#	2834	2835#	2863	2948#	3062	3080#	3095	3096#	3191	3263#	3288	3289#
3303	3411#	3459	3682#	3698	3702#	3732	3870#	3910	3911#	3954	4162#	4173
4179#	4210	4306#	4330									

\$TSK2 = 050017

1311#	1314	1382#	1385	1649#	1657	2300#	2316	2317#	2349	2838#	2847	2848#
2861	2954#	2997	2998#	3054	3102#	3153	3154#	3189	3277#	3280	3709#	3730
3917#	3934	3935#	3952	4187#	4208							

\$TSK3 = 050035

2338#	2347	2971#	2974	2986#	2989	3007#	3034	3035#	3052	3142#	3145	3167#
3187												

\$TSK4 = 050025

3024#	3027											
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\$ARGC = 000000

601#	1476#	1578#	1692#	1813#	1887#	2021#	2233#	2395#	2584#	3219#	3366#	3389#
------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------

\$BYTE = 000402

3785#	3844#	4277#										
601#	1014#	1152#	1309#	1380#	1498#	1511#	1554#	1579#	1626#	1628#	1846#	1848#
2056#	2116#	2136#	2184#	2244#	2282#	2298#	2336#	2472#	2497#	2513#	2649#	2803#
2812#	2836#	2913#	2937#	2944#	2946#	2952#	2969#	2984#	3002#	3004#	3022#	3078#
3100#	3140#	3165#	3252#	3261#	3275#	3409#	3601#	3700#	3860#	3868#	3915#	4047#
4177#	4304#											

\$CASE = 000000

\$DST = 000003

\$ELOC = 000402

601#	1494#	1550#	2630#	3418#	3445#	3454#						
601#	1014#	1019#	1152#	1157#	1283#	1292	1305#	1309#	1314#	1316#	1318#	1326#
1330#	1376#	1380#	1385#	1389#	1498#	1505#	1511#	1521	1526#	1554#	1559#	1579#
1584#	1588#	1589#	1595#	1648#	1656#	1657#	1736#	1744#	1745#	1755#	1763#	1764#
1779#	1787#	1788#	2035#	2049#	2050#	2056#	2068#	2074#	2075#	2085#	2086#	2116#
2128#	2129#	2136#	2148#	2149#	2184#	2196#	2197#	2244#	2254#	2255	2282#	2298#
2312#	2316	2336#	2346#	2347#	2349#	2355	2369#	2370#	2372#	2424#	2462	2467#
2472#	2484#	2497#	2513#	2547#	2548#	2550	2555#	2556#	2649#	2717	2743#	2744#
2803#	2812#	2833	2836#	2846	2861#	2863#	2870	2877#	2913#	2933#	2937#	2944#
2952#	2969#	2974#	2984#	2989#	2996	3002#	3022#	3027#	3033	3052#	3054#	3062#
3067	3078#	3094	3100#	3140#	3145#	3152	3165#	3187#	3189#	3191#	3193#	3252#
3261#	3275#	3280#	3287	3302#	3303#	3305	3347#	3348#	3542#	3564#	3578#	3595#
3601#	3614#	3647#	3664#	3681#	3698#	3700#	3708#	3730#	3732#	3749#	3766#	3819#
3825#	3826#	3860#	3868#	3909#	3910	3915#	3933#	3934	3951#	3952#	3954#	3956#
4021#	4038#	4047#	4052	4057#	4129#	4141#	4161#	4173#	4177#	4186#	4208#	4210#
4236#	4253#	4304#	4329#	4330#								

\$ERFL = 000000

\$FLAG = 000001

601#	1014#	1016#	1019#	1152#	1154#	1157#	1283#	1305#	1309#	1311#	1314#	1316#
1318#	1326#	1330#	1376#	1380#	1382#	1385#	1389#	1498#	1500#	1505#	1511#	1513#

	1526#	1554#	1556#	1559#	1579#	1581#	1584#	1589#	1595#	1625#	1626#	1628#	1630#
	1648#	1657#	1736#	1745#	1755#	1764#	1779#	1788#	1845#	1846#	1848#	1850#	2035#
	2050#	2056#	2058#	2068#	2075#	2086#	2116#	2118#	2129#	2136#	2138#	2149#	2184#
	2186#	2197#	2244#	2246#	2282#	2284#	2298#	2300#	2336#	2338#	2347#	2349#	2370#
	2372#	2424#	2467#	2472#	2474#	2484#	2497#	2499#	2513#	2515#	2548#	2556#	2649#
	2651#	2744#	2803#	2805#	2812#	2814#	2836#	2838#	2861#	2863#	2877#	2913#	2915#
	2933#	2937#	2939#	2944#	2946#	2948#	2952#	2954#	2969#	2971#	2974#	2984#	2986#
	2989#	3002#	3004#	3007#	3022#	3024#	3027#	3052#	3054#	3062#	3078#	3080#	3100#
	3102#	3140#	3142#	3145#	3165#	3167#	3187#	3189#	3191#	3193#	3252#	3254#	3261#
	3263#	3275#	3277#	3280#	3303#	3348#	3408#	3409#	3411#	3542#	3564#	3578#	3595#
	3601#	3603#	3614#	3647#	3664#	3681#	3698#	3700#	3702#	3708#	3730#	3732#	3749#
	3766#	3819#	3826#	3860#	3862#	3868#	3870#	3915#	3917#	3952#	3954#	3956#	4021#
	4038#	4047#	4049#	4057#	4129#	4141#	4161#	4173#	4177#	4179#	4186#	4208#	4210#
	4236#	4253#	4304#	4306#	4330#								
\$\$FROM= 000000	601#	1582#	1615#	1634#	1643#	1662#	1720#	1731#	1750#	1771#	1952#	1975#	2030#
	2063#	2092#	2158#	2260#	2419#	3537#	3549#	3569#	3580#	3641#	3649#	3674#	3683#
	3703#	3710#	3715#	3743#	3751#	3799#	3814#	4015#	4023#	4097#	4108#	4123#	4131#
\$\$LOC = 021360	4153#	4163#	4180#	4188#	4193#	4221#	4230#	4238#	4243#	4311#			
	601#	1015#	1016	1153#	1154	1283#	1284	1305#	1306	1310#	1311	1326#	1327
	1360#	1361	1376#	1377	1381#	1382	1392#	1393	1409#	1410	1499#	1500	1512#
	1513	1555#	1556	1580#	1581	1584#	1585	1627#	1628	1629#	1630	1648#	1649
	1736#	1737	1755#	1756	1779#	1780	1847#	1848	1849#	1850	2035#	2036	2057#
	2058	2068#	2069	2117#	2118	2137#	2138	2185#	2186	2245#	2246	2283#	2284
	2299#	2300	2337#	2338	2424#	2425	2473#	2474	2491#	2492	2498#	2499	2508#
	2509	2514#	2515	2643#	2644	2650#	2651	2804#	2805	2813#	2814	2837#	2838
	2914#	2915	2938#	2939	2945#	2946	2947#	2948	2953#	2954	2970#	2971	2985#
	2986	3005#	3006	3023#	3024	3079#	3080	3101#	3102	3141#	3142	3166#	3167
	3241#	3242	3253#	3254	3262#	3263	3276#	3277	3410#	3411	3542#	3543	3578#
	3579	3602#	3603	3631#	3632	3647#	3648	3681#	3682	3701#	3702	3708#	3709
	3738#	3739	3749#	3750	3819#	3820	3861#	3862	3869#	3870	3916#	3917	4021#
	4022	4048#	4049	4064#	4065	4129#	4130	4161#	4162	4178#	4179	4186#	4187
	4216#	4217	4236#	4237	4305#	4306	4345#	4346					
\$\$LOCN= 000000	601#	1476#	1478#	1479#	1482	1563	1578#	1679	1692#	1693#	1694#	1697	1796
	1813#	1814#	1815#	1818	1872	1887#	2010	2021#	2214	2233#	2234#	2235#	2238
	2380	2395#	2396#	2397#	2400	2561	2584#	2585#	2586#	2589	2756	3219#	3353
\$\$REG = 177777	3366#	3369	3389#	3390#	3391#	3394	3472	3785#	3831	3844#	3967	4277#	4356
	601#	1478#	1563	1693#	1796	1814#	1872	2234#	2380	2396#	2561	2585#	2756
\$\$RETU= 000001	3390#	3472											
	601#	1476#	1562	1578#	1586#	1654#	1677	1692#	1742#	1761#	1785#	1794	1813#
	1871	1887#	2009	2021#	2047#	2072#	2126#	2146#	2194#	2212	2233#	2252#	2310#
	2344#	2367#	2378	2395#	2545#	2553#	2559	2584#	2741#	2754	3219#	3300#	3345#
	3351	3366#	3368	3389#	3471	3785#	3823#	3829	3844#	3907#	3931#	3949#	3965
	4277#	4327#	4354										
\$\$RTN1= 050000	601#	1476#	1561	1578#	1676	1692#	1793	1813#	1870	1887#	2008	2021#	2084
	2211	2233#	2377	2395#	2558	2584#	2753	3219#	3350	3366#	3367	3389#	3470
	3785#	3828	3844#	3964	4277#	4353							
\$\$RTN2= 050001	601#	1476#	1562	1578#	1587	1655	1678	1692#	1743	1762	1786	1795	1813#
	1871	1887#	2009	2021#	2048	2073	2127	2147	2195	2213	2233#	2253	2311
	2345	2368	2379	2395#	2546	2554	2560	2584#	2742	2755	3219#	3301	3346
	3352	3366#	3368	3389#	3471	3785#	3824	3830	3844#	3908	3932	3950	3966
	4277#	4328	4355										
\$\$SRC = 000064	601#	1494#	1550#	2630#	3418#	3445#	3454#						
\$\$TGSV= 000000	601#												
\$\$TGS1= 000000	601#												
\$\$TGS2= 000000	601#												
\$\$TO = 000001	601#	1582#	1583	1615#	1616	1617	1634#	1635	1639	1643#	1644	1662#	1663

ABORTW	2856	3182													
ALLOCA	1479	1694	1815	2235	2397	2586	3391								
BGNAU	1254														
BGNCLN	1433														
BGNDU	1259														
BGNHRD	4378														
BGNHW	1220														
BGNINI	1267														
BGNMOD	606	651	1216	1244	1457	3509	4374								
BGNMSG	903	921	926	948	962	986	1000	1004	1008	1052	1070	1126	1142	1176	1198
	1203														
BGNRPT	1249														
BGNSEG	4222														
BGNSFT	4425														
BGNSRV	2792	2892													
BGNSW	1228														
BGNTST	3519	3999													
BREAK	2504														
CALL	1581	1614	1633	1642	1661	1719	1730	1749	1770	1951	1974	2029	2062	2091	2157
	2259	2418	3536	3548	3568	3579	3640	3648	3673	3682	3702	3709	3714	3742	3750
	3798	3813	4014	4022	4096	4107	4122	4130	4152	4162	4179	4187	4192	4220	4229
	4237	4242	4310												
CKLOOP	3558	3589	3608	3658	3692	3724	3760	4032	4142	4174	4202	4254			
DEALLO	1561#	1563	1676#	1793#	1796	1870#	1872	2008#	2211#	2377#	2380	2558#	2561	2753#	2756
	3350#	3367#	3470#	3472	3828#	3964#	4353#								
DECLAR	1477	1692	1813	2233	2395	2584	3389								
DEVREG	734														
DEVTYP	730														
DISPAT	1239														
ELSE	1291	1520	2254	2315	2354	2461	2549	2716	2832	2845	2869	2995	3032	3066	3093
	3151	3286	3304	3909	3933	4051									
ENDAU	1255														
ENDCLN	1453														
ENDDO	1669	1863	3458												
ENDDU	1260														
ENDHRD	4402														
ENDHW	1226														
ENDIF	1018	1156	1313	1315	1317	1329	1384	1388	1504	1525	1558	1588	1594	1656	1744
	1763	1787	2049	2074	2085	2128	2148	2196	2346	2348	2369	2371	2466	2483	2547
	2555	2743	2860	2862	2876	2932	2973	2988	3026	3051	3053	3061	3144	3186	3188
	3190	3192	3279	3302	3347	3563	3594	3613	3663	3697	3729	3731	3765	3825	3951
	3953	3955	4037	4056	4140	4172	4207	4209	4252	4329					
ENDINI	1415														
ENDMOD	650	1215	1243	1456	3508	4373	4470								
ENDMSG	911	922	935	958	973	995	1001	1005	1035	1060	1106	1133	1167	1185	1199
	1204														
ENDRPT	1250														
ENDRTN	1560	1675	1792	1869	2007	2210	2376	2557	2752	3349	3366	3469	3827	3963	4352
ENDSEG	4256														
ENDSFT	4443														
ENDSRV	2881	3199													
ENDSW	1233														
ENDTST	3770	4262													
EQUALS	655														
ERRDF	2474														
ERRHRD	1649	1737	1756	1780	2036	2118	2138	2186	2246	2304	2338	2361	2451	2539	2735

ASSEMBLY ROUTINES	MACY11 30A(1052) 03-JAN-79 13:52 PAGE 119														
DOCTOR.P11 17-FEB-78 09:08	CROSS REFERENCE TABLE -- MACRO NAMES														
	3292	3336	3553	3584	3603	3653	3687	3719	3755	3896	3920	3938	4027	4135	4167
ERRSOF	4197	4247													
EXIT	4315														
GPHARD	3560	3591	3610	3660	3694	3726	3762	4034	4204						
GPRMA	1368														
GPRMD	4380	4385													
GPRML	4390	4396	4427	4437											
HEADER	4433														
IF	607														
	1013	1151	1308	1379	1497	1510	1553	1578	2055	2115	2183	2243	2281	2297	2335
	2471	2496	2512	2648	2802	2811	2835	2912	2936	2968	2983	3021	3077	3099	3139
	3164	3251	3260	3274	3600	3699	4046	4176							
IFB	2135	2943	2951	3001	3859	3867	3914	4303							
IF.ERR	1282	1325	1583	1647	1735	1754	1778	2034	2067	2423	3541	3577	3646	3680	3707
	3748	3818	4020	4128	4150	4185	4235								
IF.NO.	1304	1375													
LASTAD	4471														
LET	1011	1016	1020	1074	1149	1154	1158	1287	1289	1306	1311	1327	1335	1337	1342
	1344	1346	1348	1350	1354	1356	1366	1377	1382	1386	1397	1401	1403	1405	1439
	1441	1448	1486	1492	1500	1502	1513	1515	1523	1531	1533	1535	1540	1542	1548
	1556	1586#	1590	1592	1599	1601	1604	1607	1609	1654#	1703	1705	1710	1713	1742#
	1761#	1768	1785#	1822	1828	1833	1839	1853	1855	1857	1859	1861	1894	1900	1905
	1907	1909	1911	1916	1918	1923	1928	1930	1935	1938	1943	1946	1962	1967	1969
	1985	1988	1990	1992	1997	2000	2047#	2058	2060	2072#	2076	2079	2084#	2102	2105
	2107	2109	2126#	2146#	2153	2155	2168	2171	2173	2175	2177	2194#	2201	2203	2206
	2252#	2267	2270	2272	2274	2276	2287	2290	2292	2300	2302	2310#	2317	2320	2322
	2324	2327	2329	2344#	2357	2359	2367#	2404	2406	2408	2432	2434	2436	2438	2440
	2442	2456	2464	2479	2481	2523	2525	2527	2529	2531	2533	2545#	2553#	2595	2601
	2603	2605	2610	2620	2628	2633	2654	2657	2659	2661	2674	2676	2692	2695	2701
	2703	2708	2710	2721	2723	2725	2727	2729	2741#	2750	2817	2819	2821	2823	2825
	2827	2841	2843	2851	2854	2858	2872	2874	2907	2915	2920	2923	2925	2927	2934
	2958	2960	2962	2964	2966	2971	2975	2977	2979	2981	2986	2993	3011	3013	3015
	3017	3019	3024	3028	3030	3039	3044	3047	3049	3059	3072	3085	3087	3089	3091
	3108	3110	3112	3114	3116	3124	3126	3132	3137	3142	3146	3158	3160	3167	3172
	3175	3177	3184	3222	3232	3246	3258	3266	3268	3270	3272	3277	3284	3297	3300#
	3310	3314	3319	3321	3323	3325	3327	3345#	3401	3403	3405	3411	3413	3415	3417
	3422	3424	3426	3428	3430	3432	3434	3438	3440	3442	3444	3449	3451	3453	3461
	3523	3528	3531	3618	3620	3627	3635	3638	3789	3791	3793	3809	3811	3820	3823#
	3853	3865	3878	3880	3882	3884	3886	3898	3890	3892	3894	3907#	3931#	3949#	4003
	4005	4007	4012	4044	4049	4054	4060	4068	4071	4076	4079	4086	4091	4118	4120
	4227	4288	4290	4292	4306	4308	4327#	4334	4336	4338					
LOCAL	1478	1693	1814	2234	2396	2585	3390								
MSBYTE	608#	613	614	615											
MSCHEC	3561#	3592#	3611#	3661#	3695#	3727#	3763#	4035#	4205#						
MSCKID	630#														
MSCOUN	905#	928#	951#	966#	988#	1023#	1030#	1054#	1077#	1084#	1091#	1098#	1128#	1144#	1161#
	1178#														
MSDATA	608#	616	617	618	619	620	621	622	623	624	625	626	627	628	629
	630#	631	632	633	635	636	637	639	640	641	642	643	644	645	646
	647	648	649	731#											
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	1177														
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READEF	1276	1301	1322												
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ROUTIN	1474	1576	1690	1811	1885	2019	2231	2393	2582	3217	3364	3387	3783	3842	4275
SETPRI	2796	2896													
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	2184#	2244#	2282#	2298#	2336#	2472#	2497#	2513#	2649#	2803#	2812#	2836#	2913#	2937#	2944#
	2946#	2952#	2969#	2984#	3002#	3004#	3022#	3078#	3100#	3140#	3165#	3252#	3261#	3275#	3409#
	3601#	3700#	3860#	3868#	3915#	4047#	4177#	4304#							
§PUT	1582#	1615#	1634#	1636	1643#	1662#	1720#	1722	1731#	1750#	1771#	1772	1952#	1954	1975#
	1977	2030#	2063#	2064	2092#	2094	2158#	2160	2260#	2262	2419#	3537#	3549#	3550	3569#
	3580#	3581	3641#	3649#	3650	3674#	3683#	3684	3703#	3710#	3711	3715#	3716	3743#	3751#
	3752	3799#	3801	3814#	4015#	4023#	4024	4097#	4099	4108#	4110	4123#	4131#	4132	4153#
	4163#	4164	4180#	4188#	4199	4193#	4194	4221#	4230#	4238#	4239	4243#	4244	4311#	4312
§SUBON	1019#	1157#	1293#	1314#	1316#	1318#	1330#	1359#	1385#	1389#	1391#	1408#	1505#	1522#	1526#
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	2008#	2050#	2075#	2086#	2129#	2149#	2197#	2211#	2255#	2316#	2347#	2349#	2356#	2370#	2372#
	2377#	2463#	2467#	2484#	2490#	2507#	2548#	2551#	2556#	2558#	2640#	2718#	2744#	2753#	2834#
	2847#	2861#	2863#	2871#	2877#	2933#	2974#	2989#	2997#	3027#	3034#	3052#	3054#	3062#	3068#
	3095#	3145#	3153#	3187#	3189#	3191#	3193#	3238#	3280#	3288#	3303#	3306#	3348#	3350#	3367#
	3459#	3460#	3470#	3564#	3595#	3614#	3630#	3664#	3698#	3730#	3732#	3737#	3766#	3826#	3828#
	3910#	3934#	3952#	3954#	3956#	3964#	4038#	4053#	4057#	4063#	4141#	4173#	4208#	4210#	4215#
	4253#	4330#	4344#	4353#											
§THEN	1014#	1152#	1309#	1380#	1498#	1511#	1554#	1579#	1626#	1628#	1846#	1848#	2056#	2116#	2136#
	2184#	2244#	2282#	2298#	2336#	2472#	2497#	2513#	2649#	2803#	2812#	2836#	2913#	2937#	2944#
	2946#	2952#	2969#	2984#	3002#	3004#	3022#	3078#	3100#	3140#	3165#	3252#	3261#	3275#	3409#
	3601#	3700#	3860#	3868#	3915#	4047#	4177#	4304#							
§UNT2	1359#	1391#	1408#	2490#	2507#	2640#	3238#	3630#	3737#	4063#	4215#	4344#			
§UNT3	1359#	1391#	1408#	2490#	2507#	2640#	3238#	3630#	3737#	4063#	4215#	4344#			
§WHILE	1325#	1845#	3408#												
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	1788#	1793#	1795#	1812#	1845#	1865#	1870#	1871#	1886#	2008#	2009#	2020#	2050#	2075#	2086#
	2129#	2149#	2197#	2211#	2213#	2232#	2255#	2316#	2347#	2349#	2356#	2370#	2372#	2377#	2379#
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	3034#	3052#	3054#	3062#	3068#	3095#	3145#	3153#	3187#	3189#	3191#	3193#	3218#	3228#	3242#
	3280#	3288#	3303#	3306#	3348#	3350#	3352#	3365#	3367#	3368#	3388#	3408#	3460#	3470#	3471#
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§GETS	1019#	1157#	1292#	1293#	1314#	1316#	1318#	1330#	1359#	1385#	1389#	1391#	1408#	1505#	1521#
	1522#	1526#	1559#	1561#	1589#	1595#	1657#	1670#	1671#	1676#	1745#	1764#	1788#	1793#	1864#
	1865#	1870#	2008#	2050#	2075#	2086#	2129#	2149#	2197#	2211#	2255#	2316#	2347#	2349#	2355#
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	3152#	3153#	3187#	3189#	3191#	3193#	3238#	3280#	3287#	3288#	3303#	3305#	3306#	3348#	3350#
	3367#	3459#	3460#	3470#	3564#	3595#	3614#	3630#	3664#	3698#	3730#	3732#	3737#	3766#	3826#
	3828#	3910#	3934#	3952#	3954#	3956#	3964#	4038#	4052#	4053#	4057#	4063#	4141#	4173#	4208#
	4210#	4215#	4253#	4330#	4344#	4353#									
§GETT	1292#	1521#	2255#	2316#	2355#	2462#	2550#	2717#	2833#	2846#	2870#	2996#	3033#	3067#	3094#
	3152#	3287#	3305#	3910#	3934#	4052#									
§POP	1019#	1157#	1292#	1293	1314#	1316#	1318#	1330#	1359#	1385#	1389#	1391#	1408#	1505#	1521#
	1522	1526#	1559#	1561#	1589#	1595#	1657#	1670#	1671	1676#	1745#	1764#	1788#	1793#	1864#

	1865	1870#	2008#	2050#	2075#	2086#	2129#	2149#	2197#	2211#	2255#	2316#	2347#	2349#	2355#
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	3152#	3153	3187#	3189#	3191#	3193#	3238#	3280#	3287#	3288	3303#	3305#	3306	3348#	3350#
	3367#	3459#	3460	3470#	3564#	3595#	3614#	3630#	3664#	3698#	3730#	3732#	3737#	3766#	3826#
	3828#	3910#	3934#	3952#	3954#	3956#	3964#	4038#	4052#	4053	4057#	4063#	4141#	4173#	4208#
	4210#	4215#	4253#	4330#	4344#	4353#									
SSPUSH	1014#	1016	1152#	1154	1283#	1284	1292#	1294	1305#	1306	1309#	1311	1326#	1327	1353#
	1354	1365#	1366	1376#	1377	1380#	1382	1400#	1401	1475#	1476	1498#	1500	1511#	1513
	1521#	1523	1554#	1556	1577#	1578	1579#	1581	1584#	1585	1625#	1626	1630	1648#	1649
	1670#	1691#	1692	1736#	1737	1755#	1756	1779#	1780	1812#	1813	1845#	1846	1850	1864#
	1886#	1887	2020#	2021	2035#	2036	2056#	2058	2068#	2069	2116#	2118	2136#	2138	2184#
	2186	2232#	2233	2244#	2246	2255#	2256	2282#	2284	2298#	2300	2316#	2317	2336#	2338
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	2504	2513#	2515	2550#	2552	2583#	2584	2616#	2617	2649#	2651	2717#	2719	2803#	2805
	2812#	2814	2833#	2835	2836#	2838	2846#	2848	2870#	2872	2913#	2915	2937#	2939	2944#
	2948	2952#	2954	2969#	2971	2984#	2986	2996#	2998	3002#	3007	3022#	3024	3033#	3035
	3067#	3069	3078#	3080	3094#	3096	3100#	3102	3140#	3142	3152#	3154	3165#	3167	3218#
	3219	3228#	3229	3252#	3254	3261#	3263	3275#	3277	3287#	3289	3305#	3307	3365#	3366
	3388#	3389	3408#	3409	3411	3459#	3542#	3543	3578#	3579	3601#	3603	3623#	3624	3647#
	3648	3669#	3670	3681#	3682	3700#	3702	3708#	3709	3749#	3750	3784#	3785	3819#	3820
	3843#	3844	3860#	3862	3868#	3870	3910#	3911	3915#	3917	3934#	3935	4021#	4022	4047#
	4049	4052#	4054	4059#	4060	4129#	4130	4148#	4149	4161#	4162	4177#	4179	4186#	4187
	4236#	4237	4276#	4277	4298#	4299	4304#	4306							
SSSETS	1014#	1016#	1152#	1154#	1283#	1284#	1294#	1305#	1306#	1309#	1311#	1326#	1327#	1353#	1354#
	1365#	1366#	1376#	1377#	1380#	1382#	1400#	1401#	1476#	1498#	1500#	1511#	1513#	1523#	1554#
	1556#	1578#	1579#	1581#	1584#	1585#	1625#	1626#	1630#	1648#	1649#	1670#	1692#	1736#	1737#
	1755#	1756#	1779#	1780#	1813#	1845#	1846#	1850#	1864#	1887#	2021#	2035#	2036#	2056#	2058#
	2068#	2069#	2116#	2118#	2136#	2138#	2184#	2186#	2233#	2244#	2246#	2256#	2282#	2284#	2298#
	2300#	2317#	2336#	2338#	2357#	2395#	2414#	2415#	2424#	2425#	2464#	2472#	2474#	2497#	2499#
	2503#	2504#	2513#	2515#	2552#	2584#	2616#	2617#	2649#	2651#	2719#	2803#	2805#	2812#	2814#
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	3142#	3154#	3165#	3167#	3219#	3228#	3229#	3252#	3254#	3261#	3263#	3275#	3277#	3289#	3307#
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	4129#	4130#	4148#	4149#	4161#	4162#	4177#	4179#	4186#	4187#	4236#	4237#	4277#	4298#	4299#
	4304#	4306#													

. ABS. 053230 000

ERRORS DETECTED: 0

CZDPGB.BIN,CZDPGB.SEQ/CRF/SOL/NL:TOC=SMAC/ML,SPMAC/ML,CZDPGB.P11
RUN-TIME: 108 109 10 SECONDS
RUN-TIME RATIO: 2280/228=9.9
CORE USED: 32K (63 PAGES)