```
1                               .TITLE  CVCLHC DPV-11 DATA COMM. LINK TEST
                                .REM &
```

IDENTIFICATION

PRODUCT CODE: AC-F582C-MC

PRODUCT NAME: CVCLHC0 DPV-11 DATA COMM. LINK TEST

PRODUCT DATE: MARCH 82

MAINTAINER: MERRIMACK DIAGNOSTIC ENGINEERING

AUTHOR: BRUCE RIBOLINI-BRUCE LUHRS

REVISION HISTORY:

REV	DATE	AUTHOR	REASON
A	20-AUG-80	BRUCE RIBOLINI BRUCE LUHRS	ORIGINAL ISSUE, DCLT FOR THE DPV-11
B	21-SEPT-81	ERNIE COOPER	ADD ''SET EXPECT=TRANSMIT COMMAND ADD ''EXIT'' COMMAND ADD ''RPT>'' LEVEL ADD CHECK TO INSURE TRANSMIT LIST TOTAL = EXPECT LIST TOTAL UPDATE DOCUMENTATION
C	JUNE-82	ERNIE COOPER	ADD ^C ABORT MESSAGE TO EVENT LOG ADD DDCMP PROTOCOL LAYER

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1.0 GENERAL INFORMATION

1.1 PROGRAM ABSTRACT

THIS DCLT (DATA COMMUNICATION LINK TEST) PROGRAM IS MEANT TO PROVIDE FIELD SERVICE WITH A TOOL TO MAINTAIN DPV-11 COMMUNICATION LINKS. THIS PROGRAM ALLOWS THE DPV-11 TO COMMUNICATE WITH OTHER SYNCHRONOUS(INCLUDING DDCMP) DEVICES ON POINT TO POINT OR MULTIPOINT NETWORKS. THIS DCLT PROGRAM WILL PROVIDE THE COVERAGE NECESSARY TO DETECT FAILURES TO THE COMPUTER EQUIPMENT, THE COMMUNICATION LINK, OR THE MODEM.

THIS DIAGNOSTIC HAS BEEN WRITTEN FOR USE WITH THE DIAGNOSTIC RUNTIME SERVICES SOFTWARE (SUPERVISOR). THESE SERVICES PROVIDE THE INTERFACE TO THE OPERATOR AND TO THE SOFTWARE ENVIRONMENT. THIS PROGRAM CAN BE USED WITH XXDP+, ACT, APT, SLIDE AND PAPER TAPE. FOR A COMPLETE DESCRIPTION OF THE RUNTIME SERVICES, REFER TO THE XXDP+ USER'S MANUAL (CHQUS?.SEQ WHERE ? IS REV. LEVEL OF THE MANUAL). THERE IS A BRIEF DESCRIPTION OF THE RUNTIME SERVICES IN SECTION 2 OF THIS DOCUMENT.

1.2 SYSTEM REQUIREMENTS

IN ORDER TO RUN THE DPV DCLT PROGRAM, THE FOLLOWING MINIMUM HARDWARE IS REQUIRED:

- A LSI-11 CPU
- MINIMUM OF 24K WORDS OF MEMORY
- A WORKING CLOCK
- A CONSOLE TERMINAL
- ANY XXDP+ SUPPORTED LOAD MEDIA
- ONE OF THESE DPV-11 CONFIGURATIONS:

  DPV11-DB
  DPV11-DA

1.3 RELATED DOCUMENTS AND STANDARDS

- XXDP+ USER'S MANUAL (CHQUS?.SEQ WHERE ? IS THE REV. LEVEL OF THE MANUAL - "C" IS THE CURRENT REV.).

1.4 DIAGNOSTIC HIERARCY PREREQUISITES

THE GOAL OF THE DATA COMM. LINK TEST PROGRAM IS TO TEST THE COMMUNICATION LINK AND THEREFORE ASSUMES THAT THE CPU'S, CLOCKS, AND DVP-11'S AT EACH END OF THE LINK HAVE ALREADY BEEN TESTED.

IF A WORKING CLOCK IS NOT FOUND, THE PROGRAM WILL CONTINUE BUT ANY OF THE PROGRAM THAT TIMES THE DEVICE WILL HANG IF THE DEVICE TIMES OUT. ALSO, THE EVENT LOG WILL CONTAIN A ZERO EVENT TIME FOR ALL EVENTS LOGGED.

IT IS NOT THE INTENTION OF A DATA COMM. LINK TEST PROGRAM TO TEST THE DPV-11'S, BUT TO TEST THE COMMUNICATION LINK TO WHICH THEY ARE CONNECTED.

SOME OF THE DIAGNOSTICS THAT COULD BE RUN IF EITHER OF THE DPV-11'S LOOK BAD:

CVDPVXX DPV-11 FCTNL DIAG
CXDPVXX DPV-11 DECX MODULE
XX= LATEST REVISION

1.5 ASSUMPTIONS - RESTRICTIONS

IT IS ASSUMED THAT THE COMMUNICATIONS DEVICE (A DPV-11) HAS BEEN TESTED USING THE PREREQUISTE DIAGNOSTICS. THE OPERATOR SHOULD HAVE READ THE USER DOCUMENTATION PORTION OF THE LISTING TO FAMILIARIZE HIMSELF WITH THE COMMANDS AND CAPABILITIES AVAILABLE UNDER THE DIAGNOSTIC SUPERVISOR AND DCLT.

THIS DIAGNOSTIC DOES NOT RUN THE DPV IN BIT STUFF MODE
IT IS ASSUMED THAT IF THE LINK WORKS IN CHAR MODE THE LINK WILL WORK IN BIT STUFF MODE.

THE DPV11 IS NOT A DMA DEVICE AND THUS MUST RELY ON THE SOFTWARE FOR SERVICE. THEREFORE THIS DCLT WILL NOT RUN WITH THE DPV AT ITS HIGH CLOCK SPEED OF 50KHZ. WITH DDCMP PROTOCOL ENABLED THE HIGHEST SPEED TO BE EXPECTED(LIMITED BY CPU) IS 9.6KB.

2.0 OPERATING INSTRUCTIONS

THIS SECTION CONTAINS A BRIEF DESCRIPTION OF THE RUNTIME SERVICES.
FOR DETAILED INFORMATION, REFER TO THE XXDP+ USER'S MANUAL (CHQUS).

2.1 COMMANDS

THERE ARE ELEVEN LEGAL COMMANDS FOR THE DIAGNOSTIC RUNTIME SERVICES
(SUPERVISOR). THIS SECTION LISTS THE COMMANDS AND GIVES A VERY
BRIEF DESCRIPTION OF THEM. THE XXDP+ USER'S MANUAL HAS MORE DETAILS.

COMMAND	EFFECT
START	START THE DIAGNOSTIC FROM AN INITIAL STATE
RESTART	START THE DIAGNOSTIC WITHOUT INITIALIZING
CONTINUE	CONTINUE AT TEST THAT WAS INTERRUPTED (AFTER ^C)
PROCEED	CONTINUE FROM AN ERROR HALT
EXIT	RETURN TO XXDP+ MONITOR (XXDP+ OPERATION ONLY!)
ADD	ACTIVATE A UNIT FOR TESTING (ALL UNITS ARE CONSIDERED TO BE ACTIVE AT START TIME
DROP	DEACTIVATE A UNIT
PRINT	PRINT STATISTICAL INFORMATION (IF IMPLEMENTED BY THE DIAGNOSTIC - SECTION 4.0)
DISPLAY	TYPE A LIST OF ALL DEVICE INFORMATION
FLAGS	TYPE THE STATE OF ALL FLAGS (SEE SECTION 2.3)
?FLAGS	CLEAR ALL FLAGS (SEE SECTION 2.3)

A COMMAND CAN BE RECOGNIZED BY THE FIRST THREE CHARACTERS. SO
YOU MAY, FOR EXAMPLE, TYPE "STA" INSTEAD OF "START".

2.2 SWITCHES

THERE ARE SEVERAL SWITCHES WHICH ARE USED TO MODIFY SUPERVISOR OPERATION.
THESE SWITCHES ARE APPENDED TO THE LEGAL COMMANDS. ALL OF THE LEGAL
SWITCHES ARE TABULATED BELOW WITH A BRIEF DESCRIPTION OF EACH.
IN THE DESCRIPTIONS BELOW, A DECIMAL NUMBER IS DESIGNATED BY "DDDDD".

SWITCH	EFFECT
/TESTS:LIST	EXECUTE ONLY THOSE TESTS SPECIFIED IN THE LIST. LIST IS A STRING OF TEST NUMBERS, FOR EXAMPLE - /TESTS:1:5:7-10. THIS LIST WILL CAUSE TESTS 1,5,7,8,9,10 TO BE RUN. ALL OTHER TESTS WILL NOT BE RUN.
/PASS:DDDDD	EXECUTE DDDDD PASSES (DDDDD = 1 TO 64000)
/FLAGS:FLGS	SET SPECIFIED FLAGS. FLAGS ARE DESCRIBED IN SECTION 2.3.
/EOP:DDDDD	REPORT END OF PASS MESSAGE AFTER EVERY DDDDD PASSES ONLY. (DDDDD = 1 TO 64000)
/UNITS:LIST	TEST/ADD/DROP ONLY THOSE UNITS SPECIFIED IN THE LIST. LIST EXAMPLE - /UNITS:0:5:10-12 USE UNITS 0,5,10,11,12 (UNIT NUMBERS = 0-63)

EXAMPLE OF SWITCH USAGE:

START/TESTS:1-5/PASS:1000/EOP:100

THE EFFECT OF THIS COMMAND WILL BE: 1) TESTS 1 THROUGH 5 WILL BE EXECUTED, 2) ALL UNITS WILL TESTED 1000 TIMES AND 3) THE END OF PASS MESSAGES WILL BE PRINTED AFTER EACH 100 PASSES ONLY. A SWITCH CAN BE RECOGNIZED BY THE FIRST THREE CHARACTERS. YOU MAY, FOR EXAMPLE, TYPE "/TES:1-5" INSTEAD OF "/TESTS:1-5".

BELOW IS A TABLE THAT SPECIFIES WHICH SWITCHES CAN BE USED BY EACH COMMAND.

	TESTS	PASS	FLAGS	EOP	UNITS
START	X	X	X	X	X
RESTART	X	X	X	X	X
CONTINUE		X	X	X	
PROCEED			X		
DROP					X
ADD					X
PRINT					
DISPLAY					X
FLAGS					
ZFLAGS					
EXIT					

2.3 FLAGS

FLAGS ARE USED TO SET UP CERTAIN OPERATIONAL PARAMETERS SUCH AS LOOPING ON ERROR. ALL FLAGS ARE CLEARED AT STARTUP AND REMAIN CLEARED UNTIL EXPLICITLY SET USING THE FLAGS SWITCH. FLAGS ARE ALSO CLEARED AFTER A START COMMAND UNLESS SET USING THE FLAG SWITCH. THE ZFLAGS COMMAND MAY ALSO BE USED TO CLEAR ALL FLAGS. WITH THE EXCEPTION OF THE START AND ZFLAGS COMMANDS, NO COMMANDS AFFECT THE STATE OF THE FLAGS; THEY REMAIN SET OR CLEARED AS SPECIFIED BY THE LAST FLAG SWITCH.

FLAG	EFFECT
HOE	HALT ON ERROR - CONTROL IS RETURNED TO RUNTIME SERVICES COMMAND MODE
LOE	LOOP ON ERROR
IER*	INHIBIT ALL ERROR REPORTS
IBE*	INHIBIT ALL ERROR REPORTS EXCEPT FIRST LEVEL (FIRST LEVEL CONTAINS ERROR TYPE, NUMBER, PC, TEST AND UNIT)
IXE*	INHIBIT EXTENDED ERROR REPORTS (THOSE CALLED BY PRINTX MACRO'S)
PRI	DIRECT MESSAGES TO LINE PRINTER
PNT	PRINT TEST NUMBER AS TEST EXECUTES
BOE	"BELL" ON ERROR
UAM	UNATTENDED MODE (NO MANUAL INTERVENTION)
ISR	INHIBIT STATISTICAL REPORTS (DOES NOT APPLY TO DIAGNOSTICS WHICH DO NOT SUPPORT STATISTICAL REPORTING)
IDR	INHIBIT PROGRAM DROPPING OF UNITS
ADR	EXECUTE AUTODROP CODE
LOT	LOOP ON TEST
EVL	EXECUTE EVALUATION (ON DIAGNOSTICS WHICH HAVE EVALUATION SUPPORT)

*ERROR MESSAGES ARE DESCRIBED IN SECTION 3.1

SEE THE XXDP+ USER'S MANUAL FOR MORE DETAILS ON FLAGS. YOU MAY SPECIFY MORE THAN ONE FLAG WITH THE FLAG SWITCH. FOR EXAMPLE, TO CAUSE THE PROGRAM TO LOOP ON ERROR, INHIBIT ERROR REPORTS AND TYPE A "BELL" ON ERROR, YOU MAY USE THE FOLLOWING STRING:

```
/FLAGS:LOE:IER:BOE
```

2.4 HARDWARE QUESTIONS

WHEN A DIAGNOSTIC IS STARTED, THE RUNTIME SERVICES WILL PROMPT THE USER FOR HARDWARE INFORMATION BY TYPING "CHANGE HW (L) ?" YOU MUST ANSWER "Y" AFTER A START COMMAND UNLESS THE HARDWARE INFORMATION HAS BEEN "PRELOADED" USING THE SETUP UTILITY (SEE CHAPTER 6 OF THE XXDP+ USER'S MANUAL). WHEN YOU ANSWER THIS QUESTION WITH A "Y", THE RUNTIME SERVICES WILL ASK FOR THE NUMBER OF UNITS (IN DECIMAL).

THE DPV-11 DATA COMM. LINK TEST PROGRAM WILL NOT USE MORE THAN ONE UNIT. FOR THE DPV-11 , THE HARDWARE INFORMATION REQUESTED WILL BE:

```
        # UNITS (D) ? 1<CR>

        UNIT 0
        FULL DUPLEX OPERATION :  (L) Y ?
        DPV CSR ADDRESS : (O)  160170 ?
        INTERRUPT VECTOR ADDRESS:  (O)  300  ?
        REMOTE NODE "ITEP" :  (L) N ?
        IS THIS A MULTIPOINT NETWORK: (L) N ?
```

THE FULL DUPLEX QUESTION SHOULD BE ANSWERED "Y" WHEN USING FULL DUPLEX MODEMS,OR NULL MODEM, OR MODEM ELIMINATORS. ANSWER "N" FOR HALF DUPLEX MODEMS.

REMOTE NODE ITEP SHOULD BE ANSWERED "Y" IF OTHER NODE IS RUNNING SOFTWARE THAT IS USING "ITEP" FORMATS(I.E. PDP-11 RUNNING INTERPROCESSOR TEST PROGRAM(ITEP)) IF OTHER NODE IS ITEP THEN THE ABOVE "MULTIPOINT NETWORK" QUESTION WILL NOT APPEAR.

IF TO THE "MULTIPOINT NETWORK" QUESTION YOU RESPOND WITH "YES" THEN

```
        ADDRESS THIS STATION: (D) A ?
```

WILL BE DISPLAYED. INPUT THE DECIMAL TRIBUTARY NUMBER (1-255) OF THIS DPV-11.

2.5 DATA COMM. LINK TEST COMMANDS

THE ''DCLT>'' COMMAND LEVEL FOLLOWS THE ANSWERING OF THE HARDWARE P-TABLE QUESTIONS. THESE COMMANDS CAN BE TYPED WHEN THE ''DCLT> (A) ?'' PROMPT IS PRINTED.

MESSAGE COMMANDS AVAILABLE:

YOU ONLY HAVE TO TYPE ENOUGH CHARACTERS TO UNIQUELY SPECIFY A COMMAND.

THE COMMAND LINE IS INTERPRETED FROM LEFT TO RIGHT. THEREFORE, IF A QUALIFIER ON THE COMMAND LINE IS RELATED OR EFFECTS A QUALIFIER TO THE LEFT ON THE COMMAND LINE, THE QUALIFIER FARTHEREST TO THE RIGHT TAKES PRECEDENCE SINCE IT IS INTERPRETED LAST. (I.E. IF /CHECK..... .../NOCHECK APPEAR ON THE SAME LINE, NOCHECK WILL BE INDICATED IN THE PARAMETERS WORD.)

REFER TO SECTION 6.0 FOR A DESCRIPTION OF THE DIFFERENT MODES OF OPERATION AND THE TYPES OF MESSAGES AVAILABLE.

2.5.1 MESSAGE COMMANDS

COMMAND		DESCRIPTION
CLEAR	EXPECTLIST	ZEROES THE EXPECTLIST (00'S) AND THEN PUTS DEFAULT ITEP MSG IN SO NOT REALLY EMPTY
CLEAR	TRANSMITLIST	FILLS TRANSMITLIST (000'S) AND THEN PUTS DEFAULT ITEP MSG IN SO NOT REALLY EMPTY
SET	EXPECTMSG=TYPE/QUAL	DEFINE A MESSAGE TO BE PUT ON THE EXPECTED LIST

WHERE: ''TYPE'' IS:
=ONES
=ZEROES
=1ALT
=0ALT
=ITEP
=CCITT
=ALPHA
=''A-Z,0-9,SPACES OR TABS IN QUOTES''

WHERE THE OPTIONAL ''QUAL'' IS:

	/SIZE=NNN	MAKE THE MESSAGE "NNN" BYTES LONG. (DEFAULT VALUE IS SIZE OF MESSAGE SPEC'D BY OPERATOR OR DEFAULTS.)
	/COPY=NN	COPY THIS MESSAGE INTO THE BUFFER "NN" TIMES (DEFAULT IS 0 = PUT THE MESSAGE IN ONLY ONCE)

NOTE: SET'S ADD MESSAGES TO THE LIST IN THE ORDER THEY'RE DEFINED. "NNN" IS A DECIMAL NUMBER. THE FIRST SET OVERWRITES THE DEFAULT ITEP MESSAGE PLACED THERE BY INITIALIZATION OR A "CLEAR" COMMAND.

SEE SECTION 6.2 FOR A DESCRIPTION OF THE PRE-DEFINED MESSAGES THAT ARE AVAILABLE. (ZEROS,ONES ...)

SET	TRANSMITMSG=TYPE/QUAL	DEFINE A MESSAGE TO BE PUT ON THE TRANSMIT LIST (SEE DESCRIPT FOR SET EXP)
SET	EXPECT=TRANSMIT	MAKES A COPY OF THE TRANSMIT LIST IN THE EXPECT LIST.
SHOW	EXPECTLIST	LISTS THE MESSAGE SIZE AND TYPE FOR THE MESSAGES IN THE EXPECT LIST
SHOW	TRANSMITLIST	LISTS THE MESSAGE SIZE AND TYPE FOR THE MESSAGES IN THE TRANSMIT LIST

2.5.2 STATISTICAL COMMANDS

COMMAND		DESCRIPTION
PRINT		TAKES THE OPERATOR TO THE REPORT LEVEL 'RPT>'. FROM HERE YOU CAN EXAMINE THE EVENT LOG.
DUMP	SSSSSS-EEEEEE/B	PRINTS THE CONTENTS OF THE MEMORY LOCATIONS BETWEEN OCTAL ADDRESSES "SSSSSS" AND "EEEEEE" WHERE "SSSSSS" IS THE START ADDRESS AND "-EEEEE" IS THE END ADDRESS.
	WHERE "/B" IS OPTIONAL: DEFAULT IS PRINT WORDS "/B" CAUSES PRINT BYTES	IF "-EEEEEE" IS NOT SPECIFIED THEN THE CONTENTS OF "SSSSSS" IS PRINTED IN WORD FORMAT.

IS PRINTED IN WORD FORMAT.

NOTE: THE DUMP COMMAND IS USEFUL FOR EXAMINING MESSAGE DATA. STARTING ADDRESSES CAN BE FOUND BY LOOKING IN THE EVENT LOG.

2.5.3 RUN COMMAND

COMMAND	DESCRIPTION
RUN MODE=MTYPE/QUAL	STARTS DCLT EXECUTING IN THE MODE SPECIFIED

NOTE: MODE=ACTIVE IS NOT DEFAULT, A MODE=MTYPE MUST BE TYPED EACH TIME A RUN IS TYPED

WHERE THE "MTYPE" IS ANY ONE OF THE FOLLOWING:

=ACTIVE	(FORCES /NOECHO ,NO LOOPING)
=PASSIVE	(FORCES NO LOOPING)
=RECEIVE	(FORCES /NOECHO ,NO LOOPING)
=LISTEN	(FORCES /NOECHO ,NO LOOPING, /NOCHECK)
=TRANSMIT	(FORCES /NOECHO ,NO LOOPING, /NOCHECK)
=TALK	(FORCES /NOECHO ,NO LOOPING, /NOCHECK)
=DOWNLINELOAD	(DOWN-LINE-LOADING IS NOT SUPPORTED FOR DPV-11 TO DPV-11 LINKS).

(FORCING NO LOOPING MEANS IT MUST BE SPECIFIED AS A QUALIFIER ANY TIME ITS DESIRED, THERE IS NO DEFAULT)

AND OPTIONAL "QUAL" IS ANY COMBINATION OF THE FOLLOWING:

/CHECK/NOCHECK	ENABLES/DISABLES CHECKING OF RECEIVED DATA AGAINST THE EXPECTED DATA

NOTE: IF BOTH MODES IN ACTIVE AND "/NOCHECK" IS USED, END-OF-PASS IS DEFINED AS RECEIVING 1 MESSAGE AND COMPLETING THE TRANSMIT LIST. WITH NO DATA CHECKING, THERE IS NO WAY FOR DCLT TO KNOW HOW MANY MESSAGES IT SHOULD EXPECT TO RECEIVE.

/STATUS/NOSTATUS	ENABLES/DISABLES PRINTING OF PROGRAM STATUS MESSAGES TO THE OPERATOR
/ECHO/NOECHO	ENABLES/DISABLES THE RETRANSMISSION OF THE DATA RECEIVED IN PASSIVE MODE. (IGNORED IN MODES OTHER THAN PASSIVE)
/MODEM/NOMODEM/	ENABLES/DISABLES THE REPORTING OF MODEM STATUS INTERRUPT CHANGES.
/LOOP=LTYPE	SPECIFIES WHICH, IF ANY, TYPE OF MAINTENANCE LOOPBACK IS BEING USED.

(IGNORED IN MODES OTHER THAN ACTIVE)
MUST BE SPECIFIED EACH TIME ELSE NO
LOOP IS USED.

''LTYPE'' IS:

=INTERNALTTL LOOPS DATA INTERNAL TO USYNRT

=CABLE USE THIS FOR TESTING WITH H3260
OR H3259 TURNARROUND CONNECTOR

NOTE: THIS SKIPS OVER THE CHECK
FOR MODEM READY WHEN DTR IS SET.

=LOCALMODEM NOT USED BY DPV
=REMOTEMODEM ''

/PASS=NN SPECIFIES NUMBER OF ITERATIONS TO MAKE BEFORE
END-OF-PASS. DEFAULT VALUE OF 1
WILL BE USED ON ANY RUN THAT A /PASS=N
IS NOT ADDED TO THE ''RUN ...'' COMMAND.
IF A ''-1'' IS TYPED, THEN THE PROGRAM
RUN UNTIL A ^C IS TYPED.

/PROTOCOL ENABLES SUBSET OF DDCMP PROTOCOL - THE DPV CAN
NOW COMMUNICATE WITH ''INTELLIGENT'' SYNCHRONOUS
DEVICES THAT SUPPORT DDCMP PROTOCOL IN THEIR
MICROCODE. (DMR,DMC,DMV OR DMP)

/NOPROTOCOL DISABLES DDCMP PROTOCOL - THE DPV NOW RUNS IN
NON-PROTOCOL MODE. COMMUNICATION POSSIBLE ONLY
BETWEEN DPV'S OR DUP TO DPV LINKS RUNNING DCLT.
WHEN COMMUNICATING WITH AN ITEP PROGRAM ALWAYS
SELECT NON-PROTOCOL MODE.

NOTE: SEE SECTION 6.1 FOR A DESCRIPTION
OF THE ''RUN MODES'' AND ''LOOP MODES''

2.5.4 DEFAULTS

IF NO ''SET'S'' THEN THE DEFAULT IS SAME AS IF TYPED:

```
SET TRANSMITMSG=ITEP/SIZE=58/COPY=0
SET EXPECTMSG=ITEP/SIZE=58/COPY=0
```

THE DEFAULT COPY AND SIZE FOR EACH OF THE MESSAGE TYPES:

```
ONES - /SIZE=64/COPY=0
ZEROES - /SIZE=64/COPY=0
0ALT - /SIZE=64/COPY=0
1ALT - /SIZE=64/COPY=0
CCITT - /SIZE=64/COPY=0
ALPHA - /SIZE=65/COPY=0
ITEP - /SIZE=58/COPY=0
OPER. SPEC'D - /SIZE=LENGTH-OF-TEXT-TYPED-BETWEEN-QUOTES/COPY=0
```

FOR THE RUN COMMAND THE DEFAULTS ARE:

```
RUN MODE=ACTIVE/NOSTATUS/CHECK/NOECHO/NOMODEM/PASS=1/NOPROTOCOL
```

NOTE: MODE=ACTIVE IS NOT DEFAULT, A MODE=MTYPE MUST BE TYPED
EACH TIME A RUN IS TYPED

IF THE DCLT PROGRAM IS RUN IN UNATTENDED MODE (UAM FLAG=1 OR CHAINED),
THE DEFAULTS ARE AS IF THESE SETUP AND RUN COMMANDS WERE TYPED:

```
SET TRANS=ITEP
SET EXPECT=ITEP
RUN MODE=ACTIVE/LOOP=INTERNAL/NOSTAT/NOECHO/NOMODEM/CHECK
                /PASS=1/NOPROTOCOL
```

OTHER NOTES:

^C	ALWAYS RETURNS YOU TO ''DR>'' (THE SUPERVISOR)
<CR>	IS SEEN AS A COMMAND TERMINATOR
''RUBOUT''	DELETE LAST CHAR. TYPED IN COMMAND STRING

2.5.5 PRINT COMMAND

THE PRINT COMMAND TAKES YOU TO THE REPORT LEVEL 'RPT>'.
THE COMMANDS AVAILABLE IN RPT> ARE ...

COMMAND	DESCRIPTION
HELP OR ?	PRINTS HELP INFORMATION FOR RPT>
EXIT	RETURNS YOU TO THE LEVEL THAT YOU ENTERED FROM. (DCLT> OR DR>)
LOG	PRINTS THE DCLT EVENT LOG
COUNTERS/FULL	PRINTS THE ENTIRE DDCMP STATISTICAL AND ERROR LOG. SEE SECTION 4.3
COUNTERS/ERRORS	PRINTS ONLY THE DDCMP ERROR LOCATIONS OF THE LOG.
COUNTERS/OFFSET=NN	PRINTS A SINGLE LOCATION OF THE LOG AS SPECIFIED BY THE OCTAL WORD OFFSET VALUE(NN). NOTE:: THE DDCMP COUNTERS WILL BE DISPLAYED ONLY WITH PROTOCOL ENABLED(/PROTOCOL).

2.5.6 MISC COMMANDS

COMMANDS	DESCRIPTION
EXIT	FROM THE DCLT> LEVEL RETURNS YOU TO DR>
HELP OR ?	PRINTS HELP INFORMATION

2.6 QUICK START-UP PROCEDURE (XXDP+)

TO START-UP THIS PROGRAM:

1. BOOT XXDP+
2. GIVE THE DATE AND ANSWER THE LSI AND 50HZ (IF THERE IS A CLOCK) QUESTIONS
3. TYPE 'R NAME', WHERE NAME IS THE NAME OF THE BIN OR BIC FILE FOR THIS PROGRAM
4. TYPE "START"
5. ANSWER THE "CHANGE HW" QUESTION WITH "Y"
6. ANSWER ALL THE HARDWARE QUESTIONS. THE NUMBER OF UNITS THAT CAN DCLT CAN USE IS ALWAYS "1".

WHEN YOU FOLLOW THIS PROCEDURE YOU WILL BE USING ONLY THE DEFAULTS FOR FLAGS. THESE DEFAULTS ARE DESCRIBED IN SECTION 2.3.

7. AFTER THE 'DCLT> (A) ?" PROMPT, TYPE "RUN MODE=ACTIVE<CR>"

WHEN YOU FOLLOW THIS PROCEDURE YOU WILL BE USING THE DEFAULT TRANSMIT AND EXPECTED MESSAGES. THE DEFAULT PASS COUNT AND "RUN" QUALIFIERS ARE ALSO BEING USED. THESE DEFAULTS ARE DESCRIBED IN SECTION 2.5.3.

3.0 ERROR INFORMATION

3.1 TYPES OF ERROR MESSAGES

THERE ARE THREE LEVELS OF ERROR MESSAGES THAT MAY BE ISSUED BY A DIAGNOSTIC: GENERAL, BASIC AND EXTENDED. GENERAL ERROR MESSAGES ARE ALWAYS PRINTED UNLESS THE "IER" FLAG IS SET (SECTION 2.3). THE GENERAL ERROR MESSAGE IS OF THE FORM:

```
NAME  TYPE  NUMBER  ON UNIT NUMBER  TST NUMBER PC:XXXXXX
ERROR MESSAGE
```

,WHERE; NAME = DIAGNOSTIC NAME
TYPE = ERROR TYPE (SYS FATAL, DEV FATAL, HARD OR SOFT)
NUMBER = ERROR NUMBER
UNIT NUMBER = 0 - N (N IS LAST UNIT IN PTABLE)
TST NUMBER = TEST AND SUBTEST WHERE ERROR OCCURRED
PC:XXXXXX = ADDRESS OF ERROR MESSAGE CALL

BASIC ERROR MESSAGES ARE MESSAGES THAT CONTAIN SOME ADDITIONAL INFORMATION ABOUT THE ERROR. THESE ARE ALWAYS PRINTED UNLESS THE "IER" OR "IBE" FLAGS ARE SET (SECTION 2.3). THESE MESSAGES ARE PRINTED AFTER THE ASSOCIATED GENERAL MESSAGE.

EXTENDED ERROR MESSAGES CONTAIN SUPPLEMENTARY ERROR INFORMATION SUCH AS REGISTER CONTENTS OR GOOD/BAD DATA. THESE ARE ALWAYS PRINTED UNLESS THE "IER", "IBE" OR "IXE" FLAGS ARE SET (SECTION 2.3). THESE MESSAGES ARE PRINTED AFTER THE ASSOCIATED GENERAL ERROR MESSAGE AND ANY ASSOCIATED BASIC ERROR MESSAGES.

3.2 SPECIFIC ERROR MESSAGES

3.2.1 COMMAND LINE INTERPRETER ERRORS

ERROR MESSAGE:	MEANING
?ILL CMD-BAD SYNTX?	A COMMAND WITH AN ILLEGAL CHAR WAS TYPED - RETYPE THE COMMAND. THE VALID COMMANDS AND THEIR SYNTAX ARE SHOWN IN SECTION 2.5.
?INCMPLTE CMD?	A REQUIRD PART OF A COMMAND WAS LEFT OUT.
?NUM TOO BIG?	THE VALUE OF A NUMERIC STRING IN THE COMMAND LINE WAS LARGER THAN 65535 OR 177777 OCTAL. (> 16 BITS).
?BAD RADIX?	A "8" OR "9" WAS TYPED WHEN AN OCTAL STRING WAS EXPECTED. PROBABLY OCCURRED WHEN TYPING A "DUMP" COMMAND WHERE OCTAL ADDRESSES ARE EXPECTED.

?''LOOP'' VALID ONLY IN ACTIVE?	THE ''/LOOP=..'' SWITCH WAS TYPED IN A RUN COMMAND BUT THE MODE WAS NOT SET TO ACTIVE. MAINTENANCE LOOP IS ONLY POSSIBLE IF THE MODE OF OPERATION IS ACTIVE.
?''ECHO'' VALID ONLY IN PASSIVE?	THE ''/ECHO'' SWITCH WAS TYPED IN A RUN COMMAND BUT THE MODE WAS NOT SET TO PASSIVE. ECHOING OF RECEIVED DATA IS ONLY POSSIBLE IF THE MODE OF OPERATION IS PASSIVE.
?ILL CHR- ''A-Z,0-9,SP,TAB'' ONLY?	A CHARACTER TYPED WITHIN QUOTES WHEN TRYING TO DEFINE THE CONTENTS OF A TRANSMIT OR EXPECT MESSAGE WAS NOT A ''A-Z,0-9,SPACE OR TAB''. RETYPE THE COMMAND WITH ONLY THESE CHARACTERS BETWEEN QUOTES.
?''SIZE=0'' NOT VALID?	A MESSAGE ZERO BYTES LONG CAN NOT BE BUILT. RETYPE THE COMMAND WITH A ''/SIZE=NNN''. IF NO ''/SIZE='' IS TYPED A DEFAULT SIZE WILL BE USED.
?TRANSMIT AND EXPECT LIST MUST BE IDENTICAL FOR LOOP?	IF RUN COMMAND WITH ''/LOOP/CH'' IS TYPED THE TRANSMIT LIST AND EXPECT LIST MUST BE EQUAL. IF THEY ARE NOT THIS ERROR WILL BE DISPLAYED. USE 'SE E=T' COMMAND.

3.2.2 DCLT OR DEVICE ERROR MESSAGES:

CLOCK NOT FOUND	THIS MEANS THAT NO CLOCK WAS FOUND ON THE SYSTEM THE DIAG-NOSTIC WILL STILL RUN BUT NONE OF THE TIME OUT CONDITIONS WILL OCCUR
BAD CLOCK - PROGRAM WILL HANG ON ''TIMEOUT''!!	THIS MEANS THAT THE CLOCK FOUND ON THE SYSTEM DID NOT INTERRUPT WHEN ASKED TO DO A ''TICK''. THE PROGRAM WILL STILL RUN, BUT ANY OF THE PROGRAM THAT TIMES THE DEVICE WILL HANG IF THE DEVICE TIMES OUT. ALSO, THE EVENT LOG WILL CONTAIN A ZERO EVENT TIME FOR ALL EVENTS LOGGED.
MAX. CHAR. MSG COUNT EXCEEDED - MSG. NOT BUILT !!	THIS MEANS THAT THE TRANSMIT OR EXPECT

BUFFER IS FULL. NO MORE MESSAGES CAN BE ADDED TO THAT BUFFER.

BUFFER FULL - MSG. NOT BUILT !!

THIS MEANS THAT THE LAST MESSAGE YOU TRIED TO ADD TO EITHER THE TRANSMIT OR EXPECT BUFFER CAUSED THE TOTAL NUMBER OF MESSAGES TO BE EXCEEDED. NO MORE MESSAGES CAN BE ADDED TO THAT BUFFER. THE LIMIT IS DETERMINED BY THE SIZE OF THE MESSAGE POINTER TABLE.

CHAR. COUNT EXCEEDS BUFF LIMIT - MSG TRUNCATED

THIS MEANS THAT THE LAST MESSAGE YOU TRIED TO ADD TO THE TRANSMIT OR EXPECT BUFFER CAUSED THE TOTAL CHAR. COUNT FOR THAT BUFFER TO EXCEED THE LIMIT. THE MESSAGE WAS TRUNCATED TO COMPLETELY FILL THE BUFFER. NO MORE MESSAGES CAN BE ADDED TO THAT BUFFER.

3.2.3 DEVICE ERROR MESSAGE

DATA COMPARISON DATA ERROR
BYTE # IN MSG=XXX EXPTD=YYY RECVD=ZZZ

XXX= OFFSET OF THAT BYTE FROM THE START OF THE COMPARE OR EXPECT MESSAGE.
YYY= THE CONTENTS OF THAT BYTE IN THE EXPECTED MESSAGE
ZZZ= THE CONTENTS OF THAT BYTE IN THE RECEIVED MESSAGE

UP TO FIVE OF THESE ERRORS WILL BE PRINTED PER MESSAGE COMPARED. ONLY THE FIRST FIVE MISMATCHES WILL BE INDIVIDUALLY REPORTED, BUT TOTAL NUMBER OF MISTMATCHES IS REPORTED BY ANOTHER ERROR.

PRINTING THE EVENT LOG AND USING THE DCLT "DUMP" COMMAND WILL ALLOW YOU TO FIND THE ADDRESS OF THE MESSAGE AND EXAMINE IT.

DATA COMPARISON DATA ERROR
TOTAL MISMATCHES IN MSG = NNN

THIS MEANS THAT WHEN THE MESSAGE RECEIVED WAS COMPARED AGAINST THE MESSAGE THAT WAS EXPECTED, SOME OF THE CHARS. WERE NOT THE SAME.

DATA COMPARISON LENGTH ERROR

```
                    COMPARE COUNT= XXX   RECEIVE COUNT= ZZZ

                                                XXX= NUMBER OF BYTES IN THE COMPARE
                                                     MESSAGE
                                                ZZZ= NUMBER OF BYTES IN THE RECEIVED
                                                     MESSAGE
                                                THIS MEANS THAT THE MESSAGE RECEIVED
                                                WAS A DIFFENT LENGTH THEN THE MESSAGE
                                                THAT WAS EXPECTED.

                    MODEM STATUS CHANGES FOR THIS PASS WERE..
                         HARD CHANGES=XXXXX   GLITCHES=XXXXX

                                                WHERE XXXXX IS A 5 DIGIT DECIMAL NUMBER
                                                THIS MSG IS ONLY PRINTED IF NUMBER OF
                                                EITHER HARD CHANGES OR GLITCHES IS
                                                GREATER THAN 0. A HARD CHANGE IS ONE
                                                WHERE THE DPV WAS ABLE TO LATCH UP A
                                                DIFFERENCE IN THE MODEM STATUS. A
                                                GLITCH IS WHEN A MODEM STATUS INTERRUPT
                                                OCCURS BUT THE DPV CANNOT FIND A
                                                DIFFERENCE IN STATUS BIT.


                    *******
                    * NOTE *  - IN THE FOLLOWING ERROR DESCRIPTIONS XXXXX
                    ********    REFERS TO THE OCTAL CONTENTS OF THE DEVICE REGISTERS
                                     SPECIFIED.


                    MASTER RESET DID NOT WORK                   THIS MEANS THAT AFTER A MASTER
                    RXCSR           TXCSR                       RESET WAS ISSUED TO DPV THE
                    XXXXXX          XXXXXXX                     RXCSR REGISTER WAS NON ZERO.

                    NO CLEAR TO SEND FROM MODEM                 WHEN REQUEST TO SEND SIGNAL
                    RXCSR           TXCSR                       IS SET MODEM DOES NOT RESPOND
                    XXXXXXX         XXXXXXX                     WITH CLEAR TO SEND

                    TIME OUT WAITING FOR RX OR TX TO COMPLETE
                    RXCSR           TXCSR                       THIS USUALLY MEANS AN OPEN
                    XXXXXXX         XXXXXXX                     COMMUNICATION LINK.

                    MODEM DID NOT RETURN MODEM READY
                    RXCSR           TXCSR                       MODEM DID NOT RESPOND WITH
                    XXXXXXX         XXXXXXX                     MODEM READY(MR).

                    CRC IN ERROR                                CRC ERROR DETECTED BY HARDWARE
                    RDSR            RXCSR                       IN INCOMING MESSAGE.
                    XXXXXX          XXXXXX

                    RECEIVER OVERRUN                            RECEIVER WASN'T SERVICED FAST
                    RDSR            RXCSR                       ENOUGH(SOFTWARE) TO PREVENT
                    XXXXXXX         XXXXXXX                     A CHARACTER FROM BEING LOST.

                    TIMED OUT IN START,STACK ACK SEQ            THIS USUALLY MEANS THAT THE DPV
```

RDATA	SDATA	
XXXXXXX	XXXXXXX	IS UNABLE TO ESTABLISH A CONNECTION WITH THE OTHER DEVICE BEING TESTED. SEE DDCMP SPEC. FOR EXPLANATION OF STARTUP SEQUENCE.

4.0 PERFORMANCE AND PROGRESS REPORTS

DCLT USES IT'S OWN METHOD FOR DETERMINING AN ''END OF PASS''
WHICH IS CALLED A ''DCLT END OF PASS''. THE NUMBER OF ''DCLT PASSES''
TO BE RUN IS SPECIFIED BY THE ''/PASS=XXX'' SWITCH ON THE DCLT
RUN COMMAND. THE TOTAL NUMBER OF ''DCLT ERRORS'' IS REPORTED
WHEN '' X NUMBER OF DCLT PASSES'' ARE COMPLETED.

4.1 PRINTING OF EVENT LOG

SIGNIFICANT EVENTS OR CHECK-POINTS WILL BE LOGGED IN A
''CIRCULAR QUEUE'' STORAGE AREA CALLED THE EVENT LOG. THE LAST
''N'' EVENTS ARE KEPT LOGGED AND CAN BE LISTED ON THE OPERATORS
CONSOLE BY GIVING A ''PRINT'' COMMAND AT THE ''DR>''(DIAGNOSTIC SUPERVISOR)
OR ''DCLT>'' (DCLT) LEVEL. THIS WILL TAKE YOU TO THE RPT> LEVEL. NOW
INPUT THE ''LOG'' COMMAND. THE EVENTS ARE PRINTED IN A ''LAST-IN
FIRST-OUT'' ORDER.

EVENT TIME IS TYPED OUT AS MMM:SS:TT (LIKE 254:36:07) WHERE MMM,SS,TT
REPRESENT THE NUMBER OF MINUTES, SECONDS, CLOCK TICKS SINCE THE LAST
START OR RESTART. IT SHOULD BE NOTED THAT THE TIMES ARE
RELATIVE SINCE WHILE THE PROCESSOR IS RUNNING AT PRIORITY 7
THE CLOCK CAN'T INTERRUPT TO KEEP TIME. THIS IS THE CASE
WHILE THE PROGRAM IS FETCHING DCLT COMMANDS FROM THE OPERATOR.
IT SHOULD ALSO BE NOTED THAT THERE ARE ONLY 8 BITS AVALIABLE TO STORE
RELATIVE MINUTES SO ''TIME'' WILL WRAP TO 000:00:00 AFTER 256:59:59.

A START OR RESTART COMMAND AT THE ''DR>'' LEVEL INITIALIZES THE EVENT
LOG. THEREFORE IT IS WISE TO DO A ''PRINT'' AT THE ''DR>'' LEVEL
BEFORE GIVING A ''START'' OR ''RESTART''.

THE TYPES OF EVENTS KEPT IN THE EVENT LOG ARE:

TRANSMIT MESSAGE QUEUED:
        EVENT TIME, ADDRESS OF 1ST BYTE OF MESSAGE,
        TOTAL NO. OF BYTES, MODEM STATUS AT THAT TIME.

TRANSMIT MESSAGE COMPLETED:
        EVENT TIME, ADDRESS OF 1ST BYTE OF MESSAGE,
        TOTAL NO. OF BYTES, MODEM STATUS AT THAT TIME.

RECEIVE SPACE QUEUED:
        EVENT TIME, ADDRESS OF 1ST BYTE OF MESSAGE,
        TOTAL NO. OF BYTES, MODEM STATUS AT THAT TIME.

```
                RECEIVE MESSAGE COMPLETED:
                        EVENT TIME, ADDRESS OF 1ST BYTE OF MESSAGE,
                        TOTAL NO. OF BYTES, MODEM STATUS AT THAT TIME.

                DATA COMPARISON STARTED:
                        EVENT TIME, ADDRESS OF 1ST BYTE OF RECEIVED MSG.,
                        TOTAL NO. OF BYTES IN RCV. MSG., TOTAL NO. OF BYTES
                        IN EXPECT MSG.

                DATA COMPARISON DATA ERROR:
                        EVENT TIME, ADDRESS OF 1ST BYTE OF RECEIVED MSG.,
                        TOTAL NO. OF BYTES IN RCV. MSG., TOTAL NO. OF
                        COMPARISON FAILURES

                DATA COMPARISON LENGTH ERROR:
                        EVENT TIME, ADDRESS OF 1ST BYTE OF RECEIVED MSG.,
                        TOTAL NO. OF BYTES IN RCV. MSG., TOTAL NO. OF BYTES
                        IN EXPECT MSG.

                DEVICE INIT AND SETUP:
                        EVENT TIME, MODE OF OPERATION, TYPE OF MAINTENANCE
                        LOOP, "DCLT" PASS COUNT, "RUN" PARAMETERS

                DEVICE ERROR:
                        EVENT TIME, DEVICE ERROR MESSAGE, CONTENTS OF TWO
                        REGISTERS RELATING TO THE ERROR.

                END OF PASS:
                ^C ABORT:
                        EVENT TIME, "DCLT" PASS COUNT, "DCLT" ERROR COUNT,
                        AND THE "STRT-TO"(COUNT OF START TIME OUTS).
```

4.2 OPERATOR STATUS MESSAGES

THE "/STATUS, /NOSTATUS" QULAIFIERS FOR THE DCLT "RUN" COMMAND ENABLES/DISABLES THE PRINTING OF PROGRAM STATUS MESSAGES TO THE OPERATOR. THESE MESSAGES ARE INTENDED TO TELL THE OPERATOR WHAT THE DCLT PROGRAM IS CURRENTLY DOING. BELOW ARE THE MESSAGES THAT MIGHT BE PRINTED AND THEIR MEANING:

MESSAGE	MEANING
TXQ	DEVICE IS ABOUT START TRANSMITING A MESSAGE
TXC	TRANSMISSION OF MESSAGE COMPLETED
RXQ	DEVICE HAS QUEUED SPACE TO RECEIVE/ COMPLETED RECEIVE
ERR	DEVICE ERROR HAS OCCURRED
INI	DEVICE ABOUT TO BE INITIALIZED
MSC	ABNORMAL MODEM STATUS CHANGE
CMP	ABOUT TO DO DATA CHECKING OF RECVD VS. EXPTD DATA
CML	LENGTH ERROR OCCURRED DURING DATA COMPARISON
CMD	DATA ERROR OCCURRED DURING DATA COMPARISON
EOP	END OF PASS

NOTE:: BECAUSE THE DPV IS AN INTERRUPT DRIVEN DEVICE, IT IS BEST TO DISABLE STATUS TO PREVENT OVERRUN ERRORS.(AT HIGH SPEEDS)

4.3 PRINTING DDCMP STATISTICAL AND ERROR LOG

IF YOU ARE RUNNING THIS PROGRAM WITH DDCMP PROTOCOL ENABLED,YOU CAN EXAMINE(VIA "RPT>" COMMAND)DDCMP STATISTICAL AND ERROR COUNTERS TO GET A BETTER UNDERSTANDING OF WHAT IS HAPPENING ON THE LINK. FOR A FULL DESCRIPTION OF THESE COUNTERS SEE (DIGITAL DATA COMMUNICATION MESSAGE PROTOCOL) SPECIFICATION VERSION 4.1.

BELOW IS A BRIEF DESCRIPTION OF EACH COUNTER. THE MOST IMPORTANT OF THESE ARE DATA MESSAGES SENT/RECEIVED AND DATA ERRORS IN/OUT.

OCTAL #	MESSAGE	MEANING
000000	STATUS FLAGS	USED ONLY IN SOFTWARE DEVELOPMENT.
000000	DATA MSGS TX	# MESSAGES TX'ED DURING THE TEST. RESET TO ZERO AT START OR RESTART. LATCHES AT -1.
000000	DATA MSGS RX	# MESSAGES RX'ED DURING THE TEST.RESET TO ZERO AT START OR RESTART. LATCHES AT -1.
000	HIGHEST MSG TX	MODULO 255 COUNTER. HIGHEST MESSAGE # SENT AND ACK'ED BY REMOTE STATION.
000	HIGHEST MSG ACK	MODULO 255 COUNTER. HIGHEST MESSAGE # RX'D BY REMOTE NODE.(WITH NO ERRORS)
000	NEXT MSG # TO TX	MODULO 255 COUNTER. ALWAYS 1 GREATER THEN CURRENT MESSAGE NUMBER BEING SENT.
000	LAST MSG # TX'ED	MODULO 255 COUNTER. ALWAYS SAME AS HIGHEST # SENT.
000	HIGHEST MSG# RX	NUMBER OF LAST MESSAGE RX'ED AND ACK'ED.
000	TRIB ADDR	IF MULTIPOINT THEN ADDRESS THIS STATION.
000	REMOTE TIME OUTS	MODULO 255 COUNTER. REPLYS RECEIVED AND ACK'ED.
000	GLOBAL CRC ERRORS	IF MULTIPOINT NETWORK-CRC ERRORS DETECTED.
000	NAK REASON	REASON FOR SENDING LAST NAK.
000	SEL THRESH ERRS	HALF/DUPLEX ONLY. SELECT TIME OUTS.
000	RX THRESH ERRS	INCREMENTED WHEN ERROR DETECTED IN INCOMING MESSAGE.(MODULO 8 COUNTER) RESET WHEN GOOD MESSAGE RECEIVED.
000	TX THRESH ERRS	INCREMENTED WHEN NAK RECEIVED. RESET WHEN ACK RECEIVED.(MODULO 8 COUNTER)

000	DATA ERRORS OUT	NAKS RECEIVED BECAUSE OF HEADER CRC ERROR OR DATA CRC ERRORS OR MESSAGE NOT RECEIVED AT ALL(REP). INDICATES NOISE ON TRANSMIT LINE.
000	DATA ERRORS IN	NAKS SENT BECAUSE HEADER CRC ERROR OR DATA CRC ERROR DETECTED IN INCOMING MESSAGE. MESSAGE TAKING NOISE HITS.
000	LOCAL BUFFER ERRS	EITHER NO BUFFER WAS AVAILABLE FOR INCOMING MESSAGE OR BUFFER THAT WAS AVAILABLE WAS TOO SMALL FOR INCOMING MESSAGE. USUALLY A SOFTWARE SPEED PROBLEM.
000	REMOTE BUFFER ERRS	SAME AS LOCAL BUT BUFFER PROBLEMS AT REMOTE STATION.
000	REMOTE STA ERRS	RX OVERRUN ERRORS(RX WASN'T SERVICED FAST ENOUGH) OR IF FORMAT ERROR A CRC EXISTED AND WASN'T DETECTED BY HARDWARE.
000	LOCAL STA ERRS	SAME AS REMOTE STATION ERRORS.
000	TX / RX THRESH ERR	OVERFLOW FROM RX OR TX THRESHOLD COUNTERS. INDICATES A PERSISTENT LINK PROBLEM THAT ISN'T CORRECTED AFTER 7 RETRIES.

5.0 DEVICE INFORMATION TABLES

THIS IS THE DEFAULT HARDWARE P-TABLE. THE VALUES AND
SIZE ARE USED AS A "TEMPLATE" FOR CREATING ACTUAL P-TABLE
ENTRIES AND THE DEFAULT VALUES PROVIDED FOR THE OPERATOR.
SEE SECTION 2.4 FOR AN EXAMPLE OF THE HARDWARE QUESTIONS.

THE NUMBERS IN BRACKETS (I.E. [10]) INDICATES THE OFFSET OF THE
WORD INTO THE HARDWARE P-TABLE. THE OFFSETS MUST MATCH THE P-TABLE
OFFSETS USED IN THE HARDWARE PARAMETER CODING SECTION WHERE THE
"GET PARAMETER" CALLS ARE USED TO FILL THE P-TABLE.

```
.WORD   1               ;[0] FULL OR HALF DUPLEX FLAG (BIT0=1 IF FULL)
.WORD   160170          ;[2] CSR ADDRESS
.WORD   300             ;[4] INTERRUPT VECTOR
.WORD   240             ;[6]  SPARE
.WORD   0               ;[10] PT-PT =0  MULTIPOINT = 1
.WORD   1               ;[12] TRIB ADDRESS THIS STATION
.WORD   0               ;[14] REMOTE NODE "ITEP"
```

6.0 MODE AND MESSAGE DESCRIPTIONS

6.1 MODE DESCRIPTIONS

THE FOLLOWING MODE DESCRIPTIONS REFER TO MESSAGE LISTS BEING
TRANSMITTED AND RECIEVED. BE AWARE THAT OTHER DATA IS ALSO
SENT WITH THE MESSAGE. ALL MESSAGES ARE PRECEDED BY SYNC
CHARACTERS(ITEP = 026)(PROTOCOL = 226). ITEP MESSAGES CONTAIN
NO CRC CHARACTERS. NON-ITEP MESSAGES ARE ENCLOSED IN A DDCMP
ENVELOPE. WITH PROTOCOL ENABLED CONTROL MESSAGES(ACK,NAK,...)
ALSO APPEAR ON THE LINK.

6.1.1 TRANSMIT MODE

A LIST OF MESSAGES IS TRANSMITTED WITHOUT EXPECTING ANY DATA
TO BE RECEIVED.

6.1.2 RECEIVE MODE

SPACE IS QUEUED FOR THE DEVICE TO RECEIVE MESSAGES.
AFTER RECEIVING AN "EXPECTED" NUMBER OF MESSAGES, THE DATA RECEIVED
CAN BE COMPARED AGAINST A LIST OF "EXPECT TO RECEIVE" MESSAGES
IF DATA-CHECKING IS ENABLED.

6.1.3 PASSIVE MODE

THEN EVERY TIME A MESSAGE IS RECEIVED, A MESSAGE IS TRANSMITTED.
DATA CHECKING CAN BE DONE ON THE RECEIVED DATA.THE "/ECHO, /NOECHO"
ENABLES/DISABLES THE RETRANSMISSION OF THE DATA RECEIVED.

6.1.4 ACTIVE MODE

A LIST OF MESSAGES IS TRANSMITTED AND MESSAGES ARE RECEIVED.
AFTER RECEIVING AN "EXPECTED" NUMBER OF MESSAGES, THE DATA RECEIVED
CAN BE COMPARED AGAINST A LIST OF "EXPECT TO RECEIVE" MESSAGES
IF DATA-CHECKING IS ENABLED.

NOTE: IF BOTH ENDS OF THE LINK ARE IN ACTIVE MODE, THEN THE
LINK MUST BE A FULL DUPLEX LINK!

6.1.5 DOWN-LINE-LOAD

DOWN-LINE-LOADING IS NOT SUPPORTED FOR DPV-11 TO DPV-11 LINKS.

6.1.6 TALK MODE

THE "TALK" END OF THE LINK TRANSMITS OPERATOR-TYPED MESSAGES
UNTIL A "EXIT" MESSAGE IS TYPED. AT THAT POINT, THE NODE GOES
INTO "LISTEN" MODE. AN "EXIT MESSAGE" IS A MESSAGE WHOSE FIRST
FOUR CHARACTERS ARE "EXIT". SINCE ONLY THE FIRST FOUR CHARACTERS
NEED TO BE "EXIT", MORE CHARACTERS CAN BE ADDED SO THAT A MESSAGE
MAY BE SENT AND THE MODE SWITCHED ALL AT ONCE. FOR EXAMPLE:

TLK> EXIT ALL OF THIS LINE IS SENT THEN MODE SWTICHED

6.1.7 LISTEN MODE

THE "LISTEN" END OF THE LINK PRINTS ALL OF THE MESSAGES
RECEIVED BY THE DEVICE ON THE OPERATOR'S CONSOLE. IF THE MESSAGE
RECEIVED IS AN "EXIT" MESSAGE, THEN THE NODE ENTERS "TALK" MODE.
AN "EXIT MESSAGE" IS A MESSAGE WHOSE FIRST FOUR CHARACTERS ARE "EXIT".

6.1.8 MAINTENANCE "LOOP" MODES

REMEMBER THAT THE WHENEVER A "RUN" COMMAND IS TYPED, THE DEFAULT IS
NO LOOPBACK AND THAT A LOOP MODE MUST BE SPECIFIED BY A "/LOOP=.."
IF A LOOP MODE IS DESIRED.
LOOP MODES ARE ONLY VALID IF THE MODE TO RUN IS ACTIVE !

INTERNALTTL LOOPS DATA INTERNAL TO THE USYNRT

THE FOLLOWING TABLE SUMMARIZES THE MODES THAT CAN BE RUN TOGETHER
WHEN THE DCLT PROGRAM IS RUNNING ON TWO PROCESSORS (ONE AT EACH
END OF THE LINK):

HALF DUPLEX START	STATION A "HOST" NODE	"/LOOP" ALLOWED?	STATION B "REMOTE" NODE	DUPLEX
B	TALK	NO	LISTEN*, RECEIVE	HALF OR FULL
A	LISTEN	NO	TALK*, TRANSMIT	HALF OR FULL
B	TRANSMIT	NO	RECEIVE*, LISTEN	HALF OR FULL
A	RECEIVE	NO	TRANSMIT*, TALK	HALF OR FULL
A	PASSIVE	NO	ACTIVE*	HALF OR FULL
-NA-	ACTIVE	YES	ACTIVE*	FULL
B	ACTIVE	YES	PASSIVE*	HALF OR FULL
-NA-	DOWNLINELOAD	** DOWN-LINE-LOADING IS NOT SUPPORTED FOR DPV-11 TO DPV-11 LINKS.		

*= MOST LIKELY TO BE IN THAT MODE

NOTE: H/D START COLUMN INDICATES WHICH NODE TO START FIRST ON A HALF DUPLEX LINK

IF PROTOCOL IS SELECTED THE HALF DUPLEX START COLUMN CAN BE IGNORED.

6.2 MESSAGE DESCRIPTIONS

NAME	DESCRIPTION
ZEROES	MESSAGE OF ALL 0'S (00000000,00000000,00000000,....)
ONES	MESSAGE OF ALL 1'S (11111111,11111111,11111111,....)
1ALT	MESSAGE OF ALTERNATING 1'S (10101010,10101010,....)
0ALT	MESSAGE OF ALTERNATING 0'S (01010101,01010101,....)
CCITT	"CCITT" 512-BIT (VS. 511 BITS) TEST PATTERN
ITEP	"INTERPROCESSOR TEST PROGRAM'S (ITEP)" MESSAGE 1(DP1:) (<177><177>/$A THE QUICK BROWN FOX JUMPED OVER THE LAZY DOG.<15><12><001><177><177><177><177>)
ALPHA	ALPHA-NUMERICS (OR FUTURE COMM TURNAROUND MSG) (#$!" (AMPERSAND)'()*+,-.0123456789:;<=>?@ABCDEFGHIJK LMNOPQRSTUVWXYZ/[\]^_%)
OPERATOR-SPECIFIED	"A-Z,0-9,SPACES,TABS" THESE ARE THAT THE CHARACTERS THAT CAN BE TYPED BETWEEN QUOTATION MARKS ("..") TO SPECIFIY A UNIQUE MESSAGE.

7.0 OTHER INFORMATION

7.1 INTERFACING TO AN "ITEP" NODE

THESE ARE THE RULES WHEN USING ITEP/WITH A DUP TO TALK
TO A DPV USING DCLT.

ITEP NODE	DCLT NODE
ANSWER ALL QUESTION TO THE SET SWITCHES PROMPT.	ANSWER ALL QUESTIONS TO THE DCLT> PROMPT.
FOR ONE WAY OUT... SET SWITCHES TO 1221	CLEAR EXPECTED SET E=ITEP/S=56 RUN MODE=REC/STATUS/CHECK/NPR
NOTE: DUP ITEP SENDS ONLY 56 CHARS	
FOR ONE WAY IN.....	
SET SWITCHES TO 1222	RUN MODE=TRA/STATUS/NPR
FOR EXTERNAL LOOPBACK....	
SET SWITCHES.....1224	CLEAR EXPECTED SET EXP=ITEP/S=56 RUN MODE=ACTIVE/STATUS/CHECK/NPR
FOR INTERNAL LOOPBACK.....	
SET SWTICHES.....1260	CLEAR EXPECTED SET EXP=ITEP/S=56 RUN MODE=ACTIVE/STATUS/CHECK/NPR

NOTE: DO NOT USE SWITCH 8 WITH ITEP GOING TO DCLT
THE ONLY MESG. DCLT SUPPORTS IS MSG 1.
DCLT IGNORES CRC ERRORS WHEN REC DATA FROM ITEP
BECAUSE ITPE SENDS NO CRC.
REMEMBER WHEN YOU ARE COMMUNICATING WITH AN "ITEP" NODE
ALWAYS DISABLE('/NOPROTOCOL').

7.2 TROUBLESHOOTING HINTS

LISTED BELOW ARE SOME SETUPS THAT COULD BE USED FOR ISOLATING FAULTS.
THESE ARE BY NO MEANS THE ONLY WAYS DCLT CAN BE USED !!!!!!!
DCLT IS MEANT TO BE A VERY FLEXIBLE TOOL! THIS SECTION IS MEANT TO
GIVE SOMEONE NOT TOO FAMILIAR WITH DCLT A PLACE TO START.

EVEN IF YOU ARE CHECKING OUT DPV TO DPV LINKS, IT IS A GOOD IDEA
TO ENABLE PROTOCOL. BY EXAMINING THE DDCMP STATISTICAL AND ERROR
LOG, YOU CAN GET A BETTER PICTURE OF WHAT IS HAPPENING ON THE LINK.

REMEMBER THAT THE PRINTING OF STATUS MESSAGES AND PRINTING O THE
EVENT LOG CAN PROVIDE A LOT OF INFORMATION ABOUT THE SEQUENCE OF
EVENTS AND HOW THE DEVICE AND LINK ARE BEHAVING.

NOTE: *IF BOTH* NODES IN ACTIVE AND "/NOCHECK" IS USED,
----- END-OF-PASS IS DEFINED AS RECEIVING 1 MESSAGE
AND COMPLETING THE TRANSMIT LIST. WITH NO DATA
CHECKING, THERE IS NO WAY FOR DCLT TO KNOW HOW
MANY MESSAGES IT SHOULD EXPECT TO RECEIVE.

7.2.1 INTERNAL LOOP AT EACH NODE

RUN EACH END OF THE LINK IN ACTIVE MODE WITH LOOP=INTERNAL.
TRANSMIT TWO OR THREE MESSAGES WITH NO DATA CHECKING.
STATUS PRINTING COULD BE TURNED OFF IF ON, BUT SEEING THE SEQUENCE
OF EVENTS MIGHT BE INFORMATIVE.

A POSSIBLE COMMMAND SEQUENCE IS:

```
C E
C T
SE T=ONES/S=20/C=2
R M=A/LO=I/NOCH/STAT
```

WHAT THE ABOVE COMMAND SEQUENCE MEANS:

THE "C E" AND THE "C T" INITIALIZES THE "EXPECT"
LIST AND THE "TRANSMIT LIST". THE "SE T=ONES/S=20/C=2"
SETS THE TRANSMIT LIST TO CONTAIN 3 MESSAGES. THE MESSAGES
CONTAIN DATA OF ALL ONES AND EACH ONE IS 20 BYTES IN LENGTH.
THE "R M=A/LO=I/NOCH/STAT" SETS THE MODE TO RUN IN TO BE
ACTIVE AND LOOP TYPE TO BE INTERNAL TTL. THE PROGRAM WILL
NOT BE CHECKING DATA SO THERE WAS NO NEED TO SET UP AN
EXPECT LIST. THE PROGRAM WILL BE PRINTING STATUS MESSAGES.

WHAT YOU SHOULD SEE AFTER ENTERING THE RUN COMMAND
IF THINGS ARE RUNNING CORRECTLY :

```
INI RXQ TXQ RXQ TXC TXQ RXQ TXC
TXQ RXQ TXC EOP
     MODE=ACTIVE/LOOP=INTERNAL/PASS    000
```

```
                                        /STATUS/NOCHECK/NOECHO/NOMODEM/NOPROTOCOL
                DCLT> (A)  ?
```

THIS GIVES YOU A IDEA IF THE COMM. DEVICE CAN EVEN TRANSMIT AND RECEIVE. ANY ERRORS REPORTED WILL PROBABLY BE DUE TO INCORRECT DEVICE ADDRESSES BEING USED OR A FAULTY DEVICE. CHECK ADDRESSES WITH "DISPLAY" AND RUN THE PREREQUISITE DIAGNOSTICS FOR THE COMM. DEVICE.

NOW TRY RUNNING EACH NODE THE SAME WAY WITH DATA CHECKING ENABLED.
A POSSIBLE COMMMAND SEQUENCE IS:

```
SE E=T
R M=A/LO=I/CH/PAS=3
```

WHAT THIS SEQUENCE MEANS:

THIS SEQUENCE IS SIMILAR TO THE ONE ABOVE . THE "SE E=T" MAKES A COPY OF THE TRANSMIT LIST IN THE EXPECT LIST. THE EXPECT LIST NOW CONTAINS 3 MESSAGES. THE MESSAGES WILL HAVE ALL ONES FOR DATA AND BE 20 BYTES EACH IN LENGTH. THE RUN COMMAND IS THE SAME WITH THE ADDITION OF TWO SWITCHES "/CH/PAS=3". THE "CH" SWITCH TELLS THE PROGRAM TO CHECK THE RECEIVED DATA AGAINST THE "EXPECTED LIST". THE "PAS=3" SWITCH TELLS THE PROGRAM TO RUN 3 PASSES BEFORE RETURNING TO THE DCLT> PROMPT.

WHAT YOU SHOULD SEE AFTER ENTERING THE RUN COMMAND
IF THINGS ARE RUNNING CORRECTLY :

```
INI RXQ TXQ TXC RXQ TXQ TXC RXQ
TXQ TXC CMP CMP CMP EOP RXQ TXQ
TXC RXQ TXQ TXC RXQ TXQ TXC CMP
CMP CMP EOP RXQ TXQ TXC RXQ TXQ
TXC RXQ TXQ TXC CMP CMP CMP EOP
     MODE=ACTIVE/LOOP=INTERNAL/PASS=00000
                /STATUS/CHECK/NOECHO/NOMODEM/NOPROTOCOL
```

IF A CABLE TURNAROUND CONNECTOR IS AVAILABLE, PUT IT ON THE END OF THE CABLE JUST BEFORE THE MODEM OR IF A H3260(RS-423) ON BOARD CONNECTOR IS AVAILABLE INSTALL IT AND RUN IN ACTIVE MODE WITH THE "/LOOP=CABLE" SWITCH.
POSSIBLE COMMAND SEQUENCE IS:

```
R M=A/L=C/CH/PAS=3
```

WHAT THIS SEQUENCE MEANS:

THIS SEQUENCE HAS THE "/LO=C". THIS INFORMS THE SOFTWARE NOT TO CHECK FOR DATA SET READY SIGNAL FROM THE MODEM.

WHAT YOU SHOULD SEE AFTER ENTERING THE RUN COMMAND
IF THINGS ARE RUNNING CORRECTLY :

```
INI RXQ TXQ TXC RXQ TXQ TXC RXQ
TXQ TXC CMP CMP CMP EOP RXQ TXQ
TXC RXQ TXQ TXC RXQ TXQ TXC CMP
CMP CMP EOP RXQ TXQ TXC RXQ TXQ
TXC RXQ TXQ TXC CMP CMP CMP EOP
     MODE=ACTIVE/LOOP=CABLE/PASS=00000
                 /STATUS/CHECK/NOECHO/NOMODEM/NOPROTOCOL
DCLT> (A)  ?
```

7.2.2 TRANSMIT ON ONE NODE RECEIVE ON THE OTHER

NOW TRY TRANSMIITING FROM ONE END AND RECEIVING ON THE
OTHER. MAYBE WITH NO DATA CHECKING AT FIRST TO ESTABLISH
IF THE LINK IS WORKING. POSSIBLE COMMAND SEQUENCES ARE:

NODE A	NODE B
C E	C E
C T	C T
SE T=1ALT/S=250	R M=R/NOCH/PAS=3
R M=TR/PAS=3	

WHAT THIS SEQUENCE MEANS:

THE "C E " AND "C T" INITIALIZE BOTH THE
TRANSMIT AND EXPECT LISTS. THE "SE T=1ALT/S=250"
SETS THE TRANSMIT LIST ON NODE A TO BE 1 MESSAGE
WITH A LENGTH OF 250 BYTES AND DATA OF ALTERNATING
ONES AND ZEROS. THE "R M=TR/PAS=3" SETS THE RUN MODE OF
NODE A TO BE TRANSMIT AND THE PASS COUNT IS SET TO 3.
THE "R M=R/NOCH/PAS=3" SETS THE RUN MODE OF NODE B
TO BE RECEIVE, NO DATA CHECKING IS TO BE DONE,AND
THE PASS COUNT IS SET TO THREE.

WHAT YOU SHOULD SEE AFTER ENTERING THE RUN COMMAND
IF THINGS ARE RUNNING CORRECTLY :

FOR NODE A:

```
INI TXQ TXC EOP TXQ TXC EOP TXQ
TXC EOP
     MODE=TRANSMIT/PASS=00000
                 /STATUS/NOCHECK/NOECHO/NOMODEM/NOPROTOCOL
DCLT> (A)  ?
```

FOR NODE B:

```
INI RXQ EOP RXQ EOP RXQ EOP
     MODE=RECEIVE/PASS=00000
                 /STATUS/NOCHECK/NOECHO/NOMODEM/NOPROTOCOL
DCLT> (A)  ?
```

```
NOW TRY DOING DATA CHECKING ON THE MESSAGE(S) BEING
TRANSMITTED.  POSSIBLE COMMAND SEQUENCES ARE:

                                                SE E=1ALT/S=250
        R M=TR/PAS=3                            R M=R/CH/PAS=3

WHAT THIS SEQUENCE MEANS:
        THE ''SE E=1ALT/S=250'' LINE MUST BE ADDED HERE
        TO SET UP THE ''EXPECT LIST'' ON THE RECEIVE NODE
        SO IT WILL KNOW WHAT TO COMPARE AGAINST.
        THE CHANGE IN THE RUN COMMAND IS FROM ''NOCH'' TO
        ''CH''. THE ''CH'' ENABLES DATA CHECKING.

WHAT YOU SHOULD SEE AFTER ENTERING THE RUN COMMAND IF THINGS
ARE RUNNING CORRECTLY:

NODE A: IS THE SAME AS ABOVE.

NODE B:
        INI RXQ CMP EOP RXQ CMP EOP RXQ CMP EOP
         MODE=RECEIVE/PASS=00000
                /STATUS/CHECK/NOECHO/NOMODEM/NOPROTOCOL
        DCLT> (A)?

NOW RUN THRU THE SEQUENCE AGAIN WITH NODE A RECEIVING
AND NODE B TRANMITTING TO CHECK OUT THE OPPOSITE
DIRECTION OF DATA FLOW.
```

7.2.3 ONE NODE ACTIVE THE OTHER NODE PASSIVE

```
NOW TRY RUNNING ONE NODE IN ACTIVE MODE WHILE THE OTHER
END RUNS IN PASSIVE. DATA CHECKING SHOULD BE TURNED OFF
IF THE MESSAGE LISTS ARE NOT THE SAME.
POSSIBLE COMMAND SEQUENCES ARE:

        NODE A                  NODE B
        ------                  ------
        C E                     C E
        C T                     C T
        SE T=CCITT/S=10/C=2     SE T=1ALT/S=20/C=2
        R M=ACT/NOCH/PAS=3      R M=P/NOCH/PAS=3

WHAT THIS SEQUENCE MEANS:
        THE EXECUTION OF THIS SEQUENCE CAUSES THE FOLLOWING
        THINGS TO HAPPEN ON NODE A. THE TRANSMIT AND EXPECT
        LISTS ARE INITIALIZED THEN THE TRANSMIT LIST IS SET
        TO 3 MESSAGES OF 10 BYTES EACH. THE DATA USED IN THE
        TRANSMIT MESSAGES IS THE CCITT PATTERN. THEN NODE A
        IS RUN IN ACTIVE MODE WITH DATA CHECKING DISABLED AND
        THE PASS COUNT SET TO THREE. NOTE STATUS WOULD STILL BE
        PRINTED IF THE PREVIOUS SEQUENCES HAD BEEN RUN.
        IF YOU ARE RUNNING FROM LOAD TIME YOU WOULD HAVE
```

TO ADD A "/STA TO THE RUN COMMAND LINE.

NODE B: THE TRANSMIT AND EXPECT LISTS ARE INTIALIZED
THEN THE TRANSMIT LIST IS SET TO 3 MESSAGES OF
20 BYTES EACH. THE DATA FOR EACH MESSAGE IS ALTERNATING
1'S AND 0'S. THE NODE IS THEN RUN IN PASSIVE MODE WITH
DATA CHECKING DISABLED AND THE PASS COUNT SET TO 3.

WHAT YOU SHOULD SEE AFTER ENTERING THE RUN COMMAND
IF THINGS ARE RUNNING CORRECTLY :

FOR NODE A:

```
INI RXQ TXQ TXC RXQ TXQ TXC RXQ
TXQ TXC EOP RXQ TXQ TXC RXQ TXQ
TXC RXQ TXQ TXC EOP RXQ TXQ TXC
RXQ TXQ TXC RXQ TXQ TXC EOP
     MODE=ACTIVE/PASS=00000
                    /STATUS/NOCHECK/NOECHO/NOMODEM/NOPROTOCOL
DCLT> (A)  ?
```

FOR NODE B:

```
INI RXQ TXQ TXC RXQ TXQ TXC RXQ
TXQ TXC EOP RXQ TXQ TXC RXQ TXQ
T  EOP RXQ TXQ TXC RXQ TXQ TXC
  J TXQ TXC EOP
     MODE=PASSIVE/PASS=00000
                    /STATUS/NOCHECK/NOECHO/NOMODEM/NOPROTOCOL
DCLT> (A)  ?
```

NOW USE DATA CHECKING WITH THE "EXPECT MESSAGE LISTS" SET
UP APPROPRIATELY. ANOTHER VARIATION IS TO HAVE LARGE SIZE
MESSAGES ON ONE SIDE WITH SMALL MESSAGES ON THE OTHER.

THEN REVERSE THE SETUP SO AT THE NODE RUNNING IN ACTIVE
IS RUNNING IN PASSIVE AND E VERSA.

7.2.4 BOTH NODES ACTIVE

NOW BOTH NODES CAN BE RUN IN ACTIVE WITH DATA CHECKING ON.
STATUS PRINTING COULD BE TURNED OFF IF YOU'RE NOT INTERESTED
IN THEM.

NODE A	NODE B
C E	C E
C T	C T
SE T=0ALT/S=10	SE E=0ALT/S=10
SE T=CCITT/S=20	SE E=CCITT/S=20
SE T=ALPHA/S=30	SE E=ALPHA/S=30
SE E=ZERO/S=11	SE T=ZERO/S=11
SE E=ONES/S=21	SE T=ONES/S=21
SE E=ITEP/S=31	SE T=ITEP/S=31

```
                R M=A/CH/NOST/PAS=3     R M=A/CH/NOST/PAS=3

WHAT THIS SEQUENCE MEANS:
        NODE A SETS UP IS TRANSMIT LIST TO BE
        3 MESSAGES. MESSAGE 1 IS 10 BYTES LONG AND
        CONTAINS DATA OF ALTENATING 0'S AND 1'S
        MESSAGE 2 IS 20 BYTES LONG AND CONTAINS
        DATA OF THE CCITT PATTERN. MESSAGE THREE
        IS 30 BYTES LONG AND CONTAINS ALPHANUMERICS
        FOR DATA. THE EXPECT LIST ALSO CONTAINS
        3 MESSAGES. MESSAGE 1 IS 11 BYTES LONG AND
        CONTAINS 0'S FOR DATA. MESSAGE TWO IS 21
        BYTES LONG AND CONTAINS 1'S FOR DATA. MESSAGE
        3 IS 31 BYTES LONG AND CONTAINS THE ITEP DATA.
        NODE B HAS THE SAME MESSAGES EXCEPT THAT THE
        TRANSMIT MESSAGE LIST IS THE EXPECT MESSAGE LIST
        AND VICE VERSA.
        BOTH NODES ARE RUN IN THE ACTIVE MODE W.
        DATA CHECKING AND PASS COUNT EQUAL TO THREE.

WHAT YOU SHOULD SEE AFTER ENTERING THE RUN COMMAND
IF THINGS ARE RUNNING CORRECTLY :
ON BOTH NODES A AND B:
              MODE=ACTIVE/PASS=00000
                        /NOSTATUS/CHECK/NOECHO/NOMODEM/NOPROTOCOL
        DCLT> (A)  ?


A GOOD VARIATION THAT COULD BE TRIED IS TO LOAD THE TRANSMIT LIST
AND EXPECT LIST WITH A LARGE MESSAGE(512 CHARACTERS),ENABLE PROTOCOL
AND RUN MANY PASSES. SET BOTH ENDS THE SAME.

        DCLT> (A) ? CL T
        DCLT> (A) ? CL E
        DCLT> (A) ? SE T=CCITT/SIZE=512
        DCLT> (A) ? SE E=T
        DCLT> (A) ? R M=A/PA=255/PR/CH/NST


7.2.5 TALK AND LISTEN MODES FOR COMMUNICATING

TALK AND LISTEN MODES ARE USEFUL IF THE OPERATORS WISH TO COMMUNICATE
WITH EACH OTHER.  JUST SETUP A TIME THAT EACH WILL GO TO THEIR MODE,
TALK OR LISTEN, AND SEND MESSAGES OVER THE LINK. POSSIBLE COMMAND
SEQUENCES ARE.

        R M=LIS/NOST            R M=TA/NOST
        LIS>                    TLK>

7.3 EXAMPLES OF COMMANDS
    --------------------
THIS SECTION WILL SHOW A SAMPLING OF COMMANDS AND
EXACTLY WHAT TO EXPECT FROM THEM.

7.3.1 EXAMPLES OF MESSAGES COMMANDS
```

```
                    THE CLEAR COMMANDS .

                            C E
                            C T

                    THIS WILL INITIALIZE THE TRANSMIT AND EXPECT LIST
                    TO 1 MESSAGE OF 58 BYTES. THE DATA OF THE MESSAGE WILL
                    BE THE ITEP MESSAGE.

                    IF THESE COMMANDS ARE FOLLOWED BY A SHOW COMMAND
                            SH E
                    SUCH AS THE SHOW EXPECT LIST. WHAT YOU WOULD SEE IS
                            MSG: TYPE=ITEP/SIZE=58
                                 MODE=ACTIVE/PASS=00001
                                              /NOSTATUS/CHECK/NOECHO/NOMODEM/NOPROTOCOL
                            DCLT> (A) ?
                    NOW IF YOU DID A SET EXPECT LIST COMMAND SUCH AS:
                            SE E=A/S=35/C=3
                    AND FOLLOWED IT WITH A SHOW EXPECT LIST COMMAND
                            SH E
                    WHAT YOU WOULD SEE IS
                            MSG: TYPE=ALPHA/SIZE=35
                            MSG: TYPE=ALPHA/SIZE=35
                            MSG: TYPE=ALPHA/SIZE=35
                            MSG: TYPE=ALPHA/SIZE=35
                                 MODE=ACTIVE/PASS=00001
                                              /NOSTATUS/CHECK/NOECHO/NOMODEM/NOPROTOCOL
                            DCLT> (A) ?


                    7.3.2 EXAMPLES STATISTICAL COMMANDS

                    IF YOU TYPE A HELP COMMMAND
                            HELP
                    WHAT YOU WILL SEE IS
                    DCLT CMDS:
                     CLEAR OR SHOW  EXPECTLIST OR TRANSMITLIST
                     PRINT
                     EXIT
                     DUMP START-END/B
                     SET EXPECTMSG OR TRANSMITMSG=TYPE/SIZE=N OR /COPY=N
                     SET EXPECT=TRANSMIT
                       TYPE=ONES,ZEROES,1ALT,0ALT,ITEP,CCITT,ALPHA
                            OR 'OPR SPCD=A-Z,SP,TAB,0-9 IN QUOTES''
                     RUN MODE=MTYP/LOOP=LTYP/CHECK,PROTOCOL,STATUS,ECHO,MODEM,PASS=N
                       MTYP=TRAN,REC,ACT,PAS,TAL,LIS,DOWN
                       LTYP=INT,CAB,LOC,REM/

                    DCLT> (A)  ?

                    THE SAME WILL HAPPEN IF YOU USE THE ?

                    THE DUMP COMMAND WORKS LIKE THIS
                            DUM 41260-41300
                    THIS WILL DUMP THE DATA FROM ADDRESSES 41260 TO
                    41300 IN THE FOLLOWING MANNER
```

```
41260   104423  000167 177772 021122 012112 006312 006312 006312
41300   006312
IF YOU HAD USED THE /B SWITCH
        DUM 41260-41300/B
WHAT YOU WOULD SEE IS
        41260   023 211 167 000 372 377 122 024
        41270   112 024 312 014 312 014 312 014
        41300   312
```

7.3.3 EXAMPLES RUN COMMMANDS

YOU CAN FIND SEVERAL EXAMPLES OF THE RUN COMMMAND IN THE
TROUBLE SHOOTING HINTS SECTION BUT HERE ARE SOME OTHERS.

IF YOU WERE TO EXECUTE THE RUN COMMAND

```
        R M=TR/NOST/CH/PAS=4
```

WHAT WOULD HAPPEN IS AFTER 4 PASSES THE PROGRAM WOULD RETURN
TO THE DCLT PROMPT AND PRINT

```
        MODE=TRANSMIT/PASS=00000
                    /NOSTATUS/CHECK/NOECHO/NOMODEM/NOPROTOCOL
  DCLT> (A)  ?
```

IF YOU WERE TO EXECUTE THE RUN COMMAND

```
        C E
        C T
        R M=A/LO=I/ST/CH/PAS=3/PR
```

WHAT YOU WOULD SEE (IF USING DEFAULT TRANSMIT AND EXPECT
MESSAGES) IS

```
        INI RXQ TXQ TXC CMP EOP RXQ TXQ
        TXC CMP EOP RXQ TXQ TXC CMP EOP
        MODE=ACTIVE/LOOP=INTERNAL/PASS=0000
                    /STATUS/CHECK/NOECHO/NOMODEM/PROTOCOL
  DCLT> (A)  ?
```

IF YOU USE THE EXIT COMMAND

```
        EXIT
```

WHAT YOU WOULD SEE IS

```
        CVCLH EOP
             0 CUMULATIVE ERRORS

        DR>
```

7.3.4 EXAMPLES PRINT COMMANDS

THE PRINT COMMAND CAN BE USED FROM THE SUPERVISOR (DR>)
LEVEL OR THE DCLT (DCLT>) LEVEL. ONCE YOU ARE AT THE
REPORT LEVEL YOU WILL KNOW IT BY THE PROMPT 'RPT>".
AFTER TYPING PRI FOR EITHER THE DCLT> OR DR> THE
FOLLOWING IS DISPLAYED.

```
        TYPE "H" OR  "?" FOR HELP!
        RPT> (A)  ?
```

HERE ARE SOME EXAMPLES OF RPT> LEVEL COMMANDS:

```
                THE HELP OR ? COMMAND
                        HELP
                OR
                        ?
                PRODUCES THE FOLLOWING:

                DCLT REPORT CMDS:
                LOG - PRINT DCLT EVENT LOG
                EXIT - EXIT REPORT LEVEL
                HELP - PRINT THIS MESSAGE
                COUNTER/SW - PRINT DDCMP COUNTERS
                WHERE /SW=FULL, /ERRORS, /OFFSET=NN(O)

                RPT> (A)  ? LOG

                THE LOG COMMAND PRODUCES THE FOLLOWING

                >>> DCLT EVENT LOG ENTRY >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
                    0:01:17      ^C ABORT
                   PASS = 12   ERRORS = 0    STRT-TO = 0
                >>> DCLT EVENT LOG ENTRY >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
                    0:01:16   TRANSMIT MSG QUEUED
                   ADDR OF MSG=003150   BYTE COUNT= 58
                        MODEM STATUS: CTS DSR DCD RTS RI SQD TM
                                      0   1   0   0   1   1   0
                >>> DCLT EVENT LOG ENTRY >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
                    0:01:16   RECEIVE SPACE QUEUED
                   ADDR OF MSG=004150   BYTE COUNT= 512
                        MODEM STATUS: CTS DSR DCD RTS RI SQD TM
                                      0   1   0   0   1   1   0
                                     .....
                                     .....
                                     .....

                        THIS GOES ON FOR 45 EVENTS IF THE MODE
                        PREVIOUSLY EXECUTED HAD THAT MANY
                        YOU EXIT FROM EVENT LOG PRINTING BY
                        TYPING A CONTROL C.

                TO LEAVE THE REPORT LEVEL INPUT THE "EXIT" COMMAND.


                7.3.5  EXAMPLE EXIT COMMAND

                THE EXIT COMMAND WORKS LIKE THIS. IF YOU
                ENTERED THE REPORT LEVEL FROM THE SUPERVISOR
                (DR>)THEN TYPING

                        EXIT

                WILL RETURN YOU TO THE SUPERVISOR.

                        DR>

                IF YOU ENTERED REPORT FROM THE DCLT LEVEL
                THEN TYPING
```

```
                EXIT
        WILL RETURN YOU TO THE DCLT LEVEL.
                DCLT>
```

7.4 THINGS TO WATCH OUT FOR

IF YOU ARE RUNNING DCLT ON SYSTEMS THAT HAVE CONSOLES WITH DIFFERENT SPEEDS YOU WILL BE UNABLE TO USE THE PRINT STATUS FEATURE IN CERTAIN MODES. THE RULE IS IF IT DOESNT WORK WITH STATUS PRINTING RUN THE MODE WITH NOSTATUS.

IF YOU ARE USING PASSIVE MODE WITH THE ECHO SWITCH THEN YOU WILL PROBABLY HAVE TO RE-ENTER THE TRANSMIT LIST ON THE SIDE WITH THE ECHO SWITCH. THE REASON IS THAT THE TRANSMIT LIST GETS OVER WRITTEN WITH THE RECEIVE LIST WHEN USING THE ECHO SWITCH. ALSO DISABLE DATACHECKING('/NOCHECK').

BEWARE THAT THIS DCLT WILL NOT RUN THE DPV11 AT ITS HIGH CLOCK SPEED OF 50KHZ SINCE THE SOFTWARE IS NOT ABLE TO KEEP UP WITH THIS SPEED.

IF YOU ARE RUNNING HALF-DUPLEX IT IS BEST TO USE THE "/NOMODEM" SWITCH BECAUSE EVERY TIME THE LINE IS TURNED-AROUND A MODEM CHANGE WILL BE REPORTED.

IF YOU ARE RUNNING WITH PROTOCOL SELECTED THE MODEM STATUS AS REPORTED IN THE EVENT LOG MAY NOT INDICATE THE TRUE CONDITION OF THE MODEM SIGNALS. THIS IS BECAUSE THE EVENT IS LOGGED BEFORE THE MESSAGE IS PASSED TO THE DDCMP PROTOCOL LAYER WHERE THE RX,TX AND MODEM SIGNALS ARE MANIPULATED.

&

```
                                .SBTTL  PROGRAM HEADER

002000                                  BGNMOD



                                ;++
                                ; THE PROGRAM HEADER IS THE INTERFACE BETWEEN
                                ; THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
                                ;--

002000                                  POINTER BGNRPT,BGNAU,BGNDU



002000                                  HEADER  CVCLH,C,0,1800.,0,#PRI07
002000                                                                  L$NAME::
002000  103                                                                     .ASCII /C/
002001  126                                                                     .ASCII /V/
002002  103                                                                     .ASCII /C/
002003  114                                                                     .ASCII /L/
002004  110                                                                     .ASCII /H/
002005  000                                                                     .BYTE   0
002006  000                                                                     .BYTE   0
002007  000                                                                     .BYTE   0
002010                                                                  L$REV::
002010  103                                                                     .ASCII  /C/
002011                                                                  L$DEPO::
002011  060                                                                     .ASCII  /0/
002012                                                                  L$UNIT::
002012  000000                                                                  .WORD   0
002014                                                                  L$TIML::
002014  003410                                                                  .WORD   1800.
002016                                                                  L$HPCP::
002016  046250                                                                  .WORD   L$HARD
002020                                                                  L$SPCP::
002020  000000                                                                  .WORD   0
002022                                                                  L$HPTP::
002022  002130                                                                  .WORD   L$HW
002024                                                                  L$SPTP::
002024  000000                                                                  .WORD   0
002026                                                                  L$LADP::
002026  046636                                                                  .WORD   L$LAST
002030                                                                  L$STA::
002030  000000                                                                  .WORD   0
002032                                                                  L$CO::
002032  000000                                                                  .WORD   0
002034                                                                  L$DTYP::
```

```
1996  002034  000000                          .WORD   0
1997  002036                          L$APT::
1998  002036  000000                          .WORD   0
1999  002040                          L$DTP::
2000  002040  002124                          .WORD   L$DISPATCH
2001  002042                          L$PRIO::
2002  002042  000340                          .WORD   #PRIO7
2003  002044                          L$ENVI::
2004  002044  000000                          .WORD   0
2005  002046                          L$EXP1::
2006  002046  000000                          .WORD   0
2007  002050                          L$MREV::
2008  002050      003                         .BYTE   C$REVISION
2009  002051      003                         .BYTE   C$EDIT
2010  002052                          L$EF::
2011  002052  000000                          .WORD   0
2012  002054  000000                          .WORD   0
2013  002056                          L$SPC::
2014  002056  000000                          .WORD   0
2015  002060                          L$DEVP::
2016  002060  011526                          .WORD   L$DVTYP
2017  002062                          L$REPP::
2018  002062  025334                          .WORD   L$RPT
2019  002064                          L$EXP4::
2020  002064  000000                          .WORD   0
2021  002066                          L$EXP5::
2022  002066  000000                          .WORD   0
2023  002070                          L$AUT::
2024  002070  026332                          .WORD   L$AU
2025  002072                          L$DUT::
2026  002072  026324                          .WORD   L$DU
2027  002074                          L$LUN::
2028  002074  000000                          .WORD   0
2029  002076                          L$DESP::
2030  002076  011536                          .WORD   L$DESC
2031  002100                          L$LOAD::
2032  002100  104035                          EMT     E$LOAD
2033  002102                          L$ETP::
2034  002102  000000                          .WORD   0
2035  002104                          L$ICP::
2036  002104  025350                          .WORD   L$INIT
2037  002106                          L$CCP::
2038  002106  026236                          .WORD   L$CLEAN
2039  002110                          L$ACP::
2040  002110  026234                          .WORD   L$AUTO
2041  002112                          L$PRT::
2042  002112  025342                          .WORD   L$PROT
2043  002114                          L$TEST::
2044  002114  000000                          .WORD   0
2045  002116                          L$DLY::
2046  002116  000000                          .WORD   0
2047  002120                          L$HIME::
2048  002120  000000                          .WORD   0
2049
```

```
                                .SBTTL  DISPATCH TABLE

                                ;++
                                ; THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.
                                ; IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.
                                ;--

002122                                  DISPATCH 1
002122  000001                                                              .WORD   1
002124                                                              L$DISPATCH::
002124  026340                                                              .WORD   T1
```

```
                                .SBTTL  DEFAULT HARDWARE P-TABLE

                                ;++
                                ; THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES OF
                                ; THE TEST-DEVICE PARAMETERS.  THE STRUCTURE OF THIS TABLE
                                ; IS IDENTICAL TO THE STRUCTURE OF THE HARDWARE P-TABLES,
                                ; AND IS USED AS A "TEMPLATE" FOR BUILDING THE P-TABLES.
                                ;--

002126                                  BGNHW   DFPTBL
002126  000010                                                         .WORD   L10000-L$HW/2
002130                                                          L$HW::
002130                                                          DFPTBL::


                                ;INDEPENDENT SECTION
                                ;       THE NUMBERS IN BRACKETS ARE THE OFFSET VALUES USED IN THE PARAMETER
                                ;       CODING SECTION.

002130  000001                          .WORD   1               ;[0] FULL OR HALF DUPLEX FLAG (BIT0=1 IF FULL)


                                ;DEVICE DEPENDENT SECTION
                                ;       ADDING OR REMOVING WORDS FROM THIS TABLE EFFECTS THE "GET" CALLS IN
                                ;       THE HARDWARE PARAMTER CODING SECTION BY CHANGING "OFFSETS"

002132  160170                          .WORD   160170          ;[2] CSR ADDRESS
002134  000300                          .WORD   300             ;[4] INTERRUPT VECTOR
002136  000240                          .WORD   240             ;[6] SPARE
002140  000000                          .WORD   0               ;[10] PT-PT = 0  MULTIPOINT = 1
002142  000001                          .WORD   1               ;[12] TRIB ADDRESS THIS STATION
002144  000000                          .WORD   0               ;[14] OTHER NODE "ADDR"
002146  000000                          .WORD   0               ;[16] SPARE

002150                                  ENDHW
002150                                                          L10000:
```

```
                                ;++
                                ; THE GLOBAL EQUATES SECTION CONTAINS PROGRAM EQUATES THAT
                                ; ARE USED IN MORE THAN ONE TEST.
                                ;--

002150                                  EQUALS
                                ;
                                ; BIT DIFINITIONS
                                ;
        100000                  BIT15== 100000
        040000                  BIT14== 40000
        020000                  BIT13== 20000
        010000                  BIT12== 10000
        004000                  BIT11== 4000
        002000                  BIT10== 2000
        001000                  BIT09== 1000
        000400                  BIT08== 400
        000200                  BIT07== 200
        000100                  BIT06== 100
        000040                  BIT05== 40
        000020                  BIT04== 20
        000010                  BIT03== 10
        000004                  BIT02== 4
        000002                  BIT01== 2
        000001                  BIT00== 1
                                ;
        001000                  BIT9==  BIT09
        000400                  BIT8==  BIT08
        000200                  BIT7==  BIT07
        000100                  BIT6==  BIT06
        000040                  BIT5==  BIT05
        000020                  BIT4==  BIT04
        000010                  BIT3==  BIT03
        000004                  BIT2==  BIT02
        000002                  BIT1==  BIT01
        000001                  BIT0==  BIT00
                                ;
                                ; EVENT FLAG DEFINITIONS
                                ;   EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
                                ;
        000040                  EF.START==      32.             ; START COMMAND WAS ISSUED
        000037                  EF.RESTART==    31.             ; RESTART COMMAND WAS ISSUED
        000036                  EF.CONTINUE==   30.             ; CONTINUE COMMAND WAS ISSUED
        000035                  EF.NEW==        29.             ; A NEW PASS HAS BEEN STARTED
        000034                  EF.PWR==        28.             ; A POWER-FAIL/POWER-UP OCCURRED
                                ;
```

```
2157                                    ;
2158                                    ; PRIORITY LEVEL DEFINITIONS
2159                                    ;
2160            000340                  PRI07== 340
2161            000300                  PRI06== 300
2162            000240                  PRI05== 240
2163            000200                  PRI04== 200
2164            000140                  PRI03== 140
2165            000100                  PRI02== 100
2166            000040                  PRI01== 40
2167            000000                  PRI00== 0
2168                                    ;
2169                                    ;OPERATOR FLAG BITS
2170                                    ;
2171            000004                  EVL--         4
2172            000010                  LOT==        10
2173            000020                  ADR==        20
2174            000040                  IDU==        40
2175            000100                  ISR==       100
2176            000200                  UAM==       200
2177            000400                  BOE==       400
2178            001000                  PNT==      1000
2179            002000                  PRI==      2000
2180            004000                  IXE==      4000
2181            010000                  IBE==     10000
2182            020000                  IER==     20000
2183            040000                  LOE==     40000
2184            100000                  HOE==    100000
2185
```

```
                        ;***** INDEPENDENT EQUATES
                        
001000                          BUFLIM=512.             ;MAX BUFFER SIZE IN BYTES
                                                        ;  APPLIES TO TX,RX AND CMP BUFFS
000017                          MSGLIM=15.              ;MAX NO. OF MESSAGES PER BUFFER
                                                        ;  (FOR EACH INCREMENT (+1) TO MSGLIM,
                                                        ;   ADD 6 WORDS TO THE POINTER TABLE
                                                        ;   (PTRTAB:) SINCE THIS MEANS 2 MORE
                                                        ;   "POINTER" WORDS PER BUFFER.
                        
                        ;MODE OF OPERATION EQUATES
000000                          REC=0                   ;RECEIVE MODE
000001                          TRA=1                   ;TRANSMIT MODE
000002                          PAS=2                   ;PASSIVE MODE
000003                          ACT=3                   ;ACTIVE MODE
000004                          DOW=4                   ;DOWN-LINE-LOAD MODE
000005                          TAL=5                   ;TALK MODE
000006                          LIS=6                   ;LISTEN MODE
                        ;MAINT LOOP TYPE EQUATES
000000                          NONE=   0               ;NO LOOP
000001                          TTL=    1               ;INTERNAL TTL
000002                          CABLE=  2               ;CABLE LOOP
000003                          MODLOC= 3               ;MODEM LOCAL
000004                          MODREM= 4               ;MODEM REMOTE
000005                          MOP=    5               ;MOP
                        
                        
                        ;CLOCK ENABLE VALUES TO BE LOADED IN CLK'S CSR
000100                          LCLKEN= 100             ;L-CLOCK CSR VALUE TO ENABLE THE CLOCK
000111                          PCLKEN= 111             ;P-CLOCK CSR VALUE TO ENABLE THE CLOCK
001600                          PCLKCT= 1600            ;P-CLOCK COUNT SET REGISTER FOR COUNTER
                        
                        ;PARAM WORD EQUATES
                        
000001                          STATB=  BIT0            ;OPERATOR AWAKE ASKED FOR
000002                          DATCKB= BIT1            ;DATA CHECK BIT
000004                          ECHOB=  BIT2            ;ECHO BIT
000010                          MOCHK=  BIT3            ;MODEM STATUS CHECK BIT
000020                          CRCB=   BIT4            ;CRC CALCUALTE ASKED FOR
000040                          PROTOB= BIT5            ;PROTOCOL PROCESSING ASKED FOR
000100                          PRORUN= BIT6            ;DDCMP PROTOCOL RUNNING
000200                          ABORT=  BIT7            ;FATAL PROTOCOL ERROR
                        
                        ;OPTION TYPE EQUATES
                        
000000                          DPV=    0       ;CODE FOR DPV CHAR MODE
                        
                        ;EVENT LOG MESSAGE TYPES (USED TO LOCATE EVENT DESCRIPTION IN EVENT TABLE
                        ;  AND DISPATCHING TO SEPERATE SECTIONS OF THE EVENT REPORTING SECTION)
000000                          TXQ=    0               ;TRANSMIT MESSAGE QUEUED
000002                          TXC=    2               ;TRANSMIT COMPLETE
000004                          RXQ=    4               ;RECEIVE BUFFER QUEUED
000006                          RXC=    6               ;RECEIVE COMPLETE
000010                          DER=    10              ;DEVICE INFORMATION
000012                          DVI=    12              ;DEVICE ABOUT TO INIT
```

```
2242    000014                  DCK=    14              ;DATA COMPARISON RESULTS
2243    000016                  MSC=    16              ;MODEM STATUS CHANGE
2244    000020                  DLE=    20              ;DATA COMPARISON LENGH ERROR
2245    000022                  DDE=    22              ;DATA COMPARISON DATA ERROR
2246    000024                  EOP=    24              ;END OF PASS
2247    000026                  ABO=    26              ;^C ABORT
2248
2249                    ;EQUATES FOR FLAG WORD
2250
2251    000001                  ININT=  BIT0            ;INPUT INT. REC.
2252    000002                  OTINT=  BIT1            ;OUTPUT INT REC
2253    000004                  QRX=    BIT2            ;RX QUED /COMPL
2254    000010                  QTX=    BIT3            ;TX QUED/COMPL
2255    000100                  ERX=    BIT6            ;EXPECT TO GET A RX COMPLED
2256    000200                  ETX=    BIT7            ;EXPECT TO GET A TX COMPLETED
2257
2258
2259    000020                  TXM=    BIT4            ;INDICATES TO TX INTERRUPT ROUTINE
2260                                                    ;THAT IT IS TIME TO TRANSMIT BODY OF MSG.
2261    000040                  RXM=    BIT5            ;INDICATES TO RX INTERUPPT ROUTINE
2262                                                    ;THAT IT IS TIME TO REC MSG BODY
2263    000400                  BCC=    BIT8            ;TIME FOR CRC CHECK.
2264
2265    001000                  PAD=    BIT9            ;INDICATES THAT PAD MUST BE SENT
2266
2267    002000                  INOVR=  BIT10           ;INIT OVER
2268
2269    004000                  FIRST=  BIT11           ;FIRST  TIME FOR CTS
2270
2271                    ; SPECIAL CLI CODES FOR "CHAR" ARGUMENT IN CLI CALLS
2272                    ;  (COMMAND LINE INTERPRETER DEFINITIONS)
2273    000000                      CLIERR= 0
2274    000001                      CLIEXI= 1
2275    000002                      CLIBR=  2
2276    000003                      CLIBIF= 3
2277    000004                      CLISPA= 4
2278    000005                      CLINUM= 5
2279    000006                      CLIALP= 6
2280    000007                      CLIALN= 7
2281    000010                      CLIOCT= 8.
2282    000011                      CLIDEC= 9.
2283    000012                      CLISTR= 10.
2284
2285                    ; DEFS FOR COMMAND LINE INTERPRETATION ACTION VALUES
2286    000000                      NULL=0
2287    000001                      CLEAR=1
2288    000002                      SHOW=2
2289    000003                      CHECK=3
2290    000004                      RUN=4
2291    000005                      HLP=5
2292    000006                      CSHEXP=6
2293    000007                      CSHTRN=7
2294    000010                      SETEXP=10
2295    000011                      SETTRN=11
2296    000012                      SIZE=12
2297    000013                      QCOPY=13
```

```
2298          000014                    NUM=14
2299          000015                    OPRMSG=15
2300          000016                    STATUS=16
2301          000017                    ENDQO=17
2302          000020                    CMSG0=20
2303          000021                    CMSG1=21
2304          000022                    CMSG2=22
2305          000023                    CMSG3=23
2306          000024                    CMSG4=24
2307          000025                    CMSG5=25
2308          000026                    CMSG6=26
2309          000027                    ATVMOD=27
2310          000030                    PASMOD=30
2311          000031                    RECMOD=31
2312          000032                    LISMOD=32
2313          000033                    DLLMOD=33
2314          000034                    TRAMOD=34
2315          000035                    TALMOD=35
2316          000036                    NO=36
2317          000037                    ECHO=37
2318          000040                    CRC=40
2319          000041                    PROTO=41
2320          000042                    PASC=42
2321          000043                    MOP=43
2322          000044                    TTLLOP=44
2323          000045                    CBLLOP=45
2324          000046                    LMDLOP=46
2325          000047                    RMDLOP=47
2326          000050                    NOTNUF=50
2327          000051                    BADCHR=51
2328          000052                    DMPS=52
2329          000053                    DMPE=53
2330          000054                    DMPQ=54
2331          000055                    PRNT=55
2332          000056                    MOSC=56
2333          000057                    EXIT=57          ;REV B BY EC
2334          000060                    SETET=60         ;REV B BY EC
2335                                ;FOLLOWING EQUATES USED IN REPORT CLI ; REV B EC
2336          000001                    RPHLP=1
2337          000002                    RPEXT=2
2338          000003                    RPLOG=3
2339          000004                    RPERR=4          ;'COUNTER/ERROR'
2340          000005                    RPFUL=5          ;'COUNTER/FULL'
2341          000006                    RNOTNF=6         ;MORE COMMAND NEEDED
2342          000007                    RPSWO=7          ;VALIDATE OFFSET
2343
2344
2345                                ;***** DEVICE DEPENDENT EQUATES
2346                                ; MODEM SIGNAL BIT DEFINITONS
2347                                ;       IF SIGNAL AVAILABLE IN DEVICE, EQUATE NAME TO BIT POSITION,
2348                                ;       ELSE EQUATE IT TO = 0
2349
2350          020000                    CTS=    BIT13            ;CLEAR TO SEND (CIRCUIT CB)
2351          001000                    DSR=    BIT9             ;DATA SET READY (CIRCUIT CC)
2352          010000                    DCD=    BIT12            ;DATA CARRIER DETECT (CIRCUIT CF)
2353          000004                    RTS=    BIT2             ;REQUEST TO SEND (CIRCUIT CA)
```

```
2354            040000                  RI=     BIT14           ;RING INDICATOR (CIRCUIT CE)
2355            000040                  SQD=    BIT5            ;SIGNAL QUALITY DETECT (CIRCUIT CG)
2356            000040                  TM=     BIT5            ;MODEM IN TEST MODE (RS 449 ONLY CIRCUIT TM)
2357
2358
2359
2360                                    ; DEVICE SIGNALS
2361            000002                  DTR=    BIT1            ;DATA TERMINAL READY
2362            000020                  RXENA=  BIT4            ;RECEIVER ENABLE
2363            000040                  DSITEN= BIT5            ;DATA SET CHANGE ENABLE
2364            000100                  RINTEN= BIT6            ;REC INT. ENABLE
2365            000200                  RDATRY= BIT7            ;REC DATA READY
2366            002000                  RSTARY= BIT10           ;REC STATUS READY
2367            004000                  RXACT=  BIT11           ;REC ACTIVE
2368            000001                  RESET=  BIT0            ;MASTER RESET
2369            000002                  TXACT=  BIT1            ;TX ACTIVE
2370            000004                  TEMT=   BIT2            ;TX BUFFER EMPTY
2371            000010                  TTLL=   BIT3            ;TTL LOOP BIT
2372            000020                  TXENA=  BIT4            ;TX ENABLE
2373            000100                  TINTEN= BIT6            ;TX INT ENABLE
2374            000400                  TSOM=   BIT8            ;TX START OF MSG.
2375            001000                  TEOM=   BIT9            ;TX END OF MSG.
2376            100000                  TERR=   BIT15           ;TX ERROR
2377            100000                  RERR=   BIT15           ;REC OVER RUN
2378            000226                  SYN=    226             ;SYNC WORD
2379            100000                  CRCOK=  BIT15           ;CRC CHECKED GOOD
2380            004000                  RXOVER= BIT11           ;RECEIVER OVERRUN ERROR
2381
```

```
                                        .SBTTL  GLOBAL DATA SECTION
                                        .SBTTL          DEFAULT MESSAGE DEFINITIONS AND TABLES

                                        ;++
                                        ; THE GLOBAL DATA SECTION CONTAINS DATA THAT ARE USED
                                        ; IN MORE THAN ONE TEST.
                                        ;--

                                        ;MESSAGE BYTE COUNT TABLE

002150                                  DMSGCT:
002150  000001                          MSG0C:  .WORD   EMSG0-MSG0      ;BYTE COUNT OF MESSAGE #0
002152  000001                          MSG1C:  .WORD   EMSG1-MSG1      ;BYTE COUNT OF MESSAGE #1
002154  000001                          MSG2C:  .WORD   EMSG2-MSG2      ;BYTE COUNT OF MESSAGE #2
002156  000001                          MSG3C:  .WORD   EMSG3-MSG3      ;BYTE COUNT OF MESSAGE #3
002160  000100                          MSG4C:  .WORD   EMSG4-MSG4      ;BYTE COUNT OF MESSAGE #4
002162  000072                          MSG5C:  .WORD   EMSG5-MSG5      ;BYTE COUNT OF MESSAGE #5
002164  000101                          MSG6C:  .WORD   EMSG6-MSG6      ;BYTE COUNT OF MESSAGE #6
002166  000000                          OPCNT:  .WORD   0               ;BYTE COUNT FOR OPERATOR SPEC'D MSG.
002170  000001                          MSG8C:  .WORD   EMSG8-MSG8      ;BYTE COUNT OF RECEIVE BUFFER FILL PATTERN

                                        ;MESSAGE ADDRESS TABLE

002172                                  DMSGAD:
002172  002214                                  MSG0                    ;ADDRESS OF MESSAGE #0
002174  002215                                  MSG1                    ;ADDRESS OF MESSAGE #1
002176  002216                                  MSG2                    ;ADDRESS OF MESSAGE #2
002200  002217                                  MSG3                    ;ADDRESS OF MESSAGE #3
002202  002220                                  MSG4                    ;ADDRESS OF MESSAGE #4
002204  002320                                  MSG5                    ;ADDRESS OF MESSAGE #5
002206  002412                                  MSG6                    ;ADDRESS OF MESSAGE #6
002210  002520                                  OPBUF                   ;ADDRESS OF OPERATOR SPEC'D MSG.
002212  002642                                  MSG8                    ;ADDRESS OF RECEIVE BUFFER FILL PATTERN

002214  000                             MSG0:   .BYTE   000             ;MESSAGE OF ALL 0'S
002215                                  EMSG0:
002215  377                             MSG1:   .BYTE   377             ;MESSAGE OF ALL 1'S
002216                                  EMSG1:
002216  252                             MSG2:   .BYTE   252             ;MESSAGE OF ALTERNATING 1'S
002217                                  EMSG2:
002217  125                             MSG3:   .BYTE   125             ;MESSAGE OF ALTERNATING 0'S
002220                                  EMSG3:
002220                                  MSG4:                           ;"CCITT" 512-BIT (VS. 511 BITS) TEST PATTERN
002220  177603  157427  031011                .WORD   177603,157427,031011,047321,163715,105221,143325,142304
002226  047321  163715  105221
002234  143325  142304
002240  040041  014116  052606                .WORD   040041,014116,052606,172334,105025,123754,111337,111523
002246  172334  105025  123754
002254  111337  111523
002260  030030  145064  137642                .WORD   030030,145064,137642,143531,063617,135075,066730,026575
002266  143531  063617  135075
002274  066730  026575
002300  052012  053627  070071                .WORD   052012,053627,070071,151172,165044,031605,166632,016741
002306  151172  165044  031605
002314  166632  016741
002320                                  EMSG4:
```

```
2438  002320                                MSG5:                           :''INTERPROCESSOR TEST PROGRAM'S (ITEP)'' MESSAGE
2439                                                                        ; #1, (DP1:)
2440  002320  077577  040444  052040              .ASCII  <177><177>/$A THE QUICK BROWN FOX JUMPED OVER THE LAZY DOG./
2441  002326  042510  050440  044525
2442  002334  045503  041040  047522
2443  002342  047127  043040  054117
2444  002350  045040  046525  042520
2445  002356  020104  053117  051105
2446  002364  052040  042510  046040
2447  002372  055101  020131  047504
2448  002400  027107
2449  002402  005015  077401  077577              .ASCIZ  <15><12><001><177><177><177><177>
2450  002410  000177
2451  002412                                EMSG5:
2452  002412                                MSG6:                           ;ALPHA-NUMERICS (OR FUTURE COMM TURNAROUND MSG)
2453  002412  022043  021041  023040              .ASCII  /#$!'' &'()*+,-.0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ/
2454  002420  024047  025051  026053
2455  002426  027055  030460  031462
2456  002434  032464  033466  034470
2457  002442  035472  036474  037476
2458  002450  040500  041502  042504
2459  002456  043506  044510  045512
2460  002464  046514  047516  050520
2461  002472  051522  052524  053526
2462  002500  054530     132
2463  002503     057  056133  057135              .ASCIZ  ?/[\]^_%?
2464  002510  022537     000
2465  002513                                EMSG6:
2466        002514                                .EVEN
2467
2468                                        ; ***************************************************************************
2469                                        ;THESE THREE STORAGE AREAS MUST NOT BE SEPERATED !!!!
2470
2471  002514  047045  040445              OPBFPT: .ASCII  /%N%A/
2472  002520  000122                      OPBUF:  .BLKB   82.             ;BUFFER FOR OPERATOR SPEC'D MESSAGES
2473  002642                              OPEND:
2474
2475                                        ; THE ABOVE THREE LINES MUST BE KEPT TOGETHER
2476                                        ; ***************************************************************************
2477
2478  002642     033                      MSG8:   .BYTE   33              ;RECEIVE BUFFER FILL PATTERN
2479  002643                              EMSG8:
2480        002644                                .EVEN
```

```
                                ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                ; THE FOLLWING IS THE AREA USED TO TRANSMIT AND REC THE ;
                                ; HEADER MSGS. AND THE START,STACK ACK SEQUENCES.       ;
                                ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

                                ;; THE TRANSMIT HEADER MESSAGE WILL BE STORED HERE
002644        000               HDMSG:  .BYTE 0         ;FILLER
002645        201               HDMID:  .BYTE 201       ;MESSAGE TYPE STORED HERE
002646                          HDMTYP:                 ;IF CONTROL MESSAGE, TYPE IS STORED HERE
002646     000000               HDMCC:  .WORD   0       ;CHAR COUNT GOES HERE
002650        001               HDMREP: .BYTE   1       ;RESPONSE NUMBER
002651        001               HDMNUM: .BYTE   1       ;MSG. NUMBER
002652        001               HDMADR: .BYTE   1       ;ADDR TO.
002653                          HSMSE:
           002654                       .EVEN
002654     000006               HDMC:   .WORD   6
                                ;; RECEIVED HEADER WILL BE STORED HERE
002656        000               RHDMSG: .BYTE 0
002657        201               RHDMID: .BYTE 201       ;MESSAGE TYPE GOES IN HERE
002660                          RHDTYP:                 ;CONTROL MESSAGE TYPE GOES HERE
002660     000000               RHDMCC: .WORD           ;BYTE COUNT GOES HERE
002662        001               RHDREP: .BYTE   1       ;RESP NUM
002663        001               RHDNUM: .BYTE   1       ;MSG NUM
002664        001               RHDADR: .BYTE   1       ;ADDR TO.
           002666                       .EVEN

```

```
                                        ;COMMAND LINE BUFFER, DATA LOCATIONS AND MESSAGES FOR ACTION ROUTINES

002666  000122                  CMDBUF: .BLKB   82.              ;BUFFER FOR OPERATOR COMMANDS
003010  000000                  KEYWD1: .WORD   0                ;THIS LOC WILL =1 IF CLEAR TYPED, 2 FOR SHOW,
                                                                 ; A 4 IF RUN WAS TYPED, 5 IF HELP WAS TYPED
003012  000000                  QUALFG: .WORD   0                ;THIS LOC HOLDS QUALIFIER VALUE (SIZE OR COPY)
003014  000000                  QUALVL: .WORD   0
003016  012300                  HLPTAB: .WORD   HLP1
003020  012313                          .WORD   HLP2
003022  012430                          .WORD   HLP3
003024  012515                          .WORD   HLP3A
003026  012542                          .WORD   HLP4
003030  012621                          .WORD   HLP4A
003032  012677                          .WORD   HLP5
003034  012767                          .WORD   HLP6
003036                          HLPEND:
                                        ;INDEX TABLE FOR REPORT 'RPT>' HELP MESSAGES REV B EC
003036  013124                  RHLPTB: .WORD   RHLP1
003040  013146                          .WORD   RHLP2
003042  013201                          .WORD   RHLP3
003044  013232                          .WORD   RHLP4
003046  013264                          .WORD   RHLP5
003050  013327                          .WORD   RHLP6
003052                          RHLPEN:

003052  013543  013552  013557  SHTYTB: .WORD   SHTYP0,SHTYP1,SHTYP2,SHTYP3,SHTYP4,SHTYP5,SHTYP6,SHTYP7
003060  013564  013571  013577
003066  013604  013612

                                        ; THE LIST OF BYTES BELOW ARE THE FIRST BYTES OF THE PREDEFINED MESSAGES
                                        ;  USED TO "SHOW" THE TRANSMIT AND COMPARE BUFFER CONTENTS.

003072    000     377     252   SHTAB:  .BYTE   0,377,252,125,203,177,043
003075    125     203     177
003100    043
003101                          SHTEND:
        003102                          .EVEN

003102  013623                  MODES:  .WORD   M00      ;ADDRESSES OF MODE TYPES IN ASCII
003104  013633                          .WORD   M01
003106  013644                          .WORD   M02
003110  013654                          .WORD   M03
003112  013663                          .WORD   M04
003114  013700                          .WORD   M05
003116  013705                          .WORD   M06

003120  013714                  LOOPS:  .WORD   LP0      ;ADDRESSES OF LOOP TYPES IN ASCII
003122  013724                          .WORD   LP1
003124  013735                          .WORD   LP2
003126  013743                          .WORD   LP3
003130  013756                          .WORD   LP4

                                        ;COMMAND LINE TRAVERSE LOCATIONS (USED BY "P$TRV")

003132  000000                  P$BUFA: .WORD   0                ;LOC. TO HOLD ADDR. OF CMD LINE BUFFER
003134  000000                  P$TREE: .WORD   0                ;LOC. TO HOLD ADDR. OF PARSING TREE
```

```
 2563  003136  000000                P$ACT:   .WORD   0              ;LOC. TO HOLD ADDR. OF ACTION ROUTINE
 2564  003140  000000                P$CNT:   .WORD   0              ;LOC. TO BE A COUNTER LOCATION
 2565  003142  000000                P$NUM:   .WORD   0              ;LOC. TO HOLD NUMERIC VALUE FROM PARSE
 2566  003144  000000                P$RADX:  .WORD   0              ;LOC. TO HOLD RADIX USED(LO) AND +/-(HI BYTE)
 2567  003146     000                P$NNUF:  .BYTE   0              ;RETURN =0 IF ENOUGH OF COMMAND FOUND
 2568  003147     000                P$GDBD:  .BYTE   0              ;RETURN CODE 0 IF NO ERROR FOUND
 2569
```

```
2570                                    .SBTTL          MESSAGE BUFFERS AND POINTER TABLES
2571
2572  003150  001000                    TXBUF:  .BLKB   BUFLIM  ;TRANSMITTER BUFFERS
2573  004150  001000                    RXBUF:  .BLKB   BUFLIM  ;RECEIVER BUFFERS
2574  005150  001000                    CMPBUF: .BLKB   BUFLIM  ;COMPARISON BUFFERS
2575  006150  000036                    PTRTAB: .BLKW   MSGLIM*2        ;TABLE FOR MESSAGE ADDRS. & BYTE COUNTS
2576  006244  000036                    PTR13:  .BLKW   MSGLIM*2
2577  006340  000036                    PTR23:  .BLKW   MSGLIM*2
2578  006434                            PTREND:                 ; END OF MSG. PTR. TABLE
2579
2580  006434  000002                            .BLKW   2       ;FILLER FOR OVERFLOW OF RX POINTER TABLE
2581
2582  006440  000000                    RXPTR:  .WORD   0       ;RECEIVER MESSAGE POINTER
2583  006442  000000                    TXPTR:  .WORD   0       ;TRANMITTER BUFFER POINTER
2584  006444  000000                    CMPPTR: .WORD   0       ;COMPARISON BUFFER POINTER
2585  006446  000000                    CMPTOT: .WORD   0       ;CMP MSG TOTAL
2586  006450  000000                    CTOTCC: .WORD   0       ;COMPARE BUFFER CHAR. COUNT
2587  006452  000000                    CCURAD: .WORD   0       ;CURRENT ADDR OF CMP BUFF TO ADD AT
2588
2589  006454  000000                    DVTXA:  .WORD   0       ;DEVICE TX ADDR
2590  006456  000000                    DVTCC:  .WORD   0       ;DEVICE TX CHAR COUNT
2591  006460  000000                    DVTCT:  .WORD   0       ;DEVICE TX MESSAGE COUNT
2592  006462  000000                    TXMTOT: .WORD   0       ;TX MSG TOTAL
2593  006464  000000                    TTOTCC: .WORD   0       ;TX BUFFER CHAR. COUNT
2594  006466  000000                    TCURAD: .WORD   0       ;CURRENT ADDR. OF TX BUFF TO ADD AT
2595
2596  006470  000000                    DVRXA:  .WORD   0       ;DEVICE RX ADDR
2597  006472  000000                    DVRCC:  .WORD   0       ;DEVICE RX CHAR COUNT
2598  006474  000000                    DVRCT:  .WORD   0       ;DEVICE RX MESSAGE COUNT
2599  006476  000000                    RXMTOT: .WORD   0       ;RX MSG TOTAL
2600
2601  006500  000000                    LNCNT:  .WORD   0       ;NUMBER OF OPERATOR AWAKE MSGS
2602  006502  000000                    OPVAR:  .WORD   0       ;OPTTIONAL VARIABLE LOCATION
2603  006504  000000                    PSCNT:  .WORD   0       ;PASS COUNTER
2604  006506  000000                    ERRCNT: .WORD   0       ;ERROR COUNTER
2605  006510  000000                    STADD:  .WORD   0       ;START ADDR.
2606  006512  000000                    ENADD:  .WORD   0       ;END ADDR. FOR DUMP
2607  006514  000000                    BYTBIT: .WORD   0       ;BYTE BIT FOR DUMP ROUTINE
2608
2609                                    ;OTHER MESSSAGE RELATED STORAGE LOCATIONS
2610
2611  006516  000000                    MSGTYP: .WORD   0       ;TYPE OF DATA 0=0'S,1=1'S,2=10'S,3=01'S
2612                                                            ;4=CCITT,5=QUICK FOX,6=ALPHA/NUM,7=OPER
2613  006520  000000                    CURCC:  .WORD   0       ;TX/RX/CMP CHAR COUNT
2614  006522  000000                    CPTRR:  .WORD   0       ;CURRENT RX POINTER
2615  006524  000000                    CPTR:   .WORD   0       ;CURRENT POINTER
2616  006526  000000                    CURADD: .WORD   0       ;CURRENT TX/RX/CMP START ADDD
2617  006530  000000                    TOTCC:  .WORD   0       ;TOTAL CHAR COUNT NOT MORE THEN 'BUFLIM'
2618  006532  000000                    OFSET:  .WORD   0       ;OFFSET COUNT
2619  006534  000000                    TEMP:   .WORD   0       ;TEMPORARY LOCATIONS (USED A LOT)
2620  006536  000000                    TEMP1:  .WORD   0
2621  006540  000000                    TEMP2:  .WORD   0
2622  006542  000000                    TEMP3:  .WORD   0
2623  006544  000000                    TEMP4:  .WORD   0
2624  006546  000000                    TEMP5:  .WORD   0
2625  006550  000000                    CONOTM: .WORD   0       ;CONTROL OUT ERROR MSG. ADDRESS
```

```
 2626  006552  000000                CONTIN: .WORD   0       ;WORD FOR CONTROL IN
 2627  006554     000                GOOD:   .BYTE   0       ;BYTE TO HOLD EXPECTED MESSAGE DATA BYTE FOR ERR REPORT
 2628  006555     000                BAD:    .BYTE   0       ;BYTE TO HOLD RECEIVED MESSAGE DATA BYTE FOR ERR REPORT
 2629
```

```
                                ;MORE INDEPENDENT CODE STORAGE LOCATIONS

006556  000000          LOGUNT: .WORD   0       ;LOC. TO HOLD LOGICAL UNIT NUMBER
006560  000000          PCADD:  .WORD   0       ;LOC. HOLD PC OF CALLING ROUTINE
006562  000000          DCLFLG: .WORD   0       ;CLEANUP & EXIT FLAG -1 = EXIT TEST
006564  000000          RESFLG: .WORD   0       ;LOC TO HOLD FLAG (-1) THAT A RESTART WAS GIVEN
006566  000000          MODTYP: .WORD   0       ;DCLT MODE OF OPERATION TYPE
                                                ;  (0=REC-ONLY, 1=TX-ONLY, 2=PASSIVE-LOOPBK,
                                                ;   3=ACTIVE-LOOPBK, 4=DOWN L.L., 5=TALK, 6=LISTEN)
006570  000000          MLTYP:  .WORD   0       ;MAINTENANCE LOOP TYPE (0=NONE, 1=INTERNAL TTL,
                                                ;  2=CABLE, 3=MODEM-ANALOG LOOPBK (LOCAL),
                                                ;  4=MODEM-DIGITAL LOOPBK (REMOTE), 5=MOP)
006572  000000          FHDPLX: .WORD   0       ;FULL OR HALF DUPLEX FLAG (1=FULL FROM P-TABLE)
006574  000002          PARAM:  .WORD   2       ;PROGRAM PARAMETERS
                                                ; BIT0= STATUS MSGS TO OPR PRINTED (1=YES)
                                                ; BIT1= DATA CHECKING DONE ON RCVD MSGS (1=YES)
                                                ; BIT2= ECHO (TRANSMIT) RCV'D MSG.(PASSIVE)(1=YES)
                                                ; BIT3= MODEM STATUS CHECK (1=YES)
                                                ; BIT4= CRC CALC./CHECK DONE (1=YES)
                                                ; BIT5= PROTOCOL EMULATION (1=YES)
                                                ; BIT6= PROTOCOL IS RUNNING
                                                ; BIT7= ABORT PROTOCOL
006576  000000          RPASS:  .WORD   0       ;PASS NUMBER FROM RUN COMMAND
006600  000000          FLAG:   .WORD   0       ;DEVICE FLAG WORD

                                ;MODE DISPATCH TABLE
006602  032206          MODE:   .WORD   RXONLY  ;RX ONLY DISPATCH
006604  032240                  .WORD   TXONLY  ;TX ONLY DISPATCH
006606  032300                  .WORD   PLCK    ;PASSIVE LOOP BACK DISP
006610  032334                  .WORD   ALCK    ;ACTIVE LOOP BACK DISP
006612  033566                  .WORD   DLL     ;DOWN LINE LOAD DISP
006614  033612                  .WORD   TALCK   ;TALK MODE DISPATCH
006616  034056                  .WORD   LISCK   ;LISTEN MODE DISPATCH


                                .SBTTL          CLOCK TABLES, EVENT LOG AND POINTERS
006620  000000          CLKCSR: .WORD   0       ;CLOCK CSR ADDRESS
006622  000000          CLKBR:  .WORD   0       ;CLOCK INTERRUPT LEVEL
006624  000000          CLKVEC: .WORD   0       ;CLOCK INTERRUPT VECTOR
006626  000074          CLKHZ:  .WORD   60.     ;CLOCK'S HERTZ RATE
006630  000000          CLKEN:  .WORD   0       ;CLOCK'S CSR VALUE TO INTRPT. ENABLE IT

006632  000000          TIMMIN: .WORD   0       ;PLACE TO KEEP TIME-SINCE-START
006634  000000          TIMSEC: .WORD   0
006636  000000          TIMTCK: .WORD   0       ;PLACE TO KEEP # OF TICKS/SEC

006640  000000          TIMER1: .WORD   0       ;EVENT TIMER #1 (TICKS)
006642  000000          TIMER2: .WORD   0       ;EVENT TIMER #2 (TICKS)
006644  000000          TIMERS: .WORD   0       ;EVENT TIMER #3 (SECONDS)
```

```
 2680                                   ;EVENT LOG TABLE AND ITS NEXT ENTRY POINTER
 2681  006646  006650                   EVTPTR: .WORD   EVTLOG  ;POINTER TO NEXT FREE SPACE IN EVENT LOG
 2682  006650  000341                   EVTLOG: .BLKW   225.    ;EVENT LOG BUFFER
 2683  007552  000001                   EVTEND: .BLKW   1.      ;APPROXIMATE END OF EVENT TABLE (ALLOWS CIRCULAR QUE)
 2684
 2685                                   .SBTTL          MODEM DATA SECTION
 2686
 2687  007554  000000                   MODS:   .WORD   0       ;MODEM STATUS
 2688
 2689
```

```
2690
2691                                    ;TABLE OF MODEM SIGNAL BIT DEFINITIONS
2692
2693  007556  020000                    MOBITS: .WORD   CTS             ;CLEAR TO SEND (CIRCUIT CB)
2694  007560  001000                            .WORD   DSR             ;DATA SET READY (CIRCUIT CC)
2695  007562  010000                            .WORD   DCD             ;DATA CARRIER DETECT (CIRCUIT CF)
2696  007564  000004                            .WORD   RTS             ;REQUEST TO SEND (CIRCUIT CA)
2697  007566  040000                            .WORD   RI              ;RING INDICATOR (CIRCUIT CE)
2698  007570  000040                            .WORD   SQD             ;SIGNAL QUALITY DETECT (CIRCUIT CG)
2699  007572  000040                            .WORD   TM              ;MODEM IN TEST MODE (RS 449 ONLY CIRCUIT TM)
2700  007574                            MOBITE:
2701
2702                                    ;TABLE OF ADDRESSES OF MODEM SIGNAL MESSAGE POSITIONS
2703
2704  007574  016477                    MOMSGS: .WORD   EVMCTS           ;CLEAR TO SEND (CIRCUIT CB)
2705  007576  016503                            .WORD   EVMDSR           ;DATA SET READY (CIRCUIT CC)
2706  007600  016507                            .WORD   EVMDCD           ;DATA CARRIER DETECT (CIRCUIT CF)
2707  007602  016513                            .WORD   EVMRTS           ;REQUEST TO SEND (CIRCUIT CA)
2708  007604  016517                            .WORD   EVMRI            ;RING INDICATOR (CIRCUIT CE)
2709  007606  016523                            .WORD   EVMSQD           ;SIGNAL QUALITY DETECT (CIRCUIT CG)
2710  007610  016527                            .WORD   EVMTM            ;MODEM IN TEST MODE (RS 449 ONLY CIRCUIT TM)
2711
2712                                    ;TABLE OF ADDRESSES OF EVENT DESCRIPTION MESSAGES
2713                                    ;       ORDER CORRESPONDS TO MESSAGE TYPE VALUES
2714
2715  007612  015101                    EVTLST: .WORD   EDTXQ    ;TRANSMIT MESSAGE QUEUED
2716  007614  015125                            .WORD   EDTXC    ;TRANSMIT OF MESSAGE COMPLETE
2717  007616  015154                            .WORD   EDRXQ    ;RECEIVE MESSAGE SPACE QUEUED
2718  007620  015201                            .WORD   EDRXC    ;MESSAGE RECEIVED -- RECEIVE COMPLETE
2719  007622  015227                            .WORD   EDDER    ;DEVICE INFORMATION
2720  007624  015274                            .WORD   EDDVI    ;DEVICE INITIALIZE STARTED
2721  007626  015244                            .WORD   EDDCK    ;DATA COMPARISON DONE
2722  007630  015426                            .WORD   EDMOS    ;MODEM STATUS CHANGE
2723  007632  015322                            .WORD   EDDLE    ;DATA COMPARE LENGTH ERROR
2724  007634  015357                            .WORD   EDDDE    ;DATA COMPARE DATA ERROR
2725  007636  015412                            .WORD   EDEOP    ;END OF PASS
2726  007640  015452                            .WORD   EDABO    ;^ C ABORT
2727
2728                                    ;LOCATIONS USED DURING EVENT REPORTING
2729
2730  007642  000000                    EVTSEC: .WORD   0        ;TEMPORARY LOCS TO KEEP EVENT TIME WHILE REPORTING
2731  007644  000000                    EVTMIN: .WORD   0
2732  007646  000000                    EVTTCK: .WORD   0
2733  007650  000000                    EVTADD: .WORD   0        ;TEMP. LOC. TO HOLD ADDRESS DURING EVENT REPORTING
2734  007652  000000                    EVTBCT: .WORD   0        ;       ''      ''  BYTE COUNT  ''      ''      ''
2735  007654  000000                    EVTTMP: .WORD   0        ;       ''      ''  OTHER DATA  ''      ''      ''
2736
2737                                    ;REPORT CODING DISPATCH TABLE
2738
2739  007656  022276                    RPTDSP: .WORD   RPTTXQ   ;TRANSMIT QUEUED ENTRY DECODING
2740  007660  022276                            .WORD   RPTTXQ   ;TRANSMIT COMPLETE ENTRY DECODING
2741  007662  022276                            .WORD   RPTTXQ   ;RECEIVER QUEUED ENTRY DECODING
2742  007664  022276                            .WORD   RPTTXQ   ;RECEIVER COMPLETE ENTRY DECODING
2743  007666  022350                            .WORD   RPTDER   ;DEVICE ERROR ENTRY DECODING
2744  007670  022444                            .WORD   RPTDVI   ;DEVICE INIT ENTRY DECODING
2745  007672  022640                            .WORD   RPTDCK   ;DATA COMPARISON ENTRY DECODING
```

```
 2746  007674  022714                    .WORD   RPTMSC  ;REPORT MODEM STATUS CHANGE
 2747  007676  022640                    .WORD   RPTDLE  ;DATA COMPARISON LENGH ERROR
 2748  007700  022564                    .WORD   RPTDDE  ;DATA COMPARISON DATA ERROR
 2749  007702  022510                    .WORD   RPTEOP  ;END OF PASS
 2750  007704  022510                    .WORD   RPTABO  ;^C ABORT
 2751
 2752
 2753  007706  000000            DEV1:   .WORD   0               ;TEMP LOCS TO HOLD DATA FOR EVENT REPORTING
 2754  007710  000000            DEV2:   .WORD   0               ;  AND SHOW MODE.... SUBROUTINE
 2755  007712  000000            DEV3:   .WORD   0
 2756  007714  000000            DEV4:   .WORD   0
 2757
```

```
                                .SBTTL          COMMAND LINE ACTION TREE

                                ;SAMPLE CLI TREE NODE   (ALWAYS AT LEAST 1 WORD)
                                ; ----------------------
                                ; ! ACTION  ! CHAR CODE !
                                ; ----------------------
                                ; !  MISS DISPLACEMENT  !       ONLY IF 'MISS'' ARGUMENT DEFINED
                                ; ----------------------
                                ; ! NEXT NODE DISPLMNT  !       ONLY IF ''ASCII'' ARGUMENT DEFINED
                                ; ----------------------
                                ; ! ASCIZ MATCH STRING  !       ONLY IF ''ASCII'' ARGUMENT DEFINED
                                ; !             (.EVEN) !
                                ; ----------------------

007716                          CLITRE:

                                ;FIRST KEYWORD
007716                                  CLI     CLISPA,0,N10$                   ;SKIP ANY LEADING SPACES
007722                          N10$:   CLI     <'?>,HLP,N42$                   ;IS THE FIRST NON-SP CHAR A ''?''
007726                                  CLI     CLIEXI,0                        ;   IF YES DO 'HLP'' AND EXIT
007730                          N42$:   CLI     CLISTR,HLP,N43$,<'HELP'>        ;ELSE, IS FIRST WORD A ''HELP''
007744                                  CLI     CLIEXI,0                        ;   IF YES DO ''HLP'' AND EXIT
007746                          N43$:   CLI     CLISTR,PRNT,N44$,<'PRINT'>      ;ELSE, IS FIRST WORD A ''PRINT''
007762                                  CLI     CLIEXI,0                        ;   IF YES DO ''PRINT'' AND EXIT
007764                          N44$:   CLI     CLISTR,EXIT,N45$,<'EXIT'>       ;ELSE, IS FIRST WORD 'EXIT' ;REV B BY EC
010000                                  CLI     CLIEXI,0                        ;   IF YES DO ''EXIT'' AND EXIT
010002                          N45$:   CLI     CLISTR,RUN,N46$,<'RUN'>         ;ELSE, IS FIRST WORD A ''RUN''
010014                                  CLI     CLIBR,0,N80$                    ;   IF YES DO ''RUN'' & GOTO N80$
010030                          N46$:   CLI     CLISTR,NOTNUF,N40$,<'DUMP'>     ;ELSE, IS FIRST WORD A ''DUMP''
010034                                  CLI     CLIBR,0,N50$                    ;   IF YES GOTO N80$
010040                          N40$:   CLI     CLISTR,CLEAR,N20$,<'CLEAR'>     ;ELSE, IS FIRST WORD A ''CLEAR''
010054                                  CLI     CLIBR,NOTNUF,N100$              ;   IF YES DO ''CLR'' & GOTO N100$
010060                          N20$:   CLI     <'S>,NOTNUF,N30$                ;ELSE, IS FIRST CHAR. A ''S''
010064                                  CLI     CLISTR,SHOW,N25$,<'HOW'>        ;   IF YES IS REST OF WORD ''HOW''
010076                                  CLI     CLIBR,0,N100$                   ;     IF YES, DO ''SHOW'',BR N100$
010102                          N25$:   CLI     CLISTR,0,N30$,<'ET'>            ;  ELSE, IS REST OF WORD 'ET''
010114                                  CLI     CLIBR,0,N110$                   ;     IF YES, DO ''SET'', BR N110$
010120                          N30$:   CLI     CLIERR,0                        ;OTHERWISE ''ILL CMD'' - EXIT

                                ;SECOND KEYWORD (MODE=) FOR RUN COMMAND

010122                          N80$:   CLI     CLISPA,0,N30$                   ;SKIP LEADING SPS, IF NONE-ERR
010126                          N81$:   CLI     CLISTR,NOTNUF,N30$,<'MODE'>     ;IS NEXT WORD ''MODE=''
010142                                  CLI     <'=>,0,N30$                     ;   IF NO, IT'S WRONG -ERR -EXIT
010146                                  CLI     CLISTR,ATVMOD,N82$,<'ACTIVE'>   ;IS NEXT WORD ''ACTIVE''
010164                                  CLI     CLIBR,0,N115$                   ;   IF YES, DO ''ACTIVE'',BR N115$
010170                          N82$:   CLI     CLISTR,PASMOD,N83$,<'PASSIVE'>  ;IS NEXT WORD ''PASSIVE''
010206                                  CLI     CLIBR,0,N115$                   ;   IF YES, DO ''PASSVE'',BR N115$
010212                          N83$:   CLI     CLISTR,RECMOD,N84$,<'RECEIVE'>  ;IS NEXT WORD ''RECEIVE''
010230                                  CLI     CLIBR,0,N115$                   ;   IF YES, DO ''RECVE'',BR N115$
010234                          N84$:   CLI     CLISTR,LISMOD,N85$,<'LISTEN'>   ;IS NEXT WORD ''LISTEN''
010252                                  CLI     CLIBR,0,N115$                   ;   IF YES, DO ''LISTEN'',BR N115$
010256                          N85$:   CLI     CLISTR,DLLMOD,N86$,<'DOWNLINELOAD'>     ;IS NEXT WORD ''DOW...''
010302                                  CLI     CLIBR,0,N115$                   ;   IF YES, DO ''DWNLL'',BR N115$
010306                          N86$:   CLI     <'T>,0,N30$                     ;IS NEXT CHAR A ''T''
```

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2814  010312                        CLI     CLISTR,TRAMOD,N87$,<'RANSMIT'>  ; IS REST OF WORD 'RANSMIT''
2815  010330                        CLI     CLIBR,0,N115$                   ;  IF YES, DO ''TRANSM'',BR N115$
2816  010334                N87$:   CLI     CLISTR,TALMOD,N30$,<'ALK'>      ; IS REST OF WORD ''ALK''
2817  010346                        CLI     CLIBR,0,N115$                   ;  IF YES, DO ''TALK'',BR N115$
2818                                                                        ; IF NO, ERROR - EXIT
2819
2820                                ;SECOND KEYWORD (FOR CLEAR OR SHOW)
2821  010352                N100$:  CLI     CLISPA,0,N30$                   ;SKIP LEADING SPACES, NONE=ERR
2822  010356                N102$:  CLI     CLISTR,CSHEXP,N104$,<'EXPECTBUFF'>      ;IS NEXT WORD ''EXPE...''
2823  010400                        CLI     CLIEXI,0                        ;  IF YES, DO CLR-EXP,EXIT
2824  010402                N104$:  CLI     CLISTR,CSHTRN,N30$,<'TRANSMITBUFF'>     ;IS NEXT WORD ''TRANS..''
2825  010426                        CLI     CLIEXI,0                        ;  IF YES, DO CLR-TRN,EXIT
2826                                                                        ;IF NO - ERROR - EXIT
2827
2828
2829                                ;SECOND KEYWORD (FOR SET)
2830  010430                N110$:  CLI     CLISPA,0,N30$
2831  010434                N111$:  CLI     CLISTR,SETEXP,N112$,<'EXPECT'>
2832  010452                        CLI     CLIBR,0,N120$
2833  010456                N112$:  CLI     CLISTR,SETTRN,N30$,<'TRANSMIT'>
2834  010476                        CLI     CLIBR,0,N120$
2835
2836                                ;GET ADDRESSES FOR DUMP COMMAND
2837  010502                N50$:   CLI     CLIALP,0,N51$
2838  010506                N51$:   CLI     CLISPA,0,N52$
2839  010512                N52$:   CLI     CLIOCT,DMPS,N30$
2840  010516                        CLI     <'->,NOTNUF,N125$
2841  010522                        CLI     CLIOCT,DMPE,N30$
2842  010526                        CLI     <'/>,NOTNUF,N125$
2843  010532                        CLI     <'B>,DMPQ,N30$
2844  010536                        CLI     CLIBR,0,N125$
2845
2846                                ;QUALIFIERS FOR THE RUN COMMAND
2847  010542                N115$:  CLI     CLIALP,0,N114$
2848  010546                N114$:  CLI     <'/>,NOTNUF,N125$
2849  010552                        CLI     CLISTR,NO,N116$,<'NO'>
2850  010564                N116$:  CLI     <'C>,0,N117$
2851  010570                        CLI     CLISTR,CHECK,N117$,<'HECK'>
2852  010604                        CLI     CLIBR,0,N115$
2853
2854
2855  010610                N117$:  CLI     CLISTR,STATUS,N118$,<'STATUS'>
2856  010626                        CLI     CLIBR,0,N115$
2857  010632                N118$:  CLI     CLISTR,ECHO,N119$,<'ECHO'>
2858  010646                        CLI     CLIBR,0,N115$
2859
2860  010652                N119$:  CLI     <'P>,0,N132$
2861  010656                        CLI     CLISTR,PROTO,N130$,<'ROTOCOL'>
2862  010674                        CLI     CLIBR,0,N115$
2863  010700                N130$:  CLI     CLISTR,0,N30$,<'ASS'>
2864  010712                        CLI     CLIBR,0,N150$
2865
2866  010716                N132$:  CLI     CLISTR,MOSC,N131$,<'MODEM'>
2867  010732                        CLI     CLIBR,0,N115$
2868
2869  010736                N131$:  CLI     CLISTR,0,N30$,<'LOOP'>
```

```
 2870  010752                          CLI     CLIBR,0,N140$
 2871
 2872                                  ;GET MESSAGE TYPE FOR SET MESSAGE COMMANDS
 2873  010756                          N120$:  CLI     <'=>,0,N30$
 2874
 2875                                  ;   LOOK FOR DEFAULT MESSAGE NAME
 2876  010762                          N60$:   CLI     CLISTR,CMSG1,N61$,<'ONES'>
 2877  010776                                  CLI     CLIBR,0,N121$
 2878  011002                          N61$:   CLI     CLISTR,CMSG0,N62$,<'ZEROES'>
 2879  011020                                  CLI     CLIBR,0,N121$
 2880  011024                          N62$:   CLI     CLISTR,CMSG2,N63$,<'1ALT'>
 2881  011040                                  CLI     CLIBR,0,N121$
 2882  011044                          N63$:   CLI     CLISTR,CMSG3,N64$,<'0ALT'>
 2883  011060                                  CLI     CLIBR,0,N121$
 2884  011064                          N64$:   CLI     CLISTR,CMSG5,N65$,<'ITEP'>
 2885  011100                                  CLI     CLIBR,0,N121$
 2886  011104                          N65$:   CLI     CLISTR,CMSG4,N66$,<'CCITT'>
 2887  011120                                  CLI     CLIBR,0,N121$
 2888  011124                          N66$:   CLI     CLISTR,CMSG6,N67$,<'ALPHA'>
 2889  011140                                  CLI     CLIBR,0,N121$
 2890  011144                          N67$:   CLI     CLISTR,SETET,N68$,<'TRANSMIT'> ;REV B BY EC
 2891  011164                                  CLI     CLIBR,0,N125$
 2892                                  ;   LOOK FOR QUOTED MESSAGE
 2893  011170                          N68$:   CLI     <''>,QPRMSG,N30$
 2894  011174                          N70$:   CLI     <''>,ENDQQ,N71$
 2895  011200                                  CLI     CLIBR,0,N121$
 2896  011204                          N71$:   CLI     CLISPA,0,N72$
 2897  011210                          N72$:   CLI     CLIALN,0,N73$           ;ONLY A-Z,SP,TAB, OR 0-9 BETWEEN '"S
 2898  011214                                  CLI     CLIBR,0,N70$
 2899  011220                          N73$:   CLI     CLIERR,BADCHR           ;PRINT ERROR IF NONE LEGAL CHAR FOR '"S
 2900
 2901                                  ;GET QUALIFIERS (SIZE OR COPY) FOR SET MESSAGE COMMANDS
 2902  011222                          N121$:  CLI     CLIALP,0,N123$
 2903  011226                          N123$:  CLI     <'/>,NOTNUF,N125$
 2904  011232                                  CLI     CLISTR,SIZE,N122$,<'SIZE'>
 2905  011246                                  CLI     CLIBR,0,N126$
 2906  011252                          N122$:  CLI     CLISTR,QCOPY,N30$,<'COPY'>
 2907  011266                                  CLI     CLIBR,0,N126$
 2908
 2909                                  ;NUMER FOR SIZE OR COPY
 2910  011272                          N126$:  CLI     <'=>,0,N30$
 2911  011276                                  CLI     CLIDEC,NUM,N30$
 2912  011302                                  CLI     CLIBR,0,N121$
 2913
 2914                                  ;GET MAINTENANCE LOOP TYPE FOR RUN ''LOOP'' QUIALIFIER
 2915  011306                          N140$:  CLI     <'=>,0,N30$
 2916
 2917
 2918  011312                          N141$:  CLI     CLISTR,TTLLOP,N142$,<'INTERNALTTL'>
 2919  011334                                  CLI     CLIBR,0,N115$
 2920  011340                          N142$:  CLI     CLISTR,CBLLOP,N143$,<'CABLE'>
 2921  011354                                  CLI     CLIBR,0,N115$
 2922  011360                          N143$:  CLI     CLISTR,LMDLOP,N144$,<'LOCALMODEM'>
 2923  011402                                  CLI     CLIBR,0,N115$
 2924  011406                          N144$:  CLI     CLISTR,RMDLOP,N30$,<'REMOTEMODEM'>
 2925  011430                                  CLI     CLIBR,0,N115$
```

```
 2926
 2927                                   ;GET LINE NUMBER FOR "PASS" RUN QUALIFIER
 2928  011434                           N150$:  CLI     <'=>,0,N30$
 2929  011440                                   CLI     CLIDEC,PASC,N30$
 2930  011444                                   CLI     CLIBR,0,N115$
 2931
 2932
 2933
 2934                                   ;END-OF-LINE
 2935  011450                           N125$:  CLI     CLIEXI,0
 2936
```

```
 2937
 2938
 2939                                ;DEVICE DEPENDENT STORAGE LOCATIONS FOR
 2940                                ;  CURRENT DEVICE PARAMTERS
 2941
 2942
 2943  011452  000000                RXCSR:  .WORD   0                ;REC CONTROL AND STATUS
 2944  011454  000000                PCSAR:  .WORD   0                ;STATUS REGISTIER
 2945  011456  000000                RDSR:   .WORD   0                ;REC DATA AND STATUS REG
 2946  011460  000000                TXCSR:  .WORD   0                ;TRANSMIT AND REC. CONTROL
 2947  011462  000000                TDSR:   .WORD   0                ;TRANSMIT DATA AND STATUS REG
 2948
 2949
 2950  011464  000000                INVEC:  .WORD   0                ;INPUT INTERRUPT VECTOR ADDRESS
 2951  011466  000000                OUTVEC: .WORD   0                ;OUTPUT INTERRUPT VECTOR ADDRESS
 2952  011470  000000                INTPRI: .WORD   0                ;INTERRUPT PRIORITY
 2953  011472  065626                DPVP1:  .WORD   065626           ;THIS WORD IS BROKEN DOWN AS FOLLOWS
 2954                                                                 ;BITS 0-7 =SYNC WORD
 2955                                                                 ;BITS 8-10=ERR DET SELECTED
 2956                                ;THIS IS SET TO SYNC 262         ;BIT11 = IDLE
 2957                                ;CRC 16 INIT TO 1                ;BIT12 = SEC ADDR. MODE
 2958                                ;STRIP SYNC AND BCP MODE         ;BIT13 = STRIP SYNC
 2959                                ;IDLE SET TO MARK                ;BIT14 = PORTO TYPE SEL(1=BCP 0=BOP)
 2960                                                                 ;BIT15 = ALL PARTIES ADDRESS..
 2961
 2962
 2963  011474  000000                CMODS:  .WORD   0                ;CURRENT MODEM
 2964  011476  000000                IRXCSR: .WORD   0                ;IMAGE OF RXCSR
 2965  011500  000000                IRDSR:  .WORD   0                ;IMAGE OR RDSR
 2966  011502  000000                MSGPTR: .WORD   0                ;MSG PTR.FOR HEADER OR CONTROL
 2967  011504  000000                MSGCC:  .WORD   0                ;MSG COUNTER OR CC
 2968  011506  000000                SYNCC:  .WORD   0                ;SYNC CHAR COUNT.
 2969  011510  000000                SYNCW:  .WORD   0                ;SYNC WORD.PLUS TSOM BIT.
 2970  011512  000000                RMSGPT: .WORD   0                ;MSG PTR FOR REC
 2971  011514  000000                RMSGCC: .WORD   0                ;CHAR COUNTER FOR REC
 2972  011516  000000                BCCW:   .WORD   0                ;CRC HOLDING LOC.
 2973  011520  000000                MGLCNT: .WORD   0                ;COUNT OF GLITCH ERRORS
 2974  011522  000000                MHRCNT: .WORD   0                ;COUNT OF HARD ERRORS
 2975  011524  000000                RNODE:  .WORD   0                ;1=REMOTE NODE ITEP,0=NON ITEP
 2976
 2977
 2978                                ;       ERRTBL
```

```
                                .SBTTL  GLOBAL TEXT SECTION

                                ;++
                                ; THE GLOBAL TEXT SECTION CONTAINS FORMAT STATEMENTS,
                                ; MESSAGES, AND ASCII INFORMATION THAT ARE USED IN
                                ; MORE THAN ONE TEST.
                                ;--

                                .SBTTL          DEVICE SUPPORTED
                                ;
                                ; NAMES OF DEVICES SUPPORTED BY PROGRAM
                                ;


011526                                  DEVTYP  <DPV-11>
011526                                                                  L$DVTYP::
011526  050104  026526  030461                                                  .ASCIZ  /DPV-11/
011534     000
        011536                                                                  .EVEN


                                .SBTTL          PROGRAM IDENTIFICATION
                                ; TEST DESCRIPTION
                                ;
011536                                  DESCRIPT        <DPV-11 DATA COMM LINK TEST >
011536                                                                  L$DESC::
011536  050104  026526  030461                                                  .ASCIZ  /DPV-11 DATA COM
011544  042040  052101  020101
011552  047503  046515  046040
011560  047111  020113  042524
011566  052123  000040

                                .EVEN                                           .EVEN
```

```
3016                                    .SBTTL          GLOBAL FORMAT STATEMENTS, MESSAGES, AND ASCII INFO
3017
3018  011572 041504 052114 000076  CLI$PM: .ASCIZ  /DCLT>/
      011600 050122 037124    000  CLI$RP: .ASCIZ  /RPT>/          ;REV B BY EC
      011605    045 022516 037501  CLIERM: .ASCIZ  /%N%A?ILL CMD-BAD SYNTX?/
      011635    045 022516 037501  CLINUF: .ASCIZ  /%N%A?INCMPLTE CMD?/
      011660 047045 040445 047077  CLINBG: .ASCIZ  /%N%A?NUM TOO BIG?/
      011702 047045 040445 041077  CLIBRX: .ASCIZ  /%N%A?BAD RADIX?/
      011722 047045 040445 021077  CLIBDL: .ASCIZ  /%N%A?"LOOP" VALID ONLY IN ACTIVE?/
      011764 047045 040445 021077  CLINPS: .ASCIZ  /%N%A?"ECHO" VALID ONLY IN PASSIVE?/
      012027    045 022516 037501  CLIBCR: .ASCIZ  /%N%A?ILL CHR- "A-Z,0-9,SP,TAB" ONLY?/
      012074 047045 040445 021077  CLISE0: .ASCIZ  /%N%A?"SIZE=0" NOT VALID?/
      012125    045 022516 037501  CLIPW:  .ASCIZ  /%N%A?TRANSMIT & EXPECT LIST MUST BE IDENTICAL FOR LOOP?/;REV B EC
      012215    045 022516 052101  HLP0:   .ASCIZ  /%N%ATHIS IS DCLT. TYPE "H" OR "?" FOR DETAILS/
      012273    045 022516 000124  HLPF:   .ASCIZ  /%N%T/
      012300 041504 052114 041440  HLP1:   .ASCIZ  /DCLT CMDS:/
      012313    040 046103 040505  HLP2:   .ASCII  / CLEAR OR SHOW  EXPECTLIST OR TRANSMITLIST/<15><12>
      012367    040 051120 047111          .ASCII  / PRINT/<15><12>
      012377    040 054105 052111          .ASCII  / EXIT/<15><12> ;REV B EC
      012406 042040 046525 020120          .ASCIZ  ? DUMP START-END/B?
      012430 051440 052105 042440  HLP3:   .ASCIZ  ? SET EXPECTMSG OR TRANSMITMSG=TYPE/SIZE=N OR /COPY=N?
      012515    040 042523 020124  HLP3A:  .ASCIZ  / SET EXPECT=TRANSMIT/  ;REV B EC
      012542 020040 052040 050131  HLP4:   .ASCIZ  ?   TYPE=ONES,ZEROES,1ALT,0ALT,ITEP,CCITT,ALPHA?
      012621    040 020040 020040  HLP4A:  .ASCIZ  /       OR 'OPR SPCD=A-Z,SP,TAB,0-9 IN QUOTES'/
      012677    040 052522 020116  HLP5:   .ASCIZ  ? RUN MODE=MTYP/LOOP=LTYP/CHECK,STATUS,ECHO,MODEM,PASS=N?
      012767    040 020040 052115  HLP6:   .ASCII  /   MTYP=TRAN,REC,ACT,PAS,TAL,LIS,DOWN/<15><12>
      013036 020040 046040 054524          .ASCIZ  /   LTYP=INT,CAB,LOC,REM/

      013066 047045 040445 054524  RHLP0:  .ASCIZ  /%N%ATYPE "H" OR "?" FOR HELP!/ ;REV B EC
      013124 041504 052114 051040  RHLP1:  .ASCIZ  /DCLT REPORT CMDS:/ ;REV B EC
      013146 047514 020107 020055  RHLP2:  .ASCIZ  /LOG - PRINT DCLT EVENT LOG/  ;REV B EC
      013201    105 044530 020124  RHLP3:  .ASCIZ  /EXIT - EXIT REPORT LEVEL/  ;REV B EC
      013232 042510 050114 026440  RHLP4:  .ASCIZ  /HELP - PRINT THIS MESSAGE/  ;REV B EC
      013264 047503 047125 042524  RHLP5:  .ASCIZ  ?COUNTERS/SW - PRINT DDCMP COUNTERS?
      013327    127 042510 042522  RHLP6:  .ASCIZ  ?WHERE /SW=FULL, /ERRORS, /OFFSET=NN(O)?
      013376 047045 040445 043117  RPTIV:  .ASCIZ  /%N%AOFFSET INVALID/
      013421    045 022516 042101  RPTNV:  .ASCIZ  /%N%ADDCMP COUNTERS VALID ONLY WITH PROTOCOL SELECTED./
      013507    045 022516 046501  SHMSG:  .ASCIZ  ?%N%AMSG: TYPE=%T%A/SIZE=%D3?
      013543    132 051105 042517  SHTYP0: .ASCIZ  /ZEROES/
      013552 047117 051505    000  SHTYP1: .ASCIZ  /ONES/
      013557    061 046101 000124  SHTYP2: .ASCIZ  /1ALT/
      013564 040440 052114    000  SHTYP3: .ASCIZ  /0ALT/
      013571    111 044503 052124  SHTYP4: .ASCIZ  /CCITT/
      013577    111 042524 000120  SHTYP5: .ASCIZ  /ITEP/
      013604 046103 044120 000101  SHTYP6: .ASCIZ  /ALPHA/
      013612 050117 020122 050123  SHTYP7: .ASCIZ  /OPR SPEC/
      013623    122 041505 041505  M00:    .ASCIZ  /RECEIVE/
      013633    124 040522 051516  M01:    .ASCIZ  /TRANSMIT/
      013644 040520 051523 052111  M02:    .ASCIZ  /PASSIVE/
      013654 041501 044524 042526  M03:    .ASCIZ  /ACTIVE/
      013663    104 053517 046116  M04:    .ASCIZ  /DOWNLINELOAD/
      013700 040524 045514    000  M05:    .ASCIZ  /TALK/
      013705    114 051511 042524  M06:    .ASCIZ  /LISTEN/
      013714    000                LP0:    .ASCIZ  //
      013715    057 047514 050117  LP00:   .ASCIZ  ?/LOOP=?
      013724 047111 042524 047122  LP1:    .ASCIZ  ?INTERNAL?
```

```
013735     103  041101  042514  LP2:    .ASCIZ  ?CABLE?
013743     114  041517  046101  LP3:    .ASCIZ  ?LOCALMODEM?
013756  042522  047515  042524  LP4:    .ASCIZ  ?REMOTEMODEM?
013772  047516                  PNST:   .ASCII  /NO/
013774  052123  052101  051525  PST:    .ASCIZ  /STATUS/
014003     116     117          PNCK:   .ASCII  /NO/
014005     103  042510  046503  PCK:    .ASCIZ  /CHECK/
014013     116     117          PNEC:   .ASCII  /NO/
014015     105  044103  000117  PEC:    .ASCIZ  /ECHO/
014022  047516                  PNMS:   .ASCII  /NO/
014024  047515  042504  000115  PMS:    .ASCIZ  /MODEM/
014032  047516                  PNPR:   .ASCII  /NO/
014034  051120  052117  041517  PPR:    .ASCIZ  /PROTOCOL/


014045     045  022516  046101  LISP:   .ASCIZ  /%N%ALIS>/
014056  046124  037113     000  OPRMM:  .ASCIZ  /TLK>/
014063     124  044510  020123  L5060:  .ASCIZ  /THIS A 50. OR 60. HZ. LSI-11:/
        014122                          .EVEN



                                ;
                                ; FORMAT STATEMENTS USED IN PRINT CALLS
                                ;

014122  047045  040445  047504  DLLCM:  .ASCIZ  /%N%ADOWN LINE LOAD NOT SUPPORTED BY THIS DEVICE/


014202  047045  040445  046103  BDCLK:  .ASCIZ  /%N%ACLOCK NOT FOUND/
014226  047045  040445  040502  NOCLK:  .ASCIZ  /%N%ABAD CLOCK - PROGRAM WILL HANG ON ''TIMEOUT''!!/
014307     115  054101  020056  TABEX:  .ASCIZ  /MAX. CHAR. MSG COUNT EXCEEDED -/
014347     102  043125  042506  BUFEX:  .ASCIZ  /BUFFER FULL -/
014365     045  022516  022524  MSGTRN: .ASCIZ  /%N%T%A MSG. NOT BUILT !!/
014416  047045  040445  044103  MSGTRU: .ASCIZ  /%N%ACHAR. COUNT EXCEEDS BUFF LIMIT - MSG TRUNCATED/
014501     045  022516  032523  SHF0:   .ASCIZ  ?%N%S5%AMODE=%T%T%T%A/PASS=%Z5?

014537     045  022516  032523  SHF1:   .ASCIZ  ?%N%S5%S5%S5%A/%T%A/%T%A/%T%A/%T%A/%T?

014604  051445  022465  052101  EFM2:   .ASCIZ  /%S5%ATOTAL MISMATCHES IN MSG = %D5/
014647     045  022516  031523  PCPM:   .ASCIZ  /%N%S3%ACALLED FROM PC=%O6/
014701     045  032523  040445  EFM11:  .ASCIZ  /%S5%ACOMPARE COUNT=%D5%S3%ARECEIVE COUNT=%D5/
014756  047515  042504  020115  MSCMS:  .ASCIZ  /MODEM STATUS CHANGES FOR THIS PASS WERE../
015030  051445  022465  044101  EFM13:  .ASCIZ  /%S5%AHARD CHANGES=%D5%A%S3%AGLITCHES=%D5/

                                ;EVENT DESCRIPTION MESSAGES

015101     124  040522  051516  EDTXQ:  .ASCIZ  /TRANSMIT MSG QUEUED/
015125     124  040522  051516  EDTXC:  .ASCIZ  /TRANSMIT MSG COMPLETED/
015154  042522  042503  053111  EDRXQ:  .ASCIZ  /RECEIVE SPACE QUEUED/
015201     122  041505  044505  EDRXC:  .ASCIZ  /RECEIVE MSG COMPLETED/
015227     104  053105  041511  EDDER:  .ASCIZ  /DEVICE ERROR/
015244  040504  040524  041440  EDDCK:  .ASCIZ  /DATA COMPARISON STARTED/
015274  042504  044526  042503  EDDVI:  .ASCIZ  /DEVICE INIT AND SETUP/
```

```
       015322  040504  040524  041440  EDDLE:  .ASCIZ  /DATA COMPARISON LENGTH ERROR/
       015357     104  052101  020101  EDDDE:  .ASCIZ  /DATA COMPARISON DATA ERROR/
       015412  047105  020104  043117  EDEOP:  .ASCIZ  /END OF PASS/
       015426  047515  042504  020115  EDMOS:  .ASCIZ  /MODEM STATUS CHANGE/
       015452  041536  040440  047502  EDABO:  .ASCIZ  /^C ABORT/

                                       ;EVENT REPORTING MESSAGES
       015463     045  031523  047445  BASM3:  .ASCIZ  /%S3%O3/
       015472  051445  022463  033117  BASM2:  .ASCIZ  /%S3%O6/
       015501     045  022516  033117  BASM1:  .ASCIZ  /%N%O6/
       015507     045  022516  052101  NULEVT: .ASCIZ  /%N%ATHE DCLT EVENT LOG IS EMPTY/
       015547     045  022516  037101  EVTF0:  .ASCIZ  /%N%A>>> DCLT EVENT LOG ENTRY <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<</
       015643     045  022516  032504  EVTF1:  .ASCIZ  /%N%D5%A:%Z2%A:%Z2%S3%T/
       015672  047045  051445  022463  EVTF2:  .ASCIZ  /%N%S3%AADDR OF MSG=%O6%S3%ABYTE COUNT=%D5/
       015744  047045  051445  022463  EVTF3:  .ASCIZ  /%N%S3%T%N/
       015756  051445  022463  033117  EVTF3C: .ASCIZ  /%S3%O6%S3%O6/
       015773     045  031523  047445  EVTF3D: .ASCIZ  /%S3%O6%S3%O6%S3%T/
       016015     045  022516  031523  EVTF4:  .ASCIZ  /%N%S3%AADDP OF MSG=%O6%S3%ABYTE COUNT=%D5%S3%ANO. OF CMP ERRS=%D5/
       016117     045  022516  031523  EVTF4A: .ASCIZ  /%N%S3%AADDR OF MSG=%O6%S3%ARX BYTES=%D5%S3%ACOMPARE BYTES=%D5/

       016215     045  022516  031523  EVTF4B: .ASCIZ  /%N%S3%APASS=%D5%S3%AERRORS=%D5%S3%ASTRT-TO=%D5/

       016274  051445  022465  041101  EVTF5A: .ASCIZ  /%S5%ABYTE# IN MSG.=%D5%S3%AEXPTD=%O3%S3%ARECVD=%O3/

       016357     045  022516  034523  EVMOCG: .ASCIZ  /%N%S9%ACHANGED TO:/

                                       ; ***********************************************************************
                                       ;DO NOT SEPERATE THE NEXT LIST OF MESSAGES - MODEM SIGNAL HEADER AND REPORT

       016402  047045  051445  022470  EVMOHD: .ASCIZ  /%N%S8%AMODEM STATUS: CTS DSR DCD RTS RI  SQD TM/
       016452  047045  051445  022471  EVMOST: .ASCII  /%N%S9%S9%S5%A/
       016477     130     040     040  EVMCTS: .BYTE   'X,40,40,40
       016503     130     040     040  EVMDSR: .BYTE   'X,40,40,40
       016507     130     040     040  EVMDCD: .BYTE   'X,40,40,40
       016513     130     040     040  EVMRTS: .BYTE   'X,40,40,40
       016517     130     040     040  EVMRI:  .BYTE   'X,40,40,40
       016523     130     040     040  EVMSQD: .BYTE   'X,40,40,40
       016527     130     040     040  EVMTM:  .BYTE   'X,40,40,40
       016533     000                          .BYTE   0
                                               .EVEN

                                       ;EXECUTION STATUS MESSAGES TO BE PRINTED TO KEEP OPERATOR AWAKE
       016534  047045     000          CR:     .ASCIZ  /%N/            ;CR FOR LINES IN A ROW
       016537     045  031523  040445  STXQ:   .ASCIZ  /%S3%ATXQ/      ;ABOUT TO TRANSMIT
       016550  051445  022463  052101  STXC:   .ASCIZ  /%S3%ATXC/      ;TX COMPLETED
       016561     045  031523  040445  SRXQ:   .ASCIZ  /%S3%ARXQ/      ;ABOUT TO RECEIVE
       016572  051445  022463  042501  SDVE:   .ASCIZ  /%S3%AERR/      ;DEVICE ERROR
       016603     045  031523  040445  SCM:    .ASCIZ  /%S3%ACMP/      ;ABOUT TO DO DATA CHECKING OF RECVD VS. EXPTD
       016614  051445  022463  044501  SDVI:   .ASCIZ  /%S3%AINI/      ;DEVICE ABOUT TO BE INITIALIZED
       016625     045  031523  040445  SCML:   .ASCIZ  /%S3%ACML/      ;COMPARE LENGTH ERROR
       016636  051445  022463  041501  SCMD:   .ASCIZ  /%S3%ACMD/      ;COMPARE DATA ERROR
       016647     045  031523  040445  SEOP:   .ASCIZ  /%S3%AEOP/      ;END  OF PASS
                                               .EVEN

       016660  051445  022463  046501  SMSC:   .ASCIZ  /%S3%AMSC/      ;MODEM STATUS CHANGE.
```

```
        016671     115  042117  046505  GLMSG:  .ASCIZ  /MODEM STATUS GLITCHED/
        016717     115  042117  046505  HRDMSG: .ASCIZ  /MODEM STATUS HARD ERROR/
```

```
016747     115  051501  042524  DVEM0:  .ASCII  /MASTER RESET DID NOT WORK/
017000  005015  020040  051040          .ASCIZ  <15><12>/   RXCSR    TXCSR  /
017026  047516  041440  042514  DVEM1:  .ASCII  /NO CLEAR TO SEND FROM MODEM /
017062  005015  020040  051040          .ASCIZ  <15><12>/   RXCSR    TXCSR  /
017110  044524  042515  047440  DVEM2:  .ASCII  /TIME OUT WAITING FOR RX OR TX TO COMPLETE/
017161     015  020012  020040          .ASCIZ  <15><12>/   RXCSR    TXCSR/
017205     103  041522  044440  DVEM3:  .ASCII  /CRC IN ERROR/
017221     015  020012  020040          .ASCIZ  <15><12>/   RDSR     RXCSR/
017245     122  041505  044505  DVEM4:  .ASCII  /RECEIVER OVERRUN/
017265     015  020012  020040          .ASCIZ  <15><12>/   RDSR     RXCSR/
017311     124  046511  042105  DVEM5:  .ASCII  /TIMED OUT IN START,STACK,ACK SEQ/
017351     015  020012  020040          .ASCIZ  <15><12>/   RDATA    SDATA/
017375     115  042117  046505  DVEM6:  .ASCII  /MODEM DID NOT RETURN MODEM READY/
017435     015  020012  020040          .ASCIZ  <15><12>/   RXCSR    TXCSR/


                                       .EVEN
```

```
                                        .SBTTL  GLOBAL ERROR REPORT SECTION

                                        ;++
                                        ; THE GLOBAL ERROR REPORT SECTION CONTAINS MESSAGE PRINTING AREAS
                                        ; USED BY MORE THAN TEST TO OUTPUT ADDITIONAL ERROR INFORMATION.  PRINTB
                                        ; (BASIC) AND PRINTX (EXTENDED) CALLS ARE USED TO CALL PRINT SERVICES.
                                        ;--

                                        .LIST BEX

017462                                          BGNMSG  ERR1
017462                                                                                  ERR1::
017462                                          PRINTB  #EVTF5A,OFSET,<B,GOOD>,<B,BAD>  ;INDIVIDUAL DATA COMPARE ERROR
017462  005046                                                                                  CLR     -(SP)
017464  153716  006555                                                                          BISB    BAD,(SP)
017470  005046                                                                                  CLR     -(SP)
017472  153716  006554                                                                          BISB    GOOD,(SP)
017476  013746  006532                                                                          MOV     OFSET,-(SP)
017502  012746  016274                                                                          MOV     #EVTF5A,-(SP)
017506  012746  000004                                                                          MOV     #4,-(SP)
017512  010600                                                                                  MOV     SP,R0
017514  104414                                                                                  TRAP    C$PNTB
017516  062706  000012                                                                          ADD     #12,SP
017522                                          ENDMSG
017522                                                                                  L10001:
017522  104423                                                                                  TRAP    C$MSG

017524                                          BGNMSG  ERR2
017524                                                                                  ERR2::
017524                                          PRINTB  #EFM2,TEMP4                     ;TOTAL DATA COMPARE FAILS ERROR
017524  013746  006544                                                                          MOV     TEMP4,-(SP)
017530  012746  014604                                                                          MOV     #EFM2,-(SP)
017534  012746  000002                                                                          MOV     #2,-(SP)
017540  010600                                                                                  MOV     SP,R0
017542  104414                                                                                  TRAP    C$PNTB
017544  062706  000006                                                                          ADD     #6,SP
017550                                          ENDMSG
017550                                                                                  L10002:
017550  104423                                                                                  TRAP    C$MSG

017552                                          BGNMSG  ERR10
017552                                                                                  ERR10::
017552                                          PRINTB  #EFM11,R4,TEMP3                 ;LENGH COMPARISON ERROR
017552  013746  006542                                                                          MOV     TEMP3,-(SP)
017556  010446                                                                                  MOV     R4,-(SP)
017560  012746  014701                                                                          MOV     #EFM11,-(SP)
017564  012746  000003                                                                          MOV     #3,-(SP)
017570  010600                                                                                  MOV     SP,R0
017572  104414                                                                                  TRAP    C$PNTB
017574  062706  000010                                                                          ADD     #10,SP
017600                                          ENDMSG
017600                                                                                  L10003:
017600  104423                                                                                  TRAP    C$MSG
```

```
3063
3064  017602                        BGNMSG  ERR4
3065  017602                                                        ERR4::
3066  017602                        PRINTB  #EFM13,MHRCNT,MGLCNT    ;MODEM STATUS CHANGE
3067  017602  013746  011520                                              MOV     MGLCNT,-(SP)
3068  017606  013746  011522                                              MOV     MHRCNT,-(SP)
3069  017612  012746  015030                                              MOV     #EFM13,-(SP)
3070  017616  012746  000003                                              MOV     #3,-(SP)
3071  017622  010600                                                      MOV     SP,R0
3072  017624  104414                                                      TRAP    C$PNTB
3073  017626  062706  000010                                              ADD     #10,SP
3074  017632                        ENDMSG
3075  017632                                                      L10004:
3076  017632  104423                                                      TRAP    C$MSG
3077
3078
3079
3080                                ;
3081                                ;PRINT THE 2 OCTAL #'S IN TEMP3/4
3082                                ;
3083
3084  017634                        BGNMSG  ERR13
3085  017634                                                        ERR13::
3086  017634                        PRINTB  #EVTF3C,TEMP3,TEMP4
3087  017634  013746  006544                                              MOV     TEMP4,-(SP)
3088  017640  013746  006542                                              MOV     TEMP3,-(SP)
3089  017644  012746  015756                                              MOV     #EVTF3C,-(SP)
3090  017650  012746  000003                                              MOV     #3,-(SP)
3091  017654  010600                                                      MOV     SP,R0
3092  017656  104414                                                      TRAP    C$PNTB
3093  017660  062706  000010                                              ADD     #10,SP
3094  017664                        ENDMSG
3095  017664                                                      L10005:
3096  017664  104423                                                      TRAP    C$MSG
3097
3098                                ;
3099                                ;PRINT THE 2 OCTAL #'S IN TEMP3/4
3100                                ; AND THE MESG. WHOSE ADDR. IS IN CONOTM
3101                                ;
3102
3103  017666                        BGNMSG  ERR14
3104  017666                                                        ERR14::
3105  017666                        PRINTB  #EVTF3D,TEMP3,TEMP4,CONOTM
3106  017666  013746  006550                                              MOV     CONOTM,-(SP)
3107  017672  013746  006544                                              MOV     TEMP4,-(SP)
3108  017676  013746  006542                                              MOV     TEMP3,-(SP)
3109  017702  013746  015773                                              MOV     #EVTF3D,-(SP)
3110  017706  013746  000004                                              MOV     #4,-(SP)
3111  017712  010600                                                      MOV     SP,R0
3112  017714  104414                                                      TRAP    C$PNTB
3113  017716  062706  000012                                              ADD     #12,SP
3114  017722                        ENDMSG
3115  017722                                                      L10006:
3116  017722  104423                                                      TRAP    C$MSG
3117
3118  017724                        EXIT    MSG
```

```
 3119  017724  000167                          .WORD   J$JMP
 3120  017726  177772                          .WORD   L10006-2-.
 3121
 3122
```

```
                        .SBTTL  GLOBAL SUBROUTINES SECTION

                        ;++
                        ; THE GLOBAL SUBROUTINES SECTION CONTAINS THE SUBROUTINES
                        ; THAT ARE USED IN MORE THAN ONE TEST.
                        ;--


                        .SBTTL          CLOCK SETUP SUBROUTINE

                        ;++
                        ; FUNCTIONAL DESCRIPTION:
                        ;       THIS SUBROUTINE SETS UP THE CLOCK INFORMATION TABLE FOLLOWING A ''CLOCK''
                        ;       CALL EXECUTED IN THE INITIALIZATION CODE. BUT SINCE THE ''CLOCK'' CALL
                        ;       SAYS NOTHING ABOUT AN LSI-11'S CLOCK, THIS ROUTINE IS ONLY USED IF A
                        ;       LINE OR P-CLOCK IS FOUND.
                        ;
                        ; INPUTS:
                        ;       R1= POINTS TO SUPERVISOR SPACE WHERE CLOCK INFO WAS RETURNED
                        ;       R2= POINTS TO ''CLK'' TABLE WHERE CLOCK INFO WILL BE KEPT
                        ;
                        ; IMPLICIT INPUTS:
                        ;       THE SUPERVISOR  SPACE WHERE CLOCK INFO WAS RETURNED BY THE ''CLOCK'' CALL
                        ;
                        ; OUTPUTS:
                        ;       ''CLKCSR'' GETS LOADED WITH THE CLOCK'S CSR ADDRESS
                        ;       ''CLKBR'' GETS LOADED WITH THE CLOCK'S INTERRUPT LEVEL
                        ;       ''CLKVEC'' GETS LOADED WITH THE CLOCK'S INTERRUPT VECTOR
                        ;       ''CLKHZ'' GETS LOADED WITH THE LINE FREQ. (HERTZ RATE) WHICH DETERMINES
                        ;               THE NUMBER OF TICKS IN A SECOND
                        ;
                        ; CALLING SEQUENCE:
                        ;       JSR     PC,CLKSET               ;CALL CLOCK SETUP WITH R1 & R2 SETUP
                        ;--

017730                  CLKSET:
017730  012122                  MOV     (R1)+,(R2)+             ;LOAD CLOCK'S CSR ADDR. INTO ''CLKCSR''
017732  012112                  MOV     (R1)+,(R2)              ;LOAD CLOCK'S INT. LEVEL INTO ''CLKBR''
017734  006312                  ASL     (R2)                    ;ADJUST THE INT. LEVEL FOR LOADING INTO
017736  006312                  ASL     (R2)                    ;   THE PSW WITH A ''SETVEC'' CALL
017740  006312                  ASL     (R2)
017742  006312                  ASL     (R2)
017744  006322                  AS      (R2)+
017746  012122                  MOV     (R1)+,(R2)+             ;LOAD CLOCK'S INT. VECTOR INTO ''CLKVEC''
017750  012122                  MOV     (R1)+,(R2)+             ;LOAD CLOCK'S HERTZ RATE INTO ''CLKHZ''
017752  000207                  RTS     PC
```

```
                        .SBTTL          CLOCK INTERRUPT SERVICE ROUTINE
                        ;++
                        ; FUNCTIONAL DESCRIPTION:
                        ;       THIS IS THE CLOCK INTERRUPT SERVICE ROUTINE WHICH TAKES CARE OF
                        ;       KEEPING THE "TIME-SINCE-START" AND COUNTING DOWN ANY OF THE
                        ;       "EVENT" TIMERS. THE TIMERS ARE USED TO TIME COMPLETION OF  DEVICE
                        ;       REQUESTS. THE "TIME-SINCE-START" IS USED TO BE LOGGED WITH EACH ENTRY
                        ;       INTO THE EVENT LOG.
                        ;
                        ; IMPLICIT INPUTS:
                        ;       TIMTCK: THE CURRENT NO. OF TICKS LEFT TO BE COUNTED UNTIL A SECOND
                        ;               HAS BEEN COUNTED OFF
                        ;       CLKHZ:  THE NO. OF TICKS IN A SECOND, DETERMINED BY THE SYS. LINE FREQ.
                        ;       TIMMIN & TIMSEC: CURRENT VALUE OF "TIME-SINCE-START"
                        ;                        IN MINUTES & SECONDS
                        ;       TIMER 1,2, & S: CURRENT VALUES OF THE "EVENT TIMERS"
                        ;
                        ; IMPLICIT OUTPUTS:
                        ;       NEW VALUE OF EVENT TIMER "1" DECREMENTED BY 1 TICK IF IT WAS NON-ZERO
                        ;       NEW VALUE OF EVENT TIMER "2" DECREMENTED BY 1 TICK IF IT WAS NON-ZERO
                        ;       NEW VALUE OF EVENT TIMER "S" DECREMENTED BY 1 SECOND IF IT WAS NON-ZERO
                        ;
                        ; FUNCTIONAL SIDE EFFECTS:
                        ;       THE CLOCK IS DISABLED UPON ENTRY AND REENABLED WHEN LEAVING
                        ;
                        ; CALLING SEQUENCE:
                        ;       THIS ROUTINE IS CALLED WHEN THE CLOCK INTERRUPTS THRU "CLKVEC".
                        ;       THE ADDRESS OF THIS ROUTINE WAS LOADED INTO THE CLOCK'S INTERRUPT
                        ;       VECTOR WITH A SUPERVISOR "SETVEC" CALL.
                        ;--
                        
017754                          BGNSRV  CLKINT
017754                                                          CLKINT::
                        
017754  005077  166640              CLR     @CLKCSR         ;DISABLE THE CLOCK FORM INTERRUPTING
017760  005337  006636              DEC     TIMTCK          ;DECREMENT THE # OF TICKS/SEC.
017764  001015                      BNE     1$              ;GO CHECK TIMERS (1&2-TICKS, 3-SECONDS)
017766  013737  006626  006636      MOV     CLKHZ,TIMTCK    ;RESET THE # OF TICKS/SEC.
017774  005237  006634              INC     TIMSEC          ;INC # OF SECS-SINCE-START
020000  022737  000074  006634      CMP     #60.,TIMSEC     ;SEE IF WE'VE COUNTED 60 SECS. YET
020006  001004                      BNE     1$              ;IF NOT, GO CHECK TIMERS
020010  005237  006632              INC     TIMMIN          ; ELSE INC MINUTES-SINCE-START
020014  005037  006634              CLR     TIMSEC          ; AND RESTART SECOND COUNTER
                        
020020  005737  006640      1$:     TST     TIMER1          ;SEE IF TIMER #1, TIMING ANYTHING
020024  001402                      BEQ     2$              ; IF=0, NOTHING BEING TIMED CHECK NEXT TIMER
020026  005337  006640              DEC     TIMER1          ; ELSE DECREMENT THE TIMER VALUE (BY 1 TICK)
020032  005737  006642      2$:     TST     TIMER2          ;SEE IF TIMER #2, TIMING ANYTHING
020036  001402                      BEQ     3$              ; IF=0, NOTHING BEING TIMED CHECK NEXT TIMER
020040  005337  006642              DEC     TIMER2          ; ELSE DECREMENT THE TIMER VALUE (BY 1 TICK)
020044  005737  006644      3$:     TST     TIMERS          ;SEE IF TIMER #3, TIMING ANYTHING
020050  001406                      BEQ     4$              ; IF=0, NOTHING BEING TIMED, LEAVE
020052  023737  006626  006636      CMP     CLKHZ,TIMTCK    ;SEE IF A SECOND HAS BEEN COUNTED OFF
020060  001002                      BNE     4$              ; BR IF NO
020062  005337  006644              DEC     TIMERS          ; ELSE DECREMENT THE TIMER VALUE (BY 1 SEC.)
```

```
 3226  020066  013777  006630  166524  4$:     MOV     CLKEN,@CLKCSR   ;REENABLE THE CLOCK TO INTERRUPT
 3227  020074                                  ENDSRV
 3228  020074                                                                          L10007:
 3229  020074  000002                                                                          RTI
```

```
                        .SBTTL          EVENT LOG SUBROUTINES

                        ;++
                        ; FUNCTIONAL DESCRIPTION:
                        ;       THIS SUBROUTINE HAS A DIFFERENT ENTRY POINT
                        ;       FOR EACH EVENT TO BE LOGGED AND ALWAYS PRINTS
                        ;       THE SHORT ''OPERATOR AWAKE'' MESSAGE TO CONSOLE THEN LOGS THE
                        ;       EVENT TYPE, TIME, AND THE OTHER 3 WORDS OF INFO PASSED TO THE
                        ;       SUBROUTINE AT CALLING TIME
                        ;
                        ; INPUTS:
                        ;       TIMMIN & TIMSEC:        CURRENT VALUE OF ''TIME-SINCE-START''
                        ;       TEMP2:  WORD #1 OF EVENT LOG INFORMATION (FOR MOST EVENT TYPES)
                        ;       TEMP3:  WORD #2 OF EVENT LOG INFORMATION
                        ;       TEMP4:  WORD #3 OF EVENT LOG INFORMATION
                        ;       MODS:   CURRENT VALUE OF THE MODEM SIGNALS AVAILABLE FROM THE DEVICE
                        ;
                        ; OUTPUTS:
                        ;       ''OPERATOR AWAKE'' MESSAGE SENT TO THE CONSOLE
                        ;       NEW EVENT LOGGED IN ''EVTLOG'' (EVENT LOG)
                        ;       UPDATED ''EVTPTR'' (EVENT LOG ENTRY POINTER)
                        ;
                        ; SUBORDINATE ROUTINES USED:
                        ;       ''DVMODS'' THE DEVICE SUBROUTINE THAT RETURNS MODEM STATUS IN ''MODS''
                        ;               (FOR SOME EVENT TYPES)
                        ;
                        ; FUNCTIONAL SIDE EFFECTS:
                        ;       TEMP:   USED TO STORE ADDRESS OF ''OPERATOR AWAKE'' MESSAGE
                        ;       TEMP1:  USED TO SETUP THE VALUE OF THE ''EVENT TYPE'' BYTE FOR LOGGING
                        ;
                        ; CALLING SEQUENCE:
                        ;       JSR     PC,LOGTXQ       ;CALL THE LOG EVENT SUBROUTINE WITH TEMP,TEMP1,
                        ;        ''      ''  ''         ; TEMP2, TEMP3, AND TEMP4 SETUP
                        ;        ''      ''  ''
                        ;       JSR     PC,LOGCMP
                        ;--
020076                  LOGTXQ:
020076  012737  016537  006536          MOV     #STXQ,TEMP1     ;SET UP MSG. TO PRINT
020104  012737  000000  006534          MOV     #TXQ,TEMP       ;SET UP EVENT TYPE
020112  000517                         BR      LOGS1           ;GO LOG EVENT AND TIME

020114                  LOGTXC:
020114  012737  016550  006536          MOV     #STXC,TEMP1     ;SET UP MSG. TO PRINT
020122  012737  000002  006534          MOV     #TXC,TEMP       ;SET UP EVENT TYPE
020130  000510                         BR      LOGS1           ;GO LOG EVENT AND TIME

020132                  LOGRXQ:
020132  012737  016561  006536          MOV     #SRXQ,TEMP1     ;SET UP MSG. TO PRINT
020140  012737  000004  006534          MOV     #RXQ,TEMP       ;SET UP EVENT TYPE
020146  000501                         BR      LOGS1           ;GO LOG EVENT AND TIME

020150                  LOGRXC:
020150  012737  000006  006534          MOV     #RXC,TEMP       ;SET UP EVENT TYPE
020156  000475                         BR      LOGS1           ;GO LOG EVENT AND TIME
020160                  LGDVE:
```

```
3286  020160  012737  016572  006536          MOV     #SDVE,TEMP1     ;SET UP MSG. TO PRINT
3287  020166  012737  000010  006534          MOV     #DER,TEMP       ;SET UP EVENT TYPE
3288  020174  000503                          BR      LOGS3           ;GO LOG EVENT AND TIME
3289
3290  020176                          LOGDVI:
3291  020176  012737  016614  006536          MOV     #SDVI,TEMP1     ;SET UP MSG. TO PRINT
3292  020204  012737  000012  006534          MOV     #DVI,TEMP       ;SET UP EVENT TYPE
3293  020212  113737  006566  006540          MOVB    MODTYP,TEMP2
3294  020220  113737  006570  006541          MOVB    MLTYP,TEMP2+1
3295  020226  013737  006576  006542          MOV     RPASS,TEMP3
3296  020234  013737  006574  006544          MOV     PARAM,TEMP4     ;SET UP EVNT ENTRIES
3297  020242  000460                          BR      LOGS3           ;GO LOG EVENT AND TIME
3298
3299  020244                          LOGCMP:
3300  020244  012737  016603  006536          MOV     #SCM,TEMP1      ;SET UP MSG. TO PRINT
3301  020252  012737  000014  006534          MOV     #DCK,TEMP       ;SET UP EVENT TYPE
3302  020260  000451                          BR      LOGS3
3303  020262                          LOGCML:
3304  020262  012737  016625  006536          MOV     #SCML,TEMP1
3305  020270  012737  000020  006534          MOV     #DLE,TEMP       ;SET UP MSG. AND TYPE
3306  020276  000442                          BR      LOGS3           ;GO LOG EVENT AND TIME
3307  020300                          LOGCMD:
3308  020300  012737  016636  006536          MOV     #SCMD,TEMP1
3309  020306  012737  000022  006534          MOV     #DDE,TEMP
3310  020314  000433                          BR      LOGS3           ;GO LOG MSG TYPE AND TIME
3311  020316                          LOGEOP:
3312  020316  012737  016647  006536          MOV     #SEOP,TEMP1
3313  020324  012737  000024  006534          MOV     #EOP,TEMP
3314  020332  000424                          BR      LOGS3           ;GO LOG MSG TYPE AND TIME
3315
3316
3317  020334                          LOGMSC:
3318  020334  012737  016660  006536          MOV     #SMSC,TEMP1
3319  020342  012737  000016  006534          MOV     #MSC,TEMP
3320  020350  000415                          BR      LOGS3
3321
3322
3323  020352  013746  006506          LOGS1:  MOV     ERRCNT,-(SP)    ;SAVE CURRENT ERROR COUNT
3324  020356  004737  035124                  JSR     PC,DVMODS       ; GO GET MODEM STATUS
3325  020362  012604                          MOV     (SP)+,R4        ;GET SAVED ERRCNT VALUE
3326  020364  020437  006506                  CMP     R4,ERRCNT       ;WHERE ANY ERRORS FOUND
3327  020370  001402                          BEQ     1$              ; BR IF NONE
3328  020372  000137  020606                  JMP     LOGEX           ; ELSE, LEAVE WITHOUT LOGGING ANYTHING
3329                                                                  ;   BUT THE DEVICE ERROR FROM "DVMODS"
3330  020376  013737  007554  006544  1$:     MOV     MODS,TEMP4      ;AND PUT IT IN TEMP4
3331
3332  020404                          LOGS3:
3333  020404  022737  000006  006534          CMP     #RXC,TEMP
3334  020412  001434                          BEQ     LOGS5           ;IF RXC DONT PRINT
3335  020414  032737  000001  006574          BIT     #STATB,PARAM
3336  020422  001430                          BEQ     LOGS5           ;IF NO STATUS SELECTED
3337                                                                  ;GO TO 5
3338
3339  020424  022737  000010  006500          CMP     #10,LNCNT       ;HAVE WE DONE 10?
3340  020432  001012                          BNE     LOGS4           ;IF NOT GO TO 4
3341  020434  005037  006500                  CLR     LNCNT           ;ESLE CLEAR IT
```

```
3342
3343  020440                                          PRINTF  #CR              ;ELSE PRINT CR
3344  020440  012746  016534                                                          MOV     #CR,-(SP)
3345  020444  012746  000001                                                          MOV     #1,-(SP)
3346  020450  010600                                                                  MOV     SP,R0
3347  020452  104417                                                                  TRAP    C$PNTF
3348  020454  062706  000004                                                          ADD     #4,SP
3349  020460                                  LOGS4:
3350  020460  005237  006500                         INC     LNCNT           ;INC COUNTER OF # OF AWAKE MSGS
3351  020464                                          PRINTF  TEMP1           ;PRINT OPERATOR AWAKE MSG.
3352  020464  013746  006536                                                          MOV     TEMP1,-(SP)
3353  020470  012746  000001                                                          MOV     #1,-(SP)
3354  020474  010600                                                                  MOV     SP,R0
3355  020476  104417                                                                  TRAP    C$PNTF
3356  020500  062706  000004                                                          ADD     #4,SP
3357  020504  010346                         LOGS5:  MOV     R3,-(SP)        ;SAVE R3 ON THE STACK
3358  020506  013703  006646                         MOV     EVTPTR,R3
3359  020512  113723  006534                         MOVB    TEMP,(R3)+      ;LOG EVENT
3360  020516  013737  006626  006534                 MOV     CLKHZ,TEMP
3361  020524  163737  006636  006534                 SUB     TIMTCK,TEMP
3362  020532  113723  006534                         MOVB    TEMP,(R3)+      ;LOG TIME SINCE START
3363  020536  113723  006634                         MOVB    TIMSEC,(R3)+
3364  020542  113723  006632                         MOVB    TIMMIN,(R3)+    ;TICKS,SECS AND MINS.
3365  020546  013723  006540                         MOV     TEMP2,(R3)+     ;LOG EVNT ENTRY 3
3366  020552  013723  006542                         MOV     TEMP3,(R3)+     ;LOG EVNT ENTRY 4
3367  020556  013723  006544                         MOV     TEMP4,(R3)+     ;LOG EVNT ENTRY 5
3368  020562  020327  007552                         CMP     R3,#EVTEND
3369  020566  103404                                 BLO     LOGS2           ;IF EVENT LOG FULL GO
3370                                                                          ;CONTINUE;ELSE GO TO 2
3371  020570  012713  177777                         MOV     #-1,(R3)        ;LOG A TABLE END
3372  020574  012703  006650                         MOV     #EVTLOG,R3      ;PUT R3 TO START OF TABLE
3373  020600  010337  006646          LOGS2:         MOV     R3,EVTPTR       ;RESTORE POINTER
3374  020604  012603                                 MOV     (SP)+,R3        ;RESTORE R3
3375  020606  000207                 LOGEX:  RTS     PC
3376
```

```
                                .SBTTL  REPORT EVENT LOG
                                        ;;DPV DCLT PROGRAM
                                        ;;RPT> LOG
                                        ;;      HELP
                                        ;;      EXIT
                                        ;;      COUNTER/FULL,ERROR,OFFSET=NN(0)

020610  010246                  REPORT: MOV     R2,-(SP)        ;SAVE R2,R3,R4 ON THE STACK
020612  010346                          MOV     R3,-(SP)
020614  010446                          MOV     R4,-(SP)

                                        ;PRINT HELP MESSAGE
020616                                  PRINTF  #RHLP0          ;BASIC HELP MESSAGE
020616  012746  013066                                                  MOV     #RHLP0,-(SP)
020622  012746  000001                                                  MOV     #1,-(SP)
020626  010600                                                          MOV     SP,R0
020630  104417                                                          TRAP    C$PNTF
020632  062706  000004                                                  ADD     #4,SP

020636  105037  003147          GETRCL: CLRB    P$GDBD          ;INIT GOOD/BAD FLAG  -1=BAD INPUT
020642  105037  003146                  CLRB    P$NNUF          ;INIT MORE COMMAND LINE INPUT NEEDED

                                        ;PRINT PROMPT 'RPT>'
020646                                  GMANID  CLI$RP,CMDBUF,A,-1,1,72.,NO
020646  104443                                                          TRAP    C$GMAN
020650  000406                                                          BR      10000$
020652  002666                                                          .WORD   CMDBUF
020654  000142                                                          .WORD   T$CODE
020656  011600                                                          .WORD   CLI$RP
020660  177777                                                          .WORD   -1
020662  000001                                                          .WORD   T$LOLIM
020664  000110                                                          .WORD   T$HILIM
020666                                                          10000$:
020666  012737  002666  003132          MOV     #CMDBUF,P$BUFA  ;INPUT BUFFER
020674  012737  021030  003134          MOV     #CLIRT,P$TREE   ;REPORT CLI TREE
020702  012737  021232  003136          MOV     #CLIRAC,P$ACT   ;ACTION ROUTINES
020710  005037  003012                  CLR     QUALFG
020714  004737  024244                  JSR     PC,P$TRV        ;GO PARSE COMMAND LINE
020720  105737  003147                  TSTB    P$GDBD          ;COMMAND OK ?
020724  001412                          BEQ     1$              ;YES,BRANCH
020726                                  PRINTF  #CLIERM         ;PRINT INVALID INPUT MESSAGE
020726  012746  011605                                                  MOV     #CLIERM,-(SP)
020732  012746  000001                                                  MOV     #1,-(SP)
020736  010600                                                          MOV     SP,R0
020740  104417                                                          TRAP    C$PNTF
020742  062706  000004                                                  ADD     #4,SP
020746  000137  020636                  JMP     GETRCL          ;TRY AGAIN

020752  105737  003146          1$:     TSTB    P$NNUF          ;MORE COMMAND NEEDED ?
020756  001412                          BEQ     10$             ;NO,BRANCH
020760                                  PRINTF  #CLINUF         ;INCOMPLETE MESSAGE
020760  012746  011635                                                  MOV     #CLINUF,-(SP)
020764  012746  000001                                                  MOV     #1,-(SP)
020770  010600                                                          MOV     SP,R0
020772  104417                                                          TRAP    C$PNTF
020774  062706  000004                                                  ADD     #4,SP
```

```
 3433  021000  000137  020636                    JMP     GETRCL                  ;TRY AGAIN
 3434
 3435  021004  023727  003010  000002  10$:      CMP     KEYWD1,#RPEXT           ;EXIT COMMAND ?
 3436  021012  001402                            BEQ     20$                     ;YES,BRANCH
 3437  021014  000137  020636                    JMP     GETRCL                  ;GET ANOTHER COMMAND
 3438  021020  012604                  20$:      MOV     (SP)+,R4                ;RESTORE R4
 3439  021022  012603                            MOV     (SP)+,R3                ;RESTORE R3
 3440  021024  012602                            MOV     (SP)+,R2                ;RESTORE R2
 3441  021026  000207                            RTS     PC                      ;RETURN
```

```
 3442                                .SBTTL  COMMAND LINE PARSING TREE FOR REPORT
 3443  021030                        CLIRT:  CLI CLISPA,0,R10$               ;SKIP SPACES IN COMMAND LINE
 3444  021034                        R10$:   CLI <'?>,RPHLP,R11$             ;IF INPUT = ? THEN PRINT HELP MESSAGE
 3445  021040                                CLI CLIEXI,0                    ;;AND EXIT PARSER
 3446  021042                        R11$:   CLI CLISTR,RPHLP,R12$,<'HELP'>  ;IF INPUT = 'HELP' THEN PRINT HELP
 3447  021056                                CLI CLIEXI,0                    ;;MESSAGE AND EXIT PARSER
 3448  021060                        R12$:   CLI CLISTR,RPEXT,R13$,<'EXIT'>  ;IF INPUT = 'EXIT' THEN SET KEYWORD =
 3449  021074                                CLI CLIEXI,0                    ;;RPEXT AND EXIT PARSER
 3450  021076                        R13$:   CLI CLISTR,RPLOG,R14$,<'LOG'>   ;IF INPUT = 'LOG' THEN GO PRINT EVENT
 3451  021110                                CLI CLIEXI,0                    ;;LOG AND EXIT PARSER
 3452  021112                        R14$:   CLI CLISTR,RNOTNF,R30$,<'COUNTERS'>;;IF INPUT = COUNTERS
 3453  021132                                CLI CLIBR,0,R20$                ;;THEN GET SWITCH
 3454  021136                        R20$:   CLI <'/>,RNOTNF,R30$            ;;
 3455  021142                                CLI CLISTR,RPERR,R21$,<'ERROR'> ;; REPORT ERROR COUNTERS
 3456  021156                                CLI CLIEXI,0
 3457  021160                        R21$:   CLI CLISTR,RPFUL,R22$,<'FULL'>  ;;REPORT ALL STATUS
 3458  021174                                CLI CLIEXI,0                    ;
 3459  021176                        R22$:   CLI CLISTR,RNOTNF,R30$,<'OFFSET'>;; REPORT ONE LOCATION
 3460  021214                                CLI <'=>,0,R30$
 3461  021220                                CLI CLIOCT,RPSWO,R30$           ;;
 3462  021224                                CLI CLIEXI,0
 3463  021226                        R30$:   CLI CLIERR,0
 3464  021230                        R125$:  CLI CLIEXI,0
```

```
3465                                    .SBTTL  CLI ACTION DISPATCHER AND ROUTINES
3466  021232  006302                    CLIRAC: ASL     R2              ;SET UP INDEX
3467  021234  016202  021250                    MOV     10$(R2),R2      ;
3468  021240  062702  021250                    ADD     #10$,R2         ;
3469  021244  004712                            JSR     PC,(R2)         ;GO DO ACTION
3470  021246  000207                            RTS     PC              ;RETURN
3471  021250  000026                    10$:    .WORD   ACTRNL-10$      ;NULL
3472  021252  000030                            .WORD   ACTRHL-10$      ;HELP ROUTINE
3473  021254  000074                            .WORD   ACTREX-10$      ;EXIT ROUTINE
3474  021256  000104                            .WORD   ACTRLG-10$      ;REPORT EVENT LOG ROUTINE
3475  021260  000142                            .WORD   ACTERR-10$      ;ERROR COUNTERS ONLY
3476  021262  000120                            .WORD   ACTFUL-10$      ;ALL COUNTERS
3477  021264  000020                            .WORD   ACTRNF-10$      ;MORE COMMAND NEEDED
3478  021266  000164                            .WORD   ACTRSO-10$      ;VALIDATE OFFSET
3479
3480                                    ;;;;;ACTION ROUTINES FOR REPORT;;;;;
3481  021270  113737  177777  003146    ACTRNF: MOVB    -1,P$NNUF       ;SET 'MORE COMMAND'' NEEDED
3482  021276  000207                    ACTRNL: RTS     PC              ;NULL
3483
3484                                            ;PRINT HELP MESSAGE
3485  021300  012702  003036            ACTRHL: MOV     #RHLPTB,R2      ;INDEX FOR HELP MESSAGES
3486  021304                             1$:     PRINTF  #HLPF,(R2)+     ;PRINT IT
3487  021304  012246                                                                    MOV     (R2)+,-(SP)
3488  021306  012746  012273                                                           MOV     #HLPF,-(SP)
3489  021312  012746  000002                                                           MOV     #2,-(SP)
3490  021316  010600                                                                    MOV     SP,R0
3491  021320  104417                                                                    TRAP    C$PNTF
3492  021322  062706  000006                                                           ADD     #6,SP
3493  021326  020227  003052                    CMP     R2,#RHLPEN      ;LAST MESSAGE ?
3494  021332  001364                            BNE     1$              ;NO,BRANCH
3495  021334  012737  000001  003010            MOV     #RPHLP,KEYWD1   ;SET KEYWORD
3496  021342  000207                            RTS     PC              ;RETURN
3497
3498                                            ;EXIT REPORT LEVEL
3499  021344  012737  000002  003010    ACTREX: MOV     #RPEXT,KEYWD1   ;SET KEYWORD AND RETURN
3500  021352  000207                            RTS     PC
3501
3502                                            ;PRINT ERROR LOG
3503  021354  004737  022056            ACTRLG: JSR     PC,REPLOG       ;GO PRINT EVENT LOG
3504  021360  012737  000003  003010            MOV     #RPLOG,KEYWD1   ;SET KEYWORD
3505  021366  000207                            RTS     PC              ;RETURN
3506
3507                                            ;;REPORT ALL MESSAGE AND ERROR COUNTERS
3508  021370  012737  000000  037250    ACTFUL: MOV     #0,FIR          ;STARTING INDEX
3509  021376  012737  000036  037246            MOV     #36,LAST        ;LAST INDEX
3510  021404  004737  021540                    JSR     PC,STAPRI       ;GO PRINT IT
3511  021410  000207                            RETURN
3512
3513                                            ;;PRINT ONLY DDCMP ERROR COUNTERS
3514  021412  012737  000014  037250    ACTERR: MOV     #14,FIR         ;FIRST ERROR
3515  021420  012737  000036  037246            MOV     #36,LAST        ;LAST ERROR
3516  021426  004737  021540                    JSR     PC,STAPRI       ;GO PRINT IT
3517  021432  000207                            RETURN
3518
3519
3520                                            ;;VERIFY OFFSET VALUE
```

```
3521  021434  105037  003146          ACTRSO: CLRB    P$NNUF          ;CLEAR 'NOT ENOUGH FLAG'
3522  021440  032737  000001  003142          BIT     #BIT0,P$NUM     ;IS IT ODD ?
3523  021446  001020                          BNE     20$             ;YES,BRANCH
3524  021450  005737  003142                  TST     P$NUM           ;NEGATIVE # ?
3525  021454  100415                          BMI     20$             ;YES,BRANCH
3526  021456  023727  003142  000036          CMP     P$NUM,#36       ;INDEX LARGER THEN 36 ?
3527  021464  003011                          BGT     20$             ;YES,BRANCH
3528  021466  013737  003142  037250          MOV     P$NUM,FIR       ;STARTING INDEX
3529  021474  013737  003142  037246          MOV     P$NUM,LAST      ;LAST LOCATION
3530  021502  004737  021540                  JSR     PC,STAPRI       ;PRINT SINGLE LOCATION
3531  021506  000413                          BR      30$             ;EXIT
3532  021510                          20$:    PRINTS  #RPTIV          ;INVALID
3533  021510  012746  013376                                                  MOV     #RPTIV,-(SP)
3534  021514  012746  000001                                                  MOV     #1,-(SP)
3535  021520  010600                                                          MOV     SP,R0
3536  021522  104416                                                          TRAP    C$PNTS
3537  021524  062706  000004                                                  ADD     #4,SP
3538  021530  112737  177777  003147          MOVB    #-1,P$GDBD      ;SET BAD DATA FLAG
3539  021536  000207                  30$:    RETURN                  ;OFFSET OK - EXIT
3540
3541
3542                                  ;; PRINT ROUTINES
3543  021540  010146                  STAPRI: MOV     R1,-(SP)        ;SAVE R1
3544  021542  032737  000040  006574          BIT     #PROTOB,PARAM   ;"/PROTOCOL" SELECTED?
3545  021550  001011                          BNE     5$              ;YES,BRANCH
3546  021552                                  PRINTF  #RPTNV          ;"VALID ONLY WITH PROTOCOL SELECTED"
3547  021552  012746  013421                                                  MOV     #RPTNV,-(SP)
3548  021556  012746  000001                                                  MOV     #1,-(SP)
3549  021562  010600                                                          MOV     SP,R0
3550  021564  104417                                                          TRAP    C$PNTF
3551  021566  062706  000004                                                  ADD     #4,SP
3552  021572  000420                          BR      20$             ;EXIT
3553  021574  013701  037250          5$:     MOV     FIR,R1  ;FIRST INDEX
3554  021600  016137  037146  037252  10$:     MOV     STALST(R1),MES  ;MESSAGE ADDRESS
3555  021606  016137  037046  037254          MOV     PRSTAT(R1),MESDATA ;MESSAGE DATA
3556  021614  004771  037206                  JSR     PC,@STAIND(R1)  ;JUMP TO PROPER PRINT ROUTINE
3557  021620  062701  000002                  ADD     #2,R1           ;BUMP INDEX
3558  021624  020137  037246                  CMP     R1,LAST         ;ALL MESSAGES PRINTED
3559  021630  003001                          BGT     20$             ;YES,BRANCH
3560  021632  000762                          BR      10$             ;PRINT NEXT MESSAGE
3561  021634  012601                  20$:    MOV     (SP)+,R1        ;RESTORE R1
3562  021636  000207                          RETURN                  ;EXIT
3563
3564
3565                                  ;; PRINT WORD LOCATION
3566  021640                          PRIW:   PRINTS  MES,MESDATA     ;PRINT WORD LOCATION
3567  021640  013746  037254                                                  MOV     MESDATA,-(SP)
3568  021644  013746  037252                                                  MOV     MES,-(SP)
3569  021650  012746  000002                                                  MOV     #2,-(SP)
3570  021654  010600                                                          MOV     SP,R0
3571  021656  104416                                                          TRAP    C$PNTS
3572  021660  062706  000006                                                  ADD     #6,SP
3573  021664  000207                          RETURN
3574
3575
3576                                  ;; PRINT TWO BYTES OF DATA
```

```
3577  021666                                PRIBB:  PRINTS  MES,<B,MESDATA>,<B,MESDATA+1>
3578  021666  005046                                                          CLR     -(SP)
3579  021670  153716  037255                                                BISB    MESDATA+1,(SP)
3580  021674  005046                                                          CLR     -(SP)
3581  021676  153716  037254                                                BISB    MESDATA,(SP)
3582  021702  013746  037252                                                MOV     MES,-(SP)
3583  021706  012746  000003                                                MOV     #3,-(SP)
3584  021712  010600                                                        MOV     SP,R0
3585  021714  104416                                                        TRAP    C$PNTS
3586  021716  062706  000010                                                ADD     #10,SP
3587  021722  000207                                RETURN
3588
3589                                          ;; PRINT SPECIAL BYTE MASK
3590  021724  005037  006536                 PRIBS:  CLR     TEMP1
3591  021730  005037  006540                         CLR     TEMP2
3592  021734  005037  006542                         CLR     TEMP3
3593  021740  132737  000001  037255               BITB    #BIT0,MESDATA+1 ;BIT 0 = 1 ?
3594  021746  001402                               BEQ     10$             ;NO,BRANCH
3595  021750  005237  006536                       INC     TEMP1           ;SET IT
3596  021754  132737  000002  037255         10$:  BITB    #BIT1,MESDATA+1 ;BIT 1 =1 ?
3597  021762  001402                               BEQ     20$             ;NO,BRANCH
3598  021764  005237  006540                       INC     TEMP2           ;SET IT
3599  021770  132737  000004  037255         20$:  BITB    #BIT2,MESDATA+1 ;BIT2 = 1 ?
3600  021776  001402                               BEQ     30$             ;NO,BRANCH
3601  022000  005237  006542                       INC     TEMP3           ;SET IT
3602  022004                                 30$:  PRINTS  MES,<B,MESDATA>,<B,TEMP1>,<B,TEMP2>,<B,TEMP3>
3603  022004  005046                                                          CLR     -(SP)
3604  022006  153716  006542                                                BISB    TEMP3,(SP)
3605  022012  005046                                                          CLR     -(SP)
3606  022014  153716  006540                                                BISB    TEMP2,(SP)
3607  022020  005046                                                          CLR     -(SP)
3608  022022  153716  006536                                                BISB    TEMP1,(SP)
3609  022026  005046                                                          CLR     -(SP)
3610  022030  153716  037254                                                BISB    MESDATA,(SP)
3611  022034  013746  037252                                                MOV     MES,-(SP)
3612  022040  012746  000005                                                MOV     #5,-(SP)
3613  022044  010600                                                        MOV     SP,R0
3614  022046  104416                                                        TRAP    C$PNTS
3615  022050  062706  000014                                                ADD     #14,SP
3616  022054  000207                                RETURN
3617
3618
3619
```

```
3620                                    .SBTTL          DUMP EVENT LOG
3621
3622
3623  022056  010246                    REPLOG: MOV     R2,-(SP)        ;SAVE R2,R3,R4 ON THE STACK
3624  022060  010346                            MOV     R3,-(SP)
3625  022062  010446                            MOV     R4,-(SP)
3626
3627
3628
3629
3630  022064  013702  006646                    MOV     EVTPTR,R2       ;MAKE R2 A POINTER TO EVENT TABLE
3631  022070  023727  006650  177777            CMP     EVTLOG,#-1      ;SEE IF EVENT TABLE IS EMPTY
3632  022076  001034                            BNE     RPT0            ;BR IF NO
3633  022100                                    PRINTS  #NULEVT         ;IF EMPTY TELL OPRERATOR.
3634  022100  012746  015507                                                    MOV     #NULEVT,-(SP)
3635  022104  012746  000001                                                    MOV     #1,-(SP)
3636  022110  010600                                                            MOV     SP,R0
3637  022112  104416                                                            TRAP    C$PNTS
3638  022114  062706  000004                                                    ADD     #4,SP
3639  022120  000137  023004                    JMP     ENDEVT          ;AND END
3640
3641  022124  162702  000012            RPT:    SUB     #12,R2          ;NOW POINT BACK TO TOP OF ENTRY U
3642                                            ;JUST PRINTED
3643
3644  022130  020227  006650                    CMP     R2,#EVTLOG      ;POINTING TO TOP OF EVNT LOG QUEUE?
3645  022134  001010                            BNE     RPT1            ; BR IF NO
3646  022136  012702  007552                    MOV     #EVTEND,R2      ;SET R2 TO POINT TO BOTTOM OF LOG
3647  022142  026227  177776  177777            CMP     -2(R2),#-1
3648  022150  001007                            BNE     RPT0            ;IF END OF LOG IS NOT EMPTY
3649  022152  000137  023004                    JMP     ENDEVT          ;CONTINUE...ELSE EXIT
3650
3651  022156  020237  006646            RPT1:   CMP     R2,EVTPTR       ;ARE WE BACK TO POINTER?
3652  022162  001002                            BNE     RPT0            ;IF NOT CONTINUE
3653  022164  000137  023004                    JMP     ENDEVT          ;IF SO EXIT....
3654
3655  022170  162702  000012            RPT0:   SUB     #12,R2          ;POINT R2 TO START OF ENTRY
3656  022174                            RPTAA:  PRINTS  #EVTF0          ;PRINT EVENT ENTRY HEADER
3657  022174  012746  015547                                                    MOV     #EVTF0,-(SP)
3658  022200  012746  000001                                                    MOV     #1,-(SP)
3659  022204  010600                                                            MOV     SP,R0
3660  022206  104416                                                            TRAP    C$PNTS
3661  022210  062706  000004                                                    ADD     #4,SP
3662  022214  112203                            MOVB    (R2)+,R3        ;PUT EVENT TYPE INTO R3
3663  022216  112237  007646                    MOVB    (R2)+,EVTTCK
3664  022222  112237  007642                    MOVB    (R2)+,EVTSEC    ;PUT EVENT TIME (TICKS,SECS,MINS IN TEMP LOC.S)
3665  022226  112237  007644                    MOVB    (R2)+,EVTMIN
3666  022232                                    PRINTS  #EVTF1,EVTMIN,EVTSEC,EVTTCK,EVTLST(R3)  ;PRINT EVENT TIME AND DESCRIPT.
3667  022232  016346  007612                                                    MOV     EVTLST(R3),-(SP)
3668  022236  013746  007646                                                    MOV     EVTTCK,-(SP)
3669  022242  013746  007642                                                    MOV     EVTSEC,-(SP)
3670  022246  013746  007644                                                    MOV     EVTMIN,-(SP)
3671  022252  012746  015643                                                    MOV     #EVTF1,-(SP)
3672  022256  012746  000005                                                    MOV     #5,-(SP)
3673  022262  010600                                                            MOV     SP,R0
3674  022264  104416                                                            TRAP    C$PNTS
3675  022266  062706  000014                                                    ADD     #14,SP
```

```
                        DUMP EVENT LOG

3676  022272  000173  007656            JMP     @RPTDSP(R3)     ;DISPATCH TO DECODING SECTION FOR SPECIFIC TYPE
3677
3678  022276  012237  007650  RPTTXQ:   MOV     (R2)+,EVTADD    ;STORE MESSAGE ADDRESS FOR PRINTING
3679  022302  012237  007652            MOV     (R2)+,EVTBCT    ;STORE BYTE COUNT FOR PRINTING
3680  022306  012203                    MOV     (R2)+,R3        ;STORE MODEM STATUS FOR PRINTING
3681  022310                            PRINTS  #EVTF2,EVTADD,EVTBCT    ;PRINT ADDR,BYTE CNT
3682  022310  013746  007652                                                    MOV     EVTBCT,-(SP)
3683  022314  013746  007650                                                    MOV     EVTADD,-(SP)
3684  022320  012746  015672                                                    MOV     #EVTF2,-(SP)
3685  022324  012746  000003                                                    MOV     #3,-(SP)
3686  022330  010600                                                            MOV     SP,R0
3687  022332  104416                                                            TRAP    C$PNTS
3688  022334  062706  000010                                                    ADD     #10,SP
3689  022340  004737  023014            JSR     PC,RPTMSB       ;GO PRINT MODEM STATUS
3690  022344  000137  022124            JMP     RPT             ;GO BACK FOR NEXT EVENT ENTRY
3691
3692  022350  012237  007654  RPTDER:   MOV     (R2)+,EVTTMP    ;GET ADDRESS OF DEVICE INFO MESSAGE
3693  022354  012237  007706            MOV     (R2)+,DEV1      ;STORE DEVICE REG CONTENTS FOR PRINTING
3694  022360  012237  007710            MOV     (R2)+,DEV2
3695  022364                            PRINTS  #EVTF3,EVTTMP   ;PRINT DEVICE REG CONTENTS.
3696  022364  013746  007654                                                    MOV     EVTTMP,-(SP)
3697  022370  012746  015744                                                    MOV     #EVTF3,-(SP)
3698  022374  012746  000002                                                    MOV     #2,-(SP)
3699  022400  010600                                                            MOV     SP,R0
3700  022402  104416                                                            TRAP    C$PNTS
3701  022404  062706  000006                                                    ADD     #6,SP
3702  022410                            PRINTS  #EVTF3C,DEV1,DEV2
3703  022410  013746  007710                                                    MOV     DEV2,-(SP)
3704  022414  013746  007706                                                    MOV     DEV1,-(SP)
3705  022420  012746  015756                                                    MOV     #EVTF3C,-(SP)
3706  022424  012746  000003                                                    MOV     #3,-(SP)
3707  022430  010600                                                            MOV     SP,R0
3708  022432  104416                                                            TRAP    C$PNTS
3709  022434  062706  000010                                                    ADD     #10,SP
3710  022440  000137  022124            JMP     RPT             ;GO BACK FOR NEXT EVENT ENTRY
3711
3712  022444  005037  007706  RPTDVI:   CLR     DEV1
3713  022450  005037  007710            CLR     DEV2            ;CLEAR UPPER BYTES OF DEV1 & DEV2 BEFORE USE
3714  022454  112237  007706            MOVB    (R2)+,DEV1      ;STORE SETUP OPERATION PARAMETERS FOR PRINTING
3715  022460  112237  007710            MOVB    (R2)+,DEV2
3716  022464  012237  007712            MOV     (R2)+,DEV3
3717  022470  012237  007714            MOV     (R2)+,DEV4
3718  022474  010246                    MOV     R2,-(SP)        ;SAVE R2 ON THE STACK
3719  022476  004737  023712            JSR     PC,SHWOP        ;GO PRINT MODE, MAINT-LOOP TYPE, PARAMTERS.
3720  022502  012602                    MOV     (SP)+,R2        ;RESTORE R2
3721  022504  000137  022124            JMP     RPT             ;GO BACK FOR NEXT EVENT ENTRY
3722
3723                            ;;REPORT END OF PASS OR ^C ABORT
3724  022510                    RPTABO:
3725  022510  012237  007650  RPTEOP:   MOV     (R2)+,EVTADD
3726  022514  012237  007652            MOV     (R2)+,EVTBCT
3727  022520  012237  007654            MOV     (R2)+,EVTTMP
3728  022524                            PRINTS  #EVTF4B,EVTADD,EVTBCT,EVTTMP    ;PRINT ADDR,RXBYTES,CMPBYTES.
3729  022524  013746  007654                                                    MOV     EVTTMP,-(SP)
3730  022530  013746  007652                                                    MOV     EVTBCT,-(SP)
3731  022534  013746  007650                                                    MOV     EVTADD,-(SP)
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3732  022540  012746  016215                                                  MOV     #EVTF4B,-(SP)
3733  022544  012746  000004                                                  MOV     #4,-(SP)
3734  022550  010600                                                          MOV     SP,R0
3735  022552  104416                                                          TRAP    C$PNTS
3736  022554  062706  000012                                                  ADD     #12,SP
3737
3738  022560  000137  022124                  JMP     RPT             ;THEN GO GET NEXT EVENT ENTRY
3739
3740
3741  022564  012237  007650          RPTDDE: MOV     (R2)+,EVTADD    ;STORE MESSAGE ADDRESS FOR PRINTING
3742  022570  012237  007652                  MOV     (R2)+,EVTBCT    ;STORE BYTE COUNT FOR PRINTING
3743  022574  012237  007654                  MOV     (R2)+,EVTTMP    ;STORE TOTAL # OF CMP ERRORS
3744  022600                                  PRINTS  #EVTF4,EVTADD,EVTBCT,EVTTMP     ;PRINT ADDR, BYTE CNT, # CMP ERRS
3745  022600  013746  007654                                                  MOV     EVTTMP,-(SP)
3746  022604  013746  007652                                                  MOV     EVTBCT,-(SP)
3747  022610  013746  007650                                                  MOV     EVTADD,-(SP)
3748  022614  012746  016015                                                  MOV     #EVTF4,-(SP)
3749  022620  012746  000004                                                  MOV     #4,-(SP)
3750  022624  010600                                                          MOV     SP,R0
3751  022626  104416                                                          TRAP    C$PNTS
3752  022630  062706  000012                                                  ADD     #12,SP
3753  022634  000137  022124                  JMP     RPT             ;THEN GO GET NEXT EVENT ENTRY
3754
3755  022640                          RPTDLE:
3756  022640  012237  007650          RPTDCK: MOV     (R2)+,EVTADD    ;STORE MSG ADDR FOR PRINT
3757  022644  012237  007652                  MOV     (R2)+,EVTBCT    ;STORE BYTE COUNT
3758  022650  012237  007654                  MOV     (R2)+,EVTTMP    ;STORE BYTE COUNT COMP
3759  022654                                  PRINTS  #EVTF4A,EVTADD,EVTBCT,EVTTMP    ;PRINT ADDR,RXBYTES,CMPBYTES,
3760  022654  013746  007654                                                  MOV     EVTTMP,-(SP)
3761  022660  013746  007652                                                  MOV     EVTBCT,-(SP)
3762  022664  013746  007650                                                  MOV     EVTADD,-(SP)
3763  022670  012746  016117                                                  MOV     #EVTF4A,-(SP)
3764  022674  012746  000004                                                  MOV     #4,-(SP)
3765  022700  010600                                                          MOV     SP,R0
3766  022702  104416                                                          TRAP    C$PNTS
3767  022704  062706  000012                                                  ADD     #12,SP
3768
3769  022710  000137  022124                  JMP     RPT             ;THEN GO GET NEXT EVENT ENTRY
3770
3771
3772
3773
3774
3775  022714  012237  007654          RPTMSC: MOV     (R2)+,EVTTMP
3776  022720                                  PRINTS  #EVTF3,EVTTMP   ;PRINT CHANGE TYPE
3777  022720  013746  007654                                                  MOV     EVTTMP,-(SP)
3778  022724  012746  015744                                                  MOV     #EVTF3,-(SP)
3779  022730  012746  000002                                                  MOV     #2,-(SP)
3780  022734  010600                                                          MOV     SP,R0
3781  022736  104416                                                          TRAP    C$PNTS
3782  022740  062706  000006                                                  ADD     #6,SP
3783  022744  012203                  MOV     (R2)+,R3        ;PUT OLD MODEM STATUS IN R3 FOR PRINTING
3784  022746  004737  023014          JSR     PC,RPTMSB       ;GO PRINT OLD MODEM STATUS
3785  022752                          PRINTS  #EVMOCG         ;GO PRINT "CHANGED TO:"
3786  022752  012746  016357                                                  MOV     #EVMOCG,-(SP)
3787  022756  012746  000001                                                  MOV     #1,-(SP)
```

```
3788  022762  010600                                                                  MOV     SP,R0
3789  022764  104416                                                                  TRAP    C$PNTS
3790  022766  062706  000004                                                          ADD     #4,SP
3791  022772  012203                  MOV     (R2)+,R3        ;PUT NEW MODEM STATUS IN R3 FOR PRINTING
3792  022774  004737  023014          JSR     PC,RPTMSB       ;GO PRINT NEW MODEM STATUS
3793  023000  000137  022124  RPTMSE: JMP     RPT             ;THEN GO GET NEXT EVENT
3794
3795
3796  023004  012604          ENDEVT: MOV     (SP)+,R4        ;RESTORE R4,R3,R2
3797  023006  012603                  MOV     (SP)+,R3
3798  023010  012602                  MOV     (SP)+,R2
3799  023012  000207                  RTS     PC              ;RETURN TO CALLING ROUTINE
3800
3801
3802                          ;REPORT MODEM STATUS SUBROUTINE
3803                          ;       PART OF STATISICAL REPORTING (DUMPING EVENT LOG)
3804
3805  023014          RPTMSB: PRINTS  #EVMOHD                 ;PRINT MODEM STATUS HEADER
3806  023014  012746  016402                                                          MOV     #EVMOHD,-(SP)
3807  023020  012746  000001                                                          MOV     #1,-(SP)
3808  023024  010600                                                                  MOV     SP,R0
3809  023026  104416                                                                  TRAP    C$PNTS
3810  023030  062706  000004                                                          ADD     #4,SP
3811  023034  012704  007556                  MOV     #MOBITS,R4      ;MAKE R4 A POINTER TO MODEM SIG. BIT DEF. TABLE
3812  023040  012705  007574                  MOV     #MOMSGS,R5      ;MAKE R5 A POINTER TO MODEM MSG. POSITION TABLE
3813  023044  005714          6$:     TST     (R4)            ;SEE IF BIT AVAIABLE FROM DEVICE
3814  023046  001004                  BNE     7$              ;BR IF THAT MODEM SIG. AVAIABLE
3815  023050  112735  000130          MOVB    #'X,@(R5)+      ;ELSE PUT 'X' IN REPORT IF SIGNAL NOT AVAILABLE
3816  023054  005724                  TST     (R4)+           ;BUMP R4 TO POINT TO NEXT BIT DEFINITION
3817  023056  000407                  BR      9$              ;GO SEE IF CHECKED ALL MODEM SIGNALS
3818  023060  032403          7$:     BIT     (R4)+,R3        ;IF THERE, SEE IF THAT BIT IN DEVICE'S ENTRY=1
3819  023062  001403                  BEQ     8$              ;BR IF BIT (SIGNAL) VALUE =0
3820  023064  112735  000061          MOVB    #'1,@(R5)+      ;IF=1, PUT '1' IN REPORT MESSAGE
3821  023070  000402                  BR      9$              ;GO SEE IF ALL MODEM SIGNALS CHECKED
3822  023072  112735  000060  8$:     MOVB    #'0,@(R5)+      ;IF BIT(SIGNAL)=0, PUT '0' IN REPORT MESSAGE
3823  023076  020427  007574  9$:     CMP     R4,#MOBITE      ;SEE IF ALL BITS(SIGNALS) CHECKED
3824  023102  002760                  BLT     6$              ;LOOP UNTIL ALL SIGNALS(BITS) CHECKED
3825  023104                          PRINTS  #EVMOST         ;THEN PRINT MODEM SIGNAL VALUE MESSAGE
3826  023104  012746  016462                                                          MOV     #EVMOST,-(SP)
3827  023110  012746  000001                                                          MOV     #1,-(SP)
3828  023114  010600                                                                  MOV     SP,R0
3829  023116  104416                                                                  TRAP    C$PNTS
3830  023120  062706  000004                                                          ADD     #4,SP
3831  023124  000207                  RTS     PC              ;RETURN TO EVENT DECODING
3832
3833
```

```
                        .SBTTL          DUMP BYTES OR WORDS


                        ;+
                        ; FUNCTIONAL DESCRIPTION:
                        ;       DUMPSR - DUMP BYTES OR WORDS SUBROUTINE
                        ;
                        ;       THIS SUBROUTINE PRINTS THE CONTENTS OF THE LOCATIONS BETWEEN
                        ;       A STARTING AND END ADDRESS IN LOCS. "STADD" AND "ENADD".
                        ;       THE WORD OR BYTE CONTENTS ARE PRINTED 8 TO A LINE WITH THE
                        ;       ADDRESS OF THE FIRST BYTE AS THE FIRST 6 OCTAL CHARS. FOLLOWED
                        ;       BY A SEMICOLON.
                        ;
                        ; INPUTS:
                        ;       STADD=  STARTING ADDRESS (FIRST LOC. TO PRINT)
                        ;       ENADD=  END ADDRESS (LAST LOCATION TO DUMP)
                        ;       BYTBIT= 1 IF SUPPOSED TO PRINT 'BYTES"
                        ;               0 IF SUPPOSED TO PRINT 'WORDS"
                        ;
                        ; OUTPUTS:
                        ;       CONTENTS OF A RANGE OF LOC.S PRINTED ON THE OPERATORS CONSOLE.
                        ;
                        ; CALLING SEQUENCE:
                        ;       JSR PC,DUMPSR           ;CALL DUMP BYTES SUBROUTINE
                        ;
                        ;--
023126  013702  006510  DUMPSR: MOV     STADD,R2        ;SET R2 UP TO STARTING ADDR.
023132  005003          DUM4:   CLR     R3              ;CLEAR R3
023134                  PRINTF  #BASM1,R2               ;PRINT ADDRESS
023134  010246                                                  MOV     R2,-(SP)
023136  012746  015501                                          MOV     #BASM1,-(SP)
023142  012746  000002                                          MOV     #2,-(SP)
023146  010600                                                  MOV     SP,R0
023150  104417                                                  TRAP    C$PNTF
023152  062706  000006                                          ADD     #6,SP
023156  005737  006514  DUM3:   TST     BYTBIT          ;IS THIS BYTE OR WORD
023162  001416                  BEQ     DUM1            ;BR IF WORD
023164  112237  006534          MOVB    (R2)+,TEMP      ;MOV BYTE TO TEMP
023170                          PRINTF  #BASM3,<B,TEMP> ;PRINT BYTE
023170  005046                                                  CLR     -(SP)
023172  153716  006534                                          BISB    TEMP,(SP)
023176  012746  015463                                          MOV     #BASM3,-(SP)
023202  012746  000002                                          MOV     #2,-(SP)
023206  010600                                                  MOV     SP,R0
023210  104417                                                  TRAP    C$PNTF
023212  062706  000006                                          ADD     #6,SP
023216  000411                  BR      DUM2
023220                  DUM1:   PRINTF  #BASM2,(R2)+    ;PRINT WORD
023220  012246                                                  MOV     (R2)+,-(SP)
023222  012746  015472                                          MOV     #BASM2,-(SP)
023226  012746  000002                                          MOV     #2,-(SP)
023232  010600                                                  MOV     SP,R0
023234  104417                                                  TRAP    C$PNTF
023236  062706  000006                                          ADD     #6,SP
023242  020237  006512  DUM2:   CMP     R2,ENADD        ;COMPARE FOR LAST ADD
```

```
 3890  023246  003005                      BGT     DUMEX           ;IF DONE EXIT
 3891  023250  005203                      INC     R3              ;ELSE BUMP R3
 3892  023252  022703  000010              CMP     #8.,R3          ;HAVE WE PRINTED 8 ACCROSS
 3893  023256  001725                      BEQ     DUM4            ;IF SO GO BACK TO 4
 3894  023260  000736                      BR      DUM3            ;ELSE GO BACK AND PRINT ANOTHER
 3895                                                              ;BYTE OR WORD
 3896  023262  000207          DUMEX:      RTS     PC              ;RETURN TO CALLER
 3897
```

```
                                .SBTTL          UPDATE TOTAL CHAR. COUNT SUBROUTINE

                                ;++
                                ; FUNCTIONAL DESCRIPTION:
                                ;               UPDATES TOTAL CHAR. COUNT TOTCC BASED ON CURCC.
                                ;               LAST MESSAGE IS TRUNCATED TO FIT INTO THE
                                ;               BUFFER IF TOTAL CHAR. COUNT EXCEEDS 'BUFLIM'  A MESSAGE
                                ;               IS PRINTED TELLING THE OPERATOR THE TRUNCATION OCCURED.
                                ;
                                ; INPUTS:
                                ;               CURCC=  CHAR. COUNT OF MESSAGE BEING ADDED
                                ;               TOTCC=  TOTAL CHAR COUNT OF BUFFER ITS BEING ADDED TO
                                ;
                                ; OUTPUTS:
                                ;               MESSAGE TO OPERATOR IF MESSAGE TRUNCATED TO FIT
                                ;
                                ; FUNCTIONAL SIDE EFFECTS:
                                ;               LOCATION "TEMP" USED FOR CALCULATIONS
                                ; CALLING SEQUENCE:
                                ;               JSR     PC,ADCC         ;UPDATED TOTAL CHAR. COUNT
                                ;--

023264  063737  006520  006530  ADDCC:  ADD     CURCC,TOTCC     ;ADD CURRENT TO TOTAL
023272  022737  001000  006530           CMP     #BUFLIM,TOTCC   ; COMPARE TO 'BUFLIM'
023300  103027                         BHIS    ADDC1           ;IF NOT MORE THEN 'BUFLIM' EXIT

                                ; PRINT MESSAGE AND TRUNCATE COUNT

023302                          PRINTF  #MSGTRU
023302  012746  014416                                                  MOV     #MSGTRU,-(SP)
023306  012746  000001                                                  MOV     #1,-(SP)
023312  010600                                                          MOV     SP,R0
023314  104417                                                          TRAP    C$PNTF
023316  062706  000004                                                  ADD     #4,SP
023322  163737  006520  006530           SUB     CURCC,TOTCC     ;SUB CURRENT FROM TOTAL
023330  012737  001000  006534           MOV     #BUFLIM,TEMP    ;MOV 'BUFLIM' TO TEMP
023336  163737  006530  006534           SUB     TOTCC,TEMP      ;SUB TOTAL FROM 'BUFLIM'
023344  013737  006534  006520           MOV     TEMP,CURCC      ;AND ESTABLISH NEW CURRENT
023352  063737  006520  006530           ADD     CURCC,TOTCC     ;ADD "ADJUSTED CURRENT" TO TOTAL CHAR. CNT.
023360  000207                  ADDC1:   RTS     PC              ;RETURN TO CALLER
```

```
                                .SBTTL          BUILD MESSAGE BUFFERS SUBROUTINE

                                ;++
                                ; FUNCTIONAL DESCRIPTION:
                                ;       BLDBUF--  BUILD POINTER TABLE AND BUFFERS
                                ;
                                ;       THIS SUBROUTINE ADDS A MESSAGE TO THE TRANSMIT OR EXPECT LIST
                                ;       USING THE POINTER, BYTE COUNT, AND ADDRESS PASSED TO IT.
                                ;
                                ; INPUTS:
                                ;       CURCC=  CHAR. COUNT OF MESSAGE TO BE ADDED
                                ;       CURADD= ADDRESS OF MESSAGE TO BE ADDED
                                ;       CPTR=   ADDRESS OF POINTER TABLE WORD WHERE MESSAGE POINTERS ARE
                                ;                       TO BE BUILT
                                ;       MSGTYP= VALUE TO USE AS AN INDEX TO FIND SOURCE OF MESSAGE DATA
                                ;                       INDEX INTO DMSGCT() AND DMSGAD().
                                ; OUTPUTS:
                                ;       A MESSAGE ADDED TO EITHER TXBUF OR CMPBUF
                                ;       APPROPRIATE POINTERS IN PTRTAB POINTER TABLE
                                ;
                                ; CALLING SEQUENCE:
                                ;       JSR PC,BLDBUF           ;BUILD MESSAGE IN BUFFER AND ADD PTRS.
                                ;--

023362                          BLDBUF:
023362  010246                          MOV     R2,-(SP)        ;SAVE R2 AND R3 ON THE STACK
023364  010346                          MOV     R3,-(SP)
023366  013702  006524                  MOV     CPTR,R2

023372  013722  006526          BLDB1:  MOV     CURADD,(R2)+    ;PUT CURRENT ADD ON POINTER TAB
023376  013722  006520                  MOV     CURCC,(R2)+     ;PUT CURRENT CC ON POINTER TAB
023402  010237  006524                  MOV     R2,CPTR         ;PUT UPDATED R2 BACK TO CURRENT POINT
023406  013702  006516                  MOV     MSGTYP,R2       ;GET MESSAGE TYPE TO USE AS INDEX
023412  006302                          ASL     R2              ;DOUBLE FOR WORD INDEX
023414  013737  006526  006534          MOV     CURADD,TEMP     ;MOVE CURRENT ADD TO TEMP
023422  063737  006520  006534          ADD     CURCC,TEMP      ;ADD CHAR COUNT TO IT TO GET END
023430  013703  006526                  MOV     CURADD,R3       ;SET R3 TO CURRENT START ADD
023434  016237  002150  006540  BLDB2:  MOV     DMSGCT(R2),TEMP2        ;GET BYTE COUNT
023442  016204  002172                  MOV     DMSGAD(R2),R4   ;PUT STARTING FROM ADD IN R4
023446  060437  006540                  ADD     R4,TEMP2        ;ADD IT TO TEMP2 TO GET END OF FROM
023452  112423                  BLDB3:  MOVB    (R4)+,(R3)+     ;MOV BYTE FROM PATTERN TO BUFFER
023454  020337  006534                  CMP     R3,TEMP         ;ALL DONE?
023460  001404                          BEQ     BLDBEX          ;IF SO EXIT
023462  020437  006540                  CMP     R4,TEMP2        ;IS PATTERN COUNT EXPIRED
023466  001762                          BEQ     BLDB2           ;IF SO GO START AGAIN
023470  000770                          BR      BLDB3           ;IF NOT GET ANOTHER BYTE
023472  063737  006520  006526  BLDBEX: ADD     CURCC,CURADD    ;BUMP CURADD
023500  012603                          MOV     (SP)+,R3        ;RESTORE R3 AND R2
023502  012602                          MOV     (SP)+,R2
023504  000207                          RTS     PC              ;RETURN TO CALLER
```

```
                        .SBTTL  CREATE FACSIMILE OF TX BUFFER AND MESSAGE LIST

                        ;++
                        ;       THIS ROUTINE ADDED FOR REV B BY EC
                        ;FUNCTIONAL DESCRIPTION:
                        ;       FACSIMILE: THIS ROUTINE IS USED TO CREATE A FACSIMILE OF THE
                        ;                  OF THE TRANSMIT LIST AND TRANSMIT BUFFER IN THE
                        ;                  EXPECTED LIST AND EXPECTED BUFFER. THE ROUTINE IS
                        ;                  NORMALLY CALLED WHEN USER COMMAND ''SET E [XPECT]=
                        ;                  T [RANSMIT] IS ENTERED.
                        ;
                        ;       CALLING SEQUENCE: JSR   PC,FACSIMILE
                        ;
                        ;--
                        ;       DEFINITIONS  CMPBUF = EXPECTED DATA BUFFER  HOLDS MAX 512 BYTES
                        ;                    TXBUF  = TRANSMIT DATA BUFFER  HOLDS MAX 512 BYTES
                        ;                    TTOTCC = NUMBER OF BYTES IN TXBUF
                        ;                    PTRTAB = TOP OF MESSAGE LIST POINTER TABLE
                        ;                    CTOTCC = NUMBER OF BYTES IN EXPECT MESSAGE
                        ;                    CMPTOT = NUMBER OF EXPECTED MESSAGES
                        ;                    CMPPTR = EXPECTED MESSAGE LIST POINTER
                        ;                    TXPTR  = TRANSMIT MESSAGE LIST POINTER
                        ;                    TXMTOT = NUMBER OF TRANSMIT MESSAGES
                        ;                    CCURAD = STORAGE ADDRESS OF MESSAGE IN CMPBUF
                        ;                    MSGLIN = MAXIMUM NUMBER OF MESSAGES THAT CAN BE STORED
                        ;
                        ;       BEGIN FACSIMILE ROUTINE
                        ;       (*COPY TXBUF ==> CMPBUF*)
                        ;       ..SAVE R1
                        ;       ..INIT R1
                        ;       ..REPEAT
                        ;       ....[CMPBUF]R1=[TXBUF]R1
                        ;       ....R1=R1+1
                        ;       ..UNTIL R1 = BUFLIM
                        ;
                        ;       (*NOW CALCULATE EXPECT LIST MESSAGE POINTER*)
                        ;       ..CMPPTR = PTRTAB + (2 * MSGLIM)
                        ;
                        ;       (*NOW PRIME THE WHILE - DO LOOP*)
                        ;       ..TXPTR = PTRTAB
                        ;       ..CCURAD = CMPBUF
                        ;       ..TXPTR = TXPTR + 2
                        ;       ..CTOTCC = [TXPTR]
                        ;       ..CMPTOT = 0
                        ;       ..WHILE TXMTOT <> CMPTOT DO
                        ;       ....[CMPPTR] = CCURAD
                        ;       ....CMPPTR = CMPPRT + 2
                        ;       ....[CMPPTR] = CTOTCC
                        ;       ....TXPTR = TXPTR + 4
                        ;       ....CCURAD = CCURAD + CTOTCC
                        ;       ....CTOTCC = [TXPTR]
                        ;       ....CMPPTR = CMPPTR + 2
                        ;       ....CMPTOT = CMPTOT + 1
                        ;       ..END WHILE DO
                        ;       ..CTOTCC = TTOTCC
                        ;       END FACSIMILE ROUTINE
```

```
4047
4048  023506                                FACSIMILE:
4049
4050  023506  010146                              MOV     R1,-(SP)                ;SAVE R1
4051  023510  005001                              CLR     R1                      ;INIT R1
4052  023512  116161  003150  005150  10$:       MOVB    TXBUF(R1),CMPBUF(R1)    ;COPY TX BUFFER TO EXPECTED BUFFER
4053  023520  005201                              INC     R1                      ;BUMP INDEX
4054  023522  020127  001000                      CMP     R1,#BUFLIM              ;ALL DATA COPIED ?
4055  023526  001371                              BNE     10$                     ;NO,BRANCH
4056
4057  023530  012701  000017          20$:       MOV     #MSGLIM,R1              ;MESSAGE LIMIT
4058  023534  006301                              ASL     R1                      ;MULTIPLY BY 2
4059  023536  006301                              ASL     R1                      ;MULTIPLY BY 2
4060  023540  012737  006150  006444              MOV     #PTRTAB,CMPPTR          ;TOP OF POINTER TABLE
4061  023546  060137  006444                      ADD     R1,CMPPTR               ;START OF EXPECTED POINTER TABLE
4062  023552  005001                              CLR     R1                      ;INIT R1
4063
4064                                              ;SET UP WHILE - DO LOOP
4065  023554  012737  006150  006442              MOV     #PTRTAB,TXPTR           ;TX POINTER NOW AT TOP OF TABLE
4066  023562  012737  005150  006452              MOV     #CMPBUF,CCURAD          ;TRANSFER ADDRESS OF 1ST MESSAGE
4067  023570  062737  000002  006442              ADD     #2,TXPTR                ;BUMP POINTER
4068  023576  017737  162640  006450              MOV     @TXPTR,CTOTCC           ;BYTE COUNTER 1ST MESSAGE
4069  023604  005037  006446                      CLR     CMPTOT                  ;INIT EXPECTED MESSAGE COUNT
4070
4071                                              ;WHILE TX MESSAGE TOTAL <> EXPECTED MESSAGE TOTAL DO
4072  023610  023737  006462  006446  30$:       CMP     TXMTOT,CMPTOT           ;ALL MESSAGES COPIED ?
4073  023616  001430                              BEQ     40$                     ;YES,BRANCH
4074  023620  013777  006452  162616              MOV     CCURAD,@CMPPTR          ;TRANSFER ADDRESS OF MESSAGE
4075  023626  062737  000002  006444              ADD     #2,CMPPTR               ;BUMP POINTER
4076  023634  013777  006450  162602              MOV     CTOTCC,@CMPPTR          ;BYTE COUNT OF MESSAGE
4077  023642  062737  000004  006442              ADD     #4,TXPTR                ;BUMP TX MESSAGE POINTER
4078  023650  063737  006450  006452              ADD     CTOTCC,CCURAD           ;CALC. TRANSFER ADDRESS
4079  023656  017737  162560  006450              MOV     @TXPTR,CTOTCC           ;BYTE COUNT NEXT MESSAGE
4080  023664  062737  000002  006444              ADD     #2,CMPPTR               ;BUMP POINTER
4081  023672  005237  006446                      INC     CMPTOT                  ;INCREMENT MESSAGE COUNT
4082  023676  000744                              BR      30$                     ;DO IT AGAIN
4083                                              ;END WHILE - DO
4084  023700  013737  006464  006450  40$:       MOV     TTOTCC,CTOTCC           ;COPY TOTAL CHARACTER COUNT
4085
4086                                              ;END ROUTINE
4087  023706  012601                              MOV     (SP)+,R1                ;RESTORE R1
4088  023710  000207                              RTS     PC                      ;RETURN
4089
4090
```

```
                                .SBTTL          SHOW MODE OF OPERATION, LOOP TYPE AND QUALIFIERS

                                ;++
                                ; FUNCTIONAL DESCRIPTION:
                                ;       SHWOP - SHOW MODE OF OPERATION, LOOP, QULAIFIERS
                                ;               PRINTED ON THE OPERATOR'S CONSOLE.
                                ;
                                ; INPUTS:
                                ;       DEV1=   MODE TYPE (MODTYP)
                                ;       DEV2=   MAINT LOOP TYPE (MLTYP)
                                ;       DEV3=   "RUN PASS" COUNT (RPASS) - COUNT DOWN
                                ;       DEV4=   PARAMTERS WORD (PARAM)
                                ;
                                ; IMPLICIT INPUTS:
                                ;       MODES= TABLE OF ADDRESSES OF MODE NAME STRINGS
                                ;       LOOPS= TABLE OF ADDRESSES OF LOOP TYPE NAMES
                                ;
                                ; CALLING SEQUENCE:
                                ;       JSR PC,SHWOP
                                ;--

023712  013702  007706        SHWOP:  MOV     DEV1,R2         ;GET THE MODE TYPE IN R2
023716  006302                        ASL     R2              ;MAKE IT A WORD TABLE OFFSET
023720  016237  003102  006534        MOV     MODES(R2),TEMP  ;GET ADDRESS OF MODE-IN-ASCII
023726  013702  007710                MOV     DEV2,R2         ;GET MAINTENANCE LOOP TYPE
023732  006302                        ASL     R2
023734  012737  013715  006542        MOV     #LP00,TEMP3     ;LOAD TEMP3 TO POINT TO "/LOOP="
023742  005702                        TST     R2              ;SEE IF /LOOP=XXXXX OR NONE
023744  001003                        BNE     10$             ; BR IF /LOOP= OF SOME KIND
023746  012737  013714  006542        MOV     #LP0,TEMP3      ;IF NO LOOP THEN DON'T PRINT "/LOOP="
023754  016237  003120  006536  10$:  MOV     LOOPS(R2),TEMP1 ;GET ADDRESS OF LOOP-IN-ASCII
023762  013737  007712  006540        MOV     DEV3,TEMP2      ;GET NUMBER OF PASSES
023770                                PRINTS  #SHF0,TEMP,TEMP3,TEMP1,TEMP2
023770  013746  006540                                                        MOV     TEMP2,-(SP)
023774  013746  006536                                                        MOV     TEMP1,-(SP)
024000  013746  006542                                                        MOV     TEMP3,-(SP)
024004  013746  006534                                                        MOV     TEMP,-(SP)
024010  012746  014501                                                        MOV     #SHF0,-(SP)
024014  012746  000005                                                        MOV     #5,-(SP)
024020  010600                                                                MOV     SP,R0
024022  104416                                                                TRAP    C$PNTS
024024  062706  000014                                                        ADD     #14,SP

024030  005002                        CLR     R2              ;NOW SET UP FOR QUALIFIERS IN ASCII
024032  012737  013774  006534        MOV     #PST,TEMP
024040  032737  000001  007714        BIT     #STATB,DEV4     ;SEE IF /STATUS OR /NOSTATUS
024046  001003                        BNE     1$              ;BR IF /STATUS
024050  012737  013772  006534        MOV     #PNST,TEMP
024056  012737  014005  006536  1$:   MOV     #PCK,TEMP1
024064  032737  000002  007714        BIT     #DATCKB,DEV4    ;SEE IF /CHECK OR /NOCHECK
024072  001003                        BNE     2$              ;BR IF /CHECK
024074  012737  014003  006536        MOV     #PNCK,TEMP1
024102  012737  014015  006540  2$:   MOV     #PEC,TEMP2
024110  032737  000004  007714        BIT     #ECHOB,DEV4     ;SEE IF /ECHO OR /NOECHO
024116  001003                        BNE     4$              ;BR IF /ECHO
024120  012737  014013  006540        MOV     #PNEC,TEMP2
```

```
 4147
 4148  024126  012737  014034  006544  4$:     MOV     #PPR,TEMP4
 4149  024134  032737  000040  007714          BIT     #PROTOB,DEV4    ;SEE OF /PROTOCOL OR /NOPROTOCOL
 4150  024142  001003                          BNE     3$              ;BR IF /PROTOCOL
 4151  024144  012737  014032  006544          MOV     #PNPR,TEMP4
 4152  024152  012737  014024  006546  3$:     MOV     #PMS,TEMP5
 4153  024160  032737  000010  007714          BIT     #MOCHK,DEV4     ;SEE IF /MODEM OR /NOMODEM
 4154  024166  001003                          BNE     5$              ;BR IF MODEM
 4155  024170  012737  014022  006546          MOV     #PNMS,TEMP5
 4156
 4157
 4158  024176                          5$:     PRINTS  #SHF1,TEMP,TEMP1,TEMP2,TEMP5,TEMP4      ;,TEMP3
 4159  024176  013746  006544                                                                  MOV     TEMP4,-(SP)
 4160  024202  013746  006546                                                                  MOV     TEMP5,-(SP)
 4161  024206  013746  006540                                                                  MOV     TEMP2,-(SP)
 4162  024212  013746  006536                                                                  MOV     TEMP1,-(SP)
 4163  024216  013746  006534                                                                  MOV     TEMP,-(SP)
 4164  024222  012746  014537                                                                  MOV     #SHF1,-(SP)
 4165  024226  012746  000006                                                                  MOV     #6,-(SP)
 4166  024232  010600                                                                          MOV     SP,R0
 4167  024234  104416                                                                          TRAP    C$PNTS
 4168  024236  062706  000016                                                                  ADD     #16,SP
 4169  024242  000207                          RTS     PC              ;RETURN
 4170
 4171
```

```
                                .SBTTL          TRAVERSE COMMAND LINE SUBROUTINES

                                ;++
                                ;       P$TRV SUBROUITNE
                                ;
                                ;PARSE THE COMMAND LINE SUBROUTINE
                                ;TAKE ACTIONS (VIA ACTION TREE) AS PARSING LINE
                                ;PARSING DIRECTIONS FROM "CLI PARSING NODES"
                                ;   REGS USED:
                                ;
                                ;       R1,R5=SCRATCH                           P$NUM=NUMERIC CODE FROM DATA
                                ;       R2=ACTION CODE PARAMETER FROM TREE
                                ;       R3=PARSE TREE POINTER
                                ;       R4=INPUT STRING POINTER
                                ; CALLING SEQUENCE:
                                ;       JSR     PC,P$TRV
                                ;--

024244                          P$TRV:
024244  013704  003132                  MOV     P$BUFA,R4
024250  013703  003134                  MOV     P$TREE,R3
024254  105714                P$TR5:    TSTB    (R4)                    ;SEE IF ANY CHARS LEFT IN INPUT STRING
024256  001441                          BEQ     P$EXIT                  ;BR IF NO
024260  121327  000013                  CMPB    (R3),#11.               ;SEE IF SPECIAL CLI CHAR CODE OR ASCII
024264  003023                          BGT     20$                     ;BR IF REGULAR ASCII CHAR.
024266  111305                          MOVB    (R3),R5                 ;GET SPECIAL CHAR CODE INTO R5
024270  006305                          ASL     R5
024272  016505  024306                  MOV     10$(R5),R5              ;BUILD TRAVERSE ROUTINE ADDRESS
024276  062705  024306                  ADD     #10$,R5
024302  004715                          JSR     PC,(R5)                 ;JSR TO SPECIAL CLI TRAVERSE ROUTINE
024304  000763                          BR      P$TR5                   ;GO SEE IF MORE OF STRING LEFT

024306  000114                10$:      .WORD   TRVERR-10$              ;TRAVERSE TABLE FOR "CLI FUNTIONS"
024310  000134                          .WORD   TRVEXI-10$              ;1
024312  000152                          .WORD   TRVBR-10$               ;2
024314  000162                          .WORD   TRVBIF-10$              ;3
024316  000204                          .WORD   TRVSPA-10$              ;4
024320  000270                          .WORD   TRVNUM-10$              ;5
024322  000604                          .WORD   TRVALP-10$              ;6
024324  000650                          .WORD   TRVALN-10$              ;7
024326  000270                          .WORD   TRVOCT-10$              ;8
024330  000256                          .WORD   TRVDEC-10$              ;9
024332  000736                          .WORD   TRVSTR-10$              ;10

                                ;NOT A SPECIAL CODE

024334  121314                20$:      CMPB    (R3),(R4)               ;SEE IF FIRST CHAR OF STRING IS A MATCH
024336  001403                          BEQ     22$                     ;BR IF A MATCH
024340  004737  024404                  JSR     PC,TRVBRC               ;IF NOT A MATCH, GO TAKE MISS BRANCH
024344  000743                          BR      P$TR5                   ; THEN GO BACK PT'G TO MISS NODE
024346  004737  024364        22$:      JSR     PC,TRVACT               ;IF A MATCH, GO DO ACTION DEFINED BY
024352  062703  000004                  ADD     #4,R3                   ; ACTION CODE IN CLI NODE, THEN
                                                                        ; ADJUST PTR TO NEXT CLI NODE
024356  005204                          INC     R4                      ;ADJUST BUF PTR TO NEXT CHAR IF MATCH
024360  000735                          BR      P$TR5
```

```

024362  000207                          P$EXIT: RTS     PC                              ;RETURN FROM PARSER

                                        ;-----------------------------------------------------------------------

                                        ;GOTO USER ACTION ROUTINE
024364  116302  000001                  TRVACT: MOVB    1(R3),R2                        ;GET ACTION CODE FROM CLI NODE
024370  042702  177400                          BIC     #177400,R2                      ;CLEAR ANY SIGN EXTENSION
024374  013705  003136                          MOV     P$ACT,R5                        ;GET ADDRESS OF CLI ACTION ROUTINE
024400  004715                                  JSR     PC,(R5)                         ;GO DO ACTION DEFINED BY CODE
024402  000207                                  RTS     PC                              ;RETURN TO CALLING CODE

                                        ;TAKE BRANCH IN TREE
024404  016305  000002                  TRVBRC: MOV     2(R3),R5                        ;GET BRANCH DISPLACEMENT FROM TREE
024410  060503                                  ADD     R5,R3                           ; AND POINT R3 TO THE "MISS" NODE
024412  000207                                  RTS     PC                              ; RETURN TO P$TRV

                                        ;NO BRANCH TAKEN
024414  062703  000004                  TRVNOB: ADD     #4,R3                           ;THINGS OK, UPDATE R3 TO POINT TO NEXT
024420  000207                                  RTS     PC                              ; NODE AND RETURN TO P$TRV

                                        ;-----------------------------------------------------------------------
024422  004737  024364                  TRVERR: JSR     PC,TRVACT                       ;TAKE ERROR ACTION
024426  112737  177777  003147                  MOVB    #-1,P$GDBD                      ;SET ERROR RETURN FLAG
024434  005726                                  TST     (SP)+                           ;GET RID OF "JSR PUSH TO TRVERR"
024436  000137  024362                          JMP     P$EXIT                          ;RETURN DIRECT TO EXIT OF P$TRV ROUTINE

024442  004737  024364                  TRVEXI: JSR     PC,TRVACT                       ;TAKE EXIT ACTION
024446  105037  003147                          CLRB    P$GDBD                          ;SET GOOD/BAD FLAG TO "SUCCESS (0)"
024452  005726                                  TST     (SP)+                           ;GET RID OF "JSR PUSH TO TRVEXI"
024454  000137  024362                          JMP     P$EXIT                          ;RETURN DIRECT TO EXIT OF P$TRV ROUTINE

024460  004737  024364                  TRVBR:  JSR     PC,TRVACT                       ;GO TAKE BRANCH ACTION
024464  000137  024404                          JMP     TRVBRC

024470  004737  024364                  TRVBIF: JSR     PC,TRVACT
024474  105737  003147                          TSTB    P$GDBD                          ;SEE IF P$GDBD SET OR CLEARED BY ACTION
024500  001402                                  BEQ     1$                              ;IF CLEAR FALL THRU TO NEXT NODE
024502  000137  024404                          JMP     TRVBRC                          ;ELSE TAKE THE "MISS" BRANCH
024506  000137  024414                  1$:     JMP     TRVNOB                          ;JUST UPDATE TO NEXT NODE IF THINGS OK

024512  005005                          TRVSPA: CLR     R5                              ;CLEAR "SPACE OR TAB FOUND" FLAG
024514  121427  000011                  1$:     CMPB    (R4),#11                        ;SEE IF CHAR. IN CMD LINE= TAB
024520  001003                                  BNE     2$                              ;BR IF NO, NOT A TAB
024522  005204                                  INC     R4                              ;INC INPUT STRING POINTER
024524  005205                                  INC     R5                              ;INDICATE A TAB FOUND
024526  000772                                  BR      1$                              ;GO CHECK NEXT CHAR

024530  121427  000040                  2$:     CMPB    (R4),#40                        ;SEE IF CHAR. IN CMD LINE= SPACE
024534  001003                                  BNE     10$                             ;BR IF NO, NON-SPACE OR NON-TAB CHAR.
024536  005204                                  INC     R4                              ;INC INPUT STRING POINTER
024540  005205                                  INC     R5                              ;INDICATE A SPACE FOUND
024542  000764                                  BR      1$                              ;GO CHECK NEXT CHAR
024544  005705                          10$:    TST     R5                              ;SEE IF ANY SPACES OR TABS FOUND
024546  001404                                  BEQ     15$                             ;BR IF NO, TAKE NO ACTION
024550  004737  024364                          JSR     PC,TRVACT                       ;GO TAKE ACTION IF ANY FOUND
```

```
 4284  024554  000137  024414                 JMP     TRVNOB                  ;JUST SO UPDATE R3 TO NEXT NODE IF OK
 4285  024560  000137  024404          15$:   JMP     TRVBRC                  ;TAKE BRANCH (MISS) IF NONE FOUND
 4286
 4287
 4288  024564  012737  000012  003144  TRVDEC: MOV    #10.,P$RADX             ;USE DECIMAL AS RADIX AND ASSUME +
 4289  024572  000137  024604                 JMP     TRVNMA
 4290  024576                          TRVOCT: ;(SAME AS TRVNUM SINCE DEFAULT RADIX IS OCTAL)
 4291  024576  012737  000010  003144  TRVNUM: MOV    #8.,P$RADX              ;USE OCTAL AS RADIX AND ASSUME +
 4292  024604  005005                  TRVNMA: CLR    R5                      ;CLEAR DIGIT COUNTER
 4293  024606  121427  000053                 CMPB    (R4),#'+                ;SEE IF THERE'S A + SIGN THERE
 4294  024612  001001                         BNE     10$                     ; BR IF NO
 4295  024614  000406                         BR      11$                     ; ELSE P$RADX ALREADY SAYS +, JUST BR
 4296  024616  121427  000055          10$:   CMPB    (R4),#'-                ;SEE IF THERE'S A - SIGN THERE
 4297  024622  001004                         BNE     1$                      ; BR IF NO
 4298  024624  112737  177777  003145         MOVB    #-1,P$RADX+1            ;SET 'MINUS FLAG' (HI BYTE OF P$RADX)
 4299  024632  005204                  11$:   INC     R4                      ;BUMP R4 TO POINT TO FIRST CHAR
 4300
 4301  024634  121427  000060          1$:    CMPB    (R4),#60                ;SEE IF CHAR. LESS THAN A '0'
 4302  024640  002434                         BLT     2$                      ;BR IF YES (NOT NUMERIC)
 4303  024642  121427  000067                 CMPB    (R4),#67                ;SEE IF CHAR. GREATER THAN A '7'
 4304  024646  003426                         BLE     13$                     ; BR IF YES
 4305  024650  123727  003144  000012         CMPB    P$RADX,#10.             ;SEE IF IN DECIMAL MODE
 4306  024656  001417                         BEQ     12$                     ; BR IF YES (CAN USE HIGHER LIMIT)
 4307  024660  121427  000071                 CMPB    (R4),#71                ;SEE IF DIGIT WAS A 8 OR 9
 4308  024664  003022                         BGT     2$                      ;BR IF NON-NUMERIC
 4309  024666                                 PRINTF  #CLIBRX                 ;ELSE WAS A 8 OR 9 WHEN IN OCTAL RADIX
 4310  024666  012746  011702                                                         MOV     #CLIBRX,-(SP)
 4311  024672  012746  000001                                                         MOV     #1,-(SP)
 4312  024676  010600                                                                 MOV     SP,R0
 4313  024700  104417                                                                 TRAP    C$PNTF
 4314  024702  062706  000004                                                         ADD     #4,SP
 4315  024706  112737  177777  003147         MOVB    #-1,P$GDBD              ;SET ERROR RETURN FLAG
 4316  024714  000474                         BR      5$                      ; PRINT ERROR AND TAKE MISS
 4317
 4318  024716  121427  000071          12$:   CMPB    (R4),#71                ;SEE IF CHAR. GREATER THAN A '9'
 4319  024722  003003                         BGT     2$                      ;BR IF YES (NOT NUMERIC)
 4320  024724  005204                  13$:   INC     R4                      ;UPDATE CMD LINE PTR TO NEXT CHAR.
 4321  024726  005205                         INC     R5                      ;INDICATE A NUMERIC FOUND
 4322  024730  000741                         BR      1$                      ;GO LOOK AT NEXT CHAR.
 4323
 4324  024732  005705                  2$:    TST     R5                      ;SEE IF FOUND ANY NUMERICS
 4325  024734  001464                         BEQ     5$                      ;BR IF NO, TAKE 'MISS' BRANCH
 4326  024736  010401                         MOV     R4,R1                   ;GET POINTER TO START OF NUMERIC STRING
 4327  024740  160501                         SUB     R5,R1
 4328  024742  005037  003142                 CLR     P$NUM                   ;CLEAR LOC. WHERE VALUE WILL BE STORED
 4329  024746  112102                  3$:    MOVB    (R1)+,R2                ;GET ASCII CHAR AND CONVERT IT TO A #
 4330  024750  162702  000060                 SUB     #60,R2
 4331  024754  006337  003142                 ASL     P$NUM                   ;SHIFT CURRENT VALUE TO MAKE ROOM
 4332  024760  103437                         BCS     7$                      ;ERROR IF NUMBER TOO BIG
 4333  024762  013737  003142  003140         MOV     P$NUM,P$CNT             ;SAVE FOR LATER IN CASE DECIMAL RADIX
 4334  024770  006337  003142                 ASL     P$NUM
 4335  024774  103431                         BCS     7$                      ;ERROR IF NUMBER TOO BIG
 4336  024776  006337  003142                 ASL     P$NUM
 4337  025002  103426                         BCS     7$                      ;ERROR IF NUMBER TOO BIG
 4338  025004  123727  003144  000012         CMPB    P$RADX,#10.             ;SEE IF DECIMAL RADIX
 4339  025012  001004                         BNE     4$                      ;BR IF NOT EQUAL
```

```
 4340  025014  063737  003140  003142          ADD     P$CNT,P$NUM
 4341  025022  103416                          BCS     7$                      ;ERROR IF NUMBER TOO BIG
 4342  025024  060237  003142          4$:     ADD     R2,P$NUM
 4343  025030  103413                          BCS     7$                      ;ERROR IF NUMBER TOO BIG
 4344  025032  005305                          DEC     R5
 4345  025034  001344                          BNE     3$
 4346  025036  105737  003145                  TSTB    P$RADX+1                ;SEE IF NUM WAS PRECEDED BY A - SIGN
 4347  025042  001402                          BEQ     15$                     ; BR IF NO
 4348  025044  005437  003142                  NEG     P$NUM                   ; ELSE NEGATE THE NUMBER BEFORE LEAVING
 4349  025050  004737  024364          15$:    JSR     PC,TRVACT               ;SINCE NUMERIC FOUND, GO TAKE ACTION
 4350  025054  000137  024414                  JMP     TRVNOB                  ;GO POINT R3 TO NEXT NODE
 4351
 4352  025060                          7$:     PRINTF  #CLINBG                 ;PRINT NUMBER TOO BIG ERROR
 4353  025060  012746  011660                                                                  MOV     #CLINBG,-(SP)
 4354  025064  012746  000001                                                                  MOV     #1,-(SP)
 4355  025070  010600                                                                           MOV     SP,R0
 4356  025072  104417                                                                          TRAP    C$PNTF
 4357  025074  062706  000004                                                                  ADD     #4,SP
 4358  025100  112737  177777  003147          MOVB    #-1,P$GDBD              ;SET ERROR RETURN FLAG
 4359  025106  000137  024404          5$:     JMP     TRVBRC                  ;TAKE "MISS" BRANCH
 4360
 4361
 4362  025112  005005                  TRVALP: CLR     R5                      ;CLEAR ALPHA FOUND FLAG
 4363  025114  121427  000101          1$:     CMPB    (R4),#101               ;SEE IF CHAR. LESS THAN A "A"
 4364  025120  002406                          BLT     2$                      ;BR IF YES (NOT ALPHA)
 4365  025122  121427  000132                  CMPB    (R4),#132               ;SEE IF CHAR. GREATER THAN A "Z"
 4366  025126  003003                          BGT     2$                      ;BR IF YES (NOT ALPHA)
 4367  025130  005204                          INC     R4                      ;UPDATE CMD LINE PTR TO NEXT CHAR
 4368  025132  005205                          INC     R5                      ;INDICATE AN ALPHA WAS FOUND
 4369  025134  000767                          BR      1$                      ;GO LOOK AT NEXT CHAR.
 4370  025136  005705                  2$:     TST     R5                      ;SEE IF ANY ALPHA'S WERE FOUND
 4371  025140  001404                          BEQ     3$                      ;BR IF NO
 4372  025142  004737  024364                  JSR     PC,TRVACT               ;IF ANY FOUND TAKE ACTION
 4373  025146  000137  024414                  JMP     TRVNOB                  ;THEN UPDATE R3 TO NEXT NODE -NO BRANCH
 4374  025152  000137  024404          3$:     JMP     TRVBRC                  ;NONE FOUND, TAKE MISS BRANCH
 4375
 4376  025156  005005                  TRVALN: CLR     R5                      ;CLEAR ALPHANUM FOUND FLAG
 4377  025160  121427  000060          10$:    CMPB    (R4),#60                ;SEE IF CHAR. LESS THAN A "0"
 4378  025164  002417                          BLT     2$                      ;BR IF YES (NOT NUMERIC OR ALPHA)
 4379  025166  121427  000072                  CMPB    (R4),#72                ;SEE IF CHAR. GREATER THAN A "9"
 4380  025172  003003                          BGT     1$                      ;BR IF YES (NOT NUMERIC)
 4381  025174  005204                          INC     R4                      ;UPDATE CMD LINE PTR TO NEXT CHAR.
 4382  025176  005205                          INC     R5                      ;INDICATE A NUMERIC FOUND
 4383  025200  000767                          BR      10$                     ;GO LOOK AT NEXT CHAR.
 4384  025202  121427  000101          1$:     CMPB    (R4),#101               ;SEE IF CHAR. LESS THAN A "A"
 4385  025206  002406                          BLT     2$                      ;BR IF YES (NOT ALPHA)
 4386  025210  121427  000132                  CMPB    (R4),#132               ;SEE IF CHAR. GREATER THAN A "Z"
 4387  025214  003003                          BGT     2$                      ;BR IF YES (NOT ALPHA)
 4388  025216  005204                          INC     R4                      ;UPDATE CMD LINE PTR TO NEXT CHAR
 4389  025220  005205                          INC     R5                      ;INDICATE AN ALPHA FOUND
 4390  025222  000767                          BR      10$                     ;GO LOOK AT NEXT CHAR.
 4391  025224  005705                  2$:     TST     R5                      ;SEE IF ANY ALPHANUM'S WERE FOUND
 4392  025226  001404                          BEQ     3$                      ;BR IF NO
 4393  025230  004737  024364                  JSR     PC,TRVACT               ;IF ANY FOUND TAKE ACTION
 4394  025234  000137  024414                  JMP     TRVNOB                  ;THEN UPDATE R3 TO NEXT NODE -NO BRANCH
 4395  025240  000137  024404          3$:     JMP     TRVBRC                  ;NONE FOUND, TAKE MISS BRANCH
```

```
4396
4397
4398
4399  025244  010401              TRVSTR: MOV     R4,R1           ;POINT R1 TO CMD STRING
4400  025246  010305                      MOV     R3,R5
4401  025250  062705  000006              ADD     #6,R5           ;POUNT R5 TO MA     TRING FROM CLI NODE
4402  025254  005037  003140              CLR     P$CNT           ;CLEAR CHAR MAT     UT
4403  025260  105715              2$:     TSTB    (R5)            ;SEE IF END OF      TRING YET
4404  025262  001411                      BEQ     10$             ;BR IF YES
4405  025264  105711                      TSTB    (R1)            ;SEE IF END OF CMD LINE YET
4406  025266  001407                      BEQ     10$             ;BR IF YES
4407  025270  121115                      CMPB    (R1),(R5)       ;SEE IF CHARACTERS MATCH
4408  025272  001005                      BNE     10$             ;BR IF NO
4409  025274  005237  003140              INC     P$CNT           ;MATCH -INCREMENT MATCH COUNT
4410  025300  005201                      INC     R1              ;UPDATE STRING POINTERS
4411  025302  005205                      INC     R5
4412  025304  000765                      BR      2$              ;BR TO CONTINUE CHECKING CHARS.
4413
4414  025306  005737  003140      10$:    TST     P$CNT           ;WHEN DONE SEE IF ANY MATCHES FOUND
4415  025312  001406                      BEQ     15$             ;BR IF NO, GO TAKE THE MISS BRANCH
4416  025314  010104                      MOV     R1,R4           ;POINT CMD POINTER TO END OF STRING &
4417  025316  004737  024364              JSR     PC,TRVACT       ;IF A MATCH FOUND, GO DO MATCH ACTION
4418  025322  066303  000004              ADD     4(R3),R3        ;UPDATE R3 TO NEXT NODE (NO BRANCH)
4419  025326  000207                      RTS     PC              ; (NO RETURN THRU TRVNOB SINCE DIFFERNT
4420                                                              ;  DISPLACEMENT DUE TO MATCH STRING)
4421  025330  000137  024404      15$:    JMP     TRVBRC          ; GO TAKE BRANCH
4422
4423                                                              ; (PARSED OK), -1 IF ILL CMD.....
4424                              ;-----------------------------------------------------------------------
4425
```

```
 4426                                   .SBTTL  REPORT CODING SECTION
 4427
 4428
 4429                                   ;++
 4430                                   ; THE REPORT CODING SECTION CONTAINS THE
 4431                                   ; "PRINTS" CALLS THAT GENERATE STATISTICAL REPORTS.
 4432                                   ;--
 4433
 4434  025334                                   BGNRPT
 4435  025334                                                                  L$RPT::
 4436
 4437
 4438  025334  004737  020610                   JSR     PC,REPORT              ;CALL SUBROUTINE TO DUMP EVENT LOG
 4439                                                                          ; AND BASE TABLE
 4440
 4441
 4442
 4443
 4444  025340                                   ENDRPT
 4445  025340                                                                  L10010:
 4446  025340  104425                                                                 TRAP    C$RPT
```

```
 4447                                   .SBTTL  PROTECTION TABLE
 4448
 4449                                   ;++
 4450                                   ; THIS TABLE IS USED BY THE RUNTIME SERVICES
 4451                                   ; TO PROTECT THE LOAD MEDIA.
 4452                                   ;--
 4453
 4454  025342                                   BGNPROT
 4455  025342                                                                  L$PROT::
 4456
 4457  025342  177777                          -1              ;OFFSET INTO P-TABLE FOR CSR ADDRESS
 4458  025344  177777                          -1              ;OFFSET INTO P-TABLE FOR MASSBUS ADDRESS
 4459  025346  177777                          -1              ;OFFSET INTO P-TABLE FOR DRIVE NUMBER
 4460
 4461  025350                                   ENDPROT
 4462
```

```
                                .SBTTL  INITIALIZE SECTION

                                ;++
                                ; THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
                                ; AT THE BEGINNING OF EACH PASS.
                                ;--

025350                                  BGNINIT
025350                                                                  L$INIT::

025350  005037  003010                  CLR     KEYWD1                  ;INIT COMMAND STORAGE VARIABLE
025354  005737  006562                  TST     DCLFLG                  ;CLEANUP AND EXIT? REV B EC
025360  001403                          BEQ     INIT1                   ;NO,BRANCH REV B EC
025362  005037  006562                  CLR     DCLFLG                  ;CLEAR FLAG REV B EC
025366                                  DOCLN                           ;GO CLEANUP AND EXIT REV B EC
025366  104444                                                                  TRAP    C$DCLN

025370  012737  177777  006564  INIT1:  MOV     #-1,RESFLG              ;SET RESTART FLAG
025376                                  READEF  #EF.START               ;IF HERE CAUSE OF START,DO SOME INIT
025376  012700  000040                                                          MOV     #EF.START,R0
025402  104447                                                                  TRAP    C$REFG
025404                                  BCOMPLETE       START
025404  103417                                                                  BCS     START
025406                                  READEF  #EF.RESTART             ;IF HERE CAUSE OF RESTART, DO SOME INIT
025406  012700  000037                                                          MOV     #EF.RESTART,R0
025412  104447                                                                  TRAP    C$REFG
025414                                  BCOMPLETE       RESTRT
025414  103513                                                                  BCS     RESTRT
025416                                  READEF  #EF.CONTINUE            ;SEE IF WE'RE HERE CAUSE OF A CONTINUE
025416  012700  000036                                                          MOV     #EF.CONTINUE,R0
025422  104447                                                                  TRAP    C$REFG
025424                                  BNCOMPLETE      S1              ;BR IF NOT HERE CAUSE OF CONITNUE
025424  103002                                                                  BCC     S1
025426  000137  026116                  JMP     ENDIT                   ;JMP IF HERE CAUSE OF A CONTINUE
025432                          S1:     READEF  #EF.NEW                 ;SEE IF THIS IS A 'NEW PASS'
025432  012700  000035                                                          MOV     #EF.NEW,R0
025436  104447                                                                  TRAP    C$REFG
025440                                  BCOMPLETE       NEW             ;IF YES, BR AROUND LOGUNIT # SETUP
02544u  103521                                                                  BCS     NEW
025442  000523                          BR      GETPRM

025444  005037  006564          START:  CLR     RESFLG                  ;CLEAR RESTART FLAG SINCE HERE ON START
025450  005037  006624                  CLR     CLKVEC                  ;CLEAR CLK VECTOR PTR. AS A FLAG IN
                                                                        ; NO CLOCK IS FOUND.
025454  012702  006620                  MOV     #CLKCSR,R2              ;SETUP R2 AS A PTR. TO CLOCK INFO BLOCK
025460                                  CLOCK   L,R1                    ;LOOK FOR A LINE CLOCK
025460  012700  000114                                                          MOV     #'L,R0
025464  104462                                                                  TRAP    C$CLCK
025466  010001                                                                  MOV     R0,R1
025470                                  BNCOMPLETE      S2              ; IF NONE THERE GO LOOK FOR A P-CLOCK
025470  103006                                                                  BCC     S2
025472  004737  017730                  JSR     PC,CLKSET               ; GO SET UP CLOCK INFO TABLE & CLK VEC.
025476  012737  000100  006630          MOV     #LCLKEN,CLKEN           ;SETUP THE ENABLE LINE CLOCK DATA
025504  000457                          BR      RESTRT

025506                          S2:     CLOCK   P,R1                    ;LOOK FOR A P-CLOCK SINCE NO LINE CLOCK
```

```
4519  025516  012700  000120                                                  MOV     #'P,R0
4520  025522  104462                                                          TRAP    C$CLCK
4521  025524  010001                                                          MOV     R0,R1
4522  025526                          BNCOMPLETE      S3              ; IF NONE THERE GO SEE IF THIS IS LSI
4523  025526  103017                                                          BCC     S3
4524  025530  004737  017730          JSR     PC,CLKSET               ; ELSE GO SET UP CLOCK INFO & VECTOR
4525  025534  062737  000002  006620  ADD     #2,CLKCSR               ;POINT CLKCSR TO P-CLK COUNT SET REG.
4526  025542  012777  001600  161060  MOV     #PCLKCT,@CLKCSR         ;LOAD CLK SET REG. WITH COUNT VALUE
4527  025550  162737  000002  006620  SUB     #2,CLKCSR               ;POINT CLKCSR BAC TO P-CLK CSR
4528  025556  012737  000111  006630  MOV     #PCLKEN,CLKEN           ;SETUP THE ENABLE THE P-CLK DATA
4529  025564  000433                  BR      RESTRT
4530
4531  025566                  S3:     READBUS                         ;READ BUS TYPE TO SEE IF ON AN LSI
4532  025566  104407                                                          TRAP    C$RDBU
4533  025570                          BNCOMPLETE      S4              ;BR IF NOT, NO CHANCE OF A CLOCK
4534  025570  103021                                                          BCC     S4
4535  025572  012737  000100  006624  MOV     #100,CLKVEC             ;LOAD 100 AS CLK VECTOR
4536  025600  005037  006622          CLR     CLKBR                   ;LOAD 0 AS CLK INT. LEVEL
4537  025604  012737  006630  006620  MOV     #CLKEN,CLKCSR           ;KLUDGE UP THE CSR & ENABLE DATA LOCS
4538  025612                          GMANID  L5060,CLKHZ,D,377,50.,60.,YES
4539  025612  104443                                                          TRAP    C$GMAN
4540  025614  000406                                                          BR      10000$
4541  025616  006626                                                          .WORD   CLKHZ
4542  025620  000052                                                          .WORD   T$CODE
4543  025622  014063                                                          .WORD   L5060
4544  025624  000377                                                          .WORD   377
4545  025626  000062                                                          .WORD   T$LOLIM
4546  025630  000074                                                          .WORD   T$HILIM
4547  025632                                                          10000$:
4548  025632  000410                          BR      RESTRT
4549
4550  025634                  S4:     PRINTF  #BDCLK                  ;INFORM OPR. NO CLOCK, & EXIT INIT
4551  025634  012746  014202                                                  MOV     #BDCLK,-(SP)
4552  025640  012746  000001                                                  MOV     #1,-(SP)
4553  025644  010600                                                          MOV     SP,R0
4554  025646  104417                                                          TRAP    C$PNTF
4555  025650  062706  000004                                                  ADD     #4,SP
4556
4557  025654  005037  006632          RESTRT: CLR     TIMMIN                  ;CLEAR TIME SINCE START LOCATIONS
4558  025660  005037  006634                  CLR     TIMSEC
4559  025664  013737  006626  006636        MOV     CLKHZ,TIMTCK            ;LOAD TICKS/SEC
4560  025672  012702  006650                MOV     #EVTLOG,R2              ;INIT EVENT TABLE TO ALL 1'S AFTER EACH
4561  025676  010237  006646                MOV     R2,EVTPTR               ; START OR RES AND INIT TABLE POINTER
4562  025702  012722  177777          1$:   MOV     #-1,(R2)+
4563  025706  020227  007552                CMP     R2,#EVTEND              ;SEE IF REACHED END OF TABLE
4564  025712  001373                        BNE     1$                      ;LOOP UNTIL DONE
4565
4566  025714  012737  177777  006556  NEW:    MOV     #-1,LOGUNT              ;INITIALIZE LOGICAL UNIT #
4567
4568  025722  005237  006556          GETPRM: INC     LOGUNT                  ;POINT TO NEXT LOGICAL UNIT
4569  025726  023737  006556  002012        CMP     LOGUNT,L$UNIT           ;SEE IF PAST MAX. LOG. UNIT #
4570  025734  002367                        BGE     NEW                     ;BR IF YES, AND START OVER
4571
4572  025736                          GPHARD  LOGUNT,R1               ;GET THE P-TABLE FOR THIS LOG. UNIT
4573  025736  013700  006556                                                  MOV     LOGUNT,R0
4574  025742  104442                                                          TRAP    C$GPHRD
```

```
025734  010001                                                                                   MOV     R0,R1
025736                                          BNCOMPLETE      GETPRM          ;IF NO P-TABLE AVAIL., GO GET NEXT ONE
025736  103365                                                                                   BCC     GETPRM

025740  011137  006572                          MOV     (R1),FHDPLX             ;PUT FULL OR HALF DUPLEX ANSWER IN LOC.


                                                ;DEVICE DEPENDENT PART OF GETTING INFO FROM P-TABLE

025744  016137  000002  011452                  MOV     2(R1),RXCSR             ;STORE AWAY CSR ADDRESSES


025752  016137  000002  011454                  MOV     2(R1),PCSAR
025760  062737  000002  011454                  ADD     #2,PCSAR
025766  016137  000002  011456                  MOV     2(R1),RDSR
025774  062737  000002  011456                  ADD     #2,RDSR
026002  016137  000002  011460                  MOV     2(R1),TXCSR
026010  062737  000004  011460                  ADD     #4,TXCSR
026016  016137  000002  011462                  MOV     2(R1),TDSR
026024  062737  000006  011462                  ADD     #6,TDSR

026032  016137  000004  011464                  MOV     4(R1),INVEC             ;STORE AWAY INPUT INTERRUPT VECTOR
026040  016137  000004  011466                  MOV     4(R1),OUTVEC
026046  062737  000004  011466                  ADD     #4,OUTVEC               ;BUILD OUTPUT INTERRUPT VECTOR
026054  016137  000006  011470                  MOV     6(R1),INTPRI            ;STORE AWAY INTERRUPT PRIORITY
026062  016137  000014  011524                  MOV     14(R1),RNODE            ;STORE AWAY THE REMOTE NODE TYPE
026070  016137  000010  037126                  MOV     10(R1),MPPTP            ;MULTI-POINT = 1
026076  001004                                  BNE     10$                     ;IF MTP THEN GET TRIB ADDRESS FROM P-TABLE
026100  112737  000001  037061                  MOVB    #1,TRIBN                ;PTP TRIB ADDRESS ALWAYS 1
026106  000403                                  BR      ENDIT                   ;BRANCH
026110  116137  000012  037061  10$:            MOVB    12(R1),TRIBN            ;STORE AWAY TRIB NUMBER
026116                          ENDIT:
026116                                          SETVEC  CLKVEC,#CLKINT,#340     ;SETUP CLOCK VECTOR
026116  012746  000340                                                                           MOV     #340,-(SP)
026122  012746  017754                                                                           MOV     #CLKINT,-(SP)
026126  013746  006624                                                                           MOV     CLKVEC,-(SP)
026132  012746  000003                                                                           MOV     #3,-(SP)
026136  104437                                                                                   TRAP    C$SVEC
026140  062706  000010                                                                           ADD     #10,SP

                                                ;DEVICE DEPENDENT VECTOR SETUP

026144                                          SETVEC  INVEC,#DVRXI,#PRI04     ;SETUP INPUT INTERRUPT VECTOR
026144  012746  000200                                                                           MOV     #PRI04,-(SP)
026150  012746  035554                                                                           MOV     #DVRXI,-(SP)
026154  013746  011464                                                                           MOV     INVEC,-(SP)
026160  012746  000003                                                                           MOV     #3,-(SP)
026164  104437                                                                                   TRAP    C$SVEC
026166  062706  000010                                                                           ADD     #10,SP
026172                                          SETVEC  OUTVEC,#DVTXI,#PRI04    ;SETUP OUTPUT INTERRUPT VECTOR
026172  012746  000200                                                                           MOV     #PRI04,-(SP)
026176  012746  036254                                                                           MOV     #DVTXI,-(SP)
026202  013746  011466                                                                           MOV     OUTVEC,-(SP)
026206  012746  000003                                                                           MOV     #3,-(SP)
026212  104437                                                                                   TRAP    C$SVEC
026214  062706  000010                                                                           ADD     #10,SP
```

```
 4631
 4632  026220                          SETPRI  #PRI00                ;SET THE ''RUN'' PRIORITY TO 0
 4633  026220  012700  000000                                                  MOV     #PRI00,R0
 4634  026224  104441                                                          TRAP    C$SPRI
 4635  026226                          EXIT    INIT
 4636  026226  104432                                                          TRAP    C$EXIT
 4637  026230  000002                                                          .WORD   L10012-.
 4638
 4639
 4640                                  .EVEN
 4641
 4642  026232                          ENDINIT
 4643  026232                                                          L10012:
 4644  026232  104                                                             TRAP    C$INIT
```

```
                                .SBTTL  AUTODROP SECTION

                                ;++
                                ; THIS CODE IS EXECUTED IMMEDIATELY AFTER THE INITIALIZE CODE IF
                                ; THE "ADR" FLAG WAS SET.  THE UNIT(S) UNDER TEST ARE CHECKED TO
                                ; SEE IF THEY WILL RESPOND.  THOSE THAT DON'T ARE IMMEDIATELY
                                ; DROPPED FROM TESTING.
                                ;--

026234                                  BGNAUTO
026234                                                                  L$AUTO::

026234                                  ENDAUTO
026234                                                                  L10013:
026234  104461                                                                  TRAP    C$AUTO
```

```
                        .SBTTL  CLEANUP CODING SECTION

                        ;++
                        ; THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED
                        ; AFTER THE HARDWARE TESTS HAVE BEEN PERFORMED.
                        ;--

                                BGNCLN
                                                                                L$CLEAN::
026236  005077  160356          CLR     @CLKCSR         ;DISABLE CLOCK
026242                          SETPRI  #PRI07          ;SET PROCESSOR PRIORITY BACK TO 7
026242  012700  000340                                                          MOV     #PRI07,R0
026246  104441                                                                 TRAP    C$SPRI
026250  022737  000057  003010      CMP     #EXIT,KEYWD1    ;'EXIT' COMMAND ?
026256  001416                      BEQ     EXITCLN         ;YES,BRANCH

                        ;;LOG ^C ABORT IN EVENT LOG
026260  012737  000026  006534      MOV     #ABO,TEMP       ;EVENT TYPE
026266  013737  006502  006544      MOV     OPVAR,TEMP4     ;START TIME OUTS
026274  013737  006504  006540      MOV     PSCNT,TEMP2     ;PASSES
026302  013737  006506  006542      MOV     ERRCNT,TEMP3    ;ERRORS
026310  004737  020504              JSR     PC,LOGS5        ;GO LOG IT

026314                  EXITCLN:BRESET                  ;RESET
026314  104433                                                                 TRAP    C$RESET
026316                          EXIT    CLN
026316  104432                                                                 TRAP    C$EXIT
026320  000002                                                                 .WORD   L10014-.

                                .EVEN

026322                          ENDCLN
026322                                                                  L10014:
026322  104412                                                                 TRAP    C$CLEAN
```

```
 4697                                   .SBTTL  DROP UNIT SECTION
 4698
 4699                                   ;++
 4700                                   ; THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
 4701                                   ; TO NO LONGER BE TESTED.
 4702                                   ;--
 4703
 4704  026324                                   BGNDU
 4705  026324                                                                  L$DU::
 4706
 4707
 4708  026324                                   EXIT    DU
 4709  026324  000167                                                                 .WORD   J$JMP
 4710  026326  000000                                                                 .WORD   L10015-2-.
 4711
 4712
 4713                                   .EVEN
 4714
 4715  026330                                   ENDDU
 4716  026330                                                                  L10015:
 4717  026330  104453                                                                 TRAP    C$DU
```

```
 4718                                   .SBTTL  ADD UNIT SECTION
 4719
 4720                                   ;++
 4721                                   ; THE ADD-UNIT SECTION CONTAINS ANY CODE THE PROGRAMMER WISHES
 4722                                   ;  TO BE EXECUTED IN CONJUNCTION WITH THE ADDING OF A UNIT BACK
 4723                                   ;  TO THE TEST CYCLE.
 4724                                   ;--
 4725
 4726  026332                           BGNAU
 4727  026332                                                                 L$AU::
 4728
 4729
 4730  026332                           EXIT    AU
 4731  026332  000167                                                                 .WORD   J$JMP
 4732  026334  000000                                                                 .WORD   L10016-2-.
 4733
 4734
 4735                                   .EVEN
 4736
 4737  026336                           ENDAU
 4738  026336                                                                 L10016:
 4739  026336  104452                                                                 TRAP    C$AU
 4740
 4741
```

```
                        .SBTTL  TEST 1:  SETUP AND MODES OF OPERATION


                        ;++
                        ; TEST TO DETECT FAULTS IN THE DATA COMMUNICATION LINK.  THIS TEST WILL
                        ; THE PROVIDE COVERAGE NECESSARY TO ISOLATE FAILURES TO THE COMPUTER
                        ; EQUIPMENT, THE COMMUNICATION LINK, OR THE MODEM.
                        ;--


026340                          BGNTST
026340                                                                  T1::


                        .SBTTL          PROGRAM SETUP SECTION

026340  013777  006630  160252          MOV     CLKEN,@CLKCSR   ;ENABLE THE CLOCK

026346                  GTXRX8:
026346  005001          GTRA2:  CLR     R1
026350  012737  000001  006640          MOV     #1,TIMER1       ;SET TIMER TO COUNT 1 TICK
026356  005737  006640  1$:     TST     TIMER1          ;CHECK FOR IT TO BE COUNTED OFF
026362  001412                  BEQ     GTRA3           ;BRANCH IF CLOCK EXISTS (COUNTED A TICK)
026364  005301                  DEC     R1
026366  001373                  BNE     1$              ;KEEP CHECKING UNTIL R1 DOES FULL COUNTDWN
026370                          PRINTF  #NOCLK          ;PRINT BAD CLK MSG AND WARN OF HANG IF TIMEOUT
026370  012746  014226                                                          MOV     #NOCLK,-(SP)
026374  012746  000001                                                          MOV     #1,-(SP)
026400  010600                                                                  MOV     SP,R0
026402  104417                                                                  TRAP    C$PNTF
026404  062706  000004                                                          ADD     #4,SP

026410  005737  006564          GTRA3:  TST     RESFLG          ;SEE IF HERE AFTER A RESTART.
026414  001112                  BNE     GTRA5           ;BR IF HERE CAUSE OF A RESTART

                        ; CLEAR COUNTS AND SET UP DEFAULTS

026416  005037  006530          GTRA4:  CLR     TOTCC           ;CLEAR TOTAL CHAR. COUNT TEMP. LOC.
026422  005037  006464                  CLR     TTOTCC          ; CLEAR TOTAL CHAR. COUNT FOR TX BUFF
026426  005037  006450                  CLR     CTOTCC          ; CLEAR TOTAL CHAR. COUNT FOR CMP BUFF
026432  012701  006150                  MOV     #PTRTAB,R1      ;INIT TRANSMIT MESSAGE POINTER
026436  010137  006442                  MOV     R1,TXPTR
026442  005037  006440                  CLR     RXPTR           ; ZERO RX POINTER

026446  012737  006244  006444          MOV     #PTR13,CMPPTR   ;INIT COMPARE MESSAGE POINTER

026454  012737  000005  006516          MOV     #5,MSGTYP       ;SET UP DEFAULT MSG TYPE (QUICK FOX - ITEP MSG)
026462  013737  002162  006520          MOV     MSGSC,CURCC     ;SET UP DEFAULT CHAR COUNT
026470  012737  003150  006466          MOV     #TXBUF,TCURAD   ;SET UP CURRENT ADD TO START OF TX BUFFER
026476  012737  005150  006452          MOV     #CMPBUF,CCURAD  ;SET UP CURRENT ADD TO START OF CMP BUFFER

026504  013737  006466  006526          MOV     TCURAD,CURADD   ;SETUP CURRENT ADDR TO START OF TXBUF
026512  013737  006442  006524          MOV     TXPTR,CPTR      ;SETUP CURRENT POINTER TABLE POINTER FOR TXBUF
026520  004737  023362                  JSR     PC,BLDBUF       ; GO BUILD POINTER TABLE AND BUFFER
026524  012737  000001  006462          MOV     #1,TXMTOT       ;BUMP TOTAL MESSAGE COUNT
```

```
                                        MOV     CMPPTR,CPTR     ;SET UP START OF COMPARE POINTER TABLE
                                        MOV     CCURAD,CURADD   ;SET UP CURRENT ADDR. TO START OF CMPBUF
                                        MOV     #5,MSGTYP
                                        MOV     MSG5C,CURCC
                                        JSR     PC,BLDBUF       ;PUT DEFAULT MESSAGE INTO CMPBUF
                                        MOV     #1,CMPTOT       ;BUMP THE COMP MESG COUNT
                                        MOV     #ACT,MODTYP     ;SET DEFAULT MODE= ACTIVE
                                        CLR     MLTYP           ;SET DEFAULT MAINTENANCE LOOP MODE =NONE
                                        MOV     #1,RPASS        ;SET UP DEFAULT 'RUN PASS" COUNT TO 1
                                        MOV     #2,PARAM        ;SET UP PROG. PARAMETERS - DATACHECKING ENABLED
                                                                ;                  OPERATOR STATUS MSGS. PRINT OFF
                                        PRINTF  #HLP0
                                                                                                MOV     #HLP0,-(SP)
                                                                                                MOV     #1,-(SP)
                                                                                                MOV     SP,R0
                                                                                                TRAP    C$PNTF
                                                                                                ADD     #4,SP
GTRA5:                                  SETVEC  INVEC,#DVRXI,#PRI04     ;DEFAULT NON-PROTOCOL RX INTER. VECTOR
                                                                                                MOV     #PRI04,-(SP)
                                                                                                MOV     #DVRXI,-(SP)
                                                                                                MOV     INVEC,-(SP)
                                                                                                MOV     #3,-(SP)
                                                                                                TRAP    C$SVEC
                                                                                                ADD     #10,SP
                                        BIC     #PRORUN!ABORT,PARAM     ;INIT PROTOCOL VARIABLES
                                        MOV     MODTYP,DEV1
                                        MOV     MLTYP,DEV2
                                        MOV     RPASS,DEV3
                                        MOV     PARAM,DEV4
                                        JSR     PC,SHWOP        ;PRINT TO OPERATOR THE CURRENT MODE.....

                                        MANUAL                  ;SEE IF MANUAL INTERVENTION ALLOWED
                                                                                                TRAP    C$MANI
                                        BCOMPLETE       GETCL   ;  BR IF YES (UAM=0 AND NOT CHAINED)
                                                                                                BCS     GETCL
                                        TST     RPASS           ;SEE IF THIS IS FIRST 'DCLT PASS"
                                        BNE     1$              ; BR IF NOT COMPLETED 1 PASS
                                        EXIT    TST             ; IF DONE 1 PASS IN UNATTENDED MODE - EXIT
                                                                                                TRAP    C$EXIT
                                                                                                .WORD   L10017-.
1$:                                     MOV     #TTL,MLTYP      ;SET UP DEFAULT FOR UNATTENDED MODE
                                        JMP     GTR9            ;  'R M=ACT/LO=1/PAS=1/NOST/CH" AND RUN

                        .SBTTL          COMMAND LINE FETCH & INTERPRETATION SECTION

GETCL:                                  CLRB    P$GDBD          ;CLEAR CMD LINE PARSING ERROR FLAGS
                                        CLRB    P$NNUF
                                        GMANID  CLI$PM,CMDBUF,A,-1,1,72.,NO     ;GET A COMMAND LINE FROM OPR.
                                                                                                TPAP    C$GMAN
                                                                                                BR      10000$
                                                                                                .WORD   CMDBUF
                                                                                                .WORD   T$CODE
                                                                                                .WORD   CLI$PM
                                                                                                .WORD   -1
                                                                                                .WORD   T$LOLIM
```

```
 4854  027010  000110                                                                  .WORD   T$HILIM
 4855  027012                                                                  10000$:
 4856  027012  012737  002666  003132          MOV     #CMDBUF,P$BUFA
 4857  027020  012737  007716  003134          MOV     #CLITRE,P$TREE
 4858  027026  012737  027736  003136          MOV     #CLIACT,P$ACT
 4859  027034  005037  003012                  CLR     QUALFG                  ;CLEAR QUALIFIER FLAG LOCATION
 4860  027040  004737  024244                  JSR     PC,P$TRV                ;GO PARSE COMMAND LINE
 4861  027044  105737  003147                  TSTB    P$GDBD                  ;SEE IF PARSED OK OR AN ERROR
 4862  027050  001412                          BEQ     1$
 4863  027052                                  PRINTF  #CLIERM
 4864  027052  012746  011605                                                  MOV     #CLIERM,-(SP)
 4865  027056  012746  000001                                                  MOV     #1,-(SP)
 4866  027062  010600                                                          MOV     SP,R0
 4867  027064  104417                                                          TRAP    C$PNTF
 4868  027066  062706  000004                                                  ADD     #4,SP
 4869  027072  000137  026762                  JMP     GETCL
 4870  027076  105737  003146          1$:     TSTB    P$NNUF                  ;SEE IF INCOMPLETE COMMAND TYPED
 4871  027102  001412                          BEQ     10$
 4872  027104                                  PRINTF  #CLINUF
 4873  027104  012746  011635                                                  MOV     #CLINUF,-(SP)
 4874  027110  012746  000001                                                  MOV     #1,-(SP)
 4875  027114  010600                                                          MOV     SP,R0
 4876  027116  104417                                                          TRAP    C$PNTF
 4877  027120  062706  000004                                                  ADD     #4,SP
 4878  027124  000137  026762                  JMP     GETCL
 4879
 4880  027130  023727  003010  000060  10$:     CMP     KEYWD1,#SETET           ;WAS''SET EXPECT=TRANSMIT'' TYPED ? REVB EC
 4881  027136  001711                          BEQ     GETCL                   ;YES,BRANCH REV B EC
 4882  027140  023727  003010  000005          CMP     KEYWD1,#HLP             ;SEE IF HELP WAS TYPED
 4883  027146  001705                          BEQ     GETCL                   ;GO GET CMD AGAIN IF YES
 4884  027150  023727  003010  000055          CMP     KEYWD1,#PRNT            ;SEE IF PRINT WAS TYPED
 4885  027156  001701                          BEQ     GETCL                   ; GO GET CMD AGAIN IF YES
 4886  027160  023727  003010  000004          CMP     KEYWD1,#RUN             ;SEE IF RUN WAS TYPED
 4887  027166  001002                          BNE     11$                     ; BR IF NO
 4888  027170  000137  031734                  JMP     GTR9                    ; START EXEC. IF YES
 4889  027174  023727  003010  000052  11$:     CMP     KEYWD1,#DMPS            ;SEE IF DUMP WAS TYPED
 4890  027202  001004                          BNE     12$                     ; BR IF NO
 4891  027204  004737  023126                  JSR     PC,DUMPSR               ; ELSE, DUMP PART OF MEMORY
 4892  027210  000137  026762                  JMP     GETCL                   ; THEN RETURN TO GET ANOTHER CMD.
 4893  027214  023727  003010  000057  12$:     CMP     KEYWD1,#EXIT            ;EXIT ? REV B EC
 4894  027222  001005                          BNE     13$                     ;NO,BRANCH REV B EC
 4895  027224  012737  000001  006562          MOV     #1,DCLFLG               ;SET CLEANUP FLAG REV B EC
 4896  027232                                  EXIT    TST                     ;GO BACK TO INIT REV B EC
 4897  027232  104432                                                                  TRAP    C$EXIT
 4898  027234  017010                                                                  .WORD   L10017-.
 4899
 4900  027236  023727  003010  000001  13$:     CMP     KEYWD1,#CLEAR           ;SEE IF CLEAR WAS TYPED
 4901  027244  001646                          BEQ     GETCL                   ; IF YES, BACK TO GET ANOTHER CMD.
 4902  027246  023727  003010  000002          CMP     KEYWD1,#SHOW            ;SEE IF SHOW WAS TYPED
 4903  027254  001642                          BEQ     GETCL                   ; IF YES, BACK TO GET ANOTHER CMD.
 4904  027256  023727  003010  000010  4$:     CMP     KEYWD1,#SETEXP          ;SEE IF SET EXPECTED
 4905  027264  001512                          BEQ     2$                      ; BR IF YES (A SETEXP WAS TYPED)
 4906  027266  013737  006464  006530  5$:     MOV     TTOTCC,TOTCC
 4907  027274  023727  006530  001000          CMP     TOTCC,#BUFLIM           ;SEE IF BUFFER ALREADY FULL
 4908  027302  002414                          BLT     15$                     ; BR IF NOT FULL (BUFLIM # OF CHARS.)
 4909  027304                                  PRINTF  #MSGTRN,#BUFEX          ; ELSE TELL OPR. AND DON'T BUILD MSG.
```

```
4910  027304  012746  014347                                                    MOV     #BUFEX,-(SP)
4911  027310  012746  014365                                                    MOV     #MSGTRN,-(SP)
4912  027314  012746  000002                                                    MOV     #2,-(SP)
4913  027320  010600                                                           MOV     SP,R0
4914  027322  104417                                                           TRAP    C$PNTF
4915  027324  062706  000006                                                   ADD     #6,SP
4916  027330  000137  026762                JMP     GETCL           ; THEN GO GET A NEW COMMAND
4917  027334  005737  006464        15$:    TST     TTOTCC          ;IF FIRST "SET" THEN GET RID OF DEFAULT
4918  027340  001002                        BNE     6$
4919  027342  005037  006462                CLR     TXMTOT
4920  027346  012737  006150  006442  6$:   MOV     #PTRTAB,TXPTR   ;GET POSITION OF END OF TX LIST
4921  027354  013701  006462                MOV     TXMTOT,R1
4922  027360  020127  000017                CMP     R1,#MSGLIM      ;SEE IF MSG COUNT EXCEEDED.
4923  027364  002414                        BLT     17$             ; BR IF NO
4924  027366                                PRINTF  #MSGTRN,#TABEX  ; ELSE TELL OPR. AND DON'T BUILD MSG.
4925  027366  012746  014307                                                    MOV     #TABEX,-(SP)
4926  027372  012746  014365                                                    MOV     #MSGTRN,-(SP)
4927  027376  012746  000002                                                    MOV     #2,-(SP)
4928  027402  010600                                                           MOV     SP,R0
4929  027404  104417                                                           TRAP    C$PNTF
4930  027406  062706  000006                                                   ADD     #6,SP
4931  027412  000137  026762                JMP     GETCL           ; THEN GO GET A NEW COMMAND.
4932  027416  006301                17$:    ASL     R1              ;# OF MSGS *4 = NEXT FREE PTR BLOCK
4933  027420  006301                        ASL     R1
4934  027422  060137  006442                ADD     R1,TXPTR
4935  027426  013737  006442  006524        MOV     TXPTR,CPTR      ;SETUP CHAR. COUNT, CURRENT ADDR, & PTR
4936  027434  013737  006466  006526        MOV     TCURAD,CURADD
4937  027442  004737  023264                JSR     PC,ADDCC        ;ADD IN CHAR. COUNT AND CHECK TOTAL
4938  027446  004737  023362                JSR     PC,BLDBUF       ;GO BUILD MESSAGE IN BUFFER AND PTRS.
4939  027452  013737  006524  006442        MOV     CPTR,TXPTR
4940  027460  013737  006530  006464        MOV     TOTCC,TTOTCC    ;UPDATE CHAR. COUNT, CURR ADDR, & PTR
4941  027466  013737  006526  006466        MOV     CURADD,TCURAD
4942  027474  005237  006462                INC     TXMTOT
4943  027500  005337  003014                DEC     QUALVL          ;DEC THE COPY COUNT
4944  027504  001270                        BNE     5$
4945  027506  000137  026762                JMP     GETCL
4946
4947  027512  013737  006450  006530  2$:   MOV     CTOTCC,TOTCC    ;SETUP CHAR. COUNT, CURR. ADDR. & PTR
4948  027520  023727  006530  001000        CMP     TOTCC,#BUFLIM   ;SEE IF BUFFER ALREADY FULL
4949  027526  002414                        BLT     16$             ; BR IF NOT FULL (BUFLIM # OF CHARS.)
4950  027530                                PRINTF  #MSGTRN,#BUFEX  ; ELSE TELL OPR. AND DON'T BUILD MSG.
4951  027530  012746  014347                                                    MOV     #BUFEX,-(SP)
4952  027534  012746  014365                                                    MOV     #MSGTRN,-(SP)
4953  027540  012746  000002                                                    MOV     #2,-(SP)
4954  027544  010600                                                           MOV     SP,R0
4955  027546  104417                                                           TRAP    C$PNTF
4956  027550  062706  000006                                                   ADD     #6,SP
4957  027554  000137  026762                JMP     GETCL           ; THEN GO GET A NEW COMMAND
4958  027560  005737  006450        16$:    TST     CTOTCC          ;IF FIRST "SET" THEN GET RID OF DEFAULT
4959  027564  001002                        BNE     7$
4960  027566  005037  006446                CLR     CMPTOT
4961  027572                        7$:
4962  027572  012737  006244  006444        MOV     #PTR13,CMPPTR   ;INIT COMPARE MESSAGE POINTER
4963  027600  013701  006446                MOV     CMPTOT,R1
4964  027604  020127  000017                CMP     R1,#MSGLIM      ;SEE IF MSG COUNT EXCEEDED.
4965  027610  002414                        BLT     18$             ; BR IF NO
```

```
 4966  027612                                  PRINTF  #MSGTRN,#TABEX          ; ELSE TELL OPR. AND DON'T BUILD MSG.
 4967  027612  012746  014307                                                          MOV     #TABEX,-(SP)
 4968  027616  012746  014365                                                          MOV     #MSGTRN,-(SP)
 4969  027622  012746  000002                                                          MOV     #2,-(SP)
 4970  027626  010600                                                                  MOV     SP,R0
 4971  027630  104417                                                                  TRAP    C$PNTF
 4972  027632  062706  000006                                                          ADD     #6,SP
 4973  027636  000137  026762                          JMP     GETCL                  ; THEN GO GET A NEW COMMAND.
 4974  027642  006301                          18$:    ASL     R1                     ;# OF MSGS *4 = NEXT FREE PTR BLOCK
 4975  027644  006301                                  ASL     R1
 4976  027646  060137  006444                          ADD     R1,CMPPTR
 4977  027652  013737  006444  006524                  MOV     CMPPTR,CPTR
 4978  027660  013737  006452  006526                  MOV     CCURAD,CURADD
 4979  02 '666  004737  023264                          JSR     PC,ADDCC               ;ADD IN XHAR. COUNT AND CHECK TOTAL
 4980  027672  004737  023362                          JSR     PC,BLDBUF
 4981  027676  013737  006524  006444                  MOV     CPTR,CMPPTR
 4982  027704  005237  006446                          INC     CMPTOT
 4983  027710  013737  006526  006452                  MOV     CURADD,CCURAD          ;UPDATE CHAR. COUNT, CURR ADDRR. & PTR
 4984  027716  013737  006530  006450                  MOV     TOTCC,CTOTCC
 4985  027724  005337  003014                          DEC     QUALVL                 ;IF COPY WAS GIVEN, PUT MSG IN BUFF
 4986  027730  001270                                  BNE     2$                     ; AGAIN
 4987  027732  000137  026762                          JMP     GETCL                  ;GO BACK UNTIL GET A 'RUN'
 4988
 4989
 4990
 4991
 4992
```

```
 4993
 4994                                   .SBTTL          ACTION TABLE AND ROUTINES
 4995                                   ;       USER MUST CLEAR/SET P$GDBD IF USE "CLIBIF" IN CONNECTION WITH ACTION
 4996                                   ;       R2 WILL HOLD ACTION CODE FROM PARSING (CLI) NODE
 4997  027736                           CLIACT:
 4998  027736  006302                           ASL     R2              ;MULTIPLY ACTION CODE BY 2
 4999  027740  016202  027754                   MOV     10$(R2),R2      ;OFFSET VALUE
 5000  027744  062702  027754                   ADD     #10$,R2         ;ADD BASE VALUE
 5001  027750  004712                           JSR     PC,(R2)         ;GO DO ACTION
 5002  027752  000207                           RTS     PC              ;RETURN TO TRVACT:
 5003
 5004                                                                   ;BRIEF DESCRIPTION OF ACTONS TAKEN
 5005  027754  000150                   10$:    .WORD   ACTNUL-10$      ;NULL
 5006  027756  000152                           .WORD   ACTCLR-10$      ;CLEAR
 5007  027760  000162                           .WORD   ACTSHO-10$      ;SHOW
 5008  027762  001550                           .WORD   ACTCHK-10$      ;CHECK
 5009  027764  000262                           .WORD   ACTRUN-10$      ;RUN
 5010  027766  000172                           .WORD   ACTHLP-10$      ;HELP
 5011  027770  000306                           .WORD   ACTCSE-10$      ;CLEAR OR SHOW EXPECT
 5012  027772  000400                           .WORD   ACTCST-10$      ;CLEAR OR SHOW TRANSMIT
 5013  027774  000722                           .WORD   ACTSTE-10$      ;SET EXPECT
 5014  027776  000732                           .WORD   ACTSTT-10$      ;SET TRANSMIT
 5015  030000  000750                           .WORD   ACTSZE-10$      ;SIZE
 5016  030002  000760                           .WORD   ACTCOP-10$      ;COPY
 5017  030004  000770                           .WORD   ACTNUM-10$      ;NUMERIC VALUE FOR SIZE OR COPY
 5018  030006  001062                           .WORD   ACTOPM-10$      ;QUOTED MESSAGE FROM USER
 5019  030010  001556                           .WORD   ACTSTS-10$      ;STATUS
 5020  030012  001102                           .WORD   ACTEQQ-10$      ;END OF QUOTED MESSAGE FROM USER
 5021  030014  001162                           .WORD   ACTMS0-10$      ;ONES AS DATA
 5022  030016  001170                           .WORD   ACTMS1-10$      ;ZEROS AS DATA
 5023  030020  001200                           .WORD   ACTMS2-10$      ;1ALT AS DATA
 5024  030022  001210                           .WORD   ACTMS3-10$      ;0ACT AS DATA
 5025  030024  001220                           .WORD   ACTMS4-10$      ;ITEP AS DATA
 5026  030026  001230                           .WORD   ACTMS5-10$      ;CCITT AS DATA
 5027  030030  001246                           .WORD   ACTMS6-10$      ;ALPHA AS DATA
 5028  030032  001334                           .WORD   ACTATV-10$      ;ACTIVE MODE
 5029  030034  001344                           .WORD   ACTPAS-10$      ;PASSIVE MODE
 5030  030036  001364                           .WORD   ACTREC-10$      ;RECEIVE MODE
 5031  030040  001372                           .WORD   ACTLIS-10$      ;LISTEN MODE
 5032  030042  001402                           .WORD   ACTDLL-10$      ;DOWNLINE LOAD
 5033  030044  001412                           .WORD   ACTTRA-10$      ;TRANSMIT MODE
 5034  030046  001422                           .WORD   ACTTAL-10$      ;TALK MODE
 5035  030050  001450                           .WORD   ACTNO-10$       ;NO    IE /NOCHECK
 5036  030052  001460                           .WORD   ACTECH-10$      ;ECHO
 5037  030054  001564                           .WORD   ACTCRC-10$      ;CRC
 5038  030056  001600                           .WORD   ACTPRO-10$      ;PROTOCOL
 5039  030060  001632                           .WORD   ACTRPS-10$      ;STATUS
 5040  030062  001642                           .WORD   ACTMOP-10$      ;SATELLITE IN MAINTENANCE LOOP MODE
 5041  030064  001652                           .WORD   ACTTLP-10$      ;INTERNALTTL
 5042  030066  001662                           .WORD   ACTCLP-10$      ;CABLE LOOP
 5043  030070  001672                           .WORD   ACTLLP-10$        OCAL MODEM LOOP
 5044  030072  001702                           .WORD   ACTRLP-10$      ;REMOTE MODEM LOOP
 5045  030074  000142                           .WORD   ACTNUF-10$      ;MORE COMMAND NEEDED
 5046  030076  001140                           .WORD   ACTBCR-10$      ;BAD CHARACTER IN OPERATOR MESSAGE
 5047  030100  000656                           .WORD   ACTDMS-10$      ;DUMP MEMORY START ADDRESS
 5048  030102  000706                           .WORD   ACTDME-10$      ;DUMP MEMORY END ADDRESS
```

```
 5049  030104  000700                    .WORD   ACTDMQ-10$      ;DUMP WORD
 5050  030106  000246                    .WORD   ACTPRT-10$      ;PRINT
 5051  030110  001572                    .WORD   ACTMOS-10$      ;MODEM STATUS
 5052  030112  000236                    .WORD   ACTEXT-10$      ;EXIT ROUTINE REV B EC
 5053  030114  001272                    .WORD   ACTSEX-10$      ;SET EX=TR REV B EC
 5054
```

```
 5055
 5056  030116  112737  177777  003146  ACTNUF: MOVB    #-1,P$NNUF      ;SET FLAG TO SAY NEED MORE OF COMMAND
 5057  030124  000207                  ACTNUL: RTS     PC              ;RETURN TO PARSER
 5058
 5059  030126  012737  000001  003010  ACTCLR: MOV     #CLEAR,KEYWD1   ;SET LOC TO SAY A CLEAR WAS TYPED
 5060  030134  000207                          RTS     PC
 5061
 5062  030136  012737  000002  003010  ACTSHO: MOV     #SHOW,KEYWD1    ;SET LOC. TO SAY A SHOW WAS TYPED
 5063  030144  000207                          RTS     PC
 5064
 5065  030146  012702  003016          ACTHLP: MOV     #HLPTAB,R2      ;SETUP R2 AS A POINTER TO HELP MSG TABLE
 5066  030152                          1$:     PRINTF  #HLPF,(R2)+     ;PRINT HELP INFORMATION MESSAGES
 5067  030152  012246                                                                  MOV     (R2)+,-(SP)
 5068  030154  012746  012273                                                          MOV     #HLPF,-(SP)
 5069  030160  012746  000002                                                          MOV     #2,-(SP)
 5070  030164  010600                                                                  MOV     SP,R0
 5071  030166  104417                                                                  TRAP    C$PNTF
 5072  030170  062706  000006                                                          ADD     #6,SP
 5073  030174  020227  003036                  CMP     R2,#HLPEND      ;SEE IF ALL INFO PRINTED YET
 5074  030200  001364                          BNE     1$              ;IF NO KEEP PRINTING
 5075  030202  012737  000005  003010          MOV     #HLP,KEYWD1     ;SET LOC. TO SAY A HELP WAS TYPED
 5076  030210  000207                          RTS     PC
 5077
 5078  030212  012737  000057  003010  ACTEXT: MOV     #EXIT,KEYWD1    ;EXIT COMMAND WAS INPUT REV B EC
 5079  030220  000207                          RTS     PC              ;RETURN
 5080
 5081  030222  012737  000055  003010  ACTPRT: MOV     #PRNT,KEYWD1    ;SET LOC. TO SAY A HELP WAS TYPED
 5082  030230  004737  020610                  JSR     PC,REPORT       ;CALL ROUTINE TO PRINT EVENT LOG AND BASE TABLE
 5083  030234  000207                          RTS     PC
 5084
 5085  030236  012737  000004  003010  ACTRUN: MOV     #RUN,KEYWD1     ;SET RUN FLAG
 5086  030244  112737  177777  003146          MOVB    #-1,P$NNUF      ;SET FLAG TO SAY NEED MORE OF COMMAND
 5087  030252  012737  000001  006576          MOV     #1,RPASS        ;SET DEFAULT RUN "PASS" TO 1
 5088  030260  000207                          RTS     PC
 5089
 5090  030262  012737  006244  006444  ACTCSE: MOV     #PTR13,CMPPTR   ;INIT COMPARE MESSAGE POINTER
 5091  030270  013701  006444                  MOV     CMPPTR,R1
 5092
 5093  030274  013702  006446                  MOV     CMPTOT,R2
 5094  030300  105037  003146                  CLRB    P$NNUF          ;FLAG THAT HAVE VALID COMMAND AT THIS PT.
 5095  030304  023727  003010  000002          CMP     KEYWD1,#SHOW    ;SEE IF A CLEAR OR SHOW WAS TYPED
 5096  030312  001471                          BEQ     ACTSHW          ;BR IF A SHOW WAS TYPED
 5097  030314  012737  000001  006446          MOV     #1,CMPTOT       ;CLEAR COMPARE MESSAGE COUNT, CHAR. COUNT
 5098  030322  005037  006450                  CLR     CTOTCC          ; AND RESET POINTER
 5099
 5100  030326  012737  006244  006444          MOV     #PTR13,CMPPTR   ;INIT COMPARE MESSAGE POINTER
 5101  030334  013737  006444  006524          MOV     CMPPTR,CPTR     ;SET UP TO FILL IN DEFAULT MESSAGE
 5102  030342  012701  005150                  MOV     #CMPBUF,R1
 5103  030346  010137  006452                  MOV     R1,CCURAD
 5104  030352  000431                          BR      ACTCLB
 5105
 5106  030354  012701  006150          ACTCST: MOV     #PTRTAB,R1
 5107  030360  013702  006462                  MOV     TXMTOT,R2
 5108  030364  105037  003146                  CLRB    P$NNUF          ;FLAG THAT HAVE VALID COMMAND AT THIS PT.
 5109  030370  023727  003010  000002          CMP     KEYWD1,#SHOW    ;SEE IF A CLEAR OR SHOW WAS TYPED
 5110  030376  001437                          BEQ     ACTSHW          ;BR IF A SHOW WAS TYPED
```

```
 5111  030400  012737  000001  006462          MOV     #1,TXMTOT       ;CLEAR TRANSMIT MESSAGE COUNT, CHAR. COUNT
 5112  030406  005037  006464                  CLR     TTOTCC          ; AND RESET POINTER
 5113  030412  012737  006150  006442          MOV     #PTRTAB,TXPTR
 5114  030420  013737  006442  006524          MOV     TXPTR,CPTR
 5115  030426  012701  003150                  MOV     #TXBUF,R1
 5116  030432  010137  006466                  MOV     R1,TCURAD
 5117
 5118  030436  012702  001000          ACTCLB: MOV     #BUFLIM,R2
 5119  030442  010137  006526                  MOV     R1,CURADD       ;SET UP TO PUT DEFAULT MSG IN LIST AFTER 033'S
 5120  030446  012737  000005  006516          MOV     #5,MSGTYP
 5121  030454  013737  002162  006520          MOV     MSG5C,CURCC
 5122  030462  105021                  1$:     CLRB    (R1)+           ;FILL EXPT OR TRAN BUFFER WITH 0'S IF A CLEAR
 5123  030464  005302                          DEC     R2              ;DO 'BUFLIM' NUMBER OF BYTE LOCATIONS
 5124  030466  001375                          BNE     1$
 5125  030470  004737  023362                  JSR     PC,BLDBUF       ;''CLEAR'' REALLY MEANS TO PUT DEFAULT MSG IN
 5126  030474  000207                          RTS     PC              ;WHEN DONE, RETURN TO PARSER
 5127
 5128
 5129  030476  012703  003072          ACTSHW: MOV     #SHTAB,R5
 5130  030502  122571  000000          5$:     CMPB    (R5)+,@(R1)     ;LOOK AT FIRST BYTE OF MSG TO DECIPHER TYPE
 5131  030506  001404                          BEQ     6$
 5132  030510  020527  003101                  CMP     R5,#SHTEND      ;SEE IF LOOKED AT ALL OF DEFAULTS YET
 5133  030514  001372                          BNE     5$
 5134  030516  005205                          INC     R5              ;MUST BE OPR. SPEC'D THEN
 5135  030520  162705  003073          6$:     SUB     #SHTAB+1,R5
 5136  030524  006305                          ASL     R5
 5137  030526  016137  000002  006534          MOV     2(R1),TEMP
 5138  030534                                  PRINTF  #SHMSG,SHTYTB(R5),TEMP  ;PRINT MSG SIZE & TYPE
 5139  030534  013746  006534                                                          MOV     TEMP,-(SP)
 5140  030540  016546  003052                                                          MOV     SHTYTB(R5),-(SP)
 5141  030544  012746  013507                                                          MOV     #SHMSG,-(SP)
 5142  030550  012746  000003                                                          MOV     #3,-(SP)
 5143  030554  010600                                                                  MOV     SP,R0
 5144  030556  104417                                                                  TRAP    C$PNTF
 5145  030560  062706  000010                                                          ADD     #10,SP
 5146  030564  062701  000004                  ADD     #4,R1           ;BUMP R1 TO NEXT SET OF POINTERS
 5147  030570  005302                          DEC     R2
 5148  030572  001341                          BNE     ACTSHW
 5149  030574  013737  006566  007706          MOV     MODTYP,DEV1
 5150  030602  013737  006570  007710          MOV     MLTYP,DEV2
 5151  030610  013737  006576  007712          MOV     RPASS,DEV3
 5152  030616  013737  006574  007714          MOV     PARAM,DEV4
 5153  030624  004737  023712                  JSR     PC,SHWOP        ;SHOW THE OPERATOR THE CURRENT MODE..... ALSO
 5154  030630  000207                          RTS     PC
 5155
 5156  030632  013737  003142  006510  ACTDMS: MOV     P$NUM,STADD     ;SETUP STARTING ADDRESS FOR DUMP
 5157  030640  005037  006514                  CLR     BYTBIT          ;SET DEFAULT OF WORD DUMP
 5158  030644  012737  000052  003010          MOV     #DMPS,KEYWD1    ;FLAG THAT A DUMP WAS TYPED
 5159  030652  000403                          BR      ACTDME
 5160
 5161  030654  012737  177777  006514  ACTDMQ: MOV     #-1,BYTBIT      ;SET DUMP FLAG TO ''DUMP-WORD''
 5162  030662  013737  003142  006512  ACTDME: MOV     P$NUM,ENADD     ;SETUP END ADDRESS FOR DUMP (=START IF NO ''EEE''
 5163  030670  105037  003146          ACTDMX: CLRB    P$NNUF          ;CLEAR NOT-ENOUGH FLAG, ''DUMP N-N/B'' IS VALID
 5164  030674  000207                          RTS     PC
 5165
```

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 5166
 5167
 5168  030676  012737  000010  003010  ACTSTE: MOV     #SETEXP,KEYWD1
 5169  030704  000403                          BR      ACTSTX
 5170
 5171  030706  012737  000011  003010  ACTSTT: MOV     #SETTRN,KEYWD1
 5172  030714  012737  000001  003014  ACTSTX: MOV     #1,QUALVL       ;SET UP DEFAULT COPY TO 1 (/COPY=0)
 5173  030722  000207                          RTS     PC
 5174
 5175  030724  012737  000012  003012  ACTSZE: MOV     #SIZE,QUALFG
 5176  030732  000207                          RTS     PC
 5177
 5178  030734  012737  000013  003012  ACTCOP: MOV     #QCOPY,QUALFG
 5179  030742  000207                          RTS     PC
 5180
 5181  030744  023727  003012  000012  ACTNUM: CMP     QUALFG,#SIZE    ;SEE IF A SIZE OR COPY TYPED
 5182  030752  001023                          BNE     1$              ;BR IF IT WAS A COPY
 5183  030754  005737  003142                  TST     P$NUM           ;CHECK TO BE SURE DIDN'T TRY SIZE=0
 5184  030760  001014                          BNE     3$              ; BR IF NO
 5185  030762                                  PRINTF  #CLISEQ
 5186  030762  012746  012074                                                  MOV     #CLISEQ,-(SP)
 5187  030766  012746  000001                                                  MOV     #1,-(SP)
 5188  030772  010600                                                          MOV     SP,R0
 5189  030774  104417                                                          TRAP    C$PNTF
 5190  030776  062706  000004                                                  ADD     #4,SP
 5191  031002  112737  177777  003147          MOVB    #-1,P$GOBD      ;SEE ERROR-IN-CMD FLAG
 5192  031010  000411                          BR      2$
 5193  031012  013737  003142  006520  3$:     MOV     P$NUM,CURCC     ;IF A SIZE LOAD CURCC WITH BYTE COUNT
 5194  031020  000405                          BR      2$
 5195  031022  013737  003142  003014  1$:     MOV     P$NUM,QUALVL    ;IF A COPY, LOAD COPY COUNT
 5196  031030  005237  003014                  INC     QUALVL          ;INCREMENT SO FIRST DEC MAKES IT REAL #
 5197  031034  000522                  2$:     BR      ACTMEX
 5198
 5199  031036  012737  000007  006516  ACTOPM: MOV     #7,MSGTYP
 5200  031044  010437  006534                  MOV     R4,TEMP         ;KEEP TRACK OF START OF QUOTED TEXT
 5201  031050  005237  006534                  INC     TEMP            ; SO CAN CALC OPCNT AT END OF QUOTES
 5202  031054  000207                          RTS     PC
 5203
 5204  031056  010402                  ACTEQO: MOV     R4,R2
 5205  031060  163702  006534                  SUB     TEMP,R2
 5206  031064  010237  006520                  MOV     R2,CURCC        ;CALC BYTE COUNT FOR QUOTED TEXT
 5207  031070  010237  002166                  MOV     R2,OPCNT
 5208  031074  013701  006534                  MOV     TEMP,R1
 5209  031100  012705  002520                  MOV     #OPBUF,R5
 5210  031104  112125                  1$:     MOVB    (R1)+,(R5)+     ;COPY QUOTED TEXT TO OPBUF
 5211  031106  005302                          DEC     R2
 5212  031110  001375                          BNE     1$
 5213  031112  000473                          BR      ACTMEX
 5214
 5215  031114                          ACTBCR: PRINTF  #CLIBCR         ;BAD CHAR. IN OPR. QUOTED STRING
 5216  031114  012746  012027                                                  MOV     #CLIBCR,-(SP)
 5217  031120  012746  000001                                                  MOV     #1,-(SP)
 5218  031124  010600                                                          MOV     SP,R0
 5219  031126  104417                                                          TRAP    C$PNTF
 5220  031130  062706  000004                                                  ADD     #4,SP
 5221  031134  000207                          RTS     PC
```

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 5222
 5223  031136  005037  006516          ACTMS0: CLR     MSGTYP
 5224  031142  000435                          BR      ACTME1
 5225  031144  012737  000001  006516  ACTMS1: MOV     #1,MSGTYP               ;SET MESSAGE TYPE = ALL ONES
 5226  031152  000431                          BR      ACTME1
 5227  031154  012737  000002  006516  ACTMS2: MOV     #2,MSGTYP               ;SET MESSAGE TYPE = ONES & ZEROS
 5228  031162  000425                          BR      ACTME1
 5229  031164  012737  000003  006516  ACTMS3: MOV     #3,MSGTYP               ;SET MESSAGE TYPE = ZEROS & ONES
 5230  031172  000421                          BR      ACTME1
 5231  031174  012737  000004  006516  ACTMS4: MOV     #4,MSGTYP               ;SET MESSAGE TYPE = CCITT
 5232  031202  000415                          BR      ACTME1
 5233  031204  012737  000005  006516  ACTMS5: MOV     #5,MSGTYP               ;SET MESS TYPE = QUICK FOX
 5234  031212  013737  002162  006520          MOV     MSG5C,CURCC             ;SETUP DEFAULT SIZE FOR THIS TYPE
 5235  031220  000430                          BR      ACTMEX
 5236  031222  012737  000006  006516  ACTMS6: MOV     #6,MSGTYP               ;SET MESSAGE TYPE = ALPHA/NUM
 5237  031230  013737  002164  006520          MOV     MSG6C,CURCC             ;SETUP DEFAULT SIZE FOR THIS TYPE
 5238
 5239  031236  012737  000100  006520  ACTME1: MOV     #64.,CURCC              ;SETUP DEFAULT SIZE FOR MSG0-4
 5240  031244  000416                          BR      ACTMEX                  ;BRANCH TO EXIT
 5241
 5242                                          ;REV B EC
 5243  031246  022737  000010  003010  ACTSEX: CMP     #SETEXP,KEYWD1          ;DID WE GET HERE FROM ''SET E=''COMMAND?
 5244  031254  001404                          BEQ     10$                     ;YES,BRANCH
 5245  031256  112737  000001  003147          MOVB    #1,P$GDBD               ;SET ERROR FLAG
 5246  031264  000406                          BR      ACTMEX                  ;GO EXIT SUBROUTINE
 5247  031266  004737  023506          10$:    JSR     PC,FACSIMILE            ;GO COPY TRANSMIT LIST TO EXPECT LIST
 5248  031272  012737  000060  003010          MOV     #SETET,KEYWD1           ;SET FLAG TO BE USED IN T1::
 5249  031300  000400                          BR      ACTMEX                  ;EXIT SUBROUTINE
 5250
 5251  031302  105037  003146  ACTMEX: CLRB    P$NNUF                  ;CLEAR NOT-ENOUGH FLAG
 5252  031306  000207                  RTS     PC
 5253
```

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 5254  031310  012737  000003  006566  ACTATV: MOV     #ACT,MODTYP             ;MODE = ACTIVE
 5255  031316  000432                  BR      ACTM2X
 5256
 5257  031320  012737  000002  006566  ACTPAS: MOV     #PAS,MODTYP             ;MODE = PASSIVE
 5258  031326  105037  003146          CLRB    P$NNUF                  ;CLEAR NOT-ENOUGH FLAG
 5259  031332  005037  006570          CLR     MLTYP                   ;CLEAR MAINT LOOP TYPE
 5260  031336  000207                  RTS     PC
 5261
 5262  031340  005037  006566  ACTREC: CLR     MODTYP                  ;MODE = RECEIVE
 5263  031344  000417                  BR      ACTM2X
 5264
 5265  031346  012737  000006  006566  ACTLIS: MOV     #LIS,MODTYP             ;MODE = LISTEN
 5266  031354  000413                  BR      ACTM2X
 5267
 5268  031356  012737  000004  006566  ACTDLL: MOV     #DOW,MODTYP             ;MODE = DOWNLINE LOAD
 5269  031364  000407                  BR      ACTM2X
 5270
 5271  031366  012737  000001  006566  ACTTRA: MOV     #TRA,MODTYP             ;MODE = TRANSMIT
 5272  031374  000403                  BR      ACTM2X
 5273
 5274  031376  012737  000005  006566  ACTTAL: MOV     #TAL,MODTYP             ;MODE = TALK
 5275
 5276  031404  042737  000004  006574  ACTM2X: BIC     #ECHOB,PARAM            ;DISABLE /ECHO (ALL BUT PASSIVE MODE)
 5277  031412  105037  003146          CLRB    P$NNUF                  ;CLEAR NOT-ENOUGH FLAG
 5278  031416  005037  006570          CLR     MLTYP                   ;CLEAR MAINT LOOP TYPE
 5279  031422  000207                  RTS     PC
 5280
```

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5281  031424  012737  000036  003012  ACTNO:  MOV     #NO,QUALFG
5282  031432  000207                  RTS     PC
5283
5284  031434  022737  000036  003012  ACTECH: CMP     #NO,QUALFG
5285  031442  001422                  BEQ     1$
5286  031444  052737  000004  006574          BIS     #ECHOB,PARAM
5287  031452  022737  000002  006566          CMP     #PAS,MODTYP             ;BE SURE IN PASSIVE MODE IF
5288  031460  001416                  BEQ     2$                              ;IF TRYING TO SET /ECHO
5289  031462                          PRINTF  #CLINPS
5290  031462  012746  011764                                                          MOV     #CLINPS,-(SP)
5291  031466  012746  000001                                                          MOV     #1,-(SP)
5292  031472  010600                                                                  MOV     SP,R0
5293  031474  104417                                                                  TRAP    C$PNTF
5294  031476  062706  000004                                                          ADD     #4,SP
5295  031502  112737  177777  003147          MOVB    #-1,P$GDBD
5296  031510  042737  000004  006574  1$:     BIC     #ECHOB,PARAM
5297  031516  005037  003012          2$:     CLR     QUALFG                  ;CLEAR 'NO' OUT OF QUALIFIER FLAG
5298  031522  000501                  BR      ACTLXX
5299
5300  031524  012701  000002          ACTCHK: MOV     #DATCKB,R1              ;SET DATA CHECK BIT
5301  031530  000413                  BR      ACTQFG
5302
5303  031532  012701  000001          ACTSTS: MOV     #STATB,R1       ;SET THE STATUS BIT
5304  031536  000410                  BR      ACTQFG
5305
5306  031540  012701  000020          ACTCRC: MOV     #CRCB,R1        ;SET THE CRC BIT
5307  031544  000405                  BR      ACTQFG
5308
5309  031546  012701  000010          ACTMOS: MOV     #MOCHK,R1       ;SET THE MODEM BIT
5310  031552  000402                  BR      ACTQFG
5311
5312  031554  012701  000040          ACTPRO: MOV     #PROTOB,R1      ;SET THE PROTOCOL BIT
5313
5314  031560  050137  006574          ACTQFG: BIS     R1,PARAM
5315  031564  022737  000036  003012          CMP     #NO,QUALFG
5316  031572  001002                  BNE     1$
5317  031574  040137  006574          BIC     R1,PARAM
5318  031600  005037  003012          1$:     CLR     QUALFG                  ;CLEAR 'NO' OUT OF QUALIFIER FLAG
5319  031604  000450                  BR      ACTLXX
5320
5321  031606  013737  003142  006576  ACTRPS: MOV     P$NUM,RPASS             ;GET NUMBER OF 'RUN PASSES'
5322  031614  000444                  BR      ACTLXX
5323
5324  031616  012737  000005  006570  ACTMOP: MOV     #5,MLTYP
5325  031624  000417                  BR      ACTLPX
5326  031626  012737  000001  006570  ACTTLP: MOV     #1,MLTYP
5327  031634  000413                  BR      ACTLPX
5328  031636  012737  000002  006570  ACTCLP: MOV     #2,MLTYP
5329  031644  000407                  BR      ACTLPX
5330  031646  012737  000003  006570  ACTLLP: MOV     #3,MLTYP
5331  031654  000403                  BR      ACTLPX
5332  031656  012737  000004  006570  ACTRLP: MOV     #4,MLTYP
5333
5334  031664  022737  000003  006566  ACTLPX: CMP     #ACT,MODTYP     ;BE SURE IN ACTIVE IF TRYING TO SET LOOP
5335  031672  001415                  BEQ     ACTLXX          ; BR IF IN ACTIVE
5336  031674  112737  177777  003147          MOVB    #-1,P$GDBD
```

```
 5337  031702  005037  006570                  CLR     MLTYP           ;CLEAR ANY LOOP TYPE THAT MAY HAVE GOT SET
 5338  031706                                  PRINTF  #CLIBDL
 5339  031706  012746  011722                                                  MOV     #CLIBDL,-(SP)
 5340  031712  012746  000001                                                  MOV     #1,-(SP)
 5341  031716  010600                                                          MOV     SP,R0
 5342  031720  104417                                                          TRAP    C$PNTF
 5343  031722  062706  000004                                                  ADD     #4,SP
 5344  031726  105037  003146          ACTLXX: CLRB    P$NNUF          ;CLEAR NOT-ENOUGH FLAG
 5345  031732  000207                          RTS     PC
 5346
```

```
5347
5348                                        ;REV B BY EC
5349  031734  005737  006570        GTR9:   TST     MLTYP           ;LOOP MODE ?
5350  031740  001422                        BEQ     10$             ;NO,BRANCH
5351  031742  032737  000002  006574        BIT     #DATCKB,PARAM   ;DATA CHECK ?
5352  031750  001416                        BEQ     10$             ;NO,BRANCH
5353  031752  023737  006446  006462        CMP     CMPTOT,TXMTOT   ;TX = EX ?
5354  031760  001412                        BEQ     10$             ;YES,BRANCH
5355  031762                              PRINTF  #CLIPW          ;PRINT WARNING
5356  031762  012746  012125                                                    MOV     #CLIPW,-(SP)
5357  031766  012746  000001                                                    MOV     #1,-(SP)
5358  031772  010600                                                          MOV     SP,R0
5359  031774  104417                                                          TRAP    C$PNTF
5360  031776  062706  000004                                                    ADD     #4,SP
5361  032002  000137  026762                JMP     GETCL           ;TRY AGAIN
5362
5363
5364                                        ; RX ALLOCATE CODE
5365  032006  012737  006150  006442  10$:   MOV     #PTRTAB,TXPTR   ;INIT TRANSMIT MESSAGE POINTER
5366  032014  012737  006244  006444        MOV     #PTR13,CMPPTR   ;INIT COMPARE MESSAGE POINTER
5367  032022  012737  006340  006440        MOV     #PTR23,RXPTR    ;INIT RECEIVE MESSAGE POINTER
5368
5369  032030  013737  006446  006476        MOV     CMPTOT,RXMTOT   ;MAKE COMPARE AND RX MESSAGE COUNTS EQUAL
5370
5371
5372  032036  005037  006600        GTREX:  CLR     FLAG            ;CLEAR FLAG
5373  032042  005037  006502                CLR     OPVAR           ;CLEAR OPTIONAL VARIABLE COUNTER
5374  032046  005037  006504                CLR     PSCNT           ;CLEAR PASS COUNT
5375  032052  005037  006506                CLR     ERRCNT          ;CLEAR ERROR COUNT
5376  032056  005037  011520                CLR     MGLCNT          ;CLEAR GLITCH COUNT
5377  032062  005037  011522                CLR     MHRCNT          ;CLEAR HARD ERR. COUNT
5378  032066  005037  006500                CLR     LNCNT           ;CLEAR LINE COUNTER
5379  032072  012737  000626  011510        MOV     #626,SYNCW      ;SET UP SYNCW FOR 226 SYNC +TSOM
5380  032100  052737  000200  011472        BIS     #BIT7,DPVP1     ;SET UP PARAM WORD FOR 226 RX SYNC
5381  032106  005737  011524                TST     RNODE
5382  032112  001406                        BEQ     1$              ;IF NON ITEP GO TO 1
5383  032114  042737  000200  011472        BIC     #BIT7,DPVP1     ;SET UP FOR 26 SYNC WORD ON RX.
5384  032122  012737  000426  011510        MOV     #426,SYNCW      ;ELSE SET UP SYNC FOR 26 AND TSOM
5385  032130  004737  020176          1$:   JSR     PC,LOGDVI       ;LOG ABOUT TO INIT DEVICE
5386  032134  004737  034304                JSR     PC,DVINIT       ;INIT DEVICE
5387
5388  032140  012737  001000  006520  GTRX2:  MOV     #BUFLIM,CURCC   ;SET CHAR COUNT TO 'BUFLIM'' NO. OF BYTES
5389  032146  012737  004150  006526        MOV     #RXBUF,CURADD   ;SET UP RX BUFFER AS CURRRENT ADD.
5390  032154  013737  006440  006524        MOV     RXPTR,CPTR
5391  032162  012737  000010  006516        MOV     #10,MSGTYP      ;SET UP FOR 33 TO FILL RX BUFFERS
5392  032170  004737  023362                JSR     PC,BLDBUF       ;CLEAR RX BUFFER
5393  032174  013702  006566                MOV     MODTYP,R2
5394  032200  006302                        ASL     R2
5395  032202  000172  006602                JMP     @MODE(R2)       ;MODE DISPATCH
5396
```

```
                                        .SBTTL          RECEIVE MODE SECTION
                                        ;++
                                        ; FUNCTIONAL DESCRIPTION:
                                        ;       RECEIVE-ONLY (OR ONE-WAY-IN) ROUTINE
                                        ;       IN THIS MODE OF TESTING THE DEVICE'S RECEIVER IS ENABLED IN EXPECTATION
                                        ;       OF RECEIVING A MESSAGE.  AFTER RECEIVING AN "EXPECTED" NUMBER OF
                                        ;       MESSAGES, THE DATA RECEIVED CAN BE COMPARED AGAINST A LIST OF "EXPECT
                                        ;       TO RECEIVE" MESSAGES IF DATA-CHECKING IS ENABLED.
                                        ;
                                        ; SUBORDINATE ROUTINES USED:
                                        ;               "ALLTR"
                                        ;
                                        ; CALLING SEQUENCE:
                                        ;       JMP     @MODE(R2)       ;DISPATCH TO MODE BASED ON MODE TYPE IN R2
                                        ;--

032206                                  RXONLY:
032206  013737  006440  006522         RXON2:  MOV     RXPTR,CPTRR
032214  013737  006476  006474                 MOV     RXMTOT,DVRCT    ;SET UP MESSAGE COUNT
032222  052737  000104  006600                 BIS     #QRX+#ERX,FLAG  ;SET UP RX QUE
032230  005037  006524                         CLR     CPTR            ;CLEAR THE TX POINTER
032234  000137  032376                         JMP     ALLTR           ;GO RX.
```

```
                                .SBTTL          TRANSMIT MODE SECTION

                                ;++
                                ; FUNCTIONAL DESCRIPTION:
                                ;       TRANSMIT-ONLY (OR ONE-WAY-OUT) ROUTINE
                                ;       IN THIS MODE OF TESTING A LIST OF MESSAGES IS TRANSMITTED WITHOUT
                                ;       EXPECTING ANY DATA TO BE RECEIVED.  A REPETITION COUNT CAN BE
                                ;       SPECIFIED TO REPETITIVELY TRANSMIT THE LIST.
                                ;
                                ; SUBORDINATE ROUTINES USED:
                                ;               "ALLTR"
                                ;
                                ; CALLING SEQUENCE:
                                ;       JMP     @MODE(R2)       ;DISPATCH TO MODE BASED ON MODE TYPE IN R2
                                ;--

032240  042737  000002  006574  TXONLY: BIC     #DATCKB,PARAM   ;SET NOCHECK
032246  013737  006442  006524  TXON2:  MOV     TXPTR,CPTR
032254  013737  006462  006460          MOV     TXMTOT,DVTCT    ;COPY COUNTER FOR THIS PASS
032262  052737  000210  006600          BIS     #QTX+#ETX,FLAG  ;SET THE QUE TX FLAG
032270  005037  006522                  CLR     CPTRR           ;CLEAR RX POINTER
032274  000137  032376                  JMP     ALLTR           ;GO TX.
```

```
                                .SBTTL          PASSIVE MODE SECTION

                                ;++
                                ; FUNCTIONAL DESCRIPTION:
                                ;       PASSIVE MODE SECTION
                                ;       IN THIS MODE OF TESTING, THE DEVICE'S RECEIVER IS ENABLED IN
                                ;       EXPECTATION OF RECEIVING A MESSAGE.  THEN EVERY TIME A MESSAGE IS
                                ;       RECEIVED, A MESSAGE IS TRANSMITTED.  DATA CHECKING CAN BE DONE ON THE
                                ;       RECEIVED DATA.
                                ;
                                ; SUBORDINATE ROUTINES USED:
                                ;
                                ;               "ALLTR"
                                ;
                                ; CALLING SEQUENCE:
                                ;       JMP     @MODE(R2)       ;DISPATCH TO MODE BASED ON MODE TYPE IN R2
                                ;--

032300                          PLCK:
032300  013737  006462  006460  PLCK2:  MOV     TXMTOT,DVTCT    ;SET UP  THE TRANSMIT COUNT
032306  013737  006442  006524          MOV     TXPTR,CPTR      ;SET UP CPTR TO TRANSMIT POINTER
032314  013737  006440  006522  PLCK3:  MOV     RXPTR,CPTRR     ;SET UP CPTRR TO REC POINTER
032322  052737  000104  006600          BIS     #QRX+#ERX,FLAG  ;SET UP Q AND EXPECT RX
032330  000137  032376                  JMP     ALLTR           ;AND GO RX FIRST MSG.
```

```
                                        .SBTTL          ACTIVE MODE SECTION

                                        ;++
                                        ; FUNCTIONAL DESCRIPTION:
                                        ;       ACTIVE MODE SECTION
                                        ;       IN THIS MODE OF TESTING A LIST OF MESSAGES IS TRANSMITTED AND
                                        ;       MESSAGES ARE EXPECTED TO BE RECEIVED.  RECEIVED DATA CAN BE COMPARED
                                        ;       AGAINST "EXPECTED" DATA IF DATA-CHECKING IS ENABLED.
                                        ;               NOTE: IF BOTH ENDS OF THE LINK ARE IN ACTIVE MODE, THEN THE
                                        ;                       LINK MUST BE A FULL DUPLEX LINK!
                                        ;
                                        ; SUBORDINATE ROUTINES USED:
                                        ;
                                        ;               "ALLTR"
                                        ;
                                        ; CALLING SEQUENCE:
                                        ;       JMP     @MODE(R2)       ;DISPATCH TO MODE BASED ON MODE TYPE IN R2
                                        ;--

032334  013737  006462  006460  ALCK:   MOV     TXMTOT,DVTCT
032342  013737  006442  006524          MOV     TXPTR,CPTR      ;SET UP TX COUNTS
032350  013737  006476  006474          MOV     RXMTOT,DVRCT    ;SET UP COUNTS
032356  013737  006440  006522          MOV     RXPTR,CPTRR
032364  052737  000314  006600          BIS     #QRX+#QTX+#ETX+#ERX,FLAG
032372  000137  032376                  JMP     ALLTR
```

```
                                .SBTTL          TRANSMIT - RECEIVE FOR ALL STANDARD MODES

                                ;++
                                ; FUNCTIONAL DESCRIPTION:
                                ;       THIS CODE PERFORMS THE FOLLOWING FUNCTIONS
                                ;       1.) IF RX BUFFERS ARE TO BE QUED,TELL DEVICE
                                ;           CODE TO QUE THEM ,LOG RECEIVE QUED.
                                ;       2.) IF TX BUFFERS ARE TO BE QUED ,TELL DEVICE
                                ;           CODE TO QUE THEM, LOG TRANSMIT QUED.
                                ;       3.) WAIT FOR EITHER RECIVE BUFFER OR TRANSMIT BUFFER OR
                                ;           BOTH TO COMPLETE
                                ;       4.) IF RECEIVE COMPLETE LOG IT UPDATE RX TABLE IF DATA
                                ;           CHECKING.
                                ;       5.) IF TRANSMIT COMPLETE LOG IT.
                                ;       6.) WHEN BOTH TRANSMIT AND RECIEVE LISTS ARE DONE
                                ;           GO TO THE COMPARE BUFFER CODE
                                ;
                                ; SUBORDINATE ROUTINES USED:
                                ;               'DVRXQ' -QUE RECEIVE BUFFER SPACE TO DEVICE
                                ;               'LOGRXQ'-LOG RECEIVE BUFFER SPACE TO EVENT LOG
                                ;               'LOGTXQ'-LOG TRANSMIT BUFFEP QUED TO EVENT LOG
                                ;               'DVTXRX'-QUE TRANSMIT BUFFER AND WAIT FOR RX
                                ;                       OR TX TO COMPLETE
                                ;               'LOGRXC'-LOG RECEIVE BUFFER COMPLETED TO EVENT LOG
                                ;               'LOGTXC'-LOG TRANSMIT BUFFER COMPLETED TO EVENT LOG
                                ;
                                ; USE OF FLAG BITS:
                                ;               QRX - SET ON INPUT TO ALLTR IF REC IS TO BE QUED TO
                                ;                     DEVICE. CLEARED BY DVRXQ AND THEN SET BY DVTXRX
                                ;                     WHEN RX BUFFER IS COMPLETED.
                                ;               QTX - SET ON INPUT TO ALLTR IF TRANSMIT IS TO BE QUED TO
                                ;                     DEVICE. CLEARED ON ENTRY TO DVTXRX AND SET BY DVTXRX
                                ;                     WHEN TX BUFFER IS COMPLETED.
                                ;               ETX - USED BY DVTXRX TO DETERMINE IF TX BUFFER COMPLETED IS
                                ;                     EXPECTED.
                                ;               ERX - USED BY DVTXRX TO DETERMINE IF RX BUFFER COMPLETED IS
                                ;                     EXPECTED.
                                ;
                                ;
                                ; CALLING SEQUENCE:
                                ;       JMP     ALLTR           ;GO TO TRANSMIT-RECEIVE FOR ALL STANDARD MODES
                                ;--

032376                          ALLTR:
032376  032737  000004  006600  ALCK5:  BIT     #QRX,FLAG
032404  001424                 BEQ     ALCK1           ;IF NOT RX GO TO TX'S
032406  013702  006522          MOV     CPTRR,R2
032412  011237  006540          MOV     (R2),TEMP2
032416  012237  006470          MOV     (R2)+,DVRXA
032422  011237  006542          MOV     (R2),TEMP3
032426  011237  006472          MOV     (R2),DVRCC
032432  010237  006522          MOV     R2,CPTRR
032436  004737  020132          JSR     PC,LOGRXQ       ;LOG REC QUED
032442  032737  000040  006574  10$:    BIT     #PROTOB,PARAM   ;'/PROTOCOL/ ?
032450  001002                 BNE     ALCK1           ;YES,BRANCH
```

```
5551  032452  004737  035136              JSR     PC,DVRXQ        ;GO QUE RX BUFFERS & ENABLE RX
5552  032456  032737  000010  006600 ALCK1: BIT     #QTX,FLAG
5553  032464  001416                      BEQ     ALCK2           ;IF NO TX'S GO TO 2
5554  032466  013702  006524              MOV     CPTR,R2
5555  032472  011237  006540              MOV     (R2),TEMP2
5556  032476  012237  006454              MOV     (R2)+,DVTXA
5557  032502  011237  006542              MOV     (R2),TEMP3
5558  032506  012237  006456              MOV     (R2)+,DVTCC
5559  032512  010237  006524              MOV     R2,CPTR
5560  032516  004737  020076              JSR     PC,LOGTXQ
5561
5562  032522  032737  000040  006574 ALCK2: BIT     #PROTOB,PARAM   ;'/PROTOCOL'?
5563  032530  001410                      BEQ     10$             ;NO,BRANCH
5564  032532  004737  040702              CALL    PROTOCOL        ;GO DO DDCMP MESSAGE PROCESSING
5565  032536  032737  000200  006574      BIT     #ABORT,PARAM    ;PROTOCOL ABORT?
5566  032544  001404                      BEQ     20$             ;NO,BRANCH
5567  032546  000137  026642              JMP     GTRA5           ;ABORT!!AND RETURN TO 'DCLT>' PROMPT
5568
5569  032552  004737  035270      10$:    JSR     PC,DVTXRX       ;GO TO TX AND RX SUB ROUT.
5570
5571  032556  032737  000004  006600 20$:  BIT     #QRX,FLAG       ;CHECK FOR REC. MSG.
5572  032564  001514                      BEQ     ALCK3
5573  032566  013737  006470  006540      MOV     DVRXA,TEMP2
5574  032574  013737  006472  006542      MOV     DVRCC,TEMP3
5575  032602  004737  020150              JSR     PC,LOGRXC       ;LOG REC COMPLETE
5576  032606  032737  000004  006574 UPTABL: BIT   #ECHOB,PARAM   ;IS THIS ECHO MODE(PASSIVE)
5577  032614  001406                      BEQ     UPTA4           ;IF NOT GO TO 4
5578  032616  013702  006524              MOV     CPTR,R2         ;ELSE SET R2 TO PRESENT TX TABL
5579  032622  013722  006540              MOV     TEMP2,(R2)+     ;STORE OFF RX ADD
5580  032626  013712  006542              MOV     TEMP3,(R2)      ;AND CC
5581  032632  032737  000002  006574 UPTA4: BIT    #DATCKB,PARAM   ;IS DATA CHECKING ASKED FOR
5582  032640  001015                      BNE     UPTA1           ;IF SO GO TO 1
5583  032642  012737  000001  006474      MOV     #01,DVRCT       ;ELSE SET DVRCT TO A 1
5584  032650  013737  006440  006522      MOV     RXPTR,CPTRR     ;RESET POINTER
5585  032656  022737  000003  006566      CMP     #ACT,MODTYP     ;IS THIS ACTIVE
5586  032664  001002                      BNE     UPTA3
5587  032666  005237  006474              INC     DVRCT           ;IF YES BUMP COUNT
5588  032672  000424              UPTA3:  BR      UPTEX
5589  032674  013702  006522      UPTA1:  MOV     CPTRR,R2
5590  032700  011237  006534              MOV     (R2),TEMP       ;LOAD TEMP WITH PREV. COUNT
5591  032704  163737  006542  006534      SUB     TEMP3,TEMP      ;LOAD TEMP WITH PREV.COUNT-CURRENT
5592  032712  013722  006542              MOV     TEMP3,(R2)+
5593  032716  063737  006542  006540      ADD     TEMP3,TEMP2
5594  032724  013722  006540              MOV     TEMP2,(R2)+     ;STORE OF NEW ADD
5595  032730  013712  006534              MOV     TEMP,(R2)       ;AND NEW CC
5596  032734  162702  000002              SUB     #2,R2           ;PUT POINTER BACK TO ADDR.
5597
5598  032740  010237  006522              MOV     R2,CPTRR        ;AND RESTORE IT.
5599
5600  032744                      UPTEX:
5601  032744  022737  000002  006566      CMP     #PAS,MODTYP
5602  032752  001007                      BNE     ALCK2A          ;IF NOT PASSIVE LOOP THEN GO TO 2A
5603  032754  042737  000104  006600      BIC     #QRX+#ERX,FLAG  ;CLEAR BOTH EXPECTED AND COMPLETED FLAGS
5604  032762  052737  000210  006600      BIS     #QTX+#ETX,FLAG  ;SET THE TX FLAGS
5605  032770  000632                      BR      ALCK1
5606
```

```
 5607  032772  005337  006474          ALCK2A: DEC     DVRCT           ;DEC REC COUNT
 5608  032776  005737  006474                  TST     DVRCT           ;IS IT ALL DONE
 5609  033002  001005                          BNE     ALCK3           ;NO. GO CHECK TX
 5610  033004  042737  000004  006600          BIC     #QRX,FLAG       ;CLEAR THE RX FLAG
 5611  033012  005037  006522                  CLR     CPTRR           ;YES. CLEAR POINTER
 5612  033016  032737  000010  006600  ALCK3:  BIT     #QTX,FLAG       ;IS IT TX
 5613  033024  001447                          BEQ     ALCK4           ;IF NOT TX THEN GO BACK
 5614  033026  013737  006454  006540          MOV     DVTXA,TEMP2
 5615  033034  013737  006456  006542          MOV     DVTCC,TEMP3     ;LOG TX COMPLETED
 5616  033042  004737  020114                  JSR     PC,LOGTXC
 5617  033046  005337  006460                  DEC     DVTCT           ;DEC TX COUNT
 5618  033052  022737  000002  006566          CMP     #PAS,MODTYP
 5619  033060  001013                          BNE     ALCK3A          ;IF NOT PASSIVE MODE GO TO 3A
 5620  033062  042737  000210  006600          BIC     #QTX+ETX,FLAG   ;CLEAR THE TX FLAGS
 5621  033070  052737  000104  006600          BIS     #QRX+ERX,FLAG   ;AND SET THE RX FLAGS
 5622  033076  005737  006460                  TST     DVTCT
 5623  033102  001005                          BNE     ALCK3C          ;IF MORE RX'S DO IT
 5624  033104  000137  033164                  JMP     CMPSR           ; ELSE COMPARE
 5625  033110  005737  006460          ALCK3A: TST     DVTCT           ;IS IT ALL DONE
 5626  033114  001402                          BEQ     ALCK3B          ;IF NOT GO BACK TO 5
 5627  033116  000137  032376          ALCK3C: JMP     ALCK5
 5628  033122  005037  006524          ALCK3B: CLR     CPTR            ;IF SO CLEAR POINTER
 5629  033126  042737  000010  006600          BIC     #QTX,FLAG       ;CLEAR TX FLAG
 5630  033134  032737  000002  006574          BIT     #DATCKB,PARAM   ;IS IT DAT CK
 5631  033142  001403                          BEQ     ALCK4A          ;IF NOT THEN END WO CKING RX.
 5632  033144  005737  006522          ALCK4:  TST     CPTRR
 5633
 5634  033150  001362                          BNE     ALCK3C          ;IF SOME RX''S LEFT GO BACK
 5635  033152  005737  006524          ALCK4A: TST     CPTR
 5636  033156  001402                          BEQ     ALCK4B          ;BRANCH IF ANY TX'S LEFT
 5637  033160  000137  032522                  JMP     ALCK2
 5638  033164                          ALCK4B:
 5639
 5640
 5641
```

```
                                .SBTTL          DATA COMPARISON CODE


                                ;++
                                ; FUNCTIONAL DESCRIPTION:
                                ;
                                ;       CMPSR - COMPARE CODE
                                ;       THIS CODE COMPARES THE RECEIVED DATA AGAINST THE
                                ;       EXPECTED AND FILLS THE EVENT LOG WITH 1 OF 3 MSGS.
                                ;
                                ;       NOTE: IF NO DATA CHECKING SKIP THIS CODE
                                ;
                                ;       1.) A DATA COMPARISON ENTRY WHICH REPORTS THE NUMBER
                                ;           OF COMPARISON ERRORS FOUND.
                                ;       2.) A DATA COMPARISON ENTRY WHICH REPORTS DIFFERENCES
                                ;           IN REC LENGTH TO COMPARE LENGTH.
                                ;       3.) A DATA COMPARISON STARTED ENTRY WHICH REPORTS ADDRESS
                                ;           OF RECEIVE BUFFER AND BYTE COUNT.
                                ;       THIS CODE ALSO REPORTS SOFT ERRORS FOR DATA COMPARISON
                                ;       (THE FIRST 5 ONLY),LENGTH ERROR,AND TOTAL NUMBER OF ERRORS
                                ;
                                ;
                                ; SUBORDINATE ROUTINES USED:
                                ;
                                ;               "LOGCMP" - SEE ITEM 3 ABOVE
                                ;               "LOGCML" - SEE ITEM 2 ABOVE
                                ;               "LOGCMD" - SEE ITEM 1 ABOVE
                                ;
                                ; CALLING SEQUENCE:
                                ;       JMP     CMPSR           ;JUMP TO DATA COMPARISON CODE
                                ;--

033164  032737  000002  006574  CMPSR:  BIT     #DATCKB,PARAM   ;IS DATA CHECKING TO BE DONE
033172  001522                         BEQ     CMPSEX          ;IF NOT THEN EXIT
033174  013737  006440  006524         MOV     RXPTR,CPTR      ;PUT START OF RX POINTERS TO CPTR
033202  013737  006444  006522         MOV     CMPPTR,CPTRR    ; AND START OF COMPARE POINTS TO CPTRR
033210  013737  006476  006474         MOV     RXMTOT,DVRCT

033216                          CMPS3:
033216  013702  006524                 MOV     CPTR,R2         ;MOVE CURRET RX PT.TO R2
033222  011237  006540                 MOV     (R2),TEMP2      ;MOVE RX ADD TO EVENT LOG
033226  012201                         MOV     (R2)+,R1        ;SET R1 TO START ADD OF RX
033230  012237  006542                 MOV     (R2)+,TEMP3     ;SET CHAR  COUNT TO EVENT LOG
033234  010237  006524                 MOV     R2,CPTR         ;RESTORE RX POINT

033240  013702  006522                 MOV     CPTRR,R2        ;PUT R2 AT COMPARE TABLE
033244  012203                         MOV     (R2)+,R3        ;SET R3 TO COMPARE ADD
033246  012204                         MOV     (R2)+,R4        ;SET R4 TO COMP CC
033250  010237  006522                 MOV     R2,CPTRR        ;RESTORE POINTER
033254  010437  006544                 MOV     R4,TEMP4
033260  004737  020244                 JSR     PC,LOGCMP       ;LOG COMPARE START.

033264  020437  006542                 CMP     R4,TEMP3        ;IS COMPARE COUNT = TO RX COUNT
033270  001410                         BEQ     CMPS7           ;IF SO GO TO 7
033272  005237  006506                 INC     ERRCNT
033276                                 ERRSOFT 1,EDDLE,ERR10   ;PRINT ERROR
```

```
                                                                                    TRAP    C$ERSOFT
                                                                                    .WORD   1
                                                                                    .WORD   EDDLE
                                                                                    .WORD   ERR10
                        JSR     PC,LOGCML       ;LOG LENGTH ERROR

CMPS7:                  CLR     TEMP4           ;CLEAR BAD BYTE COUNTER
                        MOV     #1,OFSET        ;SET OFSET BYTE COUNT TO 1
CMPS1:                  CMPB    (R1)+,(R3)+     ;COMPARE RX WITH EXPETED
                        BEQ     CMPS6           ;IF EQUAL THEN GO TO 6

CMPS2:                  INC     TEMP4           ;INC BAD COUNT
                        CMP     TEMP4,#5        ;IS IT MORE THEN 5
                        BHI     CMPS6           ;IF SO GO  FOR MORE
                        MOVB    -(R3),GOOD      ;STORE GOOD BYTE FOR ERROR
                        MOVB    -(R1),BAD       ;STORE BAD BYTE FOR ERROR
                        INC     ERRCNT
                        ERRSOFT 2,EDDDE,ERR1    ;REPORT COMPARISON FAILURE TO OPR.
                                                                                    TRAP    C$ERSOFT
                                                                                    .WORD   2
                                                                                    .WORD   EDDDE
                                                                                    .WORD   ERR1
                        INC     R1
                        INC     R3
CMPS6:                  INC     OFSET           ;INC OFFSET
                        DEC     R4              ;ELSE DEC CHAR COUNT AND SEE IF 0
                        BNE     CMPS1           ;IF NOT GO BACK
                        TST     TEMP4           ;SEE IF ANY CMP ERRS FOR THIS MSG
                        BEQ     CMPS5A          ;BR IF NONE
                        INC     ERRCNT
                        ERRSOFT 3,EDDDE,ERR2    ;REPORT # OF MISMATCHES FOR MESSAGE
                                                                                    TRAP    C$ERSOFT
                                                                                    .WORD   3
                                                                                    .WORD   EDDDE
                                                                                    .WORD   ERR2
CMPS5:  JSR     PC,LOGCMD       ;LOG DATA ERROR IN COMPARE
CMPS5A:
                        DEC     DVRCT
                        BNE     CMPS3           ;IF NOT ALL DONE GO BACK
```

```
                        .SBTTL          MODEM CHANGE REPORTS

                        ;++
                        ; FUNCTIONAL DESCRIPTION:
                        ;       THIS SECTION REPORTS THE NUMBER OF MOMDEM STATUS CHANGES
                        ;       THAT OCCUR ON EACH PASS. THE ERROR IS ONLY REPORTED IF
                        ;       THERE WERE ANY CHANGES IN OTHER WORDS A COUNT OF ZERO IS
                        ;       NOT REPORTED. THE CHANGES ARE REPORTED IN TWO CLASSES ..
                        ;       HARD ERRORS AND GLITCHES. HARD ERRORS ARE WHEN THE DEVICE
                        ;       IS ABLE TO LATCH UP THE BAD MODEM STATUS. GLITCHES OCCUR
                        ;       WHEN THE MODEM STATUS CHANGES TO CAUSE A DATA SET CHANGE
                        ;       INTERRUPT BUT THE CHANGE DOES NOT OCCUR LONG ENOUGH FOR
                        ;       THE DEVICE TO LATCH THE DATA
                        ;
                        ; INPUTS:
                        ;       'MGLCNT'        - CONTAINS NUMBER OF GLITCH ERRORS
                        ;       'MHRCNT'        - CONTAINS NUMBER OF HARD ERRORS
                        ;
                        ; OUTPUTS:
                        ;       'MGLCNT'        -ZEROED BY THIS SECTION
                        ;       'MHRCNT'        -ZEROED BY THIS SECTION
                        ;
                        ;--

033440  005737  011520  CMPSEX: TST     MGLCNT          ;CHECK FOR ANY GLITCH ERRORS
033444  001003                  BNE     MCREP           ;IF NON ZERO REPORT THEM
033446  005737  011522          TST     MHRCNT          ;CHECK FOR ANY HARD ERRORS
033452  001412                  BEQ     ENDPS           ;IF NONE GO TO END OF PASS
                                ;
                                ;REPORT ANY MODEM ERROFS HERE
                                ;
033454  005237  006506  MCREP:  INC     ERRCNT          ;BUMP ERROR COUNT
033460                          ERRSOFT 4,MSCMS,ERR4
033460  104457                                                  TRAP    C$ERSOFT
033462  000004                                                  .WORD   4
033464  014756                                                  .WORD   MSCMS
033466  017602                                                  .WORD   ERR4
033470  005037  011520          CLR     MGLCNT          ;CLEAR GLITCH COUNT
033474  005037  011522          CLR     MHRCNT          ;CLEAR THE HARD COUNT
```

```
                                    .SBTTL          INTERNAL END OF PASS CODE


                                    ;++
                                    ; FUNCTIONAL DESCRIPTION:
                                    ;       THIS CODE INCREMENTS THE PASS COUNT FOR THE
                                    ;       EVENT LOG. LOGS THE END OF PASS EVENT
                                    ;       IF 'RPASS" IS A MINUS ONE RETURN TO MODE
                                    ;       DISPATCHER. IF NOT -1 THEN DECREMENT RPASS
                                    ;       AND IF "RPASS" IS THEN = TO 0 GO TO DCLT PROMT
                                    ;       IN NOT = TO 0 THEN GO BACK TO MODE DISPATCHER
                                    ;
                                    ; SUBORDINATE ROUTINES USED:
                                    ;
                                    ;               "LOGEOP" - LOG END OF PASS TO EVENT LOG
                                    ;------

033500  005237  006504          ENDPS:  INC     PSCNT           ;BUMP PASS COUNT

033504  013737  006502  006544          MOV     OPVAR,TEMP4
033512  013737  006504  006540          MOV     PSCNT,TEMP2
033520  013737  006506  006542          MOV     ERRCNT,TEMP3
033526  004737  020316                  JSR     PC,LOGEOP       ;LOG END OF PASS

033532  022737  177777  006576          CMP     #-1,RPASS       ;SEE IF RPASS=-1
033540  001403                          BEQ     1$              ;IF IT IS DON'T DECRMNT, LOOP FOREVER
033542  005337  006576                  DEC     RPASS           ;DEC PASS COUNT
033546  001402                          BEQ     2$              ;IF DONE EXIT TEST
033550  000137  032140          1$:     JMP     GTRX2           ;ELSE GO BACK AND DISPATCH
033554  042777  000120  155670  2$:     BIC     #RINTEN!RXENA,@RXCSR    ;TURN OFF RX
033562  000137  026642                  JMP     GTRA5           ;WHEN RPASS=0 GO BACK TO 'DCLT>"
```

```
                        .SBTTL          DOWN-LINE-LOAD SECTION
                        ;++
                        ; FUNCTIONAL DESCRIPTION:
                        ;       DOWN LINE LOAD IS NOT SUPPORTED BY THIS DEVICE..
                        ;       IF THIS MODE IS CALLED BY THE COMMAND LINE INTERPRETER
                        ;       THEN A MESSAGE WILL BE PRINTED ....THAT SAYS DOWN LINE
                        ;       LOAD IS NOT!! SUPPORTED BY THIS DEVICE.
                        ;--


033566                  DLL:
                                PRINTF  #DLLCM
033566  012746  014122                                  MOV     #DLLCM,-(SP)
033572  012746  000001                                  MOV     #1,-(SP)
033576  010600                                          MOV     SP,R0
033600  104417                                          TRAP    C$PNTF
033602  062706  000004                                  ADD     #4,SP
033606  000137  026642                JMP     GTRA5
```

```
                                .SBTTL          TALK MODE SECTION

                                ;++
                                ; FUNCTIONAL DESCRIPTION:
                                ;       TALK MODE SECTION
                                ;       IN THIS MODE, THE ''TALK'' END OF THE LINK TRANSMITS OPERATOR
                                ;       SPECIFIED MESSAGES UNTIL A ''EXIT'' MESSAGE IS TYPE.  AT THAT POINT,
                                ;       THIS END OF THE LINK GOES INTO ''LISTEN'' MODE.
                                ;
                                ; SUBORDINATE ROUTINES USED:
                                ;
                                ;               ''LOGTXQ'' - LOG TX BUFFER QUED TO EVENT LOG
                                ;               ''DVTXRX'' - QUE TX BUFFER TO DEVICE AND WAIT FOR COMPLETE
                                ;               ''LOGTXC'' - LOG TX COMPLETE TO EVENT LOG
                                ;
                                ; CALLING SEQUENCE:
                                ;       JMP     @MODE(R2)       ;DISPATCH TO MODE BASED ON MODE TYPE IN R2
                                ;--

033612                          TALCK:
033612  042737  000002  006574          BIC     #DATCKB,PARAM   ;SET NOCHECK
033620  012702  002520                  MOV     #OPBUF,R2
033624  012722  177777          1$:     MOV     #-1,(R2)+       ;CLEAR OUT OPBUFFER FIRST
033630  022702  002642                  CMP     #OPEND,R2
033634  001373                          BNE     1$
033636                                  GMANID  OPRMM,OPBUF,A,-1,1,72.,NO       ;GET TALK MESSAGE
033636  104443                                                          TRAP    C$GMAN
033640  000406                                                          BR      10001$
033642  002520                                                          .WORD   OPBUF
033644  000142                                                          .WORD   T$CODE
033646  014056                                                          .WORD   OPRMM
033650  177777                                                          .WORD   -1
033652  000001                                                          .WORD   T$LOLIM
033654  000110                                                          .WORD   T$HILIM
033656                                                          10001$:
033656  005002                          CLR     R2                      ;NOW GET CHAR COUNT
033660  122762  000377  002520  2$:     CMPB    #377,OPBUF(R2)
033666  001402                          BEQ     3$
033670  005202                          INC     R2
033672  000772                          BR      2$
033674  010237  002166          3$:     MOV     R2,OPCNT

033700  012737  002520  006454          MOV     #OPBUF,DVTXA    ;SET UP TX ADDR.
033706  012737  002520  006540          MOV     #OPBUF,TEMP2
033714  013737  002166  006542          MOV     OPCNT,TEMP3
033722  013737  002166  006456          MOV     OPCNT,DVTCC     ;SET UP TX CC
033730  004737  020076                  JSR     PC,LOGTXQ
033734  052737  000210  006600          BIS     #QTX+#ETX,FLAG  ;SET UP FLAGS
033742  005037  006522                  CLR     CPTRR           ;CLEAR RX POINTER

                                ;;THIS CODE ADDED FOR PROTOCOL
033746  032737  000040  006574          BIT     #PROTOB,PARAM   ;'/PROTOCOL' ?
033754  001406                          BEQ     20$             ;NO,BRANCH
033756  042737  000004  006600          BIC     #RXQ,FLAG       ;CLEAR RX BIT
033764  004737  040702                  CALL    PROTOCOL        ;DO DDCMP TRANSMIT
033770  000402                          BR      25$             ;BRANCH
```

```
 5887
 5888  033772  004737  035270          20$:    JSR     PC,DVTXRX
 5889  033776  013737  006454  006540  25$:    MOV     DVTXA,TEMP2
 5890  034004  013737  006456  006542          MOV     DVTCC,TEMP3
 5891  034012  004737  020114                  JSR     PC,LOGTXC
 5892  034016  022737  054105  002520          CMP     #''EX,OPBUF         ;CHECK FOR EXIT
 5893  034024  001272                          BNE     TALCK
 5894  034026  022737  052111  002522          CMP     #''IT,OPBUF+2
 5895  034034  001266                          BNE     TALCK
 5896  034036  042737  000210  006600          BIC     #QTX+#ETX,FLAG      ;CLEAR THE TX BITS
 5897  034044  012737  000006  006566          MOV     #LIS,MODTYP         ;CHANGE TO LISTEN MODE
 5898  034052  000137  032140                  JMP     GTRX2               ;AND GO BACK TO DISPATCH
```

```
                                        .SBTTL          LISTEN MODE SECTION

                                        ;++
                                        ; FUNCTIONAL DESCRIPTION:
                                        ;       LISTEN MODE SECTION
                                        ;       IN THIS MODE, THE ''LISTEN'' END OF THE LINK PRINTS ALL OF THE MESSAGES
                                        ;       RECEIVED BY THE DEVICE ON THE OPERATOR'S CONSOLE.  IF THE MESSAGE
                                        ;       RECEIVED IS AN ''EXIT'' MESSAGE, THEN THE NODE ENTERS ''TALK'' MODE.
                                        ;
                                        ; SUBORDINATE ROUTINES USED:
                                        ;
                                        ;               ''DVRXQ'' - QUE RECEIVE BUFFER SPACE TO DEVICE
                                        ;               ''LOGRXQ'' - LOG RECEIVE BUFFER QUED TO EVENT LOG
                                        ;               ''DVTXRX'' - WAIT FOR RX TO COMPLETE
                                        ;               ''LOGRXC'' - LOG RX COMPLETE TO EVENT LOG
                                        ;
                                        ; CALLING SEQUENCE:
                                        ;       JMP     @MODE(R2)       ;DISPATCH TO MODE BASED ON MODE TYPE IN R2
                                        ;--

034056  042737  000002  006574  LISCK:  BIC     #DATCKB,PARAM   ;CLEAR CHECK BIT
034064                                  PRINTF  #LISP           ;PRINT PROMPT FOR OPR.
034064  012746  014045                                                  MOV     #LISP,-(SP)
034070  012746  000001                                                  MOV     #1,-(SP)
034074  010600                                                          MOV     SP,R0
034076  104417                                                          TRAP    C$PNTF
034100  062706  000004                                                  ADD     #4,SP
034104  012737  002520  006470  LISCKA: MOV     #OPBUF,DVRXA    ;SET DEVICE UP TO REC AT OPBUF
034112  012737  002520  006540          MOV     #OPBUF,TEMP2
034120  012737  000122  006472          MOV     #82.,DVRCC      ;SET UP CHAR COUNT TO 82.
034126  012737  000122  006542          MOV     #82.,TEMP3
034134  052737  000104  006600          BIS     #QRX+#ERX,FLAG  ;SET UP FLAG
034142  005037  006524                  CLR     CPTR            ;CLEAR THE TX.

                                        ;; WAS PROTOCOL SELECTED ?
034146  032737  000040  006574          BIT     #PROTOB,PARAM   ;'/PROTOCOL' ?
034154  001007                          BNE     20$             ;YES,BRANCH

034156  004737  035166                  JSR     PC,DVRXQ        ;QUE RX
034162  004737  020132                  JSR     PC,LOGRXQ
034166  004737  035270                  JSR     PC,DVTXRX       ;GO TO DEVICE RX. SUBROUTINE
034172  000402                          BR      25$             ;SKIP PROTOCOL
034174  004737  040702          20$:    CALL    PROTOCOL        ;GO DDCMP PROTOCOL
034200  013737  006470  006540  25$:    MOV     DVRXA,TEMP2
034206  013737  006472  006542          MOV     DVRCC,TEMP3     ;SET UP ADDR.AND CC.
034214  004737  020150                  JSR     PC,LOGRXC       ;LOG COMPLETED
034220  063737  006470  006472          ADD     DVRXA,DVRCC
034226  105077  152240                  CLRB    @DVRXC
034232                                  PRINTF  #OPBFPT
034232  012746  002514                                                  MOV     #OPBFPT,-(SP)
034236  012746  000001                                                  MOV     #1,-(SP)
034242  010600                                                          MOV     SP,R0
034244  104417                                                          TRAP    C$PNTF
034246  062706  000004                                                  ADD     #4,SP
034252  022737  054105  002520          CMP     #'EX,OPBUF      ;COMPARE FOR EX OF ''EXIT''
034260  001311                          BNE     LISCKA          ;IF NOT EXIT THEN GO BACK
```

```
 5955  034262  022737  052111  002522          CMP     #''IT,OPBUF+2    ;IF FIRST HALF OK CHECK NEXT PART
 5956  034270  001305                          BNE     LISCKA           ;IF NOT EXIT THE GO BACK
 5957  034272  012737  000005  006566          MOV     #TAL,MODTYP      ;CHANGE MODE TO TALK
 5958  034300  000137  032140                  JMP     GTRX2            ;RETURN TO DISPATCHER
 5959
 5960
```

```
                        .SBTTL          DEVICE FUNCTION SUBROUTINES
                        .SBTTL                  DEVICE INIT SUBROUTINE

                        ;++
                        ; FUNCTIONAL DESCRIPTION:
                        ;       DVINIT- DEVICE INIT ROUTINE
                        ;       THIS ROUTINE IS DEVICE DEPENDENT CODE THAT INITS
                        ;       THE DEVICE BEING TESTED.
                        ;       IT SETS THE DEVICE UP TO THE MODE IT IS TO RUN IN AND
                        ;       INITIATES THE START,STACK,ACK SEQUENCE IF THE "RNODE"(REMOTE
                        ;       NODE)INPUT INDICATES THE REMOTE NODE IS NON-ITEP.
                        ;
                        ; INPUTS:       "FHDPLX" INDICATES IF MODE IS FULL OR HALF DUPLEX. (1=FULL)
                        ;               ADDRESS POINTERS (SEL0,...) ALREADY POINT TO DEVICE'S REG.S
                        ;
                        ;               "MLTYP" INDICATES THE LOOP TYPE (1=TTL,2=CAB,3=RM,4=LM)
                        ;               "RNODE" INDICATES THE TYPE OF REMOTE NODE (ITEP=1,NON-ITEP=0)
                        ;
                        ; SUBORDINATE ROUTINES USED:
                        ;
                        ;               "CTSSR" - CLEAR TO SEND SUB ROUTINE
                        ;               "DVIN31" - SEND CONTROL AND REC OR TIME OUT
                        ;               "CLRRTS" - CLEAR REQUEST TO SEND ROUTINE
                        ;                "LGDVE" - LOG DEVICE ERROR TO EVENT LOG
                        ;
                        ; CALLING SEQUENCE:
                        ;               JSR     PC,DVINIT
                        ;--
                        ;
034304                  DVINIT:
                                ;MASTER CLEAR DEVICE
                        ;
034304  012777  000001  155146          MOV     #RESET,@TXCSR   ;DO A MASTER CLEAR
                        ;
034312  105777  155134                  TSTB    @RXCSR          ;SEE IF IT WORKED
034316  001423                          BEQ     DVIN1           ;BRANCH IF Ok
034320                                  BREAK
034320  104422                                                                  TRAP    C$BRK
                        ;
                                ;REPORT ERROR IF RESET
                                ;DOES NOT WORK
                        ;
034322  012737  016747  006540          MOV     #DVEM0,TEMP2
034330  017737  155116  006542          MOV     @RXCSR,TEMP3
034336  017737  155116  006544          MOV     @TXCSR,TEMP4    ;LOAD UP ERRM. AND REG OUTPUTS
034344  004737  020160                  JSR     PC,LGDVE        ;LOG TIME OUT WAITING FOR RUN
034350  005237  006506                  INC     ERRCNT
034354                                  ERRSOFT 5,DVEM0,ERR13
034354  104457                                                                  TRAP    C$ERSOFT
034356  000005                                                                  .WORD   5
034360  016747                                                                  .WORD   DVEM0
```

```
034362  017634                                                                                .WORD   ERR13
034364  000747                                BR DVINIT               ;GO BACK AND TRY MSTR CLR AGAIN IF ERROR

                                              ;SET TTL LOOP IF REQU'D

034366  042737  000003  006600  DVIN1:  BIC   #3,FLAG                 ;CLEAR INPUT AND OUTPUT INT FLAGS
034374  042777  000010  155056          BIC   #TTLL,@TXCSR            ;CLEAR INTERNAL LOOP
034402  022737  000001  006570          CMP   #TTL,MLTYP              ;IS TTL SELECTED
034410  001004                          BNE   DVIN3                   ; IF NOT GO TO 3
034412  052777  000010  155040          BIS   #TTLL,@TXCSR            ;ELSE SET INTERNAL LOOP
034420  000455                          BR    DVIN37

034422  022737  000002  006570  DVIN3:  CMP   #CABLE,MLTYP
034430  001451                          BEQ   DVIN37                  ;IF CABLE LOOP SKIP CHECK
                                                                      ;FOR MODEM READY

034432  022737  000004  006566          CMP   #DOW,MODTYP             ;CHECK IF DLL
034440  001002                          BNE   DVIN3A                  ;BRANCH IF NOT DLL
034442  000137  035102                  JMP   DVINEX                  ;ELSE EXIT

034446  012777  000002  154776  DVIN3A: MOV   #DTR,@RXCSR             ;SET UP DTR.

034454  012737  002000  006640          MOV   #2000,TIMER1
034462  005737  006640          DVIN38: TST   TIMER1
034466  001022                          BNE   DVIN39                  ;IF TIMER NOT OUT GO TO 39

                                        ;SET ERROR FOR NO MODEM READY

034470  012737  017375  006540          MOV   #DVEM6,TEMP2
034476  017737  154750  006542          MOV   @RXCSR,TEMP3
034504  017737  154750  006544          MOV   @TXCSR,TEMP4
034512  004737  020160                  JSR   PC,LGDVE
034516  005237  006506                  INC   ERRCNT
034522                                  ERRSOFT 11,DVEM6,ERR13
034522  104457                                                                        TRAP    C$ERSOFT
034524  000013                                                                        .WORD   11
034526  017375                                                                        .WORD   DVEM6
034530  017634                                                                        .WORD   ERR13
034532  000745                          BR    DVIN3A                  ;THEN TRY TO SET DTR AGAIN
034534                          DVIN39: BREAK
034534  104422                                                                        TRAP    C$BRK
034536  017737  154710  011476          MOV   @RXCSR,IRXCSR           ;GET COPY OR RXCSR
034544  032737  001000  011476          BIT   #BIT9,IRXCSR            ;IS MODEM READY SET
034552  001743                          BEQ   DVIN38
034554  013777  011472  154672  DVIN37: MOV   DPVP1,@PCSAR            ;SET UP PCASAR
034562  005737  011524                  TST   RNODE                   ;CHECK REMOTE NODE
034566  001145                          BNE   DVINEX                  ;EXIT IF ITEP
034570  005737  006572                  TST   FHDPLX                  ;IS THIS FULL DUPLEX
034574  001542                          BEQ   DVINEX                  ;BANCH IF NOT
034576  032737  000040  006574          BIT   #PROTOB,PARAM           ;'/PROTOCOL' ?
034604  001136                          BNE   DVINEX                  ;YES,EXIT

                                ;;THIS START-STACK ROUTINE USED IN NON PROTOCOL,NON ITEP,FULL DUPLEX MODE
                                        ;SET UP TO SEND STRT
034606  112737  000005  002645          MOVB  #5,HDMSG+1              ;SET UP ENQ
034614  052737  000060  006600          BIS   #RXM!TXM,FLAG           ;SET FLAG WORD
```

```
 6073  034622  012737  000074  006644          MOV     #60.,TIMERS     ;SET TIMER FOR 1 MINUTE
 6074  034630  004737  036574                  JSR     PC,CTSSR        ;SET CTS IF NESC.
 6075  034634  012737  000006  002646  DVIN41: MOV     #6,HDMCC        ;SET UP STRT CODE
 6076  034642  004737  036444                  JSR     PC,DVIN31       ;GO TX STRT AND CHK FOR RX.
 6077  034646  005737  006644                  TST     TIMERS
 6078  034652  001466                          BEQ     DVIN81          ;IF TIMER EXPIERED EXIT
 6079
 6080  034654  022737  000006  002660  DVIN4:  CMP     #6,RHDMCC       ;IS THE RCVD=STRT
 6081  034662  001441                          BEQ     DVIN8           ;IF SO GO TO ASTRT
 6082  034664  022737  000007  002660          CMP     #7,RHDMCC       ;IS IT A STACK
 6083  034672  001360                          BNE     DVIN41          ;IF NOT STACK ETIHER GO BACK
 6084
 6085  034674  004737  036574          DVIN9:  JSR     PC,CTSSR        ;SET REQUEST TO SEND
 6086  034700  042737  001010  006600          BIC     #QTX!PAD,FLAG   ;CLEAR TX COMPT FLAG.
 6087  034706  012737  000001  002646          MOV     #1,HDMCC        ;SET UP ACK
 6088  034714  012737  002645  011502          MOV     #HDMSG+1,MSGPTR ;SET UP POINTER
 6089  034722  013737  002654  011504          MOV     HDMC,MSGCC
 6090  034730  012737  000010  011506          MOV     #8.,SYNCC       ;SET UP SYNC COUNT
 6091  034736  052777  000120  154514          BIS     #TXENA!TINTEN,@TXCSR
 6092  034744  032737  000010  006600  DIVN91: BIT     #QTX,FLAG
 6093  034752  001053                          BNE     DVINEX          ;EXIT IF ACK SENT
 6094  034754                                  BREAK
 6095  034754  104422                                                                  TRAP    C$BRK
 6096  034756  005737  006644                  TST     TIMERS
 6097  034762  001370                          BNE     DIVN91          ;IF NOT TIMER EXPIRED RECHK TX.
 6098  034764  000421                          BR      DVIN81          ;IF TIMER OUT REPORT IT
 6099
 6100  034766  012737  000007  002646  DVIN8:  MOV     #7,HDMCC        ;SET POTINTER TO STACK
 6101  034774  004737  036444                  JSR     PC,DVIN31               ;AND GO SEND STACK
 6102  035000  005737  006644                  TST     TIMERS
 6103  035004  001411                          BEQ     DVIN81          ;REPORT ERROR IF TIME OUT
 6104  035006  022737  000001  002660          CMP     #1,RHDMCC       ;IS IT ACK RCVD?
 6105  035014  001432                          BEQ     DVINEX          ;IF SO EXIT
 6106  035016  022737  000007  002660          CMP     #7,RHDMCC       ;IS IT STACK RCVD
 6107  035024  001723                          BEQ     DVIN9           ;IF SO SEND ACK
 6108  035026  000757                          BR      DVIN8           ;IF NEITHER SEND ANOTHER ACK
 6109
 6110                                          ;DO ERROR AND REPEAT
 6111
 6112  035030  012737  017311  006540  DVIN81: MOV     #DVEM5,TEMP2
 6113  035036  013737  002660  006542          MOV     RHDMCC,TEMP3
 6114  035044  013737  002646  006544          MOV     HDMCC,TEMP4     ;LOAD UP ERRM. AND REG OUTPUTS
 6115  035052  004737  020160                  JSR     PC,LGDVE        ;LOG TIME OUT WAITING FOR RUN
 6116  035056  005237  006506                  INC     ERRCNT
 6117  035062                                  ERRSOFT 10.,DVEM5,ERR13
 6118  035062  104457                                                          TRAP    C$ERSOFT
 6119  035064  000012                                                          .WORD   10
 6120  035066  017311                                                          .WORD   DVEM5
 6121  035070  017634                                                          .WORD   ERR13
 6122  035072  005237  006502                  INC     OPVAR           ;COUNT HOW MANY TIMES WE DO THIS.
 6123  035076  000137  034304                  JMP     DVINIT          ;TRY ALL OVER AGAIN
 6124
 6125  035102  004737  037006          DVINEX: JSR     PC,CLRRTS       ;CLEAR RTS IF NESC
 6126  035106  042737  173777  006600          BIC     #173777,FLAG    ;CLEAR FLAG WORD
 6127  035114  052737  002000  006600          BIS     #INOVR,FLAG     ;SET THE INITT OVER FLAG
 6128  035122  000207                          RTS     PC              ;RETURN TO CALLER
```

```
6129
6130
```

```
                                .SBTTL                  DEVICE GET MODEM STATUS SUBROUTINE



                                ;++
                                ; FUNCTIONAL DESCRIPTION:
                                ;       ''DVMODS''   GET MODEM STATUS
                                ;
                                ; IMPLICIT INPUTS:
                                ;       THE BIT POSITION AND AVAILABILITY OF THE MODEM SIGNALS CTS,DSR,...RI,..
                                ;       FOUND IN THE DEPENDENT PORTION OF THE GLOBAL EQUATES SECTION.
                                ;
                                ; OUTPUTS:
                                ;       CURRENT MODEM SIGNAL VALUES IN 'MODS''
                                ;
                                ;
                                ; CALLING SEQUENCE:
                                ;       JSR     PC,DVMODS
                                ;--

035124  017737  154322  007554  DVMODS: MOV     @RXCSR,MODS
035132  042737  000040  007554          BIC     #BIT5,MODS      ;CLEAR BIT 5
035140  032777  000040  154312          BIT     #BIT5,@TXCSR    ;SEE IT TM OR SQ SET
035146  001403                          BEQ     DVMEX           ;IF NOT EXIT
035150  052737  000040  007554          BIS     #BIT5,MODS      ;IF SET SET BIT 5 IN MODS
035156  042737  106720  007554  DVMEX:  BIC     #106720,MODS    ;CLEAR ALL UNUSED BITS
035164  000207                          RTS     PC              ;RETURN TO CALLER
```

```
                        .SBTTL                  DEVICE QUEUE RECEIVE SPACE SUBROUTINE

                        ;++
                        ; FUNCTIONAL DESCRIPTION:
                        ;       DVRXQ - THIS SUBROUTINE QUEUES THE RECIEVER BUFFER SPACE TO THE
                        ;               DEVICE, THEN CLEARS THE QRX BIT OF THE FLAG WORD.
                        ;
                        ; INPUTS:
                        ;       DVRXA = ADDRESS OF RX BUFFER SPACE
                        ;       DVRCC = BYTE CHAR COUNT OF RX BUFFER
                        ;       QRX FLAG BIT = SET BY CALLING ROUTINE
                        ;
                        ; OUTPUTS:
                        ;       QRX FLAG BIT = CLEARED BY ROUTINE
                        ;
                        ; CALLING SEQUENCE:
                        ;       JSR     PC,DVRXQ
                        ;--

035166                  DVRXQ:
035166  032737  000004  006600          BIT     #QRX,FLAG
035174  001434                         BEQ     DVREX                   ;IF NOT RX THEN EXIT
                                                                        ;ELSE QUE RX
035176  042737  000444  006600          BIC     #QRX+#BCC+#RXM,FLAG     ;CLEAR FLAG FOR RX
035204  005737  011524                  TST     RNODE                   ;IF NON ITEP GO TO 2
035210  001415                         BEQ     DVRX2
035212  052737  000440  006600          BIS     #RXM+#BCC,FLAG          ;GET JUST THE DATA NO CRC.
035220  013737  006470  011512          MOV     DVRXA,RMSGPT
035226  012737  000072  011514          MOV     #72,RMSGCC              ;SET UP RX TO GET ITEP MSG.
035234  012737  000070  006472          MOV     #70,DVRCC
035242  000406                         BR      DVRX3

                        ;ENABLE RX, RX INTERRUPTS,AND DATA SET INTERRUPTS

035244  012737  002657  011512  DVRX2:  MOV     #RHDMSG+1,RMSGPT        ;SET UP POINTER
035252  013737  002654  011514          MOV     HDMC,RMSGCC             ;AND CC
035260  052777  000160  154164  DVRX3:  BIS     #RINTEN!RXENA!#DSITEN,@RXCSR
035266  000207                  DVREX:  RTS     PC                      ;RETURN TO CALLER
```

```
                        .SBTTL                  DEVICE TRANSMIT AND RECEIVE SUBROUTINE


                        ;++
                        ; FUNCTIONAL DESCRIPTION:
                        ;       DVTXRX-DEVICE TRANSMIT AND RECEIVE ROUTINE
                        ;       THIS CODE QUES THE TRANSMIT BUFFER TO THE DEVICE
                        ;       IF NEEDED. THE CODE THEN WAITS FOR A TX COMPLE,
                        ;       RX COMPLETE OR BOTH. THE CODE REPORTS A TIME OUT
                        ;       ERROR IF NO  OUTPUT INTERRUPT IS RECIEVED BEFORE
                        ;       60 SECONDS. AFTER REPORTING ERROR TIMER IS RE STARTED
                        ;       AND DEVICE WILL CONTINUE TO WAIT FOR INTERRUPT.
                        ;
                        ;INPUTS:
                        ;       'DVTXA' = ADDRESS OF TRANSMIT MSG.
                        ;       'DVTCC' = BYTE COUNT OF TRANSMIT MSG.
                        ;    'QTX' BIT  = SET IF TRANSMIT REQUESTED
                        ;    'ETX' BIT  = SET IF TRNASMIT EXPECTED
                        ;    'ERX' BIT  = SET IF RECIEVE EXPECTED
                        ;
                        ;OUTPUTS:
                        ;       'DVTXA' = ADDRESS OF TX MSG. COMPLETED
                        ;       'DVTCC' = BYTE COUNT OF TX MSG. COMPLETED
                        ;       'QTX'   = SET IF TX COMPLETED
                        ;       'DVRXA' = ADDRESS OF RX MSG. COMPLETED
                        ;       'DVRCC' = BYTE COUNT OF RX MSG. COMPLETED
                        ;       'QRX'   = SET IF RX COMPLETED
                        ;
                        ; SUBORDINATE ROUTINES USED:
                        ;
                        ;               'LGDVE'  - LOG DEVICE ERROR TO EVENT LOG
                        ;
                        ; CALLING SEQUENCE:
                        ;       JSR     PC,DVTXRX
                        ;--

035270  032737  000010  006600  DVTXRX: BIT     #QTX,FLAG               ;ANY TX TO QUE
035276  001444                        BEQ     DVTR3                   ;IF NOT GO WAIT FOR OUPUT
035300  042737  001030  006600        BIC     #QTX+#TXM+PAD,FLAG      ;CLEAR FLAG
035306  004737  036574                JSR     PC,CTSSR                ;GO SET CTS
035312  005737  011524                TST     RNODE
035316  001412                        BEQ     DVTR1                   ;IF NON-ITEP GO TO 1
035320  052737  000020  006600        BIS     #TXM,FLAG               ;SET THE BODY BIT
035326  013737  006454  011502        MOV     DVTXA,MSGPTR
035334  013737  006456  011504        MOV     DVTCC,MSGCC             ;AND SET UP FOR ACTUAL DATA
035342  000414                        BR      DVTR2
                                        ;ENABLE TX AND TX INTER.

035 4   112737  000201  002645  DVTR1:  MOVB    #201,HDMSG+1            ;SET UP SOH
035352  012737  002645  011502        MOV     #HDMSG+1,MSGPTR         ;SET POINTER TO HEADER
035360  013737  006456  002646        MOV     DVTCC,HDMCC
035366  013737  002654  011504        MOV     HDMC,MSGCC              ;SET CC FOR HEADER
035374  012737  000177  011506  DVTR2:  MOV     #177,SYNCC              ;SET UP FOR 177 SYNCS.
035402  052777  000120  154050        BIS     #TXENA!#TINTEN,@TXCSR
```

```
 6256  035410  012737  000074  006644  DVTR3:  MOV     #60.,TIMERS             ;SET TIMER FOR 60 SECS
 6257
 6258  035416                          DVTR8:  BREAK
 6259  035416  104422                                                          TRAP    C$BRK
 6260  035420  005737  006644                  TST     TIMERS                  ;IS TIMER EXPIRED
 6261  035424  001022                          BNE     TOINOT
 6262
 6263                                          ;LOG ERROR TIME OUT RX OR TX NOT COMPLETED
 6264
 6265  035426  012737  017110  006540          MOV     #DVEM2,TEMP2
 6266  035434  017737  154012  006542          MOV     @RXCSR,TEMP3
 6267  035442  017737  154012  006544          MOV     @TXCSR,TEMP4
 6268  035450  004737  020160                  JSR     PC,LGDVE
 6269  035454  005237  006506                  INC     ERRCNT
 6270  035460                                  ERRSOFT 7,DVEM2,ERR13
 6271  035460  104457                                                          TRAP    C$ERSOFT
 6272  035462  000007                                                          .WORD   7
 6273  035464  017110                                                          .WORD   DVEM2
 6274  035466  017634                                                          .WORD   ERR13
 6275  035470  000747                          BR      DVTR3           ;RETURN TO CHECK TIMER
 6276
 6277  035472  032737  000010  006600  TOINOT: BIT     #QTX,FLAG       ;IS IT TX COMPL?
 6278  035500  001406                          BEQ     DVTR4           ;BRANCH IF TX NOT DONE.
 6279  035502  004737  037006                  JSR     PC,CLRRTS
 6280  035506  032737  000100  006600          BIT     #ERX,FLAG       ;ARE WE EXPECTING TO RX
 6281  035514  001416                          BEQ     DVTREX          ;BRANCH IF NOT.
 6282
 6283  035516  032737  000004  006600  DVTR4:  BIT     #QRX,FLAG       ;IS RX DONE
 6284  035524  001734                          BEQ     DVTR8           ;GO BACK AND TIME IF NOT
 6285
 6286  035526  032737  000200  006600          BIT     #ETX,FLAG       ;ARE WE EXPECTG TO TX.
 6287  035534  001406                          BEQ     DVTREX          ;BRANCH IF NOT.
 6288
 6289  035536  032737  000010  006600          BIT     #QTX,FLAG       ;IS IT TX COMPLETED
 6290  035544  001724                          BEQ     DVTR8           ;GO BACK AND TIME OUT
 6291  035546  004737  037006                  JSR     PC,CLRRTS       ;CLEAR RTS IF NESC.
 6292  035552  000207                  DVTREX: RTS     PC              ;AND EXIT
 6293
```

```
                        ; DEVICE DEPENDENT SUBROUTINES



                        .SBTTL                  DEVICE INTERRUPT SERVICE ROUTINES


                        ;++
                        ; FUNCTIONAL DESCRIPTION:
                        ;       RECEIVER INTERRUPT ROUTINE. WHEN A RX INT. OCCURS
                        ;       THIS ROUTINE DECIDES IF IT IS A RX STATUS,DATA SET
                        ;       CHANGE OR DATA INTERRUPT. IF IT IS A DATA SET CHANGE
                        ;       INTERRUPT IT PUTS THE STATUS IN ''CMODS'' AND COMPARES
                        ;       THAT STATUS TO THE OLD STATUS IN 'MODS'. IF THEY ARE
                        ;       THE SAME THAT MEANS THE INTERRUPT WAS CAUSED BY A GLITCH
                        ;       ON ONE OF THE LINES. IF THEY ARE DIFFERENT THEN A HARD
                        ;       MODEM ERROR HAS OCCURED. IN ANY EVENT THE MODEM STATUS
                        ;       CHANGE IS LOGGED.
                        ;       IF A DATA INT. OCCURS THE ROUTINE PUTS THE DATA AWAY
                        ;       IN A BUFFER POINTED TO BY ''RMSGPT'' THE MSG. COUNT IS
                        ;       DECREMENTED BY ONE BYTE. IF COUNT IS EQUAL TO ZERO AND
                        ;       ''BCC'' BIT AND ''RXM'' BIT IS SET THEN RX IS DISABLED AND
                        ;       ''QRX'' BIT IS SET. IF COUNT IS ZERO AND ''BCC'' BIT IS SET
                        ;       BUT ''RXM'' BIT IS NOT SET THEN MSG COUNT IS SET TO LENGHT
                        ;       RECVD IN HEADER AND ''RMSGPT'' IS SET TO RX BUFFER LOCATION
                        ;       AND ''RXM'' BIT IS SET.
                        ;       IF COUNT IS EQUAL TO ZERO AND ''BCC'' IS NOT SET THEN
                        ;       COUNT IS SET TO 2 AND ''RMSGPT'' IS SET TO ''BCCW'' AND
                        ;       ''BCC'' BIT IS SET.
                        ;
                        ;       IF A STATUS INTERRUPT OCCURS THEN OVERRUN ERROR BIT IS CHECKED.
                        ;       AN ERROR IS LOGGED AND ''QRX'' IS SET AND THE RX IS DISABLED.
                        ;
                        ; INPUTS:
                        ;       RMSGPT - ADDRESS OF RX BUFFER
                        ;       RMSCC  - COUNT OF DATA TO BE RXED.
                        ;
                        ; SUBORDINATE ROUTINES USED:
                        ;               ''LOGMSC''      - LOG MODEM STATUS CHANGE
                        ;               ''LGDVE''       - LOG DEVICE ERROR
                        ;--
                        ;
035554                          BGNSRV  DVRXI
035554                                                                  DVRXI::
035554  010246                  MOV     R2,-(SP)        ;SAVE R2
035556  017737  153670  011476  MOV     @RXCSR,IRXCSR   ;MOV RX CSR TO IMAGE
035564  032737  000010  006574  BIT     #MOCHK,PARAM    ;ANY MODEM CHANGES TO REPORT
035572  001456                  BEQ     RXIN21          ;IF NOT IGNORE DS CHANGE.
035574  032737  002000  006600  BIT     #INOVR,FLAG     ;IS INIT OVER
035602  001452                  BEQ     RXIN21          ;NO THEN IGNORE DS CHANGE.
035604  005737  011476          TST     IRXCSR
035610  100047                  BPL     RXIN21          ;IF DATA SET CHANGE IS NOT SET BR
035612  013737  011476  011474  MOV     IRXCSR,CMODS    ;MOV THE NEW MODEM STATUS IN
035620  042737  106760  011474  BIC     #106760,CMODS
```

```
6350  035626  032777  000040  153624          BIT     #TM,@TXCSR
6351  035634  001403                          BEQ     RXIN2           ;IF TEST MODE SET
6352  035636  052737  000040  011474          BIS     #TM,CMODS       ;SET IT IN NEW STATUS
6353  035644  013737  011474  006542  RXIN2:  MOV     CMODS,TEMP3
6354  035652  013737  007554  006544          MOV     MODS,TEMP4
6355  035660  023737  006544  006542          CMP     TEMP4,TEMP3     ;COMPARE OLD TO CURRENT
6356  035666  001406                          BEQ     GLINC           ;INC GLITCH COUNT
6357  035670  005237  011522                  INC     MHRCNT          ;INC HARD COUNT
6358  035674  012737  016717  006540          MOV     #HRDMSG,TEMP2   ;SET UP HARD MESG.
6359  035702  000405                          BR      RXIN1
6360  035704  005237  011520  GLINC:  INC     MGLCNT          ;INC GLITCH COUNT
6361  035710  012737  016671  006540          MOV     #GLMSG,TEMP2    ;SET UP GLITCH
6362  035716  004737  020334  RXIN1:  JSR     PC,LOGMSC       ;GO LOG MODEM STATUS CHANGE
6363  035722  013737  011474  007554          MOV     CMODS,MODS      ;MOVE CURRENT TO OLD
6364                                          ;
6365                                          ;TEST FOR STATUS OR DATA
6366
6367  035730  032737  002200  011476  RXIN21: BIT     #RSTARY!RDATRY,IRXCSR
6368  035736  001544                          BEQ     RXINEX          ;IF NEITHER EXIT
6369  035740  017737  153512  011500          MOV     @RDSR,IRDSR
6370  035746  032737  000200  011476          BIT     #RDATRY,IRXCSR  ;IS THIS DATA
6371  035754  001455                          BEQ     RXIN3           ;IF NOT GO TO 3
6372
6373                                          ;GET HERE WITH GOOD DATA
6374
6375  035756  013702  011512  RXIN4:  MOV     RMSGPT,R2
6376  035762  113722  011500          MOVB    IRDSR,(R2)+     ;STORE DATA AWAY
6377  035766  010237  011512          MOV     R2,RMSGPT       ;PUT POINTER BACK
6378
6379
6380  035772  005337  011514          DEC     RMSGCC
6381  035776  001124                  BNE     RXINEX          ;GET OUT IF NOT ALL DONE
6382  036000  032737  000400  006600  BIT     #BCC,FLAG       ;IS THE BCC FLAG ALREADY SE
6383  036006  001066                  BNE     RXIN5           ;BRANCH IF YES.
6384  036010  032737  100000  011500  BIT     #RERR,IRDSR     ;IS THE ERR CHK BIT SET INDICATING
6385                                          ;GOOD BCC.
6386  036016  001022                  BNE     RXIN6           ;BRANCH IF GOO
6387  036020  013737  011500  006542          MOV     IRDSR,TEMP3
6388  036026  013737  011476  006544          MOV     IRXCSR,TEMP4
6389  036034  012737  017205  006540          MOV     #DVEM3,TEMP2
6390  036042  004737  020160                  JSR     PC,LGDVE
6391  036046  005237  006506                  INC     ERRCNT
6392  036052                                  ERRSOFT 8,DVEM3,ERR13
6393  036052  104457                                                  TRAP    C$ERSOFT
6394  036054  000010                                                  .WORD   8
6395  036056  017205                                                  .WORD   DVEM3
6396  036060  017634                                                  .WORD   ERR13
6397
6398  036062  000467                  BR      RXIN8           ;DISABLE INTERRUPTS AND EXIT
6399
6400  036064  052737  000400  006600  RXIN6:  BIS     #BCC,FLAG       ;SET FLAG
6401  036072  012737  000002  011514          MOV     #2.,RMSGCC      ;SET THE COUNT TO 2
6402  036100  012737  011516  011512          MOV     #BCCW,RMSGPT    ;SET POINTER TO BCC WORD
6403  036106  000460                  BR      RXINEX
6404
6405                                          ;STATUS CHECK
```

```
 6406
 6407  036110  032737  002000  011476  RXIN3:  BIT     #RSTARY,IRXCSR  ;IS THIS A STATUS INT.
 6408  036116  001454                  BEQ     RXINEX          ;EXIT IF NOT
 6409
 6410                                  ;LOG OVERRUN ERROR
 6411
 6412  036120  012737  017245  006540          MOV     #DVEM4,TEMP2
 6413  036126  013737  011500  006542          MOV     IRDSR,TEMP3
 6414  036134  013737  011476  006544          MOV     IRXCSR,TEMP4
 6415  036142  004737  020160                  JSR     PC,LGDVE
 6416  036146  005237  006506                  INC     ERRCNT
 6417  036152                                  ERRSOFT 9,DVEM4,ERR13
 6418  036152  104457                                                          TRAP    C$ERSOFT
 6419  036154  000011                                                          .WORD   9
 6420  036156  017245                                                          .WORD   DVEM4
 6421  036160  017634                                                          .WORD   ERR13
 6422  036162  000424                  BR      RXIN7
 6423
 6424  036164  032737  000040  006600  RXIN5:  BIT     #RXM,FLAG       ;IS THE RX M BODY BIT SET
 6425  036172  001020                  BNE     RXIN7           ;IF YES THEN ALL DONE
 6426  036174  052737  000040  006600          BIS     #RXM,FLAG
 6427  036202  042737  000400  006600          BIC     #BCC,FLAG       ;CLEAR BCC AND SET RXM
 6428  036210  013737  006470  011512          MOV     DVRXA,RMSGPT    ;MOVE ADDRESS TO POINTER
 6429  036216  013737  002660  011514          MOV     RHDMCC,RMSGCC   ;MOVE THE CHAR COUNT IN
 6430  036224  013737  002660  006472          MOV     RHDMCC,DVRCC    ;SET THE CC TO AMOUNT IN HEADER
 6431  036232  000406                  BR      RXINEX          ;AND FINISH.
 6432
 6433  036234  052737  000004  006600  RXIN7:  BIS     #QRX,FLAG       ;SET FLAG BIT
 6434
 6435  036242  042777  000120  153202  RXIN8:  BIC     #RINTEN+RXENA,@RXCSR    ;CLEAR INTAND RX ENABLE
 6436
 6437  036250  012602                  RXINEX: MOV     (SP)+,R2                ;RESTORE R2
 6438  036252                                  ENDSRV
 6439  036252                                                                  L10020:
 6440  036252  000002                                                                  RTI
```

```
                        .SBTTL                  DEVICE TRANSMIT INTERRUPT ROUTINE

                        ;++
                        ; FUNCTIONAL DESCRIPTION:
                        ;       DEVICE TRANSMIT INT. ROUTINE
                        ;
                        ;       WHEN A TRANSMIT BUFFER EMPTY CAUSES AN INTERRUPT TO OCCUR
                        ;       THE PROGRAM COMES TO THIS ROUTINE.
                        ;       IF THE SYNC COUNT''SYNCC'' IS NON ZERO TSOM IS SET
                        ;       A SYNC CHAR IS LOADED TO TDSR AND THE SYNC COUNT IS
                        ;       DECREMENTED.
                        ;
                        ;       IF THE SYNC COUNT IS ZERO TSOM AND TEOM ARE RESET
                        ;       AND THE ''PAD'' BIT IN FLAG WORD IS CHECKED IF IT IS
                        ;       SET THEN A PAD(377) CHAR IS LOADED TO TDSR AND TX
                        ;       INTERRUPT ENABLE IS CLEARD.
                        ;
                        ;       IF THE SYNC COUNT IS ZERO AND THE ''PAD'' FLAG IS
                        ;       CLEAR THEN A BYTE IS PUT IN TDSR FROM THE ADDRESS
                        ;       IN MSGPTR AND THE MSG COUNT IS DECREMENTED
                        ;
                        ;       IF THE MSG COUNT GOES TO ZERO THE ''TXM'' BIT IS
                        ;       CHECKED IF IT  IS SET THE ''PAD'' FLAG IS SET
                        ;       IF IT IS CLEAR THEN IT GETS SET AND MSGPTR IS
                        ;       LOADED WITH THE ADDRESS OF TXBUFF AND THE MSG
                        ;       COUNT IS LOADED WITH THE COUNT OF THE MSG TO
                        ;       BE TRANSMITTED.
                        ;
                        ; INPUTS:
                        ;       MSGPTR - IS SET TO THE ADDRESS OF THE MSG OR HEADER TO BE TX'D
                        ;       MSGCC  - IS SET TO THE COUNT OF MSG TO BE TX'D
                        ; OUTPUTS:
                        ;       QTX - THIS BIT IS SET WHEN MSG IS TX'D OK.
                        ;--

036254                          BGNSRV  DVTXI
036254                                                                          DVTXI::
036254  010246                  MOV     R2,-(SP)        ;SAVE R2
036256  005737  011506          TST     SYNCC           ;ANY SYNCS TO SEND
036262  001406                  BEQ     TXIN1           ;IF NOT GO TO 1
036264  013777  011510  153170  MOV     SYNCW,@TDSR     ;ELSE SET TSOM AND SYNC WORD
036272  005337  011506          DEC     SYNCC           ;DEC SYNC COUNT
036276  001060                  BNE     TXINEX          ;IF NOT ZERO EXIT
036300  042777  001400  153154  TXIN1:  BIC     #TEOM!TSOM,@TDSR
036306  032737  001000  006600          BIT     #PAD,FLAG       ;IS THE PAD BIT SET
036314  001414                  BEQ     TXIN2           ;GO TO 2 IF NOT SET
036316  012777  000377  153136  MOV     #377,@TDSR      ;LOAD FF TO TX DATA REG.
036324  042777  000100  153126  BIC     #TINTEN,@TXCSR  ;CLEAR TX INT ENABLE
036332  052737  000010  006600  BIS     #QTX,FLAG       ;SET THE TX COMPLETE IN FLAG
036340  005237  037122          INC     TXREADY         ;TELL PROTOCOL MODULE THAT WE ARE DONE
036344  000435                  BR      TXINEX          ;AND EXIT
036346  013702  011502          TXIN2:  MOV     MSGPTR,R2       ;LOAD R2 WITH TX ADDR.
036352  112277  153104          MOVB    (R2)+,@TDSR     ;LOAD DATA BYTE
036356  010237  011502          MOV     R2,MSGPTR       ;RESTORE POINTER
036362  005337  011504          DEC     MSGCC           ;DEC CC
036366  001024                  BNE     TXINEX
```

```
 6497  036370  052777  001000  153064          BIS     #TEOM,@TDSR
 6498  036376  032737  000020  006600          BIT     #TXM,FLAG       ;IS THIS THE END OF DATA MSG.
 6499  036404  001012                          BNE     TXIN3           ;IF SO SET THE PAD BIT
 6500  036406  052737  000020  006600          BIS     #TXM,FLAG       ;IF NOT MUST BE END OF HEADER
 6501  036414  013737  006454  011502          MOV     DVTXA,MSGPTR    ;SO SET UP MSGPTR FOR MSG
 6502  036422  013737  006456  011504          MOV     DVTCC,MSGCC     ;AND THE CC FOR MSG.
 6503  036430  000403                          BR      TXINEX
 6504  036432  052737  001000  006600  TXIN3:  BIS     #PAD,FLAG       ;SET THE PAD BIT
 6505
 6506  036440  012602                  TXINEX: MOV     (SP)+,R2        ;RESTORE R2
 6507  036442                                  ENDSRV
 6508  036442                                                                  L10021:
 6509  036442  000002                                                                  RTI
```

```
                        .SBTTL                  DEVICE TRANSMIT CONTROL MSG
                        ;++
                        ; FUNCTIONAL DESCRIPTION:
                        ;       THIS ROUTINE DOES THE FOLLOWING
                        ;       QUES A RX SPACE AT RHDMSG+1
                        ;       QUES A TX MSG FROM HDMSG+1
                        ;       CHECKS FOR A TIMER EXPIRED
                        ;       IF EXPIRED RETURN TO CALLER
                        ;       ELSE CHECK FOR A TX MSG COMPLETED
                        ;       IF TX COMPLETED CHECK FOR RX COMPLETED
                        ;       ELSE RECHECK TIMER AND TX COMPLETED UNTIL
                        ;       EITHER TX COMPLETE OR TIME OUT
                        ;       IF TX COMPLETE AND RX NOT COMPLETE THEN
                        ;       REQUE TX MSG.
                        ;       ELSE IF RX COMPLETE RETURN.
                        ;
                        ; INPUTS:
                        ;       TXM             - SET IN FLAG WORD
                        ;       HDMSG+2         - TYPE OF CONTROL MSG..
                        ;
                        ; SUBORDINATE ROUTINES USED:
                        ;               "CLRRTS"        - CLEAR REQUEST TO SEND IF HALF DUP.
                        ; CALLING SEQUENCE:
                        ;               JSR     PC,DVIN31
                        ; RETURN:
                        ;       RETURN TO CALLER IF SOMETHING RX'D OR TIMER OUT.
                        ;
                        ;--

036444  042737  000004  006600  DVIN31: BIC     #QRX,FLAG               ;CLEAR RX COMPLE.

036452  012737  002657  011512          MOV     #RHDMSG+1,RMSGPT        ;SET UP POINTER
036460  013737  002654  011514          MOV     HDMC,RMSGCC             ;AND CC
                                                                        ;ENABLE RCVR.

036466  052777  000160  152756          BIS     #RINTEN!RXENA!DSITEN,@RXCSR

                        ;SET UP TXMITTER TO SEND

036474  004737  036574          DVIN32: JSR     PC,CTSSR                ;SET RTS .
036500  042737  001010  006600          BIC     #QTX!PAD,FLAG           ;CLEAR TX COMPT FLAG.
036506  012737  002645  011502          MOV     #HDMSG+1,MSGPTR         ;MOVE THE CURRENT POINTER TO MSGPTR.
036514  013737  002654  011504          MOV     HDMC,MSGCC
036522  012737  000010  011506          MOV     #8.,SYNCC               ;SET UP SYNC COUNT
036530  052777  000120  152722          BIS     #TXENA!TINTEN,@TXCSR

                        ;NOW WAIT FOR TIME OUT OR TX COMPLETE

036536                  DVIN35: BREAK
036536  104422                                                          TRAP    C$BRK
036540  005737  006644          TST     TIMERS          ;IS IT TIMED OUT
036544  001412          BEQ     DVIN34          ;IF YES EXIT
036546  032737  000010  006600  BIT     #QTX,FLAG       ;IS TX DONE
036554  001770          BEQ     DVIN35          ;IF NOT GO BACK AND CK TIME OUT
036556  004737  037006          JSR     PC,CLRRTS       ;GO CLEAR RTS IF NESC.
036562  032737  000004  006600  BIT     #QRX,FLAG       ;DID WE RX ANYTHING
```

```
 6566  036570  001741                    BEQ     DVIN32          ;IF NOT RETRANSMIT LAST
 6567  036572  000207          DVIN34:   RTS     PC              ;RETURN TO CALLER
 6568
```

```
                                .SBTTL                  DEVICE RTS TO CTS DELAY
                                ;++
                                ; FUNCTIONAL DESCRIPTION:
                                ;       CTSSR--THIS ROUTINE SETS REQUEST TO SEND TO MODEM
                                ;       AND CHECKS FOR CLEAR TO SEND TO COME BACK
                                ;       IF CTS DOES NOT COME BACK BEFORE TIMER EXPIRES
                                ;       AND ERROR IS REPORTED AND WE TRY AGAIN.
                                ;       THE ROUTINE IS SKIPPED IF INTERNAL LOOP IS SET.
                                ;
                                ; OUTPUTS:
                                ;
                                ; SUBORDINATE ROUTINES USED:
                                ;               "LGDVE" -       LOG DEVICE ERROR
                                ; CALLING SEQUENCE:
                                ;               JSR     PC,CTSSR
                                ;--

036574  022737  000001  006570  CTSSR:  CMP     #1,MLTYP        ;IS THIS TTL LOOP
036602  001500                          BEQ     DVTXR9          ;BR IF YES
                                        ;SET RTS AND WAIT FOR CTS
036604  032737  004000  006600  DVTXR3: BIT     #FIRST,FLAG
036612  001014                          BNE     CTSS3           ;IF NOT FIRST TIME SKIP DELY
036614  012737  177777  006534          MOV     #-1,TEMP
036622  005237  006534          CTSS4:  INC     TEMP
036626                                  BREAK
036626  104422                                                                  TRAP    C$BRK
036630  005737  006534                  TST     TEMP
036634  001372                          BNE     CTSS4           ;IF NOT ZERO GO BACK
036636  052737  004000  006600          BIS     #FIRST,FLAG     ;SET FIRST FLAG.
036644  012737  001750  006640  CTSS3:  MOV     #1000.,TIMER1   ;1000 TICKS
036652  005737  006572                  TST     FHDPLX          ;FULL DUPLEX ?
036656  001012                          BNE     CTSS7           ;YES,BRANCH
                                ;;CHECK FOR CARRIER
036660  004737  035124          10$:    CALL    DVMODS          ;GET MODEM STATUS
036664  032737  010000  007554          BIT     #DCD,MODS       ;CARRIER PRESENT?
036672  001404                          BEQ     CTSS7           ;NO,BRANCH
036674  005737  006640                  TST     TIMER1          ;TIME DONE?
036700  001401                          BEQ     CTSS7           ;YES,BRANCH
036702  000766                          BR      10$             ;DO IT AGAIN

036704  052777  000004  152540  CTSS7:  BIS     #RTS,@RXCSR     ;SET REQUEST TO SEND
036712  012737  001750  006640          MOV     #1000.,TIMER1   ;SET UP TIMER
036720                          DVTXR2: BREAK
036720  104422                                                                  TRAP    C$BRK
036722  032777  020000  152522          BIT     #CTS,@RXCSR     ;IS CLEAR TO SEND BACK
036730  001025                          BNE     DVTXR1          ;BR. IF CTS IS SET
036732  005737  006640                  TST     TIMER1          ;ELSE TEST IF TIME EXPIRED
036736  001370                          BNE     DVTXR2          ;BR IF TIME NOT EXPRIED.

                                        ;SET ERROR FOR NO CTS
```

```
 6625  036740  012737  017026  006540          MOV     #DVEM1,TEMP2
 6626  036746  017737  152500  006542          MOV     @RXCSR,TEMP3
 6627  036754  017737  152500  006544          MOV     @TXCSR,TEMP4
 6628  036762  004737  020160                  JSR     PC,LGDVE
 6629  036766  005237  006506                  INC     ERRCNT
 6630  036772                                  ERRSOFT 6,DVEM1,ERR13
 6631  036772  104457                                                  TRAP    C$ERSOFT
 6632  036774  000006                                                  .WORD   6
 6633  036776  017026                                                  .WORD   DVEM1
 6634  037000  017634                                                  .WORD   ERR13
 6635  037002  000700                  BR      DVTXR3          ;THEN TRY TO SET RTS AGAIN
 6636  037004                  DVTXR1:
 6637  037004  000207          DVTXR9: RTS     PC              ;
```

```
 6638                                   .SBTTL                  DEVICE CLEAR REQUEST TO SEND
 6639                                   ;++
 6640                                   ; FUNCTIONAL DESCRIPTION:
 6641                                   ;       THIS ROUTINE CLEARS REQUEST TO SEND IF
 6642                                   ;       IN HALF DUPLEX MODE OR MULTI-POINT.
 6643                                   ; CALLING SEQUENCE:
 6644                                   ;       JSR     PC,CLRRTS
 6645                                   ;--
 6646
 6647  037006                           CLRRTS:
 6648  037006  005737  037126                  TST     MPPTP           ;MULTI-POINT?
 6649  037012  001003                           BNE     20$             ;YES,BRANCH
 6650  037014  005737  006572                  TST     FHDPLX          ;IS THIS FULL DUPLEX
 6651  037020  001011                           BNE     DVTR5           ;BRANCH IF YES
 6652  037022  012737  002000  006540  20$:    MOV     #2000,TEMP2
 6653  037030  005337  006540          CLRR1:  DEC     TEMP2
 6654  037034  001375                           BNE     CLRR1           ;DELAY A WHILE TO ALLOW CRC
 6655                                                                   ;TO BE TXMITT'D BEFORE YOU
 6656  037036  042777  000004  152406          BIC     #RTS,@RXCSR     ;CLEAR REQUEST TO SEND
 6657  037044  000207                  DVTR5:  RTS     PC              ;RETURN TO CALLER
 6658
```

```
                                        .SBTTL  DDCMP PROTOCOL MODULE
                                ;*****************************************************************************
                                ;       DCLT DDCMP PROTOCOL MODULE:
                                ;       THIS CODE WAS WRITTEN TO BE USED ONLY WITH DCLT.

                                        .EVEN
                                ;; LOCAL STORAGE

                                ;; TABLE OF STATISTICS AND ERRORS
                                ;;; NOTE: KEEP THE VARIABLES TOGETHER AND IN SEQUENCE
                                ;;;       OTHERWISE THE RPT> ROUTINE WILL PRINT WRONG INFO.

037046  000000                  PRSTAT: .WORD 0                 ;STATUS FLAGS
                                                                ;BIT0 = BCCOK
                                                                ;BIT1 = BCCBAD
                                                                ;BIT2 = SNAK
                                                                ;BIT3 = SACK
                                                                ;BIT4 = SDATA
                                                                ;SPARE
                                                                ;BIT6 = RXD
                                                                ;BIT7 = SPARE
                                                                ;BIT8 = NAKRX
                                                                ;BIT9 = MYDATA
                                                                ;BIT10 = SSTACK
                                                                ;BIT11 =SSTART
037050  000000                  TMESTX: .WORD 0                 ;TOTAL DATA MESSAGES TRANSMITTED(16 BIT COUNTER
037052  000000                  TMESRX: .WORD 0                 ;TOTAL DATA MESSAGES RECEIVED(16 BIT COUNTER)

037054      000                 N:      .BYTE 0                 ;# OF HIGHEST SEQUENTIAL DATA MESSAGE TRANS
                                                                ;; MITTED BY THIS STATION
037055      000                 A:      .BYTE 0                 ;# OF THE HIGHEST SEQUENTIAL DATA MESSAGE
                                                                ;; THAT HAS BEEN ACKNOWLEDGE TO THIS STATION

037056      000                 T:      .BYTE 0                 ;# OF THE NEXT DATA MESSAGE TO BE TRANSMITTED
037057      000                 X:      .BYTE 0                 ;LAST MESSAGE NUMBER TRANSMITTED

037060      000                 R:      .BYTE 0                 ;LAST MESSAGE RECEIVED
037061      000                 TRIBN:  .BYTE 0                 ;TRIB ADDRESS  PT TO PT = 1

                                ;; ERROR COUNTERS
037062      000                 REMTMO: .BYTE 0                 ;REMOTE REPLY TIMEOUTS(ACKS SENT NUM=R)
037063      000                 GLOBCC: .BYTE 0                 ;GLOBAL CRC ERRORS

037064      000                 REANAK: .BYTE 0                 ;REASON FOR LAST NAK SENT
037065      000                 SELTHR: .BYTE 0                 ;SELECTION THRESHOLD ERROR

037066      000                 RXTHER: .BYTE 0                 ;RECEIVE THRESHOLD ERRORS
037067      000                 TXTHER: .BYTE 0                 ;TRANSMIT THRESHOLD ERRORS
```

```
6709
6710  037070  000              DEROUT: .BYTE 0          ;DATA ERRORS OUTBOUND (NAKS RECEIVED
6711  037071  000              OUTMASK:.BYTE 0          ;; REASONS = 1,2,OR 3)
6712                                                    ;MASK VALUES -- BIT0 = HEADER CRC ERROR
6713                                                    ;             -- BIT1 = DATA FIELD CRC ERROR
6714                                                    ;             -- BIT2 = REP RESPONSE NUM<>R
6715
6716  037072  000              DERIN:  .BYTE 0          ;DATA ERRORS INBOUND (NAKS TRANSMITTED
6717  037073  000              INMASK: .BYTE 0          ;; REASONS = 1,2,OR 3)
6718                                                    ;MASK VALUES -- BIT0 = HEADER CRC ERROR
6719                                                    ;             -- BIT1 = DATA FIELD CRC ERROR
6720                                                    ;             -- BIT2 = REP RESPONSE NUM<>R
6721
6722  037074  000              LBUFER: .BYTE 0          ;LOCAL BUFFER ERRORS (NAKS SENT
6723  037075  000              LBMASK: .BYTE 0          ;; REASONS = 8. OR 16.)
6724                                                    ;MASK VALUES -- BIT0 = BUFFER NOT AVAILABLE
6725                                                    ;             -- BIT1 = MESSAGE TOO LONG
6726
6727  037076  000              RBUFER: .BYTE 0          ;REMOTE BUFFER ERRORS (NAKS RECEIVED
6728  037077  000              RBMASK: .BYTE 0          ;REASONS 8. OR 16.)
6729                                                    ;MASK VALUES -- BIT0 = BUFFER NOT AVAILBLE
6730                                                    ;             -- BIT1 = MESSAGE TOO LONG
6731
6732  037100  000              RMSTER: .BYTE 0          ;REMOTE STATION ERRORS (NAKS RECEIVED
6733  037101  000              RMMASK: .BYTE 0          ;REASON 9. OR 17.)
6734                                                    ;MASK VALUES-- BIT0 = RECEIVER OVERRUN
6735                                                    ;              BIT1 = FORMAT ERROR
6736
6737  037102  000              LOSTER: .BYTE 0          ;LOCAL STATION ERRORS (NAKS SENT
6738  037103  000              LSMASK: .BYTE 0          ;; REASON 9. OR 17.)
6739                                                    ;MASK VALUES -- BIT0 = RECEIVER OVERRUN
6740                                                    ;             -- BIT1 = FORMAT ERROR
6741
6742  037104  000000           RXTXTE: .WORD 0          ;RX AND TX THRESHOLD ERRORS (OVERFLOWS)
6743  037106  000              SPARE0: .BYTE 0
6744  037107  000              SPARE1: .BYTE 0
6745  037110  000000           PROEND: .WORD 0          ;END OF PROTOCOL COUNTERS
6746  037112  000000           IMFLAG: .WORD 0          ;IMAGE OF MAIN CODE FLAG WORD
6747  037114  000000           RXPRC:  .WORD 0          ;-1 = MESSAGE RX'ED & 'ACK' SENT
6748  037116  000000           TXPRC:  .WORD 0          ;-1 = MESSAGE TX'ED & 'ACK' RECEIVED
6749  037120  000000           ASTRT:  .WORD 0          ;-1 = STACK SENT
6750  037122  000000           TXREADY:.WORD 0          ; 1 = READY TO SEND ANOTHER MESSAGE
6751  037124  000000           PRUN:   .WORD 0          ; 1 = PROTOCOL RUNNING. USED IN THIS MODULE
6752  037126  000000           MPPTP:  .WORD 0          ; 1 = MULTI POINT NETWORK
6753  037130  000000           SELECT: .WORD 0          ; 1 =THIS STATION CAN NOW TRANSMIT(HALF/DUPLEX)
6754  037132  000000           IMPRSTAT:.WORD 0         ; COPY OF PROTOCOL STATUS WORD
6755  037134  000000           PRFLAG: .WORD 0          ; USED TO COMMUNICATE WITH RX INTER. ROUTINE
6756  037136  000000           HDXMTP: .WORD 0          ; 1 = HALF DUPLEX OR MULTI-POINT
6757  037140  000000           PRTEMP: .WORD 0          ; TEMPORARY WORK LOCATION
6758  037142  000000           TURNON: .WORD 0          ; 1 = RECEIVER IS ALREADY ON
6759  037144  000000           TIMEOUT: .WORD 0         ; 20 = PRINT 'TX OR RX NOT COMPLETE'
6760
```

```
6761
6762
6763                            ;; NAK REASONS VALUES AS USED IN NAK CONTROL MESSAGES
6764
6765    000001                          HEADBCC = 1             ;HEADER BCC ERROR
6766    000002                          DATABCC = 2             ;DATA BCC ERROR
6767    000003                          REPSENT = 3             ;REP RESPONSE
6768    000010                          BUFFNA  = 10            ;BUFFER TEMPORARILY NOT AVAILABLE
6769    000011                          RXOVRUN = 11            ;RECEIVER OVERRUN
6770    000020                          MESLONG = 20            ;MESSAGE TOO LONG
6771    000021                          FORMERR = 21            ;HEADER FORMAT ERROR
6772
6773
6774                            ;; ADDITIONAL NAK BIT MASKS AS USED IN COUNTERS
6775
6776    000004                          REPMSK = BIT2           ;REPLY RESPONSE
6777    000001                          RXOVMSK= BIT0           ;RECEIVER OVERRUN
6778    000002                          FMTMSK = BIT1           ;FORMAT ERROR
6779    000002                          MTLMSK = BIT1           ;MESSAGE TOO LONG
6780    000001                          BNAMSK = BIT0           ;BUFFER NOT AVAILABLE
6781
6782                            ;; MESSAGE TYPE DEFINITIONS
6783
6784    000201                          SOH = 201               ;DATA MESSAGE
6785    000144                          MAINT = 144             ;MAINTENANCE MESSAGE
6786    000005                          ENQ = 5                 ;CONTROL MESSAGE
6787
6788
6789                            ;;SUBTYPES OF CONTROL MESSAGES
6790
6791    000001                          ACK = 1                 ;ACKNOWLEDGE MESSAGE
6792    000002                          NAK = 2                 ;NEGATIVE ACKNOWLEDGE MESSAGE
6793    000003                          REP = 3                 ;REPLY TO MESSAGE NUMBER
6794    000006                          STRT = 6                ;START MESSAGE
6795    000007                          STACK = 7               ;START ACKNOWLEDGE MESSAGE
6796
6797
6798                            ;;STATUS WORD BIT DEFINITIONS
6799
6800    000001                          BCCOK = BIT0            ;BCC CHECKED GOOD
6801    000002                          BCCBAD = BIT1           ;BCC CHECKED BAD
6802    000004                          SACK = BIT2             ;SEND ACK
6803    000010                          SNAK = BIT3             ;SEND NAK
6804    000020                          SDATA = BIT4            ;SEND DATA
6805    000100                          RXD = BIT6              ;RECEIVER DONE
6806    000400                          NAKRX = BIT8            ;NAK RECEIVED
6807    001000                          MYDATA = BIT9           ;MY DATA
6808    002000                          SSTACK = BIT10          ;SEND START ACKNOWLEDGE
6809    004000                          SSTART = BIT11          ;SEND START
6810
```

```
                        ;*****************************************************************************
                        ;       THE BELOW TABLES AND ASCIZ MESSAGES ARE USED IN DCLT
                        ;               REPORTING OF ERROR COUNTERS. THEY MUST REMAIN IN THE
                        ;               CURRENT SEQUENCE ELSE WE'LL BE REPORTING ERRONEOUS
                        ;               DATA.
                        ;*****************************************************************************

037146  037256          STALST: .WORD   STA0A           ;POINTER FOR OFFSET 0 ASCII
037150  037305                  .WORD   STA1A           ;POINTER FOR OFFSET 1 ASCII
037152  037343                  .WORD   STA2A           ;POINTER FOR OFFSET 2 ASCII
037154  037377                  .WORD   STA3A           ;POINTER FOR OFFSET 3 ASCII
037156  037471                  .WORD   STA4A           ;POINTER FOR OFFSET 4 ASCII
037160  037555                  .WORD   STA5A           ;POINTER FOR OFFSET 5 ASCII
037162  037635                  .WORD   STA6A           ;POINTER FOR OFFSET 6 ASCII
037164  037721                  .WORD   STA7A           ;POINTER FOR OFFSET 7 ASCII
037166  040003                  .WORD   STA10A          ;POINTER FOR OFFSET 10 ASCII
037170  040065                  .WORD   STA11A          ;POINTER FOR OFFSET 11 ASCII
037172  040162                  .WORD   STA12A          ;POINTER FOR OFFSET 12 ASCII
037174  040256                  .WORD   STA13A          ;POINTER FOR OFFSET 13 ASCII
037176  040354                  .WORD   STA14A          ;POINTER FOR OFFSET 14 ASCII
037200  040452                  .WORD   STA15A          ;POINTER FOR OFFSET 15 ASCII
037202  040540                  .WORD   STA16A          ;POINTER FOR OFFSET 16 ASCII
037204  040625                  .WORD   STA17A          ;POINTER FOR OFFSET 17 ASCII


                                ;TABLE FOR PRINT ROUTINES
                                ;PRIW: WORD ROUTINE
                                ;PRIBB: BYTE/BYTE ROUTINE
                                ;PRIBS: BYTE SPECIAL ROUTINE

037206  021640          STAIND: .WORD   PRIW
037210  021640                  .WORD   PRIW
037212  021640                  .WORD   PRIW
037214  021666                  .WORD   PRIBB
037216  021666                  .WORD   PRIBB
037220  021666                  .WORD   PRIBB
037222  021666                  .WORD   PRIBB
037224  021666                  .WORD   PRIBB
037226  021666                  .WORD   PRIBB
037230  021724                  .WORD   PRIBS
037232  021724                  .WORD   PRIBS
037234  021724                  .WORD   PRIBS
037236  021724                  .WORD   PRIBS
037240  021724                  .WORD   PRIBS
037242  021724                  .WORD   PRIBS
037244  021640                  .WORD   PRIW


037246  000000          LAST:   .WORD   0               ;LAST MESSAGE TO PRINT
037250  000000          FIR:    .WORD   0               ;FIRST MESSAGE TO PRINT
037252  000000          MES:    .WORD   0               ;HOLDS MESSAGE
037254  000000          MESDATA:.WORD   0               ;DATA PART OF MESSAGE
```

```
6864
6865                                    ;*****************************************************************************
6866                                    ;       THE BELOW ASCIZ MESSAGES USED IN 'RPT>' LEVEL OF DCLT
6867                                    ;
6868                                    .NLIST BEX
      037256  047045  047445  022466  STA0A:  .ASCIZ  /%N%O6%S2%ASTATUS FLAGS/
      037305     045  022516  033117  STA1A:  .ASCIZ  /%N%O6%S2%ADATA MSGS. TX'MITTD/
      037343     045  022516  033117  STA2A:  .ASCIZ  /%N%O6%S2%ADATA MSGS. RX'CVD/
      037377     045  022516  031517  STA3A:  .ASCIZ  /%N%O3%S5%AHIGHEST MSG # TX'D%N%O3%S5%AHIGHEST MSG # ACK'D/
      037471     045  022516  031517  STA4A:  .ASCIZ  /%N%O3%S5%ANEXT MSG # TO TX%N%O3%S5%ALAST MSG # TX'D/
      037555     045  022516  031517  STA5A:  .ASCIZ  /%N%O3%S5%AHIGHEST MSG # RX'D%N%O3%S5%ATRIB ADDR/
      037635     045  022516  031517  STA6A:  .ASCIZ  /%N%O3%S5%AREMOTE TIME OUTS%N%O3%S5%AGLOBAL CRC ERRS/
      037721     045  022516  031517  STA7A:  .ASCIZ  /%N%O3%S5%ANAK REASON%N%O3%S5%ASELECT THRESH. ERRS/
      040003     045  022516  031517  STA10A: .ASCIZ  /%N%O3%S5%ARX THRESH ERRS%N%O3%S5%ATX THRESH. ERRS/
      040065     045  022516  031517  STA11A: .ASCIZ  /%N%O3%S5%ADATA ERRORS OUT%N%S8%AHBCC %O1%A BCC %O1%A REP %O1/
      040162  047045  047445  022463  STA12A: .ASCIZ  /%N%O3%S5%ADATA ERRORS IN%N%S8%AHBCC %O1%A BCC %O1%A REP %O1/
      040256  047045  047445  022463  STA13A: .ASCIZ  /%N%O3%S5%ALOCAL BUFFER ERRS%N%S8%A NO BUFF %O1%A TOO BIG  %O1/
      040354  047045  047445  022463  STA14A: .ASCIZ  /%N%O3%S5%AREMOTE BUFFER ERRS%N%S8%A NO BUFF %O1%A TOO BIG %O1/
      040452  047045  047445  022463  STA15A: .ASCIZ  /%N%O3%S5%AREMOTE STA ERRS%N%S8%AOVRN %O1%A FORMAT %O1/
      040540  047045  047445  022463  STA16A: .ASCIZ  /%N%O3%S5%ALOCAL STA ERRS%N%S8%AOVRN %O1%A FORMAT %O1/
      040625     045  022516  033117  STA17A: .ASCIZ  /%N%O6%S2%ATX & RX THRESHOLD ERRORS(OVERFLOW)/
                                              .EVEN
                                    .LIST BEX
6869                                    ;*****************************************************************************
6870
6871
6872
6873
6874
6875
6876
6877
6878
6879
6880
```

```
6881
6882                            ;*****************************************************************************
6883                            ; PROTOCOL ROUTINE:
6884                            ;
6885                            ;       DESCRIPTION: IF THE USER SPECIFIES THE '/PROTOCOL' SWITCH THIS
6886                            ;                    ROUTINE WILL BE CALLED. THIS ROUTINE DECIDES IF
6887                            ;                    WE ARE TRANSMITTING AND/OR RECEIVING AND CALLS
6888                            ;                    THE NECESSARY DDCMP PROTOCOL ROUTINES.
6889                            ;
6890                            ;*****************************************************************************
6891
6892
6893  040702 013737 006600 037112  PROTOC: MOV     FLAG,IMFLAG     ;SAVE COPY OF MAIN CODE 'FLAG' VARIABLE
6894  040710 012737 000001 037122          MOV     #1,TXREADY      ;INIT TRANSMIITER DONE FLAG
6895  040716 005037 037114                 CLR     RXPRC           ;INIT RX PROCOTOL DONE
6896  040722 005037 037116                 CLR     TXPRC           ;INIT TX PROCOTOL DONE
6897  040726 005037 037144                 CLR     TIMEOUT         ;INIT PRINT TIMER
6898  040732 032737 000100 006574          BIT     #PRORUN,PARAM   ;PROTOCOL RUNNING ?
6899  040740 001067                        BNE     7$              ;YES,BRANCH
6900
6901                            ;; PROTOCOL NOT RUNNING -- SO FIRE UP THE LINK
6902  040742                               SETVEC  INVEC,#PRRXI,#PRI04     ;LOAD RX PROTOCOL INTERRUPT ROUTINE
6903  040742 012746 000200                                                         MOV     #PRI04,-(SP)
6904  040746 012746 044504                                                         MOV     #PRRXI,-(SP)
6905  040752 013746 011464                                                         MOV     INVEC,-(SP)
6906  040756 012746 000003                                                         MOV     #3,-(SP)
6907  040762 104437                                                                TRAP    C$SVEC
6908  040764 062706 000010                                                         ADD     #10,SP
6909  040770 005037 037136                 CLR     HDXMTP          ;INIT HALF DUPLEX/MULTI-POINT FLAG
6910  040774 005737 006572                 TST     FHDPLX          ;HALF DUPLEX ?
6911  041000 001403                        BEQ     2$              ;YES,BRANCH
6912  041002 005737 037126                 TST     MPPTP           ;MULTI POINT ?
6913  041006 001403                        BEQ     3$              ;NO,BRANCH
6914  041010 012737 000001 037136  2$:     MOV     #1,HDXMTP       ;SET HALF DUPLEX/MULTI-POINT
6915
6916  041016 012737 000036 006644  3$:     MOV     #30.,TIMERS     ;30 SECONDS TO START
6917  041024 012737 000001 037130          MOV     #1,SELECT       ;INIT SELECT
6918  041032 005037 037142                 CLR     TURNON          ;INIT YET ANOTHER FLAG
6919  041036 005037 037124                 CLR     PRUN            ;INIT ANOTHER FLAG
6920  041042 005037 037120                 CLR     ASTRT           ;INIT 'STACK SENT' FLAG
6921  041046 005037 037046                 CLR     PRSTAT          ;INIT STATUS WORD
6922  041052 004737 041730                 JSR     PC,PROINT       ;INIT PROTOCOL COUNTERS AND VARIABLES
6923  041056 005737 037126                 TST     MPPTP           ;MULTI - POINT MODE ?
6924  041062 001005                        BNE     4$              ;YES,BRANCH
6925  041064 052737 004000 037046          BIS     #SSTART,PRSTAT  ;TELL TX ROUTINE TO SEND 'START'
6926  041072 004737 045350                 JSR     PC,TXPROTO      ;GO SEND IT
6927  041076 004737 042100         4$:     JSR     PC,RXPROTO      ;GO WAIT FOR 'STACK' OR 'START'
6928  041102 032737 000100 006574          BIT     #PRORUN,PARAM   ;DID PROTOCOL START ?
6929  041110 001742                        BEQ     3$              ;NO,TRY AGAIN
6930  041112 012737 000001 037124          MOV     #1,PRUN         ;THIS FLAG USED IN RXPROTO ROUTINE
6931
6932                            ;; IF HALF DUPLEX OR MULTI POINT, WE MUST MANAGE THE LINK DIFFERENTLY
6933  041120 012737 000003 006644  7$:     MOV     #3.,TIMERS      ;SET UP TIMER
6934  041126 005737 037136                 TST     HDXMTP          ;HALF DUPLEX OR MULTI - POINT?
6935  041132 001076                        BNE     PROHDX          ;YES,BRANCH
6936
```

```
                                ;; IF FULL DUPLEX AND ACTIVE MODE-- JUMP
041134  022737  000003  006566          CMP     #ACT.MODTYP     ;ACTIVE MODE?
041142  001440                        BEQ     200$            ;YES, BRANCH

                                ;; PROTOCOL IS RUNNING -- LINK IS HOT SO SEND DATA

041144  032737  000010  037112  10$:    BIT     #QTX.IMFLAG     ;TRANSMITTING A MESSAGE ?
041152  001414                        BEQ     100$            ;NO,BRANCH
041154  052737  000020  037046  20$:    BIS     #SDATA.PRSTAT   ;SEND DATA FLAG
041162  004737  045350                CALL    TXPROTO         ;GO SEND THE MESSAGE
041166  004737  042100                CALL    RXPROTO         ;CHECK THE REPLY
041172  005737  037116                TST     TXPRC           ;MESSAGE TRANSMITTED & ''ACK'ED''?
041176  001766                        BEQ     20$             ;NO,BRANCH
041200  005237  037050                INC     TMESTX          ;BUMP ''TOTAL MESSAGES TRANSMITTED'' COUNTER

041204  005737  037114  100$:   TST     RXPRC           ;RECEIVE PROTOCOL FINISHED ?
041210  001011                        BNE     110$            ;YES,BRANCH
041212  032737  000004  037112        BIT     #QRX.IMFLAG     ;RECEIVING A MESSAGE ?
041220  001002                        BNE     105$            ;YES,BRANCH
041222  000137  041670                JMP     PROTEX          ;EXIT

041226  004737  042100  105$:   CALL    RXPROTO         ;GO PROCESS INCOMING MESSAGE
041232  000764                        BR      100$            ;SEE IF RECEIVE PROTOCOL COMPLETE
041234  005237  037052  110$:   INC     TMESRX          ;BUMP ''TOTAL MESSAGES RECEIVED'' COUNTER
041240  000137  041670                JMP     PROTEX          ;EXIT

                                ;; ACTIVE MODE (FULL DUPLEX AND POINT TO POINT LINKS)

041244  004737  041774  200$:   CALL    RXON            ;TURN ON RECEIVER
041250  052737  000020  037046  210$:   BIS     #SDATA,PRSTAT   ;SEND DATA FLAG
041256  004737  045350                CALL    TXPROTO         ;DO SEND DATA MESSAGE
041262  004737  042100  215$:   CALL    RXPROTO         ;GO PROCESS INCOMING MESSAGE
041266  005737  037116                TST     TXPRC           ;TX PROTOCOL DONE ?
041272  001766                        BEQ     210$            ;NO,BRANCH
041274  005737  037114                TST     RXPRC           ;RX PROTOCOL DONE ?
041300  001770                        BEQ     215$            ;NO,BRANCH
041302  005237  037052                INC     TMESRX          ;BUMP 'TOTAL MESSAGES RECEIVED'
041306  005237  037050                INC     TMESTX          ;BUMP ''TOTAL MESSAGE SENT'' COUNTER

                                ;; TXREADY SET IN TX INTERRUPT ROUTINE
041312  005737  037122  220$:   TST     TXREADY         ;MESSAGE SENT ?
041316  001775                        BEQ     220$            ;NO,BRANCH
041320  004737  041774                CALL    RXON            ;TURN ON RECEIVER
041324  000137  041670                JMP     PROTEX          ;EXIT

                                ;;; THIS ROUTINE(PROHDX) IS USE IN HALF-DUPLEX PT-PT & MTP

041330                          PROHDX:
041330  005737  006572  10$:    TST     FHDPLX          ;FULL DUPLEX ?
041334  001072                        BNE     PROFDX          ;YES,BRANCH
041336  032737  000010  037112        BIT     #QTX,IMFLAG     ;TRANSMITTING ?
041344  001424                        BEQ     100$            ;NO,BRANCH
041346  005737  037130  20$:    TST     SELECT          ;DO WE HAVE THE SELECT BIT ?
```

```
                                        BNE     30$             ;YES,BRANCH
                                        CALL    RXON            ;TURN ON RX
                                25$:    CALL    RXWAIT          ;TURN ON RX AND WAIT FOR SELECT BIT
                                        BR      20$             ;DID WE GET THE SELECT BIT ?
                                30$:    BIS     #SDATA,PRSTAT   ;SEND DATA FLAG
                                        CALL    TXPROTO         ;GO SENT IT
                                        CALL    RXPROTO         ;CHECK REPLY
                                        TST     TXPRC           ;TX PROTOCOL DONE ?
                                        BEQ     20$             ;NO,BRANCH
                                        INC     TMESTX          ;BUMP TOTAL MESSAGES SENT
                                100$:   MOV     #1,TXPRC        ;SET TX PROTOCOL DONE
                                103$:   TST     RXPRC           ;RX PROTOCOL DONE ?
                                        BNE     150$            ;YES,BRANCH
                                        BIT     #QRX,IMFLAG     ;RECEIVING ?
                                        BNE     110$            ;YES,BRANCH
                                        JMP     PROTEX          ;EXIT
                                ;;WAS THE BALL TOSSED BACK IN OUR COURT ?
                                110$:   TST     SELECT          ;HAVE WE RECEIVED THE SELECT BIT YET?
                                        BNE     130$            ;YES,BRANCH
                                        CALL    RXON            ;TURN ON RECEIVER
                                115$:   CALL    RXWAIT          ;PROCESS DATA
                                        BR      103$            ;TRY AGAIN
                                130$:   BIS     #SACK,PRSTAT    ;SEND ACK TO TURN THE LINE AROUND
                                        CALL    TXPROTO         ;SEND IT
                                        CALL    RXPROTO         ;GO RECEIVE THE PENDING MESSAGE
                                        BR      103$            ;BRANCH
                                150$:   INC     TMESRX          ;BUMP'RECIEVED MESSAGE COUNTER'
                                        CALL    RXON            ;TURN ON RX
                                        JMP     PROTEX          ;EXIT

                                ;;THIS ROUTINE(PROFDX:) USED WITH FULL DUPLEX-MULTI POINT LINKS

                                PROFDX: BIT     #QTX,IMFLAG     ;TRANSMITTING ?
                                        BNE     10$             ;YES,BRANCH
                                        MOV     #1,TXPRC        ;SET TRANSMIT PROTOCOL COMPLETE
                                10$:    TST     RXPRC           ;WAS THE 1ST MESSAGE RX'ED DURING STARTUP?
                                        BNE     30$             ;YES,BRANCH
                                        BIT     #QRX,IMFLAG     ;RECEIVING ?
                                        BNE     20$             ;YES,BRANCH
                                        MOV     #1,RXPRC        ;SET RECEIVE PROTOCOL COMPLETE
                                        BR      100$            ;BRANCH
                                20$:    CALL    RXPROTO         ;PROCESS INCOMING MESSAGE
                                        TST     RXPRC           ;DONE ?
                                        BEQ     20$             ;NO,BRANCH
                                30$:    INC     TMESRX          ;BUMP RX MESSAGE COUNT
                                        BR      100$            ;BRANCH

                                100$:   TST     TXPRC           ;ANYTHING TO SEND ?
                                        BNE     135$            ;NO,BRANCH

                                120$:   TST     SELECT          ;DO WE HAVE PERMISSION TO SEND ?
                                        BNE     130$            ;YES,BRANCH
                                        CALL    RXON            ;TURN ON TX
                                125$:   CALL    RXWAIT          ;WAIT ON SELECT BIT
                                        BR      120$            ;TRY AGAIN
                                130$:   BIS     #SDATA,PRSTAT   ;SEND DATA FLAG
```

```
 7049  041642  004737  045350                  CALL    TXPROTO         ;SEND DATA
 7050  041646  004737  042100                  CALL    RXPROTO         ;CHECK REPLY
 7051  041652  005737  037116                  TST     TXPRC           ;TRANSMIT PROTOCOL DONE ?
 7052  041656  001756                          BEQ     120$            ;NO,TRY AGAIN
 7053  041660  005237  037050                  INC     TMESTX          ;BUMP 'TOTAL MESSAGE SENT' COUNTER
 7054  041664  004737  041774          135$:   CALL    RXON            ;TURN ON RX SO THAT WE WON'T MISS ANY MESSAGES
 7055                                                                  ;; WHILE WE AWAY.
 7056  041670  022737  177777  037052  PROTEX: CMP     #-1,TMESRX      ;;MAX?
 7057  041676  001002                          BNE     10$             ;NO,BRANCH
 7058  041700  005337  037052                  DEC     TMESRX          ;LATCH AT 177776
 7059  041704  022737  177777  037050  10$:    CMP     #-1,TMESTX      ;MAX?
 7060  041712  001002                          BNE     15$             ;NO,BRANCH
 7061  041714  005337  037050                  DEC     TMESTX          ;LATCH AT 177776
 7062  041720  013737  037112  006600  15$:    MOV     IMFLAG,FLAG     ;RESTORE 'FLAG' TO ITS ORIGINAL VALUE
 7063  041726  000207                          RTS     PC              ;EXIT
 7064
 7065
```

```
;*****************************************************************************
;
;       PROTOCOL INIT ROUTINE:
;
;               THIS ROUTINE WILL INITIALIZE THE ERROR COUNTERS AND  MESSAGE
;               COUNTERS AS NEEDED FOR PROPER DDCMP PROTOCOL OPERATION.
;               DURING NORMAL OPERATION THIS CODE WILL BE CALLED ONCE FROM
;               PROTOCOL STARTUP ROUTINE.
;
;*****************************************************************************

041730  010146                  PROINT: MOV     R1,-(SP)        ;SAVE R1
041732  113737  037061  006534          MOVB    TRIBN,TEMP      ;SAVE TRIB NUMBER
041740  012701  037046                  MOV     #PRSTAT,R1      ;FIRST LOCATION TO CLEAR
041744  005021                  10$:    CLR     (R1)+           ;CLEAR AND INCREMENT
041746  020127  037110                  CMP     R1,#PROEND      ;LAST LOCATION TO CLEAR
041752  001374                  BNE     10$             ;NO,BRANCH
041754  113737  006534  037061  20$:    MOVB    TEMP,TRIBN      ;RESTORE TRIB #
041762  112737  000001  037056          MOVB    #1,T            ;FIRST MESSAGE # TO BE TRANMITTED
041770  012601                  MOV     (SP)+,R1        ;RESTORE R1
041772  000207                  RETURN                  ;EXIT

;*****************************************************************************
; TURN ON RECEIVER ROUTINE:
;
;       DESCRIPTION: THIS ROUTINE SIMPLY ENABLES THE RECEIVER AND
;                       INITIALIZES VARIABLES.
;
;*****************************************************************************

041774  005737  037142          RXON:   TST     TURNON          ;RX ALREADY ON ?
042000  001036                  BNE     RXONEX          ;YES,BRANCH
042002  005037  037046                  CLR     PRSTAT          ;INIT STATUS WORD
042006  005037  002656                  CLR     RHDMSG          ;INIT 1ST WORD OF RX BUFFER
042012  042737  000444  037134          BIC     #QRX!#BCC!#RXM,PRFLAG   ;FLAGS USED IN RX INTERRUPT ROUTINE
042020  052737  001000  037046          BIS     #MYDATA,PRSTAT  ;ASSUME MESSAGE FOR ME
042026  012737  002657  011512          MOV     #RHDMID,RMSGPT  ;BUFFER ADDRESS FOR HEADER PART ON MESSAGE
042034  013737  002654  011514          MOV     HDMC,RMSGC      ;INIT CHARACTER COUNT = 6
042042  032737  000010  006574          BIT     #MOCHK,PA  M    ;MODEM CHANGES WANTED ?
042050  001004                  BNE     20$             ;YES,BRANCH
042052  052777  000120  147372          BIS     #RINTEN!R  NA,@RXCSR    ;TURN ON RX
042060  000403                  BR      25$             ;BRANCH
042062  052777  000160  147362  20$:    BIS     #RINTEN!RX  NA!DSITEN,@RXCSR    ;TURN ON RX
042070  012737  000001  037142  25$:    MOV     #1,TURNON       ;RX IS ON FLAG
042076  000207                  RXONEX: RETURN
```

```
                        ;*****************************************************************************
                        ; RECEIVER PROTOCOL ROUTINE:
                        ;
                        ;       DESCRIPTION: THIS ROUTINE WILL PROCESS AN INCOMING MESSAGE
                        ;                    AND DETERMINE IF IT'S A VALID CONTROL OR DATA
                        ;                    MESSAGE. IF AN ERROR IS DETECTED THE APPROIATE
                        ;                    ERROR COUNTERS WILL BE UPDATED BY THE ERROR
                        ;                    ROUTINE.
                        ;
                        ;       SUBORDINATE ROUTINES USED: 'TXPROTO''
                        ;                                  ''ERROR PROCESSOR''
                        ;
                        ;*****************************************************************************


042100                  RXPROTO:
042100  004737  041774          CALL    RXON            ;TURN ON RECEIVER
                        ;; WAIT FOR FIRST CHARACTER TO APPEAR IN RX BUFFER
042104                  RXWAIT:
042104                  20$:    BREAK                   ;CHECK FOR ^C
042104  104422                                                          TRAP    C$BRK
042106  105737  002657          TSTB    RHDMID          ;FIRST CHARACTER READ ?
042112  001007                  BNE     30$             ;YES, BRANCH
042114  005737  006644          TST     TIMERS          ;60 SECONDS ELAPSED ?
042120  001371                  BNE     20$             ;NO,BRANCH
042122  004737  043726          JSR     PC,ERRPRC       ;CALL ERROR PROCESSOR
042126  000137  043724          JMP     RXPREX          ;EXIT


                        ;; IF A CONTROL MESSAGE THEN TELL RX INTR. TO PROCESS HEADER ONLY
042132  123727  002657  000005  30$:    CMPB    RHDMID,#ENQ     ;CONTROL MESSAGE ?
042140  001003                  BNE     40$             ;NO,BRANCH
042142  052737  000040  037134          BIS     #RXM,PRFLAG     ;PROCESS HEADER ONLY

                        ;; WAIT FOR CRC TO BE CHECKED
042150  032737  000003  037046  40$:    BIT     #BCCOK!BCCBAD,PRSTAT    ;CRC CHECKED ?
042156  001021                  BNE     50$                     ;YES,BRANCH
042160  005737  006644          TST     TIMERS          ;60 SECONDS ELAPSED ?
042164  001004                  BNE     45$             ;NO,BRANCH
042166  004737  043726          JSR     PC,ERRPRC       ;GO PROCESS ERROR
042172  000137  042100          JMP     RXPROTO         ;TRY AGAIN
```

```
 7158
 7159                                   ;; CHECK THAT RX WAS SERVICED QUICK ENOUGH(DETERMINED BY RX INTER. ROUTINE)
 7160  042176  032737  000010  037046  45$:    BIT     #SNAK,PRSTAT    ;RX OVERRUN ?
 7161  042204  001761                          BEQ     40$             ;NO,BRANCH
 7162  042206  004737  043726                  JSR     PC,ERRPRC       ;GO PROCESS ERROR
 7163  042212  004737  045350                  JSR     PC,TXPROTO      ;GO SEND NAK
 7164  042216  000137  042100                  JMP     RXPROTO         ;TRY AGAIN
 7165
 7166                                   ;; IF HEADER CRC ERROR THEN LOG IT AND SEND NAK
 7167  042222  032737  000002  037046  50$:    BIT     #BCCBAD,PRSTAT  ;CRC ERROR ?
 7168  042230  001430                          BEQ     60$             ;NO,BRANCH
 7169  042232  052737  000010  037046          BIS     #SNAK,PRSTAT    ;SET SNAK (SEND NAK)
 7170  042240  152737  000001  037073          BISB    #HEADBCC,INMASK ;SET THE MASK
 7171  042246  112737  000001  037064          MOVB    #HEADBCC,REANAK ;NAK REASON = 1
 7172  042254  105237  037072                  INCB    DERIN           ;LOG DATA ERROR INBOUND
 7173  042260  001003                          BNE     55$             ;BRANCH IF NOT OVERFLOW
 7174  042262  112737  000377  037072          MOVB    #377,DERIN      ;LATCH COUNTER AT 256.
 7175  042270  004737  043726          55$:    JSR     PC,ERRPRC       ;GO PROCESS ERROR
 7176  042274  012737  000001  037130          MOV     #1,SELECT       ;ASSUME S-BIT WAS SET IN FAULTY MESSAGE
 7177  042302  004737  045350                  JSR     PC,TXPROTO      ;GO SEND NAK
 7178  042306  000137  042100                  JMP     RXPROTO         ;TRY AGAIN
 7179
 7180                                   ;; NOW CHECK THE ADDRESS OF THE MESSAGE- IS IT FOR ME ?
 7181  042312  123737  037061  002664  60$:    CMPB    TRIBN,RHDADR    ;MY ADDRESS ?
 7182  042320  001422                          BEQ     70$             ;YES, BRANCH
 7183
 7184                                   ;; ITS NOT FOR ME, BUT COUNT IT OUT TO KEEP RX IN SYNC
 7185  042322  042737  001000  037046  62$:    BIC     #MYDATA,PRSTAT  ;MESSAGE NOT FOR ME
 7186  042330  032737  000100  037046          BIT     #RXD,PRSTAT     ;RECEIVER DONE ?
 7187  042336  001003                          BNE     65$             ;YES,BRANCH
 7188  042340  005737  006644                  TST     TIMERS          ;HAVE WE DAWDLED LONG ENOUGH ?
 7189  042344  001366                          BNE     62$             ;NO,BRANCH
 7190
 7191  042346  032737  000001  037046  65$:    BIT     #BCCOK,PRSTAT   ;DATA CRC OK ?
 7192  042354  001002                          BNE     67$             ;YES,BRANCH
 7193  042356  105237  037063                  INCB    GLOBCC          ;LOG GLOBAL CRC ERROR
 7194  042362  000137  042100          67$:    JMP     RXPROTO         ;GO RE-QUE BUFFER
 7195
 7196
 7197                                   ;; IS IT A CONTROL MESSAGE ? IF IT IS PROCESS IT
 7198
 7199  042366  105037  037066  70$:    CLRB    RXTHER          ;INIT RX THRESHOLD ERROR COUNTER
 7200  042372  122737  000005  002657          CMPB    #ENQ,RHDMID     ;CONTROL MESSAGE ?
 7201  042400  001402                          BEQ     75$             ;YES,BRANCH
 7202  042402  000137  043252                  JMP     200$            ;GO PROCESS DATA MESSAGE
 7203
 7204                                   ;; IS IT A NAK ?
 7205  042406  122737  000002  002660  75$:    CMPB    #NAK,RHDTYP     ;NAK?
 7206  042414  001022                          BNE     90$             ;NO,BRANCH
 7207  042416  032737  000100  006574          BIT     #PRORUN,PARAM   ;PROTOCOL RUNNING ?
 7208  042424  001002                          BNE     80$             ;YES,BRANCH
 7209  042426  000137  042100                  JMP     RXPROTO         ;IGNORE THIS MESSAGE
 7210  042432  052737  000400  037046  80$:    BIS     #NAKRX,PRSTAT   ;FLAG NAK RECEIVED
 7211  042440  004737  043726                  JSR     PC,ERRPRC       ;GO LOG NAK REASON
 7212  042444  052737  000020  037046          BIS     #SDATA,PRSTAT   ;SEND DATA
 7213  042452  004737  045350                  JSR     PC,TXPROTO      ;GO RE-TRANSMIT PREVIOUS MESSAGE
```

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  7214  042456  000137  042100                JMP     RXPROTO         ;GO RE-QUE RX
```

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7215
7216                                        ;; IS IT A ACK ?
7217  042462  122737  000001  002660  90$:    CMPB    #ACK,RHDTYP     ;ACK ?
7218  042470  001057                         BNE     100$            ;NO,BRANCH
7219  042472  032737  000100  006574         BIT     #PRORUN,PARAM   ;PROTOCOL RUNNING ?
7220  042500  001004                         BNE     93$             ;YES,BRANCH
7221  042502  052737  000100  006574         BIS     #PRORUN,PARAM   ;TELL THE WORLD THAT LINK HAS STARTED
7222  042510  000445                         BR      97$             ;EXIT
7223  042512  123737  037056  002662  93$:    CMPB    T,RHDREP        ;CORRECT MESSAGE # ACKNOWLEDGED ?
7224  042520  001405                         BEQ     95$             ;YES,BRANCH
7225  042522  005737  037136                 TST     HDXMTP          ;HALF DUPLEX/MULTI -POINT ?
7226  042526  001036                         BNE     97$             ;YES,BRANCH
7227  042530  000137  042100                 JMP     RXPROTO         ;TRY AGAIN
7228  042534  105037  037067         95$:    CLRB    TXTHER          ;INIT. TX THRESHOLD COUNTER
7229  042540  113737  037056  037054         MOVB    T,N             ;HIGHEST SEQUENTIAL MESSAGE # SENT
7230  042546  113737  037056  037057         MOVB    T,X             ;HIGHEST MESSAGE # SENT
7231  042554  113737  002662  037055         MOVB    RHDREP,A        ;HIGHEST MESSAGE # ACKNOWLEDGED TO THIS STATION
7232  042562  105237  037056                 INCB    T               ;# OF NEXT DATA MESSAGE TO BE TRANSMITTED
7233  042566  012737  177777  037116         MOV     #-1,TXPRC       ;TRANSMIT PROTOCOL COMPLETE
7234  042574  022737  000003  006566         CMP     #ACT,MODTYP     ;ACTIVE MODE ?
7235  042602  001010                         BNE     97$             ;NO,BRANCH
7236  042604  005737  037114                 TST     RXPRC           ;RX PROTOCOL COMPLETE?
7237  042610  001005                         BNE     97$             ;YES,BRANCH
7238  042612  005737  006572                 TST     FHDPLX          ;HALF DUPLEX?
7239  042616  001402                         BEQ     97$             ;YES,BRANCH
7240  042620  000137  042100                 JMP     RXPROTO         ;GO PROCESS INCOMING MESSAGE
7241
7242  042624  000137  043724         97$:    JMP     RXPREX          ;EXIT
7243
7244                                        ;; IS IT A REP ?
7245  042630  122737  000003  002660  100$:   CMPB    #REP,RHDTYP     ;REP ?
7246  042636  001054                         BNE     150$            ;NO,BRANCH
7247
7248                                        ;; NUM = R ?
7249  042640  032737  000100  006574         BIT     #PRORUN,PARAM   ;PROTOCOL RUNNING ?
7250  042646  001002                         BNE     110$            ;YES,BRANCH
7251  042650  000137  042100                 JMP     RXPROTO         ;IGNORE MESSAGE- TRY AGAIN
7252  042654  123737  002663  037060  110$:   CMPB    RHDNUM,R        ;HAVE WE RECEIVED THIS MESSAGE ?
7253  042662  001015                         BNE     120$            ;NO, BRANCH
7254  042664  052737  000004  037046         BIS     #SACK,PRSTAT    ;SET SEND ACK
7255  042672  105237  037062                 INCB    REMTMO          ;BUMP REMOTE TIME OUT COUNTER
7256  042676  001003                         BNE     115$            ;BRANCH IF NOT OVERFLOW
7257  042700  112737  000377  037062         MOVB    #377,REMTMO     ;LATCH COUNTER AT 256.
7258  042706  004737  045350         115$:   JSR     PC,TXPROTO      ;GO SEND ACK
7259  042712  000137  042100                 JMP     RXPROTO         ;TRY AGAIN
7260
7261                                        ;; NUM <> R
7262  042716  052737  000010  037046  120$:   BIS     #SNAK,PRSTAT    ;SET SEND NAK
7263  042724  112737  000003  037064         MOVB    #REPSENT,REANAK ;SET REASON FOR NAK
7264  042732  105237  037072                 INCB    DERIN           ;BUMP DATA ERROR INBOUND
7265  042736  001003                         BNE     125$            ;BRANCH IF NOT OVERFLOW
7266  042740  112737  000377  037072         MOVB    #377,DERIN      ;LATCH AT 256.
7267  042746  152737  000004  037073  125$:   BISB    #REPMSK,INMASK  ;ERROR REASON IS REMOTE TIME OUT
7268  042754  004737  043726                 JSR     PC,ERRPRC       ;PROCESS NAK
7269  042760  004737  045350                 JSR     PC,TXPROTO      ;GO SEND NAK
7270  042764  000137  042100                 JMP     RXPROTO         ;TRY AGAIN
```

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7271
7272                                        ;; IS IT A START ?
7273  042770  122737  000006  002660  150$:  CMPB    #STRT,RHDTYP    ;START ?
7274  042776  001071                       BNE     170$            ;NO,BRANCH
7275  043000  032737  000100  006574       BIT     #PRORUN,PARAM   ;PROTOCOL RUNNING ?
7276  043006  001007                       BNE     160$            ;YES,BRANCH
7277  043010  052737  002000  037046       BIS     #SSTACK,PRSTAT  ;SEND START ACKNOWLEDGE
7278  043016  004737  045350               JSR     PC,TXPROTO      ;GO SEND STACK
7279  043022  000137  042100               JMP     RXPROTO         ;GO TO RX ROUTINE AND EXPECT ACK OR DATA
7280                                                               ;; IF DMV OR DMP.
7281
7282  043026  052737  000200  006574  160$:  BIS     #ABORT,PARAM    ;TELL MAIN CODE TO ABORT!!
7283  043034  012737  177777  037114       MOV     #-1,RXPRC       ;RECEIVE PROTCOL DONE
7284  043042  012737  177777  037116       MOV     #-1,TXPRC       ;TRANSMIT PROTOCOL DONE
7285  043050                               PRINTF  #165$           ;FATAL ERROR
7286  043050  012746  043074                                                       MOV     #165$,-(SP)
7287  043054  012746  000001                                                       MOV     #1,-(SP)
7288  043060  010600                                                             MOV     SP,R0
7289  043062  104417                                                             TRAP    C$PNTF
7290  043064  062706  000004                                                     ADD     #4,SP
7291  043070  000137  043724               JMP     RXPREX          ;EXIT
7292
7293                                      .NLIST BEX
      043074  047045  040445  052123  165$:  .ASCIZ  /%N%ASTART RECEIVED WITH PROTOCOL RUNNING--ABORTING!!/
              043162                       .EVEN
                                         .LIST BEX
7294
7295                                        ;; IS IT A STACK ? IF SO SEND AN 'ACK'
7296
7297  043162  122737  000007  002660  170$:  CMPB    #STACK,RHDTYP   ;STACK ?
7298  043170  001012                       BNE     180$            ;NO, BRANCH
7299  043172  052737  000004  037046       BIS     #SACK,PRSTAT    ;TELL TX ROUTINE TO SEND ACK
7300  043200  004737  045350               JSR     PC,TXPROTO      ;SEND ACK
7301  043204  052737  000100  006574       BIS     #PRORUN,PARAM   ;SET 'PROTOCOL RUNNING' FLAG
7302  043212  000137  043724               JMP     RXPREX          ;EXIT
7303
7304
7305                                        ;; IF WE GOT TO HERE, WE HAVE A STRANGE PROBLEM !
7306  043216  052737  000010  037046  180$:  BIS     #SNAK,PRSTAT    ;SET SEND NAK FLAG
7307  043224  105237  037102               INCB    LOSTER          ;LOCAL STATION ERROR
7308  043230  152737  000021  037103       BISB    #FORMERR,LSMASK ;FORMAT ERROR
7309  043236  004737  043726               JSR     PC,ERRPRC       ;PROCESS ERROR
7310  043242  004737  045350               JSR     PC,TXPROTO      ;SEND NAK
7311  043246  000137  042100               JMP     RXPROTO         ;TRY AGAIN
7312                                      ;; END OF CONTROL MESSAGE PROCESSOR
7313
7314
7315
```

```
 7316
 7317                                   ;;;HERE WE BEGIN PROCESSING DATA PART OF MESSAGE
 7318
 7319  043252  005737  037114          200$:   TST     RXPRC           ;ALREADY PROCESSED A MESSAGE?
 7320  043256  001432                          BEQ     215$            ;NO,BRANCH
 7321  043260  042737  001000  037046          BIC     #MYDATA,PRSTAT  ;TELL RX INTERRUPT ROUTINE NOT TO STORE THIS
 7322  043266  005737  037116                  TST     TXPRC           ;TX PROTOCOL COMPLETE ?
 7323  043272  001037                          BNE     220$            ;YES,BRANCH
 7324                                   ;; SEE IF IMPLICIT ACK IMBEDDED IN THIS MESSAGE
 7325  043274  123737  037056  002662          CMPB    T,RHDREP        ;RESP = MESSAGE SENT?
 7326  043302  001033                          BNE     220$            ;NO,BRANCH
 7327  043304  113737  037056  037054          MOVB    T,N             ;HIGHEST # SENT
 7328  043312  113737  037056  037057          MOVB    T,X             ;HIGHEST # SENT
 7329  043320  113737  037056  037055          MOVB    T,A             ;HIGHEST MESSAGE ACK'ED
 7330  043326  105237  037056                  INCB    T               ;NEXT MESSAGE TO SEND
 7331  043332  012737  177777  037116          MOV     #-1,TXPRC       ;TX PROTOCOL FINISHED
 7332  043340  000137  043724                  JMP     RXPREX          ;EXIT
 7333
 7334  043344  105237  037060          215$:   INCB    R               ;EXPECTED #?
 7335  043350  123737  037060  002663          CMPB    R,RHDNUM        ;CORRECT MESSAGE #?
 7336  043356  001423                          BEQ     300$            ;YES,PROCESS IT
 7337  043360  105337  037060                  DECB    R               ;SUBTRACT 1
 7338  043364  042737  001000  037046          BIC     #MYDATA,PRSTAT  ;JUST COUNT OUT MESSAGE-DON'T PUT IN BUFFER
 7339  043372  032737  000100  037046  220$:   BIT     #RXD,PRSTAT     ;WAIT FOR DONE
 7340  043400  001003                          BNE     250$            ;BRANCH
 7341  043402  005737  006644                  TST     TIMERS          ;TIME OUT?
 7342  043406  001371                          BNE     220$            ;NO,BRANCH
 7343
 7344                                   ;;SEND AN "ACK"
 7345  043410  052737  000004  037046  250$:   BIS     #SACK,PRSTAT    ;SEND ACK
 7346  043416  004737  045350                  CALL    TXPROTO         ;GO SEND IT
 7347  043422  000137  042100                  JMP     RXPROTO         ;TRY AGAIN
 7348
 7349                                   ;; IS DATA PART OF MESSAGE COMPLETE ?
 7350  043426  032737  000100  037046  300$:   BIT     #RXD,PRSTAT     ;MESSAGE COMPLETE ?
 7351  043434  001021                          BNE     330$            ;YES,BRANCH
 7352
 7353                                   ;; IS THE LINE DEAD ?
 7354  043436  005737  006644                  TST     TIMERS          ;TIMED-OUT ?
 7355  043442  001004                          BNE     305$            ;NO,BRANCH
 7356  043444  004737  043726                  JSR     PC,ERRPRC       ;GO PROCESS TIMER ERROR
 7357  043450  000137  042100                  JMP     RXPROTO         ;TRY AGAIN
 7358
 7359                                   ;; CHECK FOR RECEIVER OVERRUN OR BUFFER PROBLEM
 7360  043454  032737  000010  037046  305$:   BIT     #SNAK,PRSTAT    ;DID RX INTERRUPT SET THIS ?
 7361  043462  001761                          BEQ     300$            ;NO,BRANCH
 7362
 7363                                   ;;RX ERROR SEND A NAK AND TRY AGAIN
 7364  043464  004737  043726                  JSR     PC,ERRPRC       ;GO PROCESS ERROR
 7365  043470  004737  045350                  JSR     PC,TXPROTO      ;SEND NAK
 7366  043474  000137  042100                  JMP     RXPROTO         ;TRY AGAIN
 7367
 7368                                   ;;CHECK FOR DATA CRC ERROR
 7369  043500  032737  000001  037046  330$:   BIT     #BCCOK,PRSTAT   ;DATA CRC GOOD ?
 7370  043506  001022                          BNE     400$            ;YES,BRANCH
 7371
```

```
7372                                        ;; LOG CRC ERROR AND SEND A NAK
7373  043510  052737  000010  037046          BIS     #SNAK,PRSTAT    ;SET SEND NAK FLAG
7374  043516  105237  037072                  INCB    DERIN           ;BUMP DATA ERROR INBOUND COUNTER
7375  043522  001003                          BNE     340$            ;BRANCH IF NOT OVERFLOW
7376  043524  112737  000377  037072          MOVB    #377,DERIN      ;LATCH AT 256.
7377  043532  152737  000002  037073  340$:   BISB    #DATABCC,INMASK ;SET DATA CRC BIT
7378  043540  004737  043726                  JSR     PC,ERRPRC       ;GO PROCESS ERROR
7379  043544  004737  045350                  JSR     PC,TXPROTO      ;GO SEND NAK
7380  043550  000137  042100                  JMP     RXPROTO         ;TRY AGAIN
7381
7382
7383                                        ;; WE HAVE A GOOD MESSAGE !!! SO ACKNOWLEDGE IT
7384  043554  032737  000100  006574  400$:   BIT     #PRORUN,PARAM   ;PROTOCOL RUNNING?
7385  043562  001007                          BNE     420$            ;YES,BRANCH
7386  043564  005737  037120                  TST     ASTRT           ;DID WE SEND A STACK?
7387  043570  001001                          BNE     415$            ;YES,BRANCH
7388  043572  000454                          BR      RXPREX          ;EXIT
7389
7390                                        ;; NOTE: DMV/DPM WILL SEND 'START - STACK - DATA' FOR STARTUP SEQUENCE
7391  043574  052737  000100  006574  415$:   BIS     #PRORUN,PARAM   ;SET PROTOCOL RUNNING
7392
7393                                        ;; CHECK FOR AN IMPLICIT 'ACK'
7394  043602  123737  037056  002662  420$:   CMPB    T,RHDREP        ;RESP = MESSAGE SENT ?
7395  043610  001016                          BNE     450$            ;NO,BRANCH
7396  043612  113737  037056  037054          MOVB    T,N             ;HIGHEST SEQ MESSAGE # SENT
7397  043620  113737  037056  037057          MOVB    T,X             ;HIGHEST MESSAGE SENT
7398  043626  113737  037056  037055          MOVB    T,A             ;HIGHEST MESSAGE 'ACK'ED'
7399  043634  105237  037056                  INCB    T               ;NEXT MESSAGE # TO TRANSMIT
7400  043640  012737  177777  037116          MOV     #-1,TXPRC       ;SET TRANSMIT PROTOCOL COMPLETE
7401  043646  052737  000004  037046  450$:   BIS     #SACK,PRSTAT    ;SET SEND ACK FLAG
7402  043654  004737  045350                  JSR     PC,TXPROTO      ;SEND ACK
7403  043660  012737  177777  037114          MOV     #-1,RXPRC       ;RECEIVE MESSAGE PROTOCOL FINISHED
7404  043666  005737  037124                  TST     PRUN            ;PROTOCOL RUNNING ?
7405  043672  001414                          BEQ     RXPREX          ;NO,BRANCH
7406  043674  005737  037136                  TST     HDXMTP          ;FULL DUPLEX PT-PT?
7407  043700  001011                          BNE     RXPREX          ;NO,BRANCH
7408  043702  022737  000003  006566          CMP     #ACT,MODTYP     ;ACTIVE MODE ?
7409  043710  001005                          BNE     RXPREX          ;NO,BRANCH
7410  043712  005737  037116                  TST     TXPRC           ;TRANSMIT PROTOCOL COMPLETE ?
7411  043716  001002                          BNE     RXPREX          ;YES,BRANCH
7412  043720  000137  042100                  JMP     RXPROTO         ;GO PROCESS MESSAGE
7413
7414  043724  000207          RXPREX: RETURN                          ;DONE !!
7415
```

```
7416
7417                            ;*****************************************************************************
7418                            ;       ERROR PROCESSING ROUTINE (ERRPRC):
7419                            ;
7420                            ;       DESCRIPTION: THIS ROUTINE IS USED TO PROCESS INBOUND AND
7421                            ;                       OUTBOUND ERRORS. ALSO THE 60 SECOND 'WATCHDOG'
7422                            ;                       TIMER IS CHECKED.
7423                            ;
7424                            ;                    THE MAJORITY OF THE CODE IS USED IN PROCESSING
7425                            ;                       OUTBOUND ERRORS (NAKS RECEIVED). THE NAK REASON
7426                            ;                       TYPE IS DETERMINED AND THE APPROIATE ERROR
7427                            ;                       COUNTER IN INCREMENTED. IF THE TRANSMIT THRESHOLD
7428                            ;                       COUNTER (TXTHER) OR RECEIVE THRESHOLD COUNTER
7429                            ;                       REACHES 7, IT IS CLEARED AND THE CUMULATIVE
7430                            ;                       RECEIVE/TRANSMIT THRESHOLD ERROR (RXTXTE) COUNTER
7431                            ;                       IS BUMPED.
7432                            ;*****************************************************************************
7433
7434
7435
7436                            ;;CHECK THE WATCHDOG TIMER
7437
7438  043726  005737  006644    ERRPRC: TST     TIMERS          ;60 SECONDS ELAPSED
7439  043732  001075                    BNE     10$             ;NO,BRANCH
7440  043734  032737  000100  006574        BIT     #PRORUN,PARAM   ;PROTOCOL RUNNING ?
7441  043742  001034                    BNE     7$              ;YES,BRANCH
7442
7443                            ;; INFORM USER OF 'START - STACK' TIMEOUT
7444  043744  005037  006542            CLR     TEMP3           ;INIT IT
7445  043750  005037  006544            CLR     TEMP4           ;INIT IT
7446  043754  012737  017311  006540    MOV     #DVEM5,TEMP2    ;''TIME OUT IN START-STACK SEQUENCE''
7447  043762  113737  002660  006542    MOVB    RHDMCC,TEMP3    ;RECEIVED DATA
7448  043770  113737  002646  006544    MOVB    HDMCC,TEMP4     ;TRANSMITTED DATA
7449  043776  004737  020160            JSR     PC,LGDVE        ;LOG TIME OUT IN EVENT LOG
7450  044002  005237  006506            INC     ERRCNT          ;BUMP ERROR COUNT
7451  044006                            ERRSOFT 10.,DVEM5,ERR13 ;PRINT ERROR
7452  044006  104457                                                            TRAP    C$ERSOFT
7453  044010  000012                                                            .WORD   10
7454  044012  017311                                                            .WORD   DVEM5
7455  044014  017634                                                            .WORD   ERR13
7456  044016  005237  006502            INC     OPVAR           ;BUMP ERROR COUNTER
7457  044022  012737  000036  006644    MOV     #30.,TIMERS     ;RE-INIT TIMER
7458  044030  000137  044502            JMP     ERREXT          ;EXIT
7459
7460                            ;; INFORM USER OF ''DATA MESSAGE'' TIMEOUT
7461  044034  005237  037144    7$:     INC     TIMEOUT         ;BUMP COUNTER
7462  044040  022737  000024  037144    CMP     #20.,TIMEOUT    ;60 SECONDS ?
7463  044046  001023                    BNE     9$              ;NO,BRANCH
7464  044050  012737  017110  006540    MOV     #DVEM2,TEMP2    ;''TIME OUT WAITING FOR RX OR TX TO COMPLETE''
7465  044056  017737  145370  006542    MOV     @RXCSR,TEMP3    ;RECEIVER ADDRESS
7466  044064  017737  145370  006544    MOV     @TXCSR,TEMP4    ;TRANSMIT ADDRESS
7467  044072  004737  020160            JSR     PC,LGDVE        ;LOG ERROR
7468  044076  005237  006506            INC     ERRCNT          ;BUMP ERROR COUNT
7469  044102                            ERRSOFT 7,DVEM2,ERR13   ;PRINT ERROR
7470  044102  104457                                                            TRAP    C$ERSOFT
7471  044104  000007                                                            .WORD   7
```

```
 7472  044106  017110                                                                  .WORD   DVEM2
 7473  044110  017634                                                                  .WORD   ERR13
 7474  044112  005037  037144          CLR     TIMEOUT         ;INIT TIMEOUT
 7475
 7476  044116  012737  000003  006644  9$:     MOV     #3.,TIMERS      ;SET UP TIMER
 7477  044124  000566                  BR      ERREXT          ;EXIT
 7478
 7479
 7480                                  ;;IF A 'NAK' RECEIVED THEN PROCESS IT
 7481  044126  032737  000400  037046  10$:    BIT     #NAKRX,PRSTAT   ;NAK RECEIVED?
 7482  044134  001542                  BEQ     100$            ;NO,BRANCH
 7483
 7484                                  ;;IF TRANSMIT THRESHOLD COUNTER = 7 THEN BUMP CUMULATIVE TXRX COUNTER
 7485  044136  122737  000007  037067          CMPB    #7,TXTHER       ;THRESHOLD REACHED?
 7486  044144  001403                  BEQ     20$             ;YES,BRANCH
 7487  044146  105237  037067          INCB    TXTHER          ;BUMP TRANSMIT THESHOLD
 7488  044152  000404                  BR      30$             ;BRANCH
 7489  044154  005237  037104  20$:    INC     RXTXTE          ;BUMP TRANSMIT/RECEIVE THRESHOLD COUNTER
 7490  044160  105037  037067          CLRB    TXTHER          ;SET TRANSMIT COUNTER TO ZERO
 7491
 7492                                  ;;;;DETERMINE THE 'NAK' REASON
 7493
 7494                                  ;;HEADER CRC ERROR ?
 7495  044164  042737  140000  002660  30$:    BIC     #BIT15!BIT14,RHDTYP     ;CLEAR SELECT & QS FLAG
 7496  044172  122737  000001  002661          CMPB    #HEADBCC,RHDTYP+1       ;HEADER CRC ERROR?
 7497  044200  001012                  BNE     35$             ;NO,BRANCH
 7498  044202  105237  037070          INCB    DEROUT          ;LOG ERROR
 7499  044206  001003                  BNE     32$             ;BRANCH IF NOT OVERFLOW
 7500  044210  112737  000377  037070          MOVB    #377,DEROUT     ;LATCH AT 256.
 7501  044216  152737  000001  037071  32$:    BISB    #HEADBCC,OUTMASK        ;SET MASK
 7502  044224  000526                  BR      ERREXT          ;EXIT
 7503
 7504                                  ;;DATA CRC ERROR ?
 7505  044226  122737  000002  002661  35$:    CMPB    #DATABCC,RHDTYP+1       ;DATA CRC ERROR ?
 7506  044234  001012                  BNE     40$             ;NO,BRANCH
 7507  044236  105237  037070          INCB    DEROUT          ;LOG ERROR
 7508  044242  001003                  BNE     37$             ;BRANCH IF NOT OVERFLOW
 7509  044244  112737  000377  037070          MOVB    #377,DEROUT     ;LATCH AT 256.
 7510  044252  152737  000002  037071  37$:    BISB    #DATABCC,OUTMASK        ;SET MASK
 7511  044260  000510                  BR      ERREXT          ;EXIT
 7512
 7513                                  ;;REMOTE STATION BUFFER NOT AVAILABLE?
 7514  044262  122737  000010  002661  40$:    CMPB    #BUFFNA,RHDTYP+1        ;BUFFER NOT AVAILABLE?
 7515  044270  001012                  BNE     45$             ;NO,BRANCH
 7516  044272  105237  037076          INCB    RBUFER          ;LOG ERROR
 7517  044276  001003                  BNE     43$             ;BRANCH IF NOT OVERFLOW
 7518  044300  112737  000377  037076          MOVB    #377,RBUFER     ;LATCH AT 256.
 7519  044306  152737  000001  037077  43$:    BISB    #BNAMSK,RBMASK          ;SET MASK
 7520  044314  000472                  BR      ERREXT          ;EXIT
 7521
 7522                                  ;;REMOTE STATION RECEIVER OVERRUN?
 7523  044316  122737  000011  002661  45$:    CMPB    #RXOVRUN,RHDTYP+1       ;RECEIVER OVERRUN?
 7524  044324  001012                  BNE     50$             ;NO, BRANCH
 7525  044326  105237  037100          INCB    RMSTER          ;LOG ERROR
 7526  044332  001003                  BNE     47$             ;BRANCH IF NO OVERFLOW
 7527  044334  112737  000377  037100          MOVB    #377,RMSTER     ;LATCH AT 256.
```

```
7528  044342  152737  000001  037101  47$:    BISB    #RXOVMSK,RMMASK         ;SET MASK
7529  044350  000454                          BR      ERREXT                  ;EXIT
7530
7531                                  ;;REMOTE STATION MESSAGE TOO LONG?
7532  044352  122737  000020  002661  50$:    CMPB    #MESLONG,RHDTYP+1       ;MESSAGE TOO LONG?
7533  044360  001012                          BNE     55$                     ;NO,BRANCH
7534  044362  105237  037076                  INCB    RBUFER                  ;LOG REMOTE STATION BUFFER ERROR
7535  044366  001003                          BNE     52$                     ;BRANCH IF NO OVERFLOW
7536  044370  112737  000377  037076          MOVB    #377,RBUFER             ;LATCH AT 256.
7537  044376  152737  000002  037077  52$:    BISB    #MTLMSK,RBMASK          ;SET MASK
7538  044404  000436                          BR      ERREXT                  ;EXIT
7539
7540                                  ;;REMOTE STATION FORMAT ERROR?
7541  044406  122737  000021  002661  55$:    CMPB    #FORMERR,RHDTYP+1       ;REMOTE STATION FORMAT ERROR?
7542  044414  001012                          BNE     100$                    ;NO,BRANCH
7543  044416  105237  037100                  INCB    RMSTER                  ;LOG ERROR
7544  044422  001003                          BNE     57$                     ;BRANCH IF NO OVERFLOW
7545  044424  112737  000377  037100          MOVB    #377,RMSTER             ;LATCH AT 256.
7546  044432  152737  000002  037101  57$:    BISB    #FMTMSK,RMMASK          ;SET MASK
7547  044440  000420                          BR      ERREXT                  ;EXIT
7548
7549
7550                                  ;; IF SEND NAK (SNAK=1) THEN BUMP RECEIVER THRESHOLD ERROR COUNTER
7551                                  ;;   IF RXTHER = 7 THE BUMP RXTXTE COUNTER AND CLEAR RXTHER
7552  044442  032737  000010  037046  100$:   BIT     #SNAK,PRSTAT            ;SEND NAK ?
7553  044450  001414                          BEQ     ERREXT                  ;NO, BRANCH
7554
7555  044452  122737  000007  037066          CMPB    #7,RXTHER               ;RECEIVER THRESHOLD = 7?
7556  044460  001403                          BEQ     120$                    ;YES,BRANCH
7557  044462  105237  037066                  INCB    RXTHER                  ;BUMP COUNTER
7558  044466  000405                          BR      ERREXT                  ;BRANCH
7559
7560  044470  005237  037104          120$:   INC     RXTXTE                  ;BUMP CUMULATIVE COUNTER
7561  044474  105037  037066                  CLRB    RXTHER                  ;INIT RECEIVER THRESHOLD COUNTER
7562  044500  000400                          BR      ERREXT                  ;EXIT
7563
7564
7565
7566  044502  000207                  ERREXT: RETURN
7567
```

```
                                .SBTTL          RECEIVER PROTOCOL INTERRUPT ROUTINE

                                ;++
                                ; FUNCTIONAL DESCRIPTION:
                                ;       THIS ROUTINE IS USED ONLY WHEN THE ''/PROTOCOL'' SWITCH
                                ;       IS SPECIFIED BY THE USER.
                                ;
                                ;       WHEN A RX INT. OCCURS THIS ROUTINE DECIDES IF IT IS A DATA SET
                                ;       CHANGE OR DATA INTERRUPT. IF IT IS A DATA SET CHANGE
                                ;       INTERRUPT IT PUTS THE STATUS IN ''CMODS'' AND COMPARES
                                ;       THAT STATUS TO THE OLD STATUS IN 'MODS''. IF THEY ARE
                                ;       THE SAME THAT MEANS THE INTERRUPT WAS CAUSED BY A GLITCH
                                ;       ON ONE OF THE LINES. IF THEY ARE DIFFERENT THEN A HARD
                                ;       MODEM ERROR HAS OCCURED. IN ANY EVENT THE MODEM STATUS
                                ;       CHANGE IS LOGGED.
                                ;
                                ;       IF A DATA INTERRUPT, THE ROUTINE CHECK FOR AN OVERRUN
                                ;       CONDITION AND IF SET
                                ;
                                ; INPUTS:
                                ;       RMSGPT - ADDRESS OF RX BUFFER
                                ;       RMSCC  - COUNT OF DATA TO BE RXED.
                                ;
                                ; SUBORDINATE ROUTINES USED:
                                ;               ''LOGMSC''      - LOG MODEM STATUS CHANGE
                                ;               ''LGDVE''       - LOG DEVICE ERROR
                                ;--

044504                                  BGNSRV  PRRXI
044504                                                                          PRRXI::
044504  010246                  MOV     R2,-(SP)        ;SAVE R2
044506  017737  144740  011476  MOV     @RXCSR,IRXCSR   ;MOV RX CSR TO IMAGE
044514  032737  000010  006574  BIT     #MOCHK,PARAM    ;ANY MODEM CHANGES TO REPORT
044522  001462                  BEQ     PRIN21          ;IF NOT IGNORE DS CHANGE.
044524  032737  002000  037112  BIT     #INOVR,IMFLAG   ;IS INIT OVER
044532  001456                  BEQ     PRIN21          ;NO THEN IGNORE DS CHANGE.
044534  032737  004000  037112  BIT     #FIRST,IMFLAG   ;FIRST TIME HERE?
044542  001452                  BEQ     PRIN21          ;YES,BRANCH
044544  005737  011476          TST     IRXCSR          ;DATA SET CHANGE ?
044550  100047                  BPL     PRIN21          ;IF DATA SET CHANGE IS NOT SET BR
044552  013737  011476  011474  MOV     IRXCSR,CMODS    ;MOV THE NEW MODEM STATUS IN
044560  042737  106760  011474  BIC     #106760,CMODS   ;CLEAR BITS NOT RELATING TO MODEM STATUS
044566  032777  000040  144664  BIT     #TM,@TXCSR      ;TEST MODE?
044574  001403                  BEQ     PRIN2           ;NO,BRANCH
044576  052737  000040  011474  BIS     #TM,CMODS       ;SET TM MODE IN CHANGE STATUS
044604  013737  011474  006542  PRIN2:  MOV     CMODS,TEMP3
044612  013737  007554  006544  MOV     MODS,TEMP4
044620  023737  006544  006542  CMP     TEMP4,TEMP3     ;COMPARE OLD TO CURRENT
044626  001406                  BEQ     10$             ;INC GLITCH COUNT
044630  005237  011522          INC     MHRCNT          ;INC HARD COUNT
044634  012737  016717  006540  MOV     #HRDMSG,TEMP2   ;SET UP HARD MESG.
044642  000405                  BR      PRIN1
044644  005237  011520          10$:    INC     MGLCNT          ;INC GLITCH COUNT
044650  012737  016671  006540  MOV     #GLMSG,TEMP2    ;SET UP GLITCH
044656  004737  020334          PRIN1:  JSR     PC,LOGMSC       ;GO LOG MODEM STATUS CHANGE
```

```
 7624  044662  013737  011474  007554          MOV     CMODS,MODS      ;MOVE CURRENT TO OLD
 7625
 7626                                  ;;TEST FOR DATA
 7627
 7628  044670  032737  002200  011476  PRIN21: BIT     #RSTARY!RDATRY,IRXCSR   ;RX DONE OR STATUS AVAILABLE ?
 7629  044676  001002                          BNE     10$             ;YES,BRANCH
 7630  044700  000137  045344                  JMP     PRINEX          ;EXIT
 7631  044704  017737  144546  011500  10$:    MOV     @RDSR,IRDSR     ;SAVE A COPY OF STATUS & DATA
 7632  044712  032737  004000  011500          BIT     #RXOVER,IRDSR   ;OVERRUN ERROR ?
 7633  044720  001414                          BEQ     PRIN4           ;NO,BRANCH
 7634                                  ;;IF AN OVERRUN THEN LOG ERROR,SET NAK REASON,TURN OFF RX & EXIT
 7635  044722  052737  000010  037046          BIS     #SNAK,PRSTAT    ;TELL MAIN CODE ABOUT OVERRUN ERROR
 7636  044730  105237  037102                  INCB    LOSTER          ;LOG LOCAL STATION ERROR
 7637  044734  152737  000001  037103          BISB    #RXOVMSK,LSMASK ;SET RX OVERRUN MASK BIT
 7638  044742  112737  000011  037064          MOVB    #RXOVRUN,REANAK ;SET REASON FOR SENDING NAK
 7639  044750  000570                          BR      PRIN8           ;GO TURN OFF RX AND EXIT
 7640
 7641
 7642                                  ;;;IF IN MULTI-POINT MODE AND NOT MY ADDRESS THEN JUST BUMP CHAR COUNT
 7643
 7644                                  ;;STORE AWAY DATA
 7645  044752  032737  001000  037046  PRIN4:  BIT     #MYDATA,PRSTAT  ;STORE THIS DATA ?
 7646  044760  001406                          BEQ     10$             ;NO,BRANCH
 7647  044762  013702  011512                  MOV     RMSGPT,R2       ;SET RX MESSAGE POINTER
 7648  044766  113722  011500                  MOVB    IRDSR,(R2)+     ;STORE DATA AWAY
 7649  044772  010237  011512                  MOV     R2,RMSGPT       ;SAVE UPDATED MESSAGE POINTER
 7650
 7651                                  ;;DECREMENT CHARACTER COUNT
 7652  044776  005337  011514          10$:    DEC     RMSGCC          ;ALL DATA RECEIVED ?
 7653  045002  001160                          BNE     PRINEX          ;NO,BRANCH
 7654  045004  032737  000400  037134          BIT     #BCC,PRFLAG     ;CRC ALREADY CHECKED?
 7655  045012  001022                          BNE     PRIN5           ;YES,BRANCH
 7656  045014  032737  100000  011500          BIT     #CRCOK,IRDSR    ;CRC GOOD ?
 7657  045022  001004                          BNE     PRIN6           ;YES,BRANCH
 7658  045024  052737  000002  037046          BIS     #BCCBAD,PRSTAT  ;TELL MAIN CODE ABOUT CRC ERROR
 7659  045032  000537                          BR      PRIN8           ;DISABLE INTERRUPTS AND EXIT
 7660
 7661                                  ;;; READ 2 MORE CHARACTERS TO FLUSH CRC
 7662  045034  052737  000400  037134  PRIN6:  BIS     #BCC,PRFLAG     ;SET CRC ALREADY CHECKED FLAG
 7663  045042  012737  000002  011514          MOV     #2,RMSGCC       ;COUNT TWO CHARACTERS
 7664  045050  012737  011516  011512          MOV     #BCCW,RMSGPT    ;CRC STORAGE ADDRESS
 7665  045056  000532                          BR      PRINEX          ;EXIT
 7666
 7667  045060  052737  000001  037046  PRIN5:  BIS     #BCCOK,PRSTAT   ;TELL MAIN CODE CRC HAS BEEN CHECKED
 7668  045066  123737  037061  002660          CMPB    TRIBN,RHDADR    ;MY MESSAGE
 7669  045074  001404                          BEQ     5$              ;YES,BRANCH
 7670  045076  042737  001000  037046          BIC     #MYDATA,PRSTAT  ;DON'T STORE IT
 7671  045104  000407                          BR      7$              ;BRANCH
 7672                                  ;; SELECT BIT SET ?
 7673  045106  032737  100000  002660  5$:     BIT     #BIT15,RHDMCC   ;SELECT BIT SET?
 7674  045114  001403                          BEQ     7$              ;NO,BRANCH
 7675  045116  012737  000001  037130          MOV     #1,SELECT       ;WE NOW HAVE THE RIGHT TO TRANSMIT,IF HALF-DUPL
 7676
 7677  045124  032737  000040  037134  7$:     BIT     #RXM,PRFLAG     ;READ DATA MESSAGE ?
 7678  045132  001071                          BNE     PRIN7           ;NO,BRANCH
 7679
```

```
7680                                        ;;SET UP TO READ IN DATA PART OF MESSAGE
7681  045134  042737  000003  037046          BIC     #BCCOK!BCCBAD,PRSTAT ;CLEAR FLAGS (USED IN PROTOCOL CODE)
7682  045142  052737  000040  037134          BIS     #RXM.PRFLAG     ;SET DATA MESSAGE READ FLAG
7683  045150  042737  000400  037134          BIC     #BCC,PRFLAG     ;CLEAR CRC CHECKED FLAG(USED BY THIS ROUTINE)
7684  045156  042737  140000  002660          BIC     #BIT15!BIT14,RHDMCC ;CLEAR SELECT & QS BITS
7685
7686                                        ;;IS ALLOCATED BUFFER SPACE LARGE ENOUGH FOR MESSAGE?
7687  045164  023727  002660  001000          CMP     RHDMCC,#512.    ;WILL MESSAGE FIT IN MAX BUFFER SPACE
7688  045172  003414                          BLE     10$             ;YES,BRANCH
7689
7690                                        ;;MESSAGE TOO LONG !! LOG ERROR
7691  045174  105237  037074                  INCB    LBUFER          ;LOG LOCAL BUFFER ERROR
7692  045200  152737  000002  037075          BISB    #MTLMSK,LBMASK  ;SET MESSAGE TOO LONG BIT
7693  045206  112737  000020  037064          MOVB    #MESLONG,REANAK ;SET REASON FOR NAK
7694  045214  152737  000010  037046          BISB    #SNAK,PRSTAT    ;SET SEND NAK FLAG
7695  045222  000443                          BR      PRIN8           ;TURN OFF RX & EXIT
7696
7697                                        ;; IF A NEW BUFFER IS AVAILABLE
7698                                        ;;SET BUFFER AND CHARACTER COUNT FOR MESSAGE
7699  045224  005737  037114        10$:     TST     RXPRC           ;IS RX PROTOCOL DONE?
7700  045230  001420                          BEQ     15$             ;NO,BRANCH
7701  045232  105237  037074                  INCB    LBUFER          ;LOCAL BUFFER ERROR
7702  045236  001003                          BNE     12$             ;OVERFLOW?
7703  045240  012737  000377  037074          MOV     #377,LBUFER     ;LATCH A 256.
7704  045246  152737  000001  037075  12$:    BISB    #BNAMSK,LBMASK  ;SET MASK
7705  045254  112737  000010  037064          MOVB    #BUFFNA,REANAK  ;SET NAK REASON
7706  045262  152737  000010  037046          BISB    #SNAK,PRSTAT    ;SET "SEND NAK FLAG"
7707  045270  000412                          BR      PRIN7           ;EXIT
7708
7709  045272  013737  006470  011512  15$:    MOV     DVRXA,RMSGPT    ;MESSAGE BUFFER ADDRESS
7710  045300  013737  002660  011514          MOV     RHDMCC,RMSGCC   ;CHARACTER COUNT OF MESSAGE
7711  045306  013737  002660  006472          MOV     RHDMCC,DVRCC    ;TELL MAIN CODE HOW LARGE MESSAGE IS
7712  045314  000413                          BR      PRINEX          ;EXIT
7713
7714                                        ;;MESSAGE COMPLETE
7715  045316  052737  000004  037134  PRIN7:  BIS     #QRX,PRFLAG     ;SET MESSAGE COMPLETE FLAG(USED BY MAIN CODE)
7716  045324  052737  000100  037046          BIS     #RXD,PRSTAT     ;MESSAGE COMPLETE(USED BY PROTOCOL MODULE)
7717
7718  045332  005037  037142  PRIN8:  CLR     TURNON          ;RX NOT ON
7719  045336  042777  000120  144106          BIC     #RINTEN+RXENA,@RXCSR    ;TURN OFF RECEIVER
7720
7721  045344  012602        PRINEX: MOV     (SP)+,R2        ;RESTORE R2
7722  045346                          ENDSRV
7723  045346                                                                  L10022:
7724  045346  000002                                                                  RTI
7725
7726
7727
```

```
                        .SBTTL  PROTOCOL TRANSMIT ROUTINE

                        ;++
                        ;; FUNCTIONAL DESCRIPTION:
                        ;;      THIS ROUTINE IS USED TO SETUP EITHER CONTROL MESSAGES OR
                        ;;      DATA MESSAGES FOR TRANSMISSION.
                        ;;      IF THE SEND ACK(SACK) IS SET AN 'ACK' MESSAGE WILL BE SETUP
                        ;;      AND TRANSMITTED.
                        ;;      IF THE SEND NAK(SNAK) IS SET A 'NAK' MESSAGE WILL BE SETUP
                        ;;      AND TRANSMITTED.
                        ;;      IF NO FLAGS ARE SET, A DATA MESSAGE WILL BE SETUP AND SENT.
                        ;;      IF THE NETWORK IS HALF-DUPLEX THEN REQUEST TO SEND(RTS) WILL
                        ;;      BE ASSERTED BEFORE TRANSMISSION.


045350  013737  037046  037132  TXPROT: MOV     PRSTAT,IMPRSTAT ;SAVE A COPY OF FLAGS
045356  032737  000100  006574          BIT     #PRORUN,PARAM   ;PROTOCOL RUNNING ?
045364  001407                        BEQ     7$              ;NO,BRANCH
045366  022737  000003  006566        CMP     #ACT,MODTYP     ;ACTIVE MODE?
045374  001003                        BNE     7$              ;NO,BRANCH
045376  005737  037122          5$:   TST     TXREADY         ;TRANSMITTER READY FOR MESSAGE ?
045402  001775                        BEQ     5$              ;NO,BRANCH

                        ;;IF HALF DUPLEX OR MULTI-POINT LINK, WE NEED THE SELECT BIT
                        ;;; BEFORE WE CAN SEND.
045404  005737  037136  7$:     TST     HDXMTP          ;FULL DUPLEX AND PT TO PT ?
045410  001416                        BEQ     9$              ;YES,BRANCH
045412  005737  037130  6$:     TST     SELECT          ;OK TO SEND ?
045416  001003                        BNE     8$              ;YES,BRANCH
045420  004737  042100                CALL    RXPROTO         ;GO WAIT ON SELECT BIT
045424  000772                        BR      6$              ;TRY AGAIN

                        ;; DETERMINE WHAT TO SEND
045426  005737  006572  8$:     TST     FHDPLX          ;FULL DUPLEX?
045432  001005                        BNE     9$              ;YES,BRANCH
                        ;; IF HALF DUPLEX WE MUST DISABLE RX BEFORE SENDING
045434  042777  000120  144010        BIC     #RINTEN!RXENA,@RXCSR ;TU' ' OFF RX
045442  005037  037142                CLR     TURNON          ;"RX NOT  V" FLAG
045446  013737  037132  037046  9$:   MOV     IMPRSTAT,PRSTAT ;RESTORE ORIGINAL FLAGS
045454  113737  037061  002652        MOVB    TRIBN,HDMADR    ;SET TRIB ADDRESS
045462  042737  001000  006600        BIC     #PAD,FLAG       ;THIS BIT USED IN TX INTER ROUTINE
045470  005037  037122                CLR     TXREADY         ;TRANSMITTER BUSY
045474  005037  037130                CLR     SELECT          ;IF HALF DUPLEX/MTP MODE
045500  032737  000004  037046        BIT     #SACK,PRSTAT    ;SEND ACK ?
045506  001021                        BNE     10$             ;YES,BRANCH
045510  032737  000010  037046        BIT     #SNAK,PRSTAT    ;SEND NAK ?
045516  001062                        BNE     50$             ;YES, BRANCH
045520  032737  004000  037046        BIT     #SSTART,PRSTAT  ;SEND START ?
045526  001106                        BNE     60$             ;YES,BRANCH
045530  032737  002000  037046        BIT     #SSTACK,PRSTAT  ;SEND START ACKNOWLEDGE ?
045536  001126                        BNE     70$             ;YES,BRANCH
045540  032737  000020  037046        BIT     #SDATA,PRSTAT   ;SEND DATA MESSAGE ?
045546  001151                        BNE     100$            ;YES,BRANCH
045550  000000                        HALT                    ;FATAL ERROR
```

```
 7784
 7785
 7786
 7787                                        ;; SETUP TO SEND AN 'ACK'
 7788  045552  052737  000020  006600  10$:   BIS     #TXM,FLAG          ;SEND HEADER ONLY(USED IN TX INTER. ROUTINE)
 7789  045560  112737  000005  002645        MOVB    #ENQ,HDMID         ;CONTROL MESSAGE
 7790  045566  012737  000001  002646        MOV     #ACK,HDMTYP        ;ACK CONTROL MESSAGE
 7791  045574  052737  140000  002646        BIS     #BIT15!BIT14,HDMTYP ;SET SELECT & QS FLAG
 7792  045602  005737  037136                TST     HDXMTP             ;HALF DUPLEX OR MULTI - POINT
 7793  045606  001415                        BEQ     20$                ;NO,BRANCH
 7794  045610  005737  037116                TST     TXPRC              ;ANY THING TO SENT ?
 7795  045614  001012                        BNE     20$                ;NO,BRANCH
 7796  045616  032737  000100  006574        BIT     #PRORUN,PARAM      ;PROTOCOL RUNNING?
 7797  045624  001406                        BEQ     20$                ;NO,BRANCH
 7798  045626  042737  100000  002646        BIC     #BIT15,HDMTYP      ;CLEAR SELECT BIT
 7799  045634  012737  000001  037130        MOV     #1,SELECT          ;WE HAVE SOMETHING TO SEND, SO KEEP THE LINE
 7800  045642  113737  037060  002650  20$:   MOVB    R,HDMREP           ;SET RESPONSE NUMBER
 7801  045650  105037  002651                CLRB    HDMNUM             ;FILLER
 7802  045654  042737  000004  037046        BIC     #SACK,PRSTAT       ;CLEAR SEND ACK FLAG
 7803  045662  000526                        BR      200$               ;GO SEND IT
 7804
 7805
 7806                                        ;; SETUP TO SEND A 'NAK'
 7807  045664  052737  000020  006600  50$:   BIS     #TXM,FLAG          ;TELL TX INTERRUPT TO SEND HEADER ONLY
 7808  045672  112737  000005  002645        MOVB    #ENQ,HDMID         ;CONTROL MESSAGE
 7809  045700  012737  000002  002646        MOV     #NAK,HDMTYP        ;'NAK'
 7810  045706  113737  037064  002647        MOVB    REANAK,HDMTYP+1    ;REASON FOR NAK
 7811  045714  052737  140000  002646  55$:   BIS     #BIT15!BIT14,HDMTYP ;SET SELECT & QS FLAGS
 7812  045722  105037  002651                CLRB    HDMNUM             ;FILLER
 7813  045726  113737  037060  002650        MOVB    R,HDMREP           ;LAST MESSAGE RECEIVED CORRECTLY
 7814  045734  042737  000010  037046        BIC     #SNAK,PRSTAT       ;CLEAR SEND NAK FLAG
 7815  045742  000476                        BR      200$               ;GO SEND IT
 7816
 7817
 7818                                        ;; SETUP TO SEND START MESSAGE
 7819  045744  052737  000020  006600  60$:   BIS     #TXM,FLAG          ;TELL TX INT. ROUTINE TO SEND HEADER ONLY
 7820  045752  112737  000005  002645        MOVB    #ENQ,HDMID         ;CONTROL MESSAGE
 7821  045760  012737  000006  002646        MOV     #STRT,HDMTYP       ;START MESSAGE
 7822  045766  052737  140000  002646        BIS     #BIT15!BIT14,HDMTYP ;SET SELECT & QS FLAGS
 7823  045774  105037  002650                CLRB    HDMREP             ;FILLER
 7824  046000  105037  002651                CLRB    HDMNUM             ;FILLER
 7825  046004  042737  004000  037046        BIC     #SSTART,PRSTAT     ;CLEAR SEND START FLAG
 7826  046012  000452                        BR      200$               ;GO SEND IT
 7827
 7828                                        ;; SETUP TO SEND STACK MESSAGE
 7829  046014  052737  000020  006600  70$:   BIS     #TXM,FLAG          ;TELL TX INT. TO SEND HEADER ONLY
 7830  046022  112737  000005  002645        MOVB    #ENQ,HDMID         ;CONTROL MESSAGE
 7831  046030  012737  000007  002646        MOV     #STACK,HDMTYP      ;START ACKNOWLEDGE MESSAGE
 7832  046036  052737  140000  002646        BIS     #BIT15!BIT14,HDMTYP     ;SET SELECT &QS FLAGS
 7833  046044  105037  002650                CLRB    HDMREP             ;FILLER
 7834  046050  105037  002651                CLRB    HDMNUM             ;FILLER
 7835  046054  012737  177777  037120        MOV     #-1,ASTRT          ;START HAS BEEN ACKNOWLEDGED
 7836  046062  042737  002000  037046        BIC     #SSTACK,PRSTAT     ;CLEAR SEND STACK FLAG
 7837  046070  000423                        BR      200$               ;GO SEND IT
 7838
 7839
```

```
7840                                    ;; SETUP TO SEND DATA
7841  046072  042737  000020  002600  100$:   BIC     #TXM,FLAG       ;TELL TX INTERRUPT TO SEND HEADER + DATA
7842  046100  112737  000201  002645          MOVB    #SOH,HDMID      ;DATA MESSAGE
7843  046106  013737  006456  002646          MOV     DVTCC,HDMCC     ;CHARACTERS COUNT
7844  046114  052737  140000  002646          BIS     #BIT15!BIT14,HDMCC  ;SET SELECT & QS FLAGS
7845  046122  113737  037060  002650          MOVB    R,HDMREP        ;LAST MESSAGE RECEIVED CORRECTLY
7846  046130  113737  037056  002651          MOVB    T,HDMNUM        ;THIS MESSAGE NUMBER
7847  046136  000400                          BR      200$            ;GO SEND IT
7848
7849                                    ;; GO SET 'REQUEST TO SEND'
7850  046140  004737  036574          200$:   JSR     PC,CTSSR        ;GO SET REQUEST TO SEND
7851  046144  052737  004000  037112          BIS     #FIRST,IMFLAG   ;TELL THE CTSSR SUBROUTINE TO SKIP DELAY
7852
7853                                    ;; SETUP TO TRANSMIT HEADER PORTION OF MESSAGE
7854  046152  012737  002645  011502  210$:   MOV     #HDMID,MSGPTR   ;HEADER MESSAGE ADDRESS
7855  046160  012737  000006  011504          MOV     #6,MSGCC        ;CHARACTER COUNT OF HEADER = 6
7856  046166  012737  000020  011506          MOV     #20,SYNCC       ;NUMBER OF SYNCS TO TRANSMIT
7857
7858                                    ;; SEND THE DATA
7859  046174  052777  000120  143256  215$:   BIS     #TXENA!#TINTEN,@TXCSR  ;TURN ON TRANSMITTER
7860
7861
7862                                    ;;IF ACTIVE MODE, TURN ON TX AND GET OUT IN A HURRY
7863                                    ;; NOTE: START UP SEQUENCE OPERATES LIKE HALF-DUPLEX
7864
7865  046202  005737  037136          217$:   TST     HDXMTP          ;FULL DUPLEX PT-PT
7866  046206  001005                          BNE     220$            ;NO,BRANCH
7867  046210  022737  000003  006566          CMP     #ACT,MODTYP     ;ACTIVE MODE ?
7868  046216  001001                          BNE     220$            ;NO,BRANCH
7869  046220  000406                          BR      TXPREX          ;EXIT
7870
7871  046222                          220$:   BREAK
7872  046222  104422                                                          TRAP    C$BRK
7873  046224  005737  037122                  TST     TXREADY         ;TX FINISHED ?
7874  046230  001774                          BEQ     220$            ;NO, BRANCH
7875
7876                                    ;; IF HALF-DUPLEX OR MULTI-POINT REQUEST TO SEND WILL BE DROPPED
7877  046232  004737  037006          230$:   JSR     PC,CLRRTS       ;DROP RTS IF HALF DUPLEX
7878
7879  046236  004737  041774          TXPREX: CALL    RXON            ;TURN ON RX IF NECESSARY
7880  046242  000207                          RETURN                  ;WE ARE DONE !
7881
7882
7883
7884
7885
7886                                            .EVEN
7887
7888  046244                                    ENDTST
7889  046244                                                    L10017:
7890  046244  104401                                                   TRAP    C$ETST
7891
7892
7893
7894
```

```
                        .SBTTL  HARDWARE PARAMETER CODING SECTION


                        ;++
                        ; THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
                        ; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
                        ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
                        ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
                        ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
                        ; WITH THE OPERATOR.
                        ;--

                                BGNHRD
046246
046246  000030                                                        .WORD L10023-L$HARD/2
046250                                                          L$HARD::


                        .SBTTL          DEVICE INDEPENDENT SECTION

                                GPRML   DPLX,0,1,YES
046250
046250  000130                                                      .WORD   T$CODE
046252  046330                                                      .WORD   DPLX
046254  000001                                                      .WORD   1


                        .SBTTL          DEVICE DEPENDENT SECTION

                                GPRMA   CSRADR,2,0,160000,177776,YES
046256
046256  001031                                                      .WORD   T$CODE
046260  046361                                                      .WORD   CSRADR
046262  160000                                                      .WORD   T$LOLIM
046264  177776                                                      .WORD   T$HILIM
046266
                                GPRMA   VECTOR,4,0,300,776,YES
046266  002031                                                      .WORD   T$CODE
046270  046407                                                      .WORD   VECTOR
046272  000300                                                      .WORD   T$LOLIM
046274  000776                                                      .WORD   T$HILIM
046276
                                GPRML   RNODM,14,1,YES
046276  006130                                                      .WORD   T$CODE
046300  046442                                                      .WORD   RNODM
046302  000001                                                      .WORD   1
046304
                                XFERT   ENDHWL
046304  012024                                                      .WORD   T$CODE
046306
                                GPRML   PTPMLP,10,1,YES
046306  004130                                                      .WORD   T$CODE
046310  046466                                                      .WORD   PTPMLP
046312  000001                                                      .WORD   1
046314
                                XFERF   ENDHWL
046314  006044                                                      .WORD   T$CODE
046316
                                GPRMD   TRIBNQ,12,D,-1,1,255.,YES
046316  005052                                                      .WORD   T$CODE
046320  046524                                                      .WORD   TRIBNQ
046322  177777                                                      .WORD   -1
046324  000001                                                      .WORD   T$LOLIM
```

```
 7951  046326  000377                                                          .WORD   T$HILIM
 7952  046330                  ENDHWL: ENDHRD
 7953                                                                          .EVEN
 7954  046330                                                          L10023:
 7955
 7956                          .NLIST  BEX

                               ;DEVICE INDEPENDENT QUESTIONS

       046330  052506  046114  042040  DPLX:   .ASCIZ  /FULL DUPLEX OPERATION : /


                               ;DEVICE DEPENDENT QUESTION

       046361     104  053105  041511  CSRADR: .ASCIZ  /DEVICE CSR ADDRESS : /
       046407     111  052116  051105  VECTOR: .ASCIZ  /INTERRUPT VECTOR ADDRESS: /
       046442  042522  047515  042524  RNODM:  .ASCIZ  /REMOTE NODE "ITEP":/
       046466  051511  052040  044510  PTPMLP: .ASCIZ  /IS THIS A MULTIPOINT NETWORK:/
       046524  042101  051104  051505  TRIBNQ: .ASCIZ  /ADDRESS THIS STATION:/
                               .LIST   BEX
 7957                                  .EVEN
 7958
 7959
```

```
                                ;.SBTTL SOFTWARE PARAMETER CODING SECTION

                                ;++
                                ; THE SOFTWARE PARAMETER CODING SECTION CONTAINS MACROS
                                ; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
                                ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
                                ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
                                ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
                                ; WITH THE OPERATOR.
                                ;--

                                ;       BGNSFT



                                ;       ENDSFT



                                ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                ; TEMPORARY PATCH AREA - FOR DEBUG PURPOSES
                                ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

046552                          $PATCH:
046552  000030                          .BLKW   30

046632                                  LASTAD
                                                                        .EVEN
046632  000000                                                          .WORD   0
046634  000000                                                          .WORD   0
046636                          L$LAST::
046636                                  ENDMOD

                        000001  .END
```

```
A       037055          6691#   7231*   7329*   7398*
ABO   = 000026          2247#   4679
ABORT = 000200          2227#   4827    5565    7282
ACK   = 000001          6791#   7217    7790
ACT   = 000003          2200#   4805    5254    5334    5585    6938    7234    7408    7748    7867
ACTATV  031310          5028    5254#
ACTBCR  031114          5046    5215#
ACTCHK  031524          5008    5300#
ACTCLB  030436          5104    5118#
ACTCLP  031636          5042    5328#
ACTCLR  030126          5006    5059#
ACTCOP  030734          5016    5178#
ACTCRC  031540          5037    5306#
ACTCSE  030262          5011    5090#
ACTCST  030354          5012    5106#
ACTDLL  031356          5032    5268#
ACTDME  030662          5048    5159    5162#
ACTDMQ  030654          5049    5161#
ACTDMS  030632          5047    5156#
ACTDMX  030670          5163#
ACTECH  031434          5036    5284#
ACTEQO  031056          5020    5204#
ACTERR  021412          3475    3514#
ACTEXT  030212          5052    5078#
ACTFUL  021370          3476    3508#
ACTHLP  030146          5010    5065#
ACTLIS  031346          5031    5265#
ACTLLP  031646          5043    5330#
ACTLPX  031664          5325    5327    5329    5331    5334#
ACTLXX  031726          5298    5319    5322    5335    5344#
ACTMEX  031302          5197    5213    5235    5240    5246    5249    5251#
ACTME1  031236          5224    5226    5228    5230    5232    5239#
ACTMOP  031616          5040    5324#
ACTMOS  031546          5051    5309#
ACTMS0  031136          5021    5223#
ACTMS1  031144          5022    5225#
ACTMS2  031154          5023    5227#
ACTMS3  031164          5024    5229#
ACTMS4  031174          5025    5231#
ACTMS5  031204          5026    5233#
ACTMS6  031222          5027    5236#
ACTM2X  031404          5255    5263    5266    5269    5272    5276#
ACTNO   031424          5035    5281#
ACTNUF  030116          5045    5056#
ACTNUL  030124          5005    5057#
ACTNUM  030744          5017    5181#
ACTOPM  031036          5018    5199#
ACTPAS  031320          5029    5257#
ACTPRO  031554          5038    5312#
ACTPRT  030222          5050    5081#
ACTQFG  031560          5301    5304    5307    5310    5314#
ACTREC  031340          5030    5262#
ACTREX  021344          3473    3499#
ACTRHL  021300          3472    3485#
ACTRLG  021354          3474    3503#
ACTRLP  031656          5044    5332#
```

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ACTRNF  021270            3477    3481#
ACTRNL  021276            3471    3482#
ACTRPS  031606            5039    5321#
ACTRSO  021434            3478    3521#
ACTRUN  030236            5009    5085#
ACTSEX  031246            5053    5243#
ACTSHD  030136            5007    5062#
ACTSHW  030476            5096    5110    5129#   5148
ACTSTE  030676            5013    5168#
ACTSTS  031532            5019    5303#
ACTSTT  030706            5014    5171#
ACTSTX  030714            5169    5172#
ACTSZE  030724            5015    5175#
ACTTAL  031376            5034    5274#
ACTTLP  031626            5041    5326#
ACTTRA  031366            5033    5271#
ADDCC   023264            3921#   4937    4979
ADDC1   023360            3923    3938#
ADR   = 000020 G          2173#
ALCK    032334            2659    5486#
ALCK1   032456            5541    5550    5552#   5605
ALCK2   032522            5553    5562#   5637
ALCK2A  032772            5602    5607#
ALCK3   033016            5572    5609    5612#
ALCK3A  033110            5619    5625#
ALCK3B  033122            5626    5628#
ALCK3C  033116            5623    5627#   5634
ALCK4   033144            5613    5632#
ALCK4A  033152            5631    5635#
ALCK4B  033164            5636    5638#
ALCK5   032376            5540#   5627
ALLTR   032376            5418    5441    5465    5491    5539#
ASSEMB= 000010            1945
ASTRT   037120            6749#   6920*   7386    7835*
ATVMOD= 000027            2309#   2804
BAD     006555            2628#   3024    5713*
BADCHR= 000051            2327#   2900
BASM1   015501            3018#   3865
BASM2   015472            3018#   3884
BASM3   015463            3018#   3876
BCC   = 000400            2263#   6184    6187    6382    6400    6427    7102    7654    7662    7683
BCCBAD= 000002            6801#   7152    7167    7658    7681
BCCOK = 000001            6800#   7155    7191    7369    7667    7681
BCCW    011516            2972#   6402    7664
BDCLK   014202            3018#   4551
BIT0  = 000001 G          2146#   2220    2251    2368    3522    3593    6777    6780    6800
BIT00 = 000001 G          2135#   2146
BIT01 = 000002 G          2134#   2145
BIT02 = 000004 G          2133#   2144
BIT03 = 00001C G          2132#   2143
BIT04 = 000020 G          2131#   2142
BIT05 = 000040 G          2130#   2141
BIT06 = 000100 G          2129#   2140
BIT07 = 000200 G          2128#   2139
BIT08 = 000400 G          2127#   2138
BIT09 = 001000 G          2126#   2137
```

```
BIT1   = 000002 G   2145#  2221   2252   2361   2369   3596   6778   6779   6801
BIT10  = 002000 G   2125#  2267   2366   6808
BIT11  = 004000 G   2124#  2269   2367   2380   6809
BIT12  = 010000 G   2123#  2352
BIT13  = 020000 G   2122#  2350
BIT14  = 040000 G   2121#  2354   7495   7684   7791   7811   7822   7832   7844
BIT15  = 100000 G   2120#  2376   2377   2379   7495   7673   7684   7791   7798   7811   7822   7832   7844
BIT2   = 000004 G   2144#  2222   2353   2353   2370   3599   6776   6802
BIT3   = 000010 G   2143#  2223   2354   2371   6803
BIT4   = 000020 G   2142#  2224   2229   2362   2372   6804
BIT5   = 000040 G   2141#  2225   2230   2355   2356   2363   6152   6153   6155
BIT6   = 000100 G   2140#  2226   2255   2364   2373   6805
BIT7   = 000200 G   2139#  2227   2256   2365   5380   5383
BIT8   = 000400 G   2138#  2263   2374   6806
BIT9   = 001000 G   2137#  2265   2351   2375   6059   6807
BLDBEX   023472     3982   3986#
BLDBUF   023362     3964#  4796   4803   4938   4980   5125   5392
BLDB1    023372     3969#
BLDB2    023434     3977#  3984
BLDB3    023452     3980#  3985
BNAMSK=  000001     6780#  7519   7704
BOE    = 000400 G   2177#
BUFEX    014347     3018#  4910   4951
BUFFNA=  000010     6768#  7514   7705
BUFLIM=  001000     2188#  2572   2573   2574   3922   3934   4054   4907   4948   5118   5388
BYTBIT   006514     2607#  3870   5157*  5161*
CABLE  = 000002     2207#  6029
CBLLOP=  000045     2323#  2921
CCURAD   006452     2587#  4066*  4074   4078*  4792*  4800   4978   4983*  5103*
CHECK  = 000003     2289#  2852
CLEAR  = 000001     2287#  2790   4900   5059
CLIACT   027736     4858   4997#
CLIALN=  000007     2280#  2898
CLIALP=  000006     2279#  2838   2848   2903
CLIBCR   012027     3018#  5216
CLIBDL   011722     3018#  5339
CLIBIF=  000003     2276#
CLIBR  = 000002     2275#  2787   2789   2791   2794   2796   2805   2807   2809   2811   2813   2816   2818
                    2833   2835   2845   2853   2857   2859   2863   2865   2868   2871   2878   2880   2882
                    2884   2886   2888   2890   2892   2896   2899   2906   2908   2913   2920   2922   2924
                    2926   2931   3454
CLIBRX   011702     3018#  4310
CLIDEC=  000011     2282#  2912   2930
CLIERM   011605     3018#  3418   4864
CLIERR=  000000     2273#  2797   2900   3464
CLIEXI=  000001     2274#  2779   2781   2783   2785   2824   2826   2936   3446   3448   3450   3452   3457
                    3459   3463   3465
CLINBG   011660     3018#  4353
CLINPS   011764     3018#  5290
CLINUF   011635     3018#  3428   4873
CLINUM=  000005     2278#
CLIOCT=  000010     2281#  2840   2842   3462
CLIPW    012122     3018#  5356
CLIRAC   021232     3412   3466#
CLIRT    021030     3411   3443#
CLISEQ   012074     3018#  5186
```

```
CLISPA= 000004          2277#  2777  2801  2822  2831  2839  2897  3444
CLISTR= 000012          2283#  2780  2782  2784  2786  2788  2790  2793  2795  2802  2804  2806  2808
                        2810   2812  2815  2817  2823  2825  2832  2834  2850  2852  2856  2858  2862
                        2864   2867  2870  2877  2879  2881  2883  2885  2887  2889  2891  2905  2907
                        2919   2921  2923  2925  3447  3449  3451  3453  3456  3458  3460
CLITRE  007716          2773#  4857
CLI$PM  011572          3018#  4851
CLI$RP  011600          3018#  3405
CLKBR   006622          2667#  4536*
CLKCSR  006620          2666#  3205*  3226*  4507  4525*  4526*  4527*  4537*  4671*  4759*
CLKEN   006630          2670#  3226   4515*  4528*  4537  4759
CLKHZ   006626          2669#  3208   3223   3360   4541  4559
CLKINT  017754 G        3203#  4609
CLKSET  017730          3158#  4514   4524
CLKVEC  006624          2668#  4505*  4535*  4610
CLRRTS  037006          6125   6279   6291   6564   6647#  7877
CLRR1   037030          6653#  6654
CMDBUF  002666          2509#  3403   3410   4849   4856
CMODS   011474          2963#  6348*  6349*  6352*  6353  6363  7609*  7610*  7513*  7614  7624
CMPBUF  005150          2574#  4052*  4066   4792   5102
CMPPTR  006444          2584#  4060*  4061*  4074*  4075*  4076*  4080*  4787*  4799  4962*  4976*  4977  4981*
                        5090*  5091   5100*  5101   5366*  5677
CMPSEX  033440          5675   5763#
CMPSR   033164          5624   5674#
CMPS1   033324          5706#  5724
CMPS2   033330          5709#
CMPS3   033216          5680#  5736
CMPS5   033426          5733#
CMPS5A  033432          5726   5734#
CMPS6   033374          5707   5711   5722#
CMPS7   033312          5695   5704#
CMPTOT  006446          2585#  4069*  4072  4081*  4804*  4960*  4963  4982*  5093  5097*  5353  5369
CMSG0 = 000020          2302#  2879
CMSG1 = 000021          2303#  2877
CMSG2 = 000022          2304#  2881
CMSG3 = 000023          2305#  2883
CMSG4 = 000024          2306#  2887
CMSG5 = 000025          2307#  2885
CMSG6 = 000026          2308#  2889
CONOTM  006550          2625#  3106
CONTIN  006552          2626#
CPTR    006524          2615#  3967  3971*  4795*  4799*  4935*  4939  4977*  4981  5101*  5114*  5390*  5417*
                        5437*  5462* 5487*  5554   5559*  5578   5628*  5635  5676*  5681  5685*  5931*
CPTRR   006522          2614#  5414*  5440*  5463*  5489*  5542  5547*  5584*  5589  5598*  5611*  5632  5677*
                        5687   5690*  5879*
CR      016534          3018#  3344
CRC   = 000040          2318#
CRCB  = 000020          2224#  5306
CRCOK = 100000          2379#  7656
CSHEXP= 000006          2292#  2823
CSHTRN= 000007          2293#  2825
CSRADR  046361          7926   7956#
CTOTCC  006450          2586#  4068*  4076  4078  4079*  4084*  4782*  4947  4958  4984*  5098*
CTS   = 020000          2350#  2693   6618
CTSSR   036574          6074   6085   6240  6549  6588#  7850
CTSS3   036644          6595   6603#
```

```
CTSS4   036622          6597#  6601
CTSS7   036704          6605   6609   6611   6614#
CURADD  006526          2616#  3969   3974   3976   3986*  4794*  4800*  4936*  4941   4978*  4983   5119*  5389*
CURCC   006520          2613#  3921   3933   3936*  3937   3970   3975   3986   4790*  4802*  5121*  5193*  5206*
                        5234*  5237*  5239*  5388*
C$AU  = 000052          1945#  4739
C$AUTO= 000061          1945#  4660
C$BRK = 000022          1945#  6003   6057   6095   6259   6559   6599   6617   7137   7872
C$BSEG= 000004          1945#
C$BSUB= 000002          1945#
C$CEFG= 000045          1945#
C$CLCK= 000062          1945#  4510   4520
C$CLEA= 000012          1945#  4696
C$CLOS= 000035          1945#
C$CLPT= 000006          1945#
C$CVEC= 000036          1945#
C$DCLN= 000044          1945#  4478
C$DODU= 000051          1945#
C$DRPT= 000024          1945#
C$DU  = 000053          1945#  4717
C$EDIT= 000003          1945#  2009
C$ERDF= 000055          1945#
C$ERHR= 000056          1945#
C$ERRO= 000060          1945#
C$ERSF= 000054          1945#
C$ERSO= 000057          1945#  5698   5716   5729   5772   6014   6051   6118   6271   6393   6418   6631   7452
                        7470
C$ESCA= 000010          1945#
C$ESEG= 000005          1945#
C$ESUB= 000003          1945#
C$ETST= 000001          1945#  7890
C$EXIT= 000032          1945#  4636   4688   4837   4897
C$GETB= 000026          1945#
C$GETW= 000027          1945#
C$GMAN= 000043          1945#  3401   4539   4847   5857
C$GPHR= 000042          1945#  4574
C$GPLO= 000030          1945#
C$GPRI= 000040          1945#
C$INIT= 000011          1945#  4644
C$INLP= 000020          1945#
C$MANI= 000050          1945#  4831
C$MEM = 000031          1945#
C$MSG = 000023          1945#  3035   3048   3062   3076   3096   3116
C$OPEN= 000034          1945#
C$PNTB= 000014          1945#  3031   3044   3058   3072   3092   3112
C$PNTF= 000017          1945#  3347   3355   3393   3421   3431   3491   3550   3868   3879   3887   3931   4313
                        4356   4554   4772   4814   4867   4876   4914   4929   4955   4971   5071   5144   5189
                        5219   5293   5342   5359   5827   5924   5951   7289
C$PNTS= 000016          1945#  3536   3571   3585   3614   3637   3660   3674   3687   3700   3708   3735   3751
                        3766   3781   3789   3809   3829   4131   4167
C$PNTX= 000015          1945#
C$QIO = 000377          1945#
C$RDBU= 000007          1945#  4532
C$REFG= 000047          1945#  4483   4488   4493   4499
C$RESE= 000033          1945#  4686
C$REVI= 000003          1945#  2008
```

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C$RFLA= 000021           1945#
C$RPT = 000025           1945#   4446
C$SEFG= 000046           1945#
C$SPRI= 000041           1945#   4634    4674
C$SVEC= 000037           1945#   4612    4622    4629    4821    6907
C$TPRI= 000013           1945#
DATABC= 000002           6766#   7377    7505    7510
DATCKB= 000002           2221#   4140    5300    5351    5436    5581    563^    5674    5851    5919
DCD   = 010000           2352#   2695    6608
DCK   = 000014           2242#   3301
DCLFLG  006562           2634#   4474    4476*   4895*
DDE   = 000022           2245#   3309
DER   = 000010           2240#   3287
DERIN   037072           6716#   7172*   7174*   7264*   7266*   7374*   7376*
DEROUT  037070           6710#   7498*   7500*   7507*   7509*
DEV1    007706           2753#   3693*   3704    3712*   3714*   4112    4824*   5149*
DEV2    007710           2754#   3694*   3703    3713*   3715*   4115    4825*   5150*
DEV3    007712           2755#   3716*   4122    4826*   5151*
DEV4    007714           2756#   3717*   4136    4140    4144    4149    4153    4827*   5152*
DFPTBL  002130 G         2074#
DIAGMC= 000000           1945
DIVN91  034744           6092#   6097
DLE   = 000020           2244#   3305
DLL     033566           2660    5822#
DLLCM   014122           3018#   5824
DLLMOD= 000033           2313#   2812
DMPE  = 000053           2329#   2842
DMPQ  = 000054           2330#   2844
DMPS  = 000052           2328#   2840    4889    5158
DMSGAD  002172           2405#   3978
DMSGCT  002150           2392#   3977
DOW   = 000004           2201#   5268    6033
DPLX    046330           7916    7956#
DPV   = 000000           2232#
DPVP1   011472           2953#   5380*   5383*   6061
DSITEN= 000040           2363#   6197    6545    7110
DSR   = 001000           2351#   2694
DTR   = 000002           2361#   6037
DUMEX   023262           3890    3896#
DUMPSR  023126           3861#   4891
DUM1    023220           3871    3882#
DUM2    023242           3881    3889#
DUM3    023156           3870#   3894
DUM4    023132           3862#   3893
DVEM0   016747           3018#   6008    6016
DVEM1   017026           3018#   6625    6633
DVEM2   017110           3018#   6265    6273    7464    7472
DVEM3   017205           3018#   6389    6395
DVEM4   017245           3018#   6412    6420
DVEM5   017311           3018#   6112    6120    7446    7454
DVEM6   017375           3018#   6045    6053
DVI   = 000012           2241#   3292
DVINEX  035102           6035    6063    6065    6067    6093    6105    6125#
DVINIT  034304           5386    5995#   6018    6123
DVIN1   034366           6001    6022#
DVIN3   034422           6025    6029#
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DVIN3A  034446            6034    6037#   6055
DVIN31  036444            6076    6101    6539#
DVIN32  036474            6549#   6566
DVIN34  036572            6561    6567#
DVIN35  036536            6558#   6563
DVIN37  034554            6027    6030    6061#
DVIN38  034462            6040#   6060
DVIN39  034534            6041    6056#
DVIN4   034654            6080#
DVIN41  034634            6075#   6083
DVIN8   034766            6081    6100#   6108
DVIN81  035030            6078    6098    6103    6112#
DVIN9   034674            6085#   6107
DVMEX   035156            6154    6156#
DVMODS  035124            3324    6151#   6607*
DVRCC   006472            2597#   5546*   5574    5928*   5943    5945*   5946*   6190*   6430*   7711*
DVRCT   006474            2598#   5415*   5488*   5583*   5587*   5607*   5608    5678*   5735*
DVREX   035266            6182    6198#
DVRXA   006470            2596#   5544*   5573    5926*   5942    5945    6188    6428    7709
DVRXI   035554 G          4619    4818    6339#
DVRXQ   035166            5551    5937    6180#
DVRX2   035244            6186    6195#
DVRX3   035260            6191    6197#
DVTCC   006456            2590#   5558*   5615    5876*   5890    6245    6251    6502    7843
DVTCT   006460            2591#   5438*   5461*   5486*   5617*   5622    5625
DVTREX  035552            6281    6287    6292#
DVTR1   035344            6242    6249#
DVTR2   035374            6246    6253#
DVTR3   035410            6238    6256#   6275
DVTR4   035516            6278    6283#
DVTR5   037044            6651    6657#
DVTR8   035416            6258#   6284    6290
DVTXA   006454            2589#   5556*   5614    5873*   5889    6244    6501
DVTXI   036254 G          4626    6477#
DVTXRX  035270            5569    5888    5939    6237#
DVTXR1  037004            6619    6636#
DVTXR2  036720            6616#   6621
DVTXR3  036604            6594#   6635
DVTXR9  037004            6590    6637#
ECHO  = 000037            2317#   2858
ECHOB = 000004            2222#   4144    5276    5286    5296    5576
EDABO   015452            2726    3018#
EDDCK   015244            2721    3018#
EDDDE   015357            2724    3018#   5718    5731
EDDER   015227            2719    3018#
EDDLE   015322            2723    3018#   5700
EDDVI   015274            2720    3018#
EDEOP   015412            2725    3018#
EDMOS   015426            2722    3018#
EDRXC   015201            2718    3018#
EDRXQ   015154            2717    3018#
EDTXC   015125            2716    3018#
EDTXQ   015101            2715    3018#
EFM11   014701            3018#   3055
EFM13   015030            3018#   3069
EFM2    014604            3018#   3041
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EF.CON= 000036 G          2153#   4492
EF.NEW= 000035 G          2154#   4498
EF.PWR= 000034 G          2155#
EF.RES= 000037 G          2152#   4487
EF.STA= 000040 G          2151#   4482
EMSG0   002215            2393    2417#
EMSG1   002216            2394    2419#
EMSG2   002217            2395    2421#
EMSG3   002220            2396    2423#
EMSG4   002320            2397    2437#
EMSG5   002412            2398    2451#
EMSG6   002513            2399    2465#
EMSG8   002643            2401    2479#
ENADD   006512            2606#   3889    5162*
ENDEVT  023004            3639    3649    3653    3796#
ENDHWL  046330            7939    7945    7952#
ENDIT   026116            4496    4604    4606#
ENDPS   033500            5766    5796#
ENDQQ = 000017            2301#   2895
ENQ   = 000005            6786#   7147    7200    7789    7808    7820    7830
EOP   = 000024            2246#   3313
ERRCNT  006506            2604#   3323    3326    4682    5375*   5696*   5714*   5727*   5770*   5800    6012*   6049*   6116*
                          6269*   6391*   6416*   6629*   7450*   7468*
ERREXT  044502            7458    7477    7502    7511    7520    7529    7538    7547    7553    7558    7562    7566#
ERRPRC  043726            7142    7156    7162    7175    7211    7268    7309    7356    7364    7378    7438#
ERR1    017462 G          3021#   5719
ERR10   017552 G          3051#   5701
ERR13   017634 G          3085#   6017    6054    6121    6274    6396    6421    6634    7455    7473
ERR14   017666 G          3104#
ERR2    017524 G          3038#   5732
ERR4    017602 G          3065#   5775
ERX   = 000100            2255#   5416    5464    5490    5603    5621    5930    6280
ETX   = 000200            2256#   5439    5490    5604    5620    5878    5896    6286
EVL   = 000004 G          2171#
EVMCTS  016477            2704    3018#
EVMDCD  016507            2706    3018#
EVMDSR  016503            2705    3018#
EVMOCG  016357            3018#   3786
EVMOHD  016402            3018#   3806
EVMOST  016462            3018#   3826
EVMRI   016517            2708    3018#
EVMRTS  016513            2707    3018#
EVMSQD  016523            2709    3018#
EVMTM   016527            2710    3018#
EVTADD  007650            2733#   3678*   3683    3725*   3731    3741*   3747    3756*   3762
EVTBCT  007652            2734#   3679*   3682    3726*   3730    3742*   3746    3757*   3761
EVTEND  007552            2683#   3368    3646    4563
EVTF0   015547            3018#   3657
EVTF1   015643            3018#   3671
EVTF2   015662            3018#   3684
EVTF3   015744            3018#   3697    3778
EVTF3C  015756            3018#   3709    3705
EVTF3D  015773            3018#   3109
EVTF4   016015            3018#   3748
EVTF4A  016117            3018#   3763
EVTF4B  016215            3018#   3732
```

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EVTF5A  016274           3018#  3028
EVTLOG  006650           2681   2682#  3372   3631   3644   4560
EVTLST  007612           2715#  3667
EVTMIN  007644           2731#  3665*  3670
EVTPTR  006646           2681#  3358   3373*  3630   3651   4561*
EVTSEC  007442           2730#  3664*  3669
EVTTCK  007646           2732#  3663*  3668
EVTTMP  007654           2735#  3692*  3696   3727*  3729   3743*  3745   3758*  3760   3775*  3777
EXIT  = 000057           2333#  2784   4675   4893   5078
EXITCL  026314           4676   4685#
E$END = 002100           1945#
E$LOAD= 000035           1945#  2032
FACSIM  023506           4048#  5247
FHDPLX  006572           2642#  4579*  6064   6604   6650   6910   6988   7238   7763
FIR     037250           3508*  3514*  3528*  3553   6860#
FIRST = 004000           2269#  6594   6602   7605   7851
FLAG    006600           2653#  5372*  5416*  5439*  5464*  5490*  5540   5552   5571   5603*  5604*  5610*  5612
                         5620   5621*  5629*  5878*  5884*  5896*  5930*  6022*  6072*  6086*  6092   6126*  6127*
                         6181   6184*  6187*  6237   6239*  6243*  6277   6280   6283   6286   6289   6344   6382
                         6400*  6424   6426*  6427*  6433*  6485   6489*  6498   6500*  6504*  6539*  6550*  6562
                         6565   6594   6602*  6893   7062*  7770*  7788*  7807*  7819*  7829*  7841*
FMTMSK= 000002           6778#  7546
FORMER= 000021           6771#  7308   7541
F$AU  = 000015           1945#  4727   4738
F$AUTO= 000020           1945#  4655   4659
F$BGN = 000040           1945#  1947   3021   3038   3051   3065   3085   3104   3121   3203   4435   4455   4471
                         4636   4655   4669   4688   4705   4711   4727   4733   4754   4837   4897   6339   6477
                         7598   7889   7908   7993
F$CLEAR 000007           1945#  4669   4695
F$DU  = 000016           1945#  4705   4716
F$END = 000041           1945#  1947   3036   3049   3063   3077   3097   3117   3119   3230   4447   4636   4645
                         4661   4688   4697   4709   4718   4731   4740   4754   4837   4897   6441   6510   7725
                         7889   7891   7955   7993
F$HARD= 000004           1945#  7908   7939   7945   7953
F$HW  = 000013           1945#  2072   2100
F$INIT= 000006           1945#  4471   4643
F$JMP = 000050           1945#  3119   4636   4688   4709   4731   4837   4897
F$MOD = 000000           1945#  1947   7993
F$MSG = 000011           1945#  3021   3034   3038   3047   3051   3061   3065   3075   3085   3095   3104   3115
F$PROT= 000021           1945#  4455   4462
F$PWR = 000017           1945#
F$RPT = 000012           1945#  4435   4445
F$SEG = 000003           1945#
F$SOFT= 000005           1945#
F$SRV = 000010           1945#  3203   3228   6339   6439   6477   6508   7598   7723
F$SUB = 000002           1945#
F$SW  = 000014           1945#
F$TEST= 000001           1945#  4755   7889
GETCL   026762           4833   4844#  4869   4878   4881   4883   4885   4892   4901   4903   4916   4931   4945
                         4957   4973   4987   5361
GETPRM  025712           4502   4568#  4577
GETRCL  020636           3396#  3423   3433   3437
GLINC   035704           6356   6360#
GLMSG   016671           3018*  6361   7622
GLOBCC  037063           6706   7193*
GOOD    006554           2627#  3026   5712*
```

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GTRA2   026346          4762#
GTRA3   026410          4765    4775#
GTRA4   026416          4780#
GTRA5   026642          4776    4816#   5567    5809    5829
GTREX   032036          5372#
GTRX2   032140          5388#   5807    5898    5958
GTR9    031734          4840    4888    5349#
GTXRXB  026346          4761#
G$CNTO= 000200          1945#
G$DELM= 000372          1945#
G$DISP= 000003          1945#
G$EXCP= 000400          1945#
G$HILI= 000002          1945#
G$LOLI= 000001          1945#
G$NO  = 000000          1945#   3404    4850    5860
G$OFFS= 000400          1945#   3404    4542    4850    5860    7915    7925    7930    7935    7941    7947
G$OFSI= 000376          1945#   3404    4542    4850    5860    7915    7925    7930    7935    7941    7947
G$PRMA= 000001          1945#   7925    7930
G$PRMD= 000002          1945#   3404    4542    4850    5860    7947
G$PRML= 000000          1945#   7915    7935    7941
G$RADA= 000140          1945#   3404    4850    5860
G$RADB= 000000          1945#
G$RADD= 000040          1945#   4542    7947
G$RADL= 000120          1945#   7915    7935    7941
G$RADO= 000020          1945#   7925    7930
G$XFFR= 000004          1945#   7939    7945
G$YES = 000010          1945#   4542    7915    7925    7930    7935    7941    7947
HDMADR  002652          2493#   7769*
HDMC    002654          2496#   6089    6196    6252    6542    6552    7105
HDMCC   002646          2490#   6075*   6087*   6100*   6114    6251*   7448    7843*   7844*
HDMID   002645          2488#   7789*   7808*   7820*   7830*   7842*   7854
HDMNUM  002651          2492#   7801*   7812*   7824*   7834*   7846*
HDMREP  002650          2491#   7800*   7813*   7823*   7833*   7845*
HDMSG   002644          2487#   6071*   6088    6249*   6250    6551
HDMTYP  002646          2489#   7790*   7791*   7798*   7809*   7810*   7811*   7821*   7822*   7831*   7832*
HDXMTP  037136          6756#   6909*   6914*   6934    7225    7406    7755    7792    7865
HEADBC= 000001          6765#   7170    7171    7496    7501
HELP  = 000000            1#    1945    1959    2050    2062    2076    2104    2108    2115    2976    2999    3013    3018
                        3130    4437    4441    4443    4463    4473    4639    4657    4671    4691    4707    4712    4729
                        4734    4751    4752    4756    7885    7892    7911    7959    7973    7978    7986
HELPDC= 000000            1#    1961    2085    2103    2231    2258    2344    2358    2937    2977    2992    3018    3079
                        3317    3627    3773    4581    4617    5821    5963    5968    6133    6161    6202    6296    6301
                        6442    7920    7956
HLP   = 000005          2291#   2778    2780    4882    5075
HLPEND  003036          2522#   5073
HLPF    012273          3018#   3488    5068
HLPTAB  003016          2514#   5065
HLP0    012215          3018#   4811
HLP1    012300          2514    3018#
HLP2    012313          2515    3018#
HLP3    012430          2516    3018#
HLP3A   012515          2517    3018#
HLP4    012542          2518    3018#
HLP4A   012621          2519    3018#
HLP5    012677          2520    3018#
HLP6    012767          2521    3018#
```
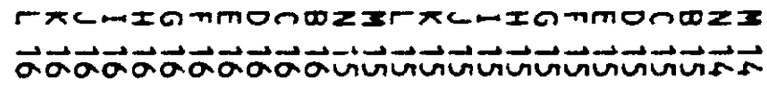

```
HOE   = 100000 G          2184#
HRDMSG  016717            3018#   6358    7619
HSMSE   002653            2494#
IBE   = 010000 G          2181#
IDU   = 000040 G          2174#
IER   = 020000 G          2182#
IMFLAG  037112            6746#   6893*   6943    6954    6990    7006    7025    7030    7062    7603    7605    7851*
IMPRST  037132            6754#   7745*   7768
ININT = 000001            2251#
INIT1   025370            4475    4480#
INMASK  037073            6717#   7170*   7267*   7377*
INOVR = 002000            2267#   6127    6344    7603
INTPRI  011470            2952#   4599*
INVEC   011464            2950#   4596*   4620    4819    6905
IRDSR   011500            2965#   6369*   6376    6384    6387    6413    7631*   7632    7648    7656
IRXCSR  011476            2964#   6058*   6059    6341*   6346    6348    6367    6370    6388    6407    6414    7600*   7607
                          7609    7628
ISR   = 000100 G          2175#
IXE   = 004000 G          2180#
I$AU  = 000041            1945#   4727#   4740#
I$AUTO= 000041            1945#   4655#   4661#
I$CLN = 000041            1945#   4669#   4688    4697#
I$DU  = 000041            1945#   4705#   4718#
I$HRD = 000041            7908#   7955#
I$INIT= 000041            1945#   4471#   4636    4645#
I$MOD = 000041            1945#   1947#   7993#
I$MSG = 000041            1945#   3021#   3036#   3038#   3049#   3051#   3063#   3065#   3077#   3085#   3097#   3104#   3117#
I$PROT= 000040            1945#   4455#
I$PTAB= 000041            1945#
I$PWR = 000041            1945#
I$RPT = 000041            1945#   4435#   4447#
I$SEG = 000041            1945#   4754
I$SETU= 000041            1945#
I$SRV = 000041            1945#   3203#   3230#   6339#   6441#   6477#   6510#   7598#   7725#
I$SUB = 000041            1945#   4754
I$TST = 000041            1945#   4754#   4837    4897    7889#   7891#
J$JMP = 000167            1945#   3119    4709    4731
KEYWD1  003010            2510#   3435    3495*   3499*   3504*   4473*   4675    4880    4882    4884    4886    4889    4893
                          4900    4902    4904    5059*   5062*   5075*   5078*   5081*   5085*   5095    5109    5158*   5168*
                          5171*   5243    5248*
LAST    037246            3509*   3515*   3529*   3558    6859#
LBMASK  037075            6723#   7692*   7704*
LBUFER  037074            6722#   7691*   7701*   7703*
LCLKEN= 000100            2214#   4515
LGDVE   020160            3285#   6011    6048    6115    6268    6390    6415    6628    7449    7467
LIS   = 000006            2203#   5265    5897
LISCK   034056            2662    5919#
LISCKA  034104            5926#   5954    5956
LISMOD= 000032            2312#   2810
LISP    014045            3018#   5921
LMDLOP= 000046            2324#   2923
LNCNT   006500            2601#   3339    3341*   3350*   5378*
LOE   = 040000 G          2183#
LOGCMD  020300            3307#   5733
LOGCML  020262            3303#   5702
LOGCMP  020244            3299#   5692
```

```
LOGDVI  020176            3290#   5385
LOGEOP  020316            3311#   5801
LOGEX   020606            3328    3375
LOGMSC  020334            3317#   6362    7623
LOGRXC  020150            3282#   5575    5944
LOGRXQ  020132            3277#   5548    5938
LOGS1   020352            3270    3275    3280    3284    3323#
LOGS2   020600            3369    3373#
LOGS3   020404            3288    3297    3302    3306    3310    3314    3320    3332#
LOGS4   020460            3340    3349#
LOGS5   020504            3334    3336    3357#   4683
LOGTXC  020114            3272#   5616    5891
LOGTXQ  020076            3267#   5560    5877
LOGUNT  006556            2632#   4566*   4568*   4569    4573
LOOPS   003120            2553#   4121
LOSTER  037102            6737#   7307*   7636*
LOT   = 000010 G          2172#
LP0     013714            2553    3018#   4120
LP00    013715            3018#   4117
LP1     013724            2554    3018#
LP2     013735            2555    3018#
LP3     013743            2556    3018#
LP4     013756            2557    3018#
LSMASK  037103            6738#   7308*   7637*
L$ACP   002110 G          2039#
L$APT   002036 G          1997#
L$AU    026332 G          2024    4727#
L$AUI   002070 G          2023#
L$AUTO  026234 G          2040    4655#
L$CCP   002106 G          2037#
L$CLEA  026236 G          2038    4669#
L$CO    002032 G          1993#
L$DEPO  002011 G          1975#
L$DESC  011536 G          2030    3004#
L$DESP  002076 G          2029#
L$DEVP  002060 G          2015#
L$DISP  002124 G          2000    2059#
L$DLY   002116 G          2045#
L$DTP   002040 G          1999#
L$DTYP  002034 G          1995#
L$DU    026324 G          2026    4705#
L$DUT   002072 G          2025#
L$DVTY  011526 G          2016    2994#
L$EF    002052 G          2010#
L$ENVI  002044 G          2003#
L$ETP   002102 G          2033#
L$EXP1  002046 G          2005#
L$EXP4  002064 G          2019#
L$EXP5  002066 G          2021#
L$HARD  046250 G          1982    7908    7909#
L$HIME  002120 G          2047#
L$HPCP  002016 G          1981#
L$HPTP  002022 G          1985#
L$HW    002150 G          1986    2072    2073#
L$ICP   002104 G          2035#
L$INIT  025350 G          2036    4471#
```



```
L$LADP  002026 G          1989#
L$LAST  046636 G          1990    7991#
L$LOAD  002100 G          2031#
L$LUN   002074 G          2027#
L$MREV  002050 G          2007#
L$NAME  002000 G          1964#
L$PRIO  002042 G          2001#
L$PROT  025342 G          2042    4455#
L$PRT   002112 G          2041#
L$REPP  002062 G          2017#
L$REV   002010 G          1973#
L$RPT   025334 G          2018    4435#
L$SPC   002056 G          2013#
L$SPCP  002020 G          1983#
L$SPTP  002024 G          1987#
L$STA   002030 G          1991#
L$TEST  002114 G          2043#
L$TIML  002014 G          1979#
L$UNIT  002012 G          1977#   4569
L10000  002150            2072    2100#
L10001  017522            3034#
L10002  017550            3047#
L10003  017600            3061#
L10004  017632            3075#
L10005  017664            3095#
L10006  017722            3115#   3120
L10007  020074            3228#
L10010  025340            4445#
L10012  026232            4637    4643#
L10013  026234            4659#
L10014  026322            4689    4695#
L10015  026330            4710    4716#
L10016  026336            4732    4738#
L10017  046244            4838    4898    7889#
L10020  036252            6439#
L10021  036442            6508#
L10022  045346            7723#
L10023  046330            7908    7954#
L5060   014063            3018#   4543
MAINT =  000144           6785#
MCREP   033454            5764    5770#
MES     037252            3554*   3568    3582    3611    6861#
MESDAT  037254            3555*   3567    3579    3581    3593    3596    3599    3610    6862#
MESLON=  000020           6770#   7532    7693
MGLCNT  011520            2973#   3067    5376*   5763    5776*   6360*   7621*
MHRCNT  011522            2974#   3068    5377*   5765    5777*   6357*   7618*
MLTYP   006570            2639#   3294    4806*   4825    4839*   5150    5259*   5278*   5324*   5326*   5328*   5330*   5332*
                          5337*   5349    6024    6029    6588
MOBITE  007574            2700#   3823
MOBITS  007556            2693#   3811
MOCHK =  000010           2223#   4153    5309    6342    7106    7601
MODE    006602            2656#   5395
MODES   003102            2545#   4114
MODLOC=  000003           2208#
MODREM=  000004           2209#
MODS    007554            2687#   3330    6151*   6152*   6155*   6156*   6354    6363*   6608    7615    7624*
```

```
MODTYP  006566          2636#  3293   4805*  4824   5149   5254*  5257*  5262*  5265*  5268*  5271*  5274*  5287
                        5334   5393   5585   5601   5618   5897*  5957*  6033   6938   7234   7408   7748   7867
MOMSGS  007574          2704#  3812
MOP   = 000043          2210#  2321#
MOSC  = 000056          2332#  2867
MO0     013623          2545   3018#
MO1     013633          2546   3018#
MO2     013644          2547   3018#
MO3     013654          2548   3018#
MO4     013663          2549   3018#
MO5     013700          2550   3018#
MO6     013705          2551   3018#
MPPTP   037126          4601*  6648   6752#  6912   6923
MSC   = 000016          2243#  3319
MSCMS   014756          3018#  5774
MSGCC   011504          2967#  6089*  6245*  6252*  6495*  6502*  6552*  7855*
MSGLIM= 000017          2190#  2575   2576   2577   4057   4922   4964
MSGPTR  011502          2966#  6088*  6244*  6250*  6492   6494*  6551*  6551*  7854*
MSGTRN  014365          3018#  4911   4926   4952   4968
MSGTRU  014416          3018#  3928
MSGTYP  006516          2611#  3972   4789*  4801*  5120*  5199*  5223*  5225*  5227*  5229*  5231*  5233*  5236*
                        5391*
MSG0    002214          2393   2406   2416#
MSG0C   002150          2393#
MSG1    002215          2394   2407   2418#
MSG1C   002152          2394#
MSG2    002216          2395   2408   2420#
MSG2C   002154          2395#
MSG3    002217          2396   2409   2422#
MSG3C   002156          2396#
MSG4    002220          2397   2410   2424#
MSG4C   002160          2397#
MSG5    002320          2398   2411   2438#
MSG5C   002162          2398#  4790   4802   5121   5234
MSG6    002412          2399   2412   2452#
MSG6C   002164          2399#  5237
MSG8    002642          2401   2414   2478#
MSG8C   002170          2401#
MTLMSK= 000002          6779#  7537   7692
MYDATA= 001000          6807#  7103   7185   7321   7338   7645   7670
N       037054          6689#  7229*  7321*  7396*
NAK   = 000002          6792#  7205   7809
NAKRX = 000400          6806#  7210   7481
NEW     025704          4501   4566#  4570
NO    = 000036          2316#  2850   5281   5284   5315
NOCLK   014226          3018#  4769
NOD0    007716          2777#
NOD1    007722          2778#
NOD10   010000          2785#
NOD100  010626          2857#
NOD101  010632          2858#
NOD102  010646          2859#
NOD103  010652          2861#
NOD104  010656          2862#
NOD105  010674          2863#
NOD106  010700          2864#
```

```
NOD107  010712            2865#
NOD11   010002            2786#
NOD110  010716            2867#
NOD111  010732            2868#
NOD112  010736            2870#
NOD113  010752            2871#
NOD114  010756            2874#
NOD115  010762            2877#
NOD116  010776            2878#
NOD117  011002            2879#
NOD12   010014            2787#
NOD120  011020            2880#
NOD121  011024            2881#
NOD122  011040            2882#
NOD123  011044            2883#
NOD124  011060            2884#
NOD125  011064            2885#
NOD126  011100            2886#
NOD127  011104            2887#
NOD13   010020            2788#
NOD130  011120            2888#
NOD131  011124            2889#
NOD132  011140            2890#
NOD133  011144            2891#
NOD134  011164            2892#
NOD135  011170            2894#
NOD136  011174            2895#
NOD137  011200            2896#
NOD14   010034            2789#
NOD140  011204            2897#
NOD141  011210            2898#
NOD142  011214            2899#
NOD143  011220            2900#
NOD144  011222            2903#
NOD145  011226            2904#
NOD146  011232            2905#
NOD147  011246            2906#
NOD15   010040            2790#
NOD150  011252            2907#
NOD151  011266            2908#
NOD152  011272            2911#
NOD153  011276            2912#
NOD154  011302            2913#
NOD155  011306            2916#
NOD156  011312            2919#
NOD157  011334            2920#
NOD16   010054            2791#
NOD160  011340            2921#
NOD161  011354            2922#
NOD162  011360            2923#
NOD163  011402            2924#
NOD164  011406            2925#
NOD165  011430            2926#
NOD166  011434            2929#
NOD167  011440            2930#
NOD17   010060            2792#
```

```
NOD170  011444            2931#
NOD171  011450            2936#
NOD172  021030            3444#
NOD173  021034            3445#
NOD174  021040            3446#
NOD175  021042            3447#
NOD176  021056            3448#
NOD177  021060            3449#
NOD2    007726            2779#
NOD20   010064            2793#
NOD200  021074            3450#
NOD201  021076            3451#
NOD202  021110            3452#
NOD203  021112            3453#
NOD204  021132            3454#
NOD205  021136            3455#
NOD206  021142            3456#
NOD207  021156            3457#
NOD21   010076            2794#
NOD210  021160            3458#
NOD211  021174            3459#
NOD212  021176            3460#
NOD213  021214            3461#
NOD214  021220            3462#
NOD215  021224            3463#
NOD216  021226            3464#
NOD217  021230            3465#
NOD22   010102            2795#
NOD23   010114            2796#
NOD24   010120            2797#
NOD25   010122            2801#
NOD26   010126            2802#
NOD27   010142            2803#
NOD3    007730            2780#
NOD30   010146            2804#
NOD31   010164            2805#
NOD32   010170            2806#
NOD33   010206            2807#
NOD34   010212            2808#
NOD35   010230            2809#
NOD36   010234            2810#
NOD37   010252            2811#
NOD4    007744            2781#
NOD40   010256            2812#
NOD41   010302            2813#
NOD42   010306            2814#
NOD43   010312            2815#
NOD44   010330            2816#
NOD45   010334            2817#
NOD46   010346            2818#
NOD47   010352            2822#
NOD5    007746            2782#
NOD50   010356            2823#
NOD51   010400            2824#
NOD52   010402            2825#
NOD53   010426            2826#
```

```
NOD54   010430          2831#
NOD55   010434          2832#
NOD56   010452          2833#
NOD57   010456          2834#
NOD6    007762          2783#
NOD60   010476          2835#
NOD61   010502          2838#
NOD62   010506          2839#
NOD63   010512          2840#
NOD64   010516          2841#
NOD65   010522          2842#
NOD66   010526          2843#
NOD67   010532          2844#
NOD7    007764          2784#
NOD70   010536          2845#
NOD71   010542          2848#
NOD72   010546          2849#
NOD73   010552          2850#
NOD74   010564          2851#
NOD75   010570          2852#
NOD76   010604          2853#
NOD77   010610          2856#
NONE  = 000000          2205#
NOTNUM= 000050          2326#   2788    2791    2792    2802    2841    2843    2849    2904
NULEVT  015507          3018#   3634
NULL  = 000000          2286#
NUM   = 000014          2298#   2912
N10$    007722          2777#
N100$   010352          2791    2794    2821#
N102$   010356          2822#
N104$   010402          2823    2824#
N110$   010430          2796    2830#
N111$   010434          2831#
N112$   010456          2832    2833#
N114$   010546          2848#
N115$   010542          2805    2807    2809    2811    2813    2816    2818    2847#   2853    2857    2859    2863    2868
                        2920    2922    2924    2926    2931
N116$   010564          2850#
N117$   010610          2851    2852    2855#
N118$   010632          2856    2857#
N119$   010652          2858    2860#
N120$   010756          2833    2835    2873#
N121$   011222          2878    2880    2882    2884    2886    2888    2890    2896    2902#   2913
N122$   011252          2905    2906#
N123$   011226          2903#
N125$   011450          2841    2843    2845    2849    2892    2904    2935#
N126$   011272          2906    2908    2910#
N130$   010700          2862    2863#
N131$   010736          2867    2869#
N132$   010716          2861    2866#
N140$   011306          2871    2915#
N141$   011312          2918#
N142$   011340          2919    2920#
N143$   011360          2921    2922#
N144$   011406          2923    2924#
N150$   011434          2865    2928#
```

```
N20$    010060          2790    2791#
N25$    010102          2793    2794#
N30$    010120          2792    2795    2796#   2801    2802    2803    2814    2817    2822    2825    2831    2834    2840
                        2842    2844    2864    2870    2874    2894    2907    2911    2912    2916    2925    2929    2930
N40$    010040          2788    2789#
N42$    007730          2778    2779#
N43$    007746          2780    2781#
N44$    007764          2782    2783#
N45$    010002          2784    2785#
N46$    010020          2786    2787#
N50$    010502          2789    2837#
N51$    010506          2838#
N52$    010512          2839#
N60$    010762          2876#
N61$    011002          2877    2878#
N62$    011024          2879    2880#
N63$    011044          2881    2882#
N64$    011064          2883    2884#
N65$    011104          2885    2886#
N66$    011124          2887    2888#
N67$    011144          2889    2890#
N68$    011170          2891    2893#
N70$    011174          2894#   2899
N71$    011204          2895    2896#
N72$    011210          2897#
N73$    011220          2898    2899#
N80$    010122          2787    2800#
N81$    010126          2801#
N82$    010170          2804    2805#
N83$    010212          2806    2807#
N84$    010234          2808    2809#
N85$    010256          2810    2811#
N86$    010306          2812    2813#
N87$    010334          2815    2816#
OFSET   006532          2518#   3027    5705*   5722*
OPBFPT  002514          2471#   5948
OPBUF   002520          2413    2472#   5209    5852    5859    5867    5873    5874    5892    5894    5926    5927    5953
                        5995
OPCNT   002166          2400#   5207*   5871*   5875    5876
OPEND   002642          2475#   5854
OPRMM   014056          3018#   5861
OPRMSG= 000015          2299#   2894
OPVAR   006002          2602#   4680    5373*   5798    6122*   7456*
OTINT = 000002          2252#
OUTMAS  037071          6711#   7501*   7510*
OUTVEC  011466          2951#   4597*   4598*   4627
O$APTS= 000000          1945#   1991
O$AU  = 000001          1945#   1958#   2023
O$BGNR= 000001          1945#   1958#   2017
O$BGNS= 000000          1945#   1983
O$DU  = 000001          1945#   1958#   2025
O$ERRT= 000000          1945#   2033
O$GNSW= 000000          1945#   1987
O$POIN= 000001          1945#   1958#   2049
O$SETU= 000000          1945#   1977    7989
PAD   = 001000          2265#   6086    6239    6485    6504    6550    7770
```

```
PARAM   006574          2643# 3296  3335  3544  4808* 4823* 4827  5152  5276* 5286* 5296* 5314* 5317*
                        5351  5436* 5549  5562  5565  5576  5581  5630  5674  5851* 5882  5919* 5934
                        6066  6342  6898  6928  7106  7207  7219  7221* 7249  7275  7282* 7301* 7384
                        7391* 7440  7601  7746  7796
PAS    = 000002         2199# 5257  5287  5601  5618
PASC   = 000042         2320# 2930
PASMOD= 000030          2310# 2806
PCADD   006560          2633#
PCK     014005          3018# 4139
PCLKCT= 001600          2216# 4526
PCLKEN= 000111          2215# 4528
PCPM    014647          3018#
PCSAR   011454          2944# 4587* 4588* 6061*
PEC     014015          3018# 4143
PLCK    032300          2658  5460#
PLCK2   032300          5461#
PLCK3   032314          5463#
PMS     014024          3018# 4152
PNCK    014003          3018# 4142
PNEC    014013          3018# 4146
PNMS    014022          3018# 4155
PNPR    014032          3018# 4151
PNST    013772          3018# 4138
PNT    = 001000 G       2178#
PPR     014034          3018# 4148
PRFLAG  037134          6755# 7102* 7149* 7654  7662* 7677  7682* 7683* 7715*
PRI    = 002000 G       2179#
PRIBB   021666          3577# 6845  6846  6847  6848  6849  6850
PRIBS   021724          3590# 6851  6852  6853  6854  6855  6856
PRINEX  045344          7630  7653  7665  7712  7721#
PRIN1   044656          7620  7623#
PRIN2   044604          7612  7614#
PRIN21  044670          7602  7604  7606  7608  7628#
PRIN4   044752          7633  7645#
PRIN5   045060          7655  7667#
PRIN6   045034          7657  7662#
PRIN7   045316          7678  7707  7715#
PRIN8   045332          7639  7659  7695  7718#
PRIW    021640          3566# 6842  6843  6844  6857
PRI00  = 000000 G       2167# 4633
PRI01  = 000040 G       2166#
PRI02  = 000100 G       2165#
PRI03  = 000140 G       2164#
PRI04  = 000200 G       2163# 4618  4625  4817  6903
PRI05  = 000240 G       2162#
PRI06  = 000300 G       2161#
PRI07  = 000340 G       2003  2160# 4673
PRNT   = 000055         2351# 2782  4884  5081
PROEND  037110          6745# 7083
PROFDX  041522          6989  7025#
PROHDX  041330          6935  6987#
PROINT  041730          6922  7079#
PRORUN= 000100          2226# 4823  6898  6928  7207  7219  7221  7249  7275  7301  7384  7391  7440
                        7746  7796
PROTEX  041670          6956  6962  6982  7008  7021  7056#
PROTO  = 000041         2319# 2862
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PROTOB=  000040            2225#  3544   4149   5312   5549   5562   5882   5934   6066
PROTOC   040702            5564*  5885*  5941*  6893#
PRRXI    044504 G          6904   7598#
PRSTAT   037046            3555   6673#  6921*  6925*  6945*  6968*  6997*  7015*  7048*  7081   7100*  7103*  7152
                           7160   7167   7169*  7185*  7186   7191   7210*  7212*  7254*  7262*  7277*  7299*  7306*
                           7321*  7338*  7339   7345*  7350   7360   7369   7373*  7401*  7481   7552   7635*  7645
                           7658*  7667*  7670*  7681*  7694*  7706*  7716*  7745   7768*  7773   7775   7777   7779
                           7781   7802*  7814*  7825*  7836*
PRTEMP   037140            6757#
PRUN     037124            6751#  6919*  6930*  7404
PSCNT    000504            2603#  4681   5374*  5796*  5799
PST      013774            3018#  4135
PTPMLP   046466            7942   7956#
PTREND   006434            2578#
PTRTAB   006150            2575#  4060   4065   4783   4920   5106   5113   5365
PTR13    006244            2576#  4787   4962   5090   5100   5366
PTR23    006340            2577#  5367
P$ACT    003136            2563#  3412*  4236   4858*
P$BUFA   003132            2561#  3410*  4191   4856*
P$CNT    003140            2564#  4333*  4340   4402*  4409*  4414
P$EXIT   024362            4194   4229#  4253   4258
P$GDBD   003147            2568#  3396*  3415   3538*  4251*  4256*  4264   4315*  4358*  4844*  4861   5191*  5245*
                           5295*  5336*
P$NXDF   003146            2567#  3397*  3425   3481*  3521*  4845*  4870   5056*  5086*  5094*  5108*  5163*  5251*
                           5258*  5277*  5344*
P$NUM    003142            2565#  3522   3524   3526   3528   3529   4328*  4331*  4333   4334*  4336*  4340*  4342*
                           4348*  5156   5162   5183   5193   5195   5321
P$RADX   003144            2566#  4288*  4291*  4298*  4305   4338   4346
P$TREE   003134            2562#  3411*  4192   4857*
P$TRV    024244            3414   4190#  4860
P$TR5    024254            4193#  4202   4222   4227
QCOPY  = 000013            2297#  2907   5178
QRX    = 000004            2253#  5416   5464   5490   5540   5571   5603   5610   5621   5930   6181   6184   6283
                           6433   6539   6565   6954   7006   7030   7102   7715
QTX    = 000010            2254#  5439   5490   5552   5604   5612   5620   5629   5878   5896   6086   6092   6237
                           6239   6277   6289   6489   6550   6562   6943   6990   7025
QUALFG   003012            2512#  3413*  4859*  5175*  5178*  5181   5281*  5284   5297*  5315   5318*
QUALVL   003014            2513#  4943*  4985*  5172*  5195*  5196*
R        037060            6697#  7252   7334*  7335   7337*  7800   7813   7845
RBMASK   037077            6728#  7519*  7537*
RBUFER   037076            6727#  7516*  7518*  7534*  7536*
RDATRY=  000200            2365#  6367   6370   7628
RDSR     011456            2945#  4589*  4590*  6369   7631
REANAK   037064            6704#  7171*  7263*  7638*  7693*  7705*  7810
REC    = 000000            2197#
RECMOD=  000031            2311#  2808
REMIMO   037062            6701#  7255*  7257*
REP    = 000003            6793#  7235
REPLOG   022056            3503   3623#
REPMSK=  000004            6776#  7267
REPORT   020610            3384#  4438   5082
REPSEN=  000003            6767#  7263
RERR   = 100000            2377#  6384
RESET  = 000001            2368#  5998
RESFLG   006564            2635#  4480   4504*  4775
RESTRT   025644            4490   4516   4529   4548   4557#
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RHDADR  002664            2504#  7181   7668
RHDMLC  002660            2501#  6080   6082   6104   6106   6113   6429   6430   7447   7675   7684*  7687   7710
                          7711
RHDMID  002657            2499#  7104   7138   7147   7200
RHDMSG  002656            2498#  6195   6541   7101*
RHDNUM  002663            2503#  7252   7335
RHDREP  002662            2502#  7223   7231   7325   7394
RHDTYP  002660            2500#  7205   7217   7245   7273   7297   7495*  7496   7505   7514   7523   7532   7541
RHLPEN  003052            2530#  3493
RHLPTB  003036            2524#  3485
RHLP0   013066            3018#  3390
RHLP1   013124            2524   3018#
RHLP2   013146            2525   3018#
RHLP3   013201            2526   3018#
RHLP4   013232            2527   3018#
RHLP5   013264            2528   3018#
RHLP6   013327            2529   3018#
RI      =  040000         2354#  2697
RINTEN= 000100            2364#  5808   6197   6435   6545   7108   7110   7719   7766
RMDLOP= 000047            2325#  2925
RMMASK  037101            6733#  7528*  7546*
RMSGCC  011514            2971#  6189*  6196*  6380*  6401*  6429*  6542*  7105*  7652*  7663*  7710*
RMSGPT  011512            2970#  6188*  6195*  6375   6377*  6402*  6428*  6541*  7104*  7647   7649*  7664*  7709*
RMSTER  037100            6732#  7525*  7527*  7543*  7545*
RNODE   011524            2975#  4600*  5381   6062   6185   6241
RNODM   046442            7936   7956#
RNOTNF= 000006            2341#  3453   3455   3460
RPASS   006576            2652#  3295   4807*  4826   4834   5087*  5151   5321*  5803   5805*
RPERR   000004            2339#  3456
RPEXT   =  000002         2337#  3435   3449   3499
RPFUL   =  000005         2340#  3458
RPHLP   =  000001         2336#  3445   3447   3495
RPLOG   =  000003         2338#  3451   3504
RPSWO   =  000007         2342#  3462
RPT     022124            3641#  3690   3710   3721   3738   3753   3769   3793
RPTAA   022174            3656#
RPTABO  022510            2750   3724#
RPTDCK  022640            2745   3756#
RPTDDE  022564            2748   3741#
RPTDER  022350            2743   3692#
RPTDLE  022640            2747   3755#
RPTDSP  007656            2739#  3676
RPTDVI  022444            2744   3712#
RPTEOP  022510            2749   3725#
RPTIV   013376            3018#  3533
RPTMSB  023014            3689   3784   3792   3805#
RPTMSC  022714            2746   3775#
RPTMSE  023000            3795#
RPTNV   013421            3018#  3547
RPTTXQ  022276            2739   2740   2741   2742   3678#
RPT0    022170            3632   3648   3652   3655#
RPT1    022156            3645   3651#
RSTARY= 002000            2366#  6367   6407   7628
RTS     =  000004         2303#  2696   6614   6656
RUN     =  000004         2290#  2786   4886   5085
RXACT   =  004000         2367#
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RXBUF   004150          2573#   5389
RXC   = 000006          2239#   3283    3333
RXCSR   011452          2943#   4584*   5808*   6000    6009    6037*   6046    6058    6151    6197*   6266    6341    6435*
                        6545*   6614*   6618    6626    6656*   7108*   7110*   7465    7600    7719*   7766*
RXD   = 000100          6805#   7186    7339    7350    7716
RXENA = 000020          2362#   5808    6197    6435    6545    7108    7110    7719    7766
RXINEX  036250          6368    6381    6403    6408    6431    6437#
RXIN1   035716          6359    6362#
RXIN2   035644          6351    6353#
RXIN21  035730          6343    6345    6347    6367#
RXIN3   036110          6371    6407#
RXIN4   035756          6375#
RXIN5   036164          6383    6424#
RXIN6   036064          6386    6400#
RXIN7   036234          6422    6425    6433#
RXIN8   036242          6398    6435#
RXM   = 000040          2261#   6072    6184    6187    6424    6426    7102    7149    7677    7682
RXMTOT  006476          2599#   5369*   5415    5488    5678
RXON    041774          6967*   6981*   6994*   7012*   7020*   7045*   7054*   7098#   7132*   7879*
RXONEX  042076          7099    7112#
RXONLY  032206          2656    5413#
RXON2   032206          5414#
RXOVER= 004000          2380#   7632
RXOVMS= 000001          6777#   7528    7637
RXOVRU= 000011          6769#   7523    7638
RXPRC   037114          6747#   6895*   6952    6973    7004    7028    7032*   7035    7236    7283*   7319    7403*   7699
RXPREX  043724          7143    7242    7291    7302    7332    7388    7405    7407    7409    7411    7414#
RXPROT  042100          6927    6947*   6959*   6970*   6999*   7017*   7034*   7050*   7131#   7157    7164    7178    7194
                        7209    7214    7227    7240    7251    7259    7270    7279    7311    7347    7357    7366    7380
                        7412    7759*
RXPTR   006440          2582#   4785*   5367*   5390    5414    5463    5489    5584    5676
RXQ   = 000004          2238#   3279    5084
RXTHER  037066          6707#   7199*   7555    7557*   7561*
RXTXTE  037104          6742#   7489*   7560*
RXWAIT  042104          6995*   7013*   7046*   7135#
R10$    021034          3444#
R11$    021042          3445    3446#
R12$    021060          3447    3448#
R125$   021230          3464#
R13$    021076          3449    3450#
R14$    021112          3451    3452#
R20$    021136          3454#
R21$    021160          3456    3457#
R22$    021176          3458    3459#
R30$    021226          3453    3455    3460    3461    3462    3463#
SACK  = 000004          6802#   7015    7254    7299    7345    7401    7773    7802
SCM     016603          3018#   3300
SCMD    016636          3018#   3308
SCML    016625          3018#   3304
SDATA = 000020          6804#   6945    6968    6997    7048    7212    7781
SDVE    016572          3018#   3286
SDVI    016614          3018#   3291
SELECT  037130          6753#   6917*   6992    7010    7043    7176*   7675*   7757    7772*   7799*
SELTHE  037065          6705#
SEOP    016647          3018#   3312
SETET = 000060          2334#   2891    4880    5248
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SETEXP= 000010            2294#   2832    4904    5168    5243
SETTRN= 000011            2295#   2834    5171
SHF0    014501            3018#   4126
SHF1    014537            3018#   4164
SHMSG   013507            3018#   5141
SHOW  = 000002            2288#   2793    4902    5062    5095    5109
SHTAB   003072            2539#   5129    5135
SHTSTD  003101            2542#   5132
SHTYP0  013543            2532    3018#
SHTYP1  013552            2532    3018#
SHTYP2  013557            2532    3018#
SHTYP3  013564            2532    3018#
SHTYP4  013571            2532    3018#
SHTYP5  013577            2532    3018#
SHTYP6  013604            2532    3018#
SHTYP7  013612            2532    3018#
SHTYTB  003052            2532#   5140
SHWOP   023712            3719    4112#   4828    5153
SIZE  = 000012            2296#   2905    5175    5181
SMSC    016660            3018#   3318
SNAK  = 000010            6805#   7160    7169    7262    7306    7360    7373    7552    7635    7694    7706    7775    7814
SOH   = 000201            6784#   7842
SPARE0  037106            6743#
SPARE1  037107            6744#
SQD   = 000040            2355#   2698
SRXQ    016561            3018#   3278
SSTACK= 002000            6808#   7277    7779    7836
SSTART= 004000            6809#   6925    7777    7825
STACK = 000007            6795#   7297    7831
STADD   006510            2605#   3861    5156*
STAIND  037206            3556    6842#
STALST  037146            3554    6819#
STAPRI  021540            3510    3516    3530    3543#
START   025444            4485    4504#
STATB = 000001            2220#   3335    4136    5303
STATUS= 000016            2300#   2856
STA0A   037256            6819    6868#
STA1A   037305            6820    6868#
STA10A  040003            6827    6868#
STA11A  040065            6828    6868#
STA12A  040162            6829    6868#
STA13A  040256            6830    6868#
STA14A  040354            6831    6868#
STA15A  040452            6832    6868#
STA16A  040540            6833    6868#
STA17A  040625            6834    6868#
STA2A   037343            6821    6868#
STA3A   037377            6822    6868#
STA4A   037471            6823    6868#
STA5A   037555            6824    6868#
STA6A   037635            6825    6868#
STA7A   037721            6826    6868#
STRT  = 000006            6794#   7273    7821
STXC    016550            3018#   3273
STXQ    016557            3018#   3268
SVCGBL= 000000            1945#   1964    1973    1975    1977    1979    1981    1983    1985    1987    1989    1991    1993
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                    5717  5718  5719  5729  5730  5731  5732  5772  5773  5774  5775  5824  5825
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                    5923  5924  5925  5948  5949  5950  5951  5952  6003  6014  6015  6016  6017
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                    6273  6274  6393  6394  6395  6396  6418  6419  6420  6421  6440  6509  6559
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                    7932  7933  7935  7936  7937  7939  7941  7942  7943  7945  7947  7948  7949
                    7950  7951  7953  7988  7989  7990
SVCSUB- 000001       19 5#
SVCTAG= 000001       1945#  2100  3034  3047  3061  3075  3095  3115  3228  3409  4445  4547  4643
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SYNCC   011506  2968#  6090  6253*  6479  6482*  6553*  7856*
SYNCW   011510  2969#  5379*  5384*  6481
S$LSYM= 010000  1945#  2101#  3035#  3048#  3062#  3076#  3096#  3116#  3229#  3402  3409  3410#  4446#
                4540  4547  4578#  4644#  4660#  4696#  4717#  4739#  4848  4855  4856#  5858  5865
                5866#  6440#  6509#  7724#  7890#  7955#
S1      025432  4495  4497#
S2      025506  4513  4518#
S3      025556  4523  4531#
S4      025626  4534  4550#
T       037056  6694#  7086*  7223  7229  7230  7232*  7325  7327  7328  7329  7330*  7394  7396
                7397  7398  7399*  7846
TABEX   014307  3018#  4925  4967
TAL   = 000005  2202#  5274  5957
TALCK   033612  2661  5850#  5893  5895
TALMOD= 000035  2315#  2817
TBMT  = 000004  2370#
TCURAD  006466  2594#  4791*  4794  4936  4941*  5116*
TDSR    011462  2947#  4593*  4594*  6481*  6484*  6487*  6493*  6497*
TEMP    006534  2619#  3269*  3274*  3279*  3283*  3287*  3292*  3301*  3305*  3309*  3313*  3319*  3333
                3359  3360*  3361*  3362  3872*  3875  3934*  3935*  3936  3974*  3975*  3981  4114*
                4127  4135*  4138*  4163  4679*  5137*  5139  5200*  5201*  5205  5208  5590*  5591*
                5595  6596*  6597*  6600  7080*  7085
TEMP1   006536  2620#  3268*  3273*  3278*  3286*  3291*  3300*  3304*  3308*  3312*  3318*  3352  3590*
                3595*  3608  4121*  4125  4139*  4142*  4162
TEMP2   006540  2621#  3293*  3294*  3365  3591*  3598*  3606  3977*  3979*  3983  4122*  4124  4143*
                4146*  4161  4681*  5543*  5555*  5573*  5579  5593*  5594  5614*  5682*  5799*  5874*
                5889*  5921  5942*  6008*  6043*  6112*  6265*  6358*  6361*  6389*  6412*  6625*  6652*
                6653*  7440*  7464*  7619*  7622*
TEMP3   006542  2622#  3053  3088  3108  3295*  3366  3592*  3601*  3604  4117*  4120*  4126  4682*
                5545*  5557*  5574*  5580  5591  5592  5593  5615*  5684*  5694  5800*  5875*  5890*
                5929*  5943*  6009*  6046*  6113*  6266*  6353*  6355  6387*  6413*  6626*  7444*  7447*
                7465*  7614*  7616
TEMP4   006544  2623#  3040  3087  3107  3296*  3330*  3367  4148*  4151*  4159  4680*  5691*  5704*
                5709*  5710  5725  5798*  6010*  6047*  6114*  6267*  6354*  6355  6388*  6414*  6627*
                7445*  7448*  7466*  7615*  7616
TEMP5   006546  2624#  4152*  4155*  4160
TEOM  = 001000  2375#  6484  6497
TERR  = 100000  2376#
TIMEOU  037144  6759#  6897*  7461*  7462  7474*
TIMERS  006644  2678#  3221  3225*  6073*  6077  6096  6107*  6256*  6260  6560  6916*  6933*  7140
                7154  7188  7341  7354  7438  7457*  7470*
TIMER1  006640  2676#  3215  3217*  4763*  4764  6039*  6040  6603*  6610  6615*  6620
TIMER2  006642  2677#  3218  3220*
TIMMIN  006632  2672#  3212*  3364  4557*
TIMSEC  006634  2673#  3209*  3210  3213*  3363  4558*
TIMTCK  006636  2674#  3206*  3208*  3223  3361  4559*
TINTEN= 000100  2373#  6091  6254  6488  6554  7859
TM    = 000040  2356#  2699  6350  6352  7611  7613
TMESRX  037052  6687#  6961*  6975*  7079*  7037*  7056  7058*
TMESTX  037050  6686#  6950*  6976*  7002*  7053*  7059  7061*
TOINOT  035472  6261  6277#
TOTCC   006530  2617#  3921*  3922  3933*  3935  3937*  4780*  4906*  4907  4940  4947*  4948  4984
TRA   = 000001  2198#  5271
TRAMOD= 000034  2314#  2815
```

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TRIBN   037061          4603* 4605* 6698# 7080  7085* 7181  7668  7769
TRIBNQ  046524          7948  7956#
TRVACT  024364          4223  4234# 4250  4255  4260  4263  4283  4349  4372  4393  4417
TRVALN  025156          4212  4376#
TRVALP  025112          4211  4362#
TRVBIF  024470          4208  4263#
TRVBR   024460          4207  4260#
TRVBRC  024404          4221  4241# 4261  4266  4285  4359  4374  4395  4421
TRVDEC  024564          4214  4288#
TRVERR  024422          4205  4250#
TRVEXI  024442          4206  4255#
TRVNMA  024604          4289  4292#
TRVNOB  024414          4246# 4267  4284  4350  4373  4394
TRVNUM  024576          4210  4291#
TRVOCT  024576          4213  4290#
TRVSPA  024512          4209  4269#
TRVSTR  025244          4215  4399#
TSOM  = 000400          2374# 6484
TTL   = 000001          2206# 4839  6024
TTLL  = 000010          2371# 6023  6026
TTLLOP= 000044          2322# 2919
TTOTCC  006464          2593# 4084  4781* 4906  4917  4940* 5112*
TURNON  037142          6758# 6918* 7098  7111* 7718* 7767*
TXACT = 000002          2369#
TXBUF   003150          2572# 4052  4791  5115
TXC   = 000002          2237# 3274
TXCSR   011160          2946# 4591* 4592* 5998* 6010  6023* 6026* 6047  6091* 6153  6254* 6267  6350
                        6488* 6554* 6627  7466  7611  7859*
TXENA = 000020          2372# 6091  6256  6554  7859
TXINEX  036440          6483  6491  6496  6503  6506#
TXIN1   036300          6480  6484#
TXIN2   036346          6486  6492#
TXIN3   036432          6499  6504#
TXM   = 000020          2259# 6072  6239  6243  6498  6500  7788  7807  7819  7829  7841
TXMTOT  006462          2592# 4072  4797* 4919* 4921  4942* 5107  5111* 5353  5438  5461  5486
TXONLY  032240          2657  5436#
TXON2   032246          5437#
TXPRC   037116          6748# 6896* 6948  6971  7000  7003* 7027* 7040  7051  7233* 7284* 7322  7331*
                        7400* 7410  7794
TXPREX  046236          7869  7879#
TXPROT  045350          6926  6946* 6969* 6998* 7016* 7049* 7163  7177  7213  7258  7269  7278  7300
                        7310  7346* 7365  7379  7402  7745#
TXPTR   006442          2583# 4065* 4067* 4068  4077* 4079  4784* 4795  4920* 4934* 4935  4939* 5113*
                        5114  5365* 5437  5462  5487
TXQ   = 000000          2236# 3269
TXREAD  037122          6490* 6750# 6894* 6979  7750  7771* 7873
TXTHER  037067          6708# 7228* 7485  7487* 7490*
T$ARGC= 000001          1965# 1966# 1967# 1968# 1969# 1970# 3023# 3032  3040# 3045  3053# 3059  3067#
                        3073  3087# 3093  3106# 3113  3344# 3348  3352# 3356  3390# 3394  3418# 3422
                        3428# 3432  3487# 3492  3533# 3537  3547# 3551  3567# 3572  3578# 3586  3603#
                        3615  3634# 3638  3657# 3661  3667# 3675  3682# 3688  3696# 3701  3703# 3709
                        3729# 3736  3745# 3752  3760# 3767  3777# 3782  3786# 3790  3806# 3810  3826#
                        3830  3864# 3869  3874# 3880  3883# 3888  3928# 3932  4124# 4132  4159# 4168
                        4310# 4314  4353# 4357  4551# 4555  4769# 4773  4811# 4815  4864# 4868  4873#
                        4877  4910# 4915  4925# 4930  4951# 4956  4967# 4972  5067# 5072  5139# 5145
                        5186# 5190  5216# 5220  5290# 5294  5339# 5343  5356# 5360  5824# 5828  5921#
```

```
                    5925    5948#   5952    7286#   7290
T$CODE= 005052      3404#   4542#   4850#   5860#   7915#   7925#   7930#   7935#   7939#   7941#   7945#   7947#
T$ERRN= 000007      1945#   5699#   5717#   5730#   5773#   6015#   6052#   6119#   6272#   6394#   6419#   6632#   7453#
                    7471#
T$EXCP= 000000      3404#   3409    4542#   4547    4850#   4855    5860#   5865    7925#   7929    7930#   7934    7947#
                    7952
T$FLAG= 000040      3119#   3121    4636#   4688#   4709#   4711    4731#   4733    4837#   4897#
T$GMAN= 000000      1945#   3401#   3404    3410#   4539#   4548#   4847#   4850    4856#   5857#   5860    5866#
T$HILI= 000377      3404#   3408    4542#   4546    4850#   4854    5860#   5864    7925#   7928    7930#   7933    7947#
                    7951
T$LAST= 000001      1945#   7989#
T$LOLI= 000001      3404#   3407    4542#   4545    4850#   4853    5860#   5863    7925#   7927    7930#   7932    7947#
                    7950
T$LSYM= 010000      1945#   2101    3035    3048    3062    3076    3096    3116    3229    4446    4644    4660    4696
                    4717    4739    6440    6509    7724    7890    7955
T$LTNO= 000001      7992#
T$NEST= 177777      1945#   1947#   2072#   2100#   3021#   3034#   3038#   3047#   3051#   3061#   3065#   3075#   3085#
                    3095#   3104#   3115#   3203#   3228#   4435#   4445#   4455#   4462#   4471#   4643#   4655#   4659#
                    4669#   4695#   4705#   4716#   4727#   4738#   4755#   6339#   6439#   6477#   6508#   7598#   7723#
                    7889#   7908#   7939    7945    7953#   7993#
T$NS0 = 000000      1947#   7993
T$NS1 = 000004      2072#   2100    3021#   3034    3038#   3047    3051#   3061    3065#   3075    3085#   3095    3104#
                    3115    3203#   3228    4435#   4445    4455#   4462    4471#   4643    4655#   4659    4669#   4695
                    4705#   4716    4727#   4738    4755#   7889    7908#   7939    7945    7953
T$NS2 = 000010      6339#   6439    6477#   6508    7598#   7723
T$PTNU= 000000      1945#
T$SAVL= 177777      1945#
T$SEGL= 177777      1945#
T$SUBN= 000000      1945#   4754#
T$TAGL= 177777      1945#
T$TAGN= 010024      1945#   2072#   3021#   3038#   3051#   3065#   3085#   3104#   3203#   4435#   4455#   4471#   4655#
                    4669#   4705#   4727#   4755#   6339#   6477#   7598#   7908#
T$TEMP= 000000      2060#   2061#   2100#   3034#   3047#   3061#   3075#   3095#   3115#   3119#   3120    3228#   3404#
                    4445#   4462#   4542#   4636#   4637    4643#   4659#   4688#   4689    4695#   4709#   4710    4716#
                    4731#   4732    4738#   4837#   4838    4850#   4897#   4898    5860#   6439#   6508#   7723#   7889#
                    7915#   7925#   7930#   7935#   7941#   7947#   7953#   7993#
T$TEST= 000001      1945#   4754#   7992
T$TSTM= 177777      1945#   3031    3035    3044    3048    3058    3062    3072    3076    3092    3096    3112    3116
                    3347    3355    3393    3401    3421    3431    3491    3536    3550    3571    3585    3614    3637
                    3660    3674    3687    3700    3708    3735    3751    3766    3781    3789    3809    3829    3868
                    3879    3887    3931    4131    4167    4313    4356    4446    4478    4483    4488    4493    4499
                    4510    4520    4532    4539    4554    4574    4612    4622    4629    4634    4636    4644    4660
                    4674    4686    4688    4696    4717    4739    4772    4814    4821    4831    4837    4847    4867
                    4876    4897    4914    4929    4955    4971    5071    5144    5189    5219    5293    5342    5359
                    5698    5716    5729    5773    5827    5857    5924    5951    6003    6014    6051    6057    6095
                    6118    6259    6271    6393    6418    6559    6599    6617    6631    6907    7137    7289    7452
                    7470    7872    7890
T$TSTS= 000001      1945#   4755#
T$$AU = 010016      4727#   4731    4738
T$$AUT= 010013      4655#   4659
T$$CLE= 010014      4669#   4688    4695
T$$PU = 010015      4705#   4709    4716
T$$PAR= 010023      7908#   7954
T$$HW = 010000      2072#   2100
T$$INI= 010012      4471#   4636    4643
T$$MSG= 010006      3021#   3034    3038#   3047    3051#   3061    3065#   3075    3085#   3095    3104#   3115    3119
```

```
T$$PRO= 010011            4455#
T$$RPT= 010010            4435#   4445
T$$SRV= 010022            3203#   3228    6339#   6439    6477#   6508    7598#   7723
T$$TES= 010017            4755#   4837    4897    7889
T1      026340 G          2060    4754#
UAM     = 000200 G        2176#
UPTABL  032606            5576#
UPTA1   032674            5582    5589#
UPTA3   032672            5586    5588#
UPTA4   032632            5577    5581#
UPTEX   032744            5586    5590#
VECTOR  046407            7951    7956#
X       037057            6695#   7230*   7328*   7397*
X$      = 000220          1940#   2777#   2778#   2779#   2780#   2781#   2782#   2783#   2784#   2785#   2786#   2787#   2788#
                          2789#   2790#   2791#   2792#   2793#   2794#   2795#   2796#   2797#   2801#   2802#   2803#   2804#
                          2805#   2806#   2807#   2808#   2809#   2810#   2811#   2812#   2813#   2814#   2815#   2816#   2817#
                          2818#   2822#   2823#   2824#   2825#   2826#   2831#   2832#   2833#   2834#   2835#   2838#   2839#
                          2840#   2841#   2842#   2843#   2844#   2845#   2848#   2849#   2850#   2851#   2852#   2853#   2856#
                          2857#   2858#   2859#   2861#   2862#   2863#   2864#   2865#   2867#   2868#   2870#   2871#   2874#
                          2877#   2878#   2879#   2880#   2881#   2882#   2883#   2884#   2885#   2886#   2887#   2888#   2889#
                          2890#   2891#   2892#   2894#   2895#   2896#   2897#   2898#   2899#   2900#   2903#   2904#   2905#
                          2906#   2907#   2908#   2911#   2912#   2913#   2916#   2919#   2920#   2921#   2922#   2923#   2924#
                          2925#   2926#   2929#   2930#   2931#   2936#   3444#   3445#   3446#   3447#   3448#   3449#   3450#
                          3451#   3452#   3453#   3454#   3455#   3456#   3457#   3458#   3459#   3460#   3461#   3462#   3463#
                          3464#   3465#
X$ALWA= 000000            1945#
X$FALS= 000040            1945#   7945
X$OFFS= 000400            1945#   7939    7945
X$TRUE= 000020            1945#   7939
$PATCH  046552            7983#
.       = 046636          1945#   2466#   2472#   2480#   2495#   2505#   2509#   2543#   2572#   2573#   2574#   2575#   2576#
                          2577#   2580#   2682#   2683#   2780#   2784#   2788#   2795#   2802#   2804#   2810#   2812#   2823#
                          2825#   2832#   2834#   2850#   2852#   2856#   2858#   2870#   2877#   2879#   2881#   2883#   2885#
                          2891#   2905#   2907#   2923#   2997#   3018#   3120    3447#   3449#   3453#   3458#   3460#   4637
                          4689    4710    4732    4838    4898    7293#   7939    7945    7984#
```

```
BCOMPL      1#   1945#  4484   4489   4500   4832
BERROR      1#   1945#
BGNAU       1#   1945#  4726
BGNAUT      1#   1945#  4654
BGNCLN      1#   1945#  4668
BGNDU       1#   1945#  4704
BGNHRD      1#   1945#  7907
BGNHW       1#   1945#  2071
BGNINI      1#   1945#  4470
BGNMOD      1#   1945#  1946
BGNMSG      1#   1945#  3020   3037   3050   3064   3084   3103
BGNPRO      1#   1945#  4454
BGNPTA      1#   1945#
BGNRPT      1#   1945#  4434
BGNSEG      1#   1945#
BGNSET      1#   1945#
BGNSFT      1#   1945#
BGNSRV      1#   1945#  3202   6338   6476   7597
BGNSUB      1#   1945#
BGNSW       1#   1945#
BGNTST      1#   1945#  4753
BNCOMP      1#   1945#  4494   4512   4522   4533   4576
BNERRO      1#   1945#
BREAK       1#   1945#  6002   6056   6094   6258   6558   6598   6616   7136   7871
BRESET      1#   1945#  4685
CKLOOP      1#   1945#
CLI      1949#   2776   2777   2778   2779   2780   2781   2782   2783   2784   2785   2786   2787   2788   2789
         2790    2791   2792   2793   2794   2795   2796   2800   2801   2802   2803   2804   2805   2806   2807
         2808    2809   2810   2811   2812   2813   2814   2815   2816   2817   2821   2822   2823   2824   2825
         2830    2831   2832   2833   2834   2837   2838   2839   2840   2841   2842   2843   2844   2847   2848
         2849    2850   2851   2852   2855   2856   2857   2858   2860   2861   2862   2963   2864   2866   2867
         2869    2870   2873   2876   2877   2878   2879   2880   2881   2882   2883   2884   2885   2886   2887
         2888    2889   2890   2891   2893   2894   2895   2896   2897   2898   2899   2902   2903   2904   2905
         2906    2907   2910   2911   2912   2915   2918   2919   2920   2921   2922   2923   2924   2925   2928
         2929    2930   2935   3443   3444   3445   3446   3447   3448   3449   3450   3451   3452   3453   3454
         3455    3456   3457   3458   3459   3460   3461   3462   3463   3464
CLOCK       1#   1945#  4508   4518
CLOSE       1#   1945#
CLRVEC      1#   1945#
COMMEN      1#   1945#
DELAY       1#   1945#
DESCRI      1#   1945#  3003
DEVTYP      1#   1945#  2993
DISPAT      1#   1945#  2057
DISPLA      1#   1945#
DOCLN       1#   1945#  4477
DODU        1#   1945#
DORPT       1#   1945#
ENDAU       1#   1945#  4737
ENDAUT      1#   1945#  4658
ENDCLN      1#   1945#  4694
ENDCOM      1#   1945#
ENDDU       1#   1945#  4715
ENDHRD      1#   1945#  7952
ENDHW       1#   1945#  2099
ENDINI      1#   1945#  4642
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ENDMOD      1#  1945#  7992
ENDMSG      1#  1945#  3033  3046  3060  3074  3094  3114
ENDPRO      1#  1945#  4461
ENDPTA      1#  1945#
ENDRPT      1#  1945#  4444
ENDSEG      1#  1945#
ENDSET      1#  1945#
ENDSFT      1#  1945#
ENDSRV      1#  1945#  3227  6438  6507  7722
ENDSUB      1#  1945#
ENDSW       1#  1945#
ENDTST      1#  1945#  7888
EQUALS      1#  1945#  2113
ERRDF       1#  1945#
ERRHRD      1#  1945#
ERROR       1#  1945#
ERRSF       1#  1945#
ERRSOF      1#  1945#  5697  5715  5728  5771  6013  6050  6117  6270  6392  6417  6630  7451  7469
ERRTBL      1#  1945#
ESCAPE      1#  1945#
EXIT        1#  1945#  3118  4635  4687  4708  4730  4836  4896
FEQUAL      1#  1945#
GETBYT      1#  1945#
GETPRI      1#  1945#
GETWOR      1#  1945#
GMANIA      1#  1945#
GMANID      1#  1945#  3400  4538  4846  5856
GMANIL      1#  1945#
GPHARD      1#  1945#  4572
GPRMA       1#  1945#  7924  7929
GPRMD       1#  1945#  3401#  3404  4539#  4542  4847#  4850  5857#  5860  7946
GPRML       1#  1945#  7914  7934  7940
HEADER      1#  1945#  1963
INLOOP      1#  1945#
IOSETU      1#  1945#
IOSTAR      1#  1945#
KT11        1#  1945#
LASTAD      1#  1945#  7987
MANUAL      1#  1945#  4830
MEMORY      1#  1945#
M$BYTE      1#  1945#  1964#  1970  1971  1972
M$CHEC      1#  1945#  3119#  4636#  4688#  4709#  4731#  4837#  4897#
M$CNTO      1#  1945#  3404#  4542#  4850#  5860#  7915#  7925#  7930#  7935#  7941#  7947#
M$COUN      1#  1945#  3023#  3040#  3053#  3067#  3087#  3106#  3344#  3352#  3390#  3418#  3428#  3487#  3533#
            3547#  3567#  3578#  3603#  3634#  3657#  3667#  3682#  3696#  3703#  3729#  3745#  3760#  3777#  3786#
            3806#  3826#  3864#  3874#  3883#  3928#  4124#  4159#  4310#  4353#  4551#  4769#  4811#  4864#  4873#
            4910#  4925#  4951#  4967#  5067#  5139#  5186#  5216#  5290#  5339#  5356#  5824#  5921#  5948#  7286#
M$DATA      1#  1945#  1964#  1973  1975  1977  1979  1981  1983  1985  1987  1989  1991  1993  1995
            1997  1999  2001  2003#  2005  2007  2010  2013  2015  2017  2019  2021  2023  2025  2027
            2029  2031  2033  2035  2037  2039  2041  2043  2045  2047  2994#  3004#
M$DECR      1#  1945#  2100#  3034#  3047#  3061#  3075#  3095#  3115#  3228#  4445#  4462#  4643#  4659#  4695#
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M$ENDE      1#  1945#  2100#  3034#  3047#  3061#  3075#  3095#  3115#  3228#  4445#  4643#  4659#  4695#  4716#
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M$ERRI      1#  1945#  5698#  5716#  5729#  5772#  6014#  6051#  6118#  6271#  6393#  6418#  6631#  7452#  7470#
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M$ESCS      1#  1945#
M$EXCP      1#  1945#  3404#  4542#  4850#  5860#  7925#  7930#  7947#
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M$EXTJ      1#  1945#  3119#  3120   4636#  4688#  4709#  4710   4731#  4732   4837#  4897#
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         1997#  1999#  2001#  2003#  2005#  2007#  2010#  2013#  2015#  2017#  2019#  2021#  2023#  2025#  2027#
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M$GETS      1#  1945#  2100#  3034#  3047#  3061#  3075#  3095#  3115#  3228#  4445#  4462#  4643#  4659#  4695#
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         1995#  1997#  1999#  2001#  2003#  2005#  2007#  2010#  2013#  2015#  2017#  2019#  2021#  2023#  2025#
         2027#  2029#  2051#  2033#  2035#  2037#  2039#  2041#  2043#  2045#  2047#  2058#  2059   2072#  2073
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         4705#  4727#  6339#  6477#  7598#  7908#  7909   7988#  7991
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         1992   1993#  1994   1995#  1996   1997#  1998   1999#  2000   2001#  2002   2003#  2004   2005#  2006
         2007#  2008   2009   2010#  2011   2012#  2013#  2014   2015#  2016   2017#  2018   2019#  2020   2021#
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```

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M$HAPT             1#  1945#  1964#
M$HNAP             1#  1945#  1964#  2003
M$INCR             1#  1945#  1947#  2072#  3021#  3031#  3035#  3038#  3044#  3048#  3051#  3058#  3062#  3065#  3072#
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M$MCHI             1#  1945#
M$MCLO             1#  1945#
M$MSK1             1#  1945#
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            7286#   7287
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M$RNRO        1#    1945#   4509#   4511    4519#   4521    4573#   4575
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            4831#   4837#   4847#   4867#   4876#   4897#   4914#   4929#   4955#   4971#   5071#   5144#   5189#   5219#   5293#
            5342#   5359#   5698#   5716#   5729#   5772#   5827#   5857#   5924#   5951#   6003#   6014#   6051#   6057#   6095#
            6118#   6259#   6271#   6393#   6418#   6559#   6599#   6617#   6631#   6907#   7137#   7289#   7452#   7470#   7872#
            7890#
M$WORD        1#    1945#   2003#   2012    2058#   2060    3119#   3401#   3403    3404#   4539#   4541    4542#   4636#   4688#
            4709#   4731#   4837#   4847#   4849    4850#   4897#   5698#   5699    5700    5701    5716#   5717    5718    5719
            5729#   5730    5731    5732    5772#   5773    5774    5775    5857#   5859    5860#   6014#   6015    6016    6017
            6051#   6052    6053    6054    6118#   6119    6120    6121    6271#   6272    6273    6274    6393#   6394    6395
            6396    6418#   6419    6420    6421    6631#   6632    6633    6634    7452#   7453    7454    7455    7470#   7471
            7472    7473    7915#   7925#   7930#   7935#   7939#   7941#   7945#   7947#   7989    7990
M$XFER        1#    1945#   7939#   7945#
NODCL       1951#   2777    2778    2779    2780    2781    2782    2783    2784    2785    2786    2787    2788    2789    2790
            2791    2792    2793    2794    2795    2796    2797    2801    2802    2803    2804    2805    2806    2807    2808
            2809    2810    2811    2812    2813    2814    2815    2816    2817    2818    2822    2823    2824    2825    2826
            2831    2832    2833    2834    2835    2838    2839    2840    2841    2842    2843    2844    2845    2848    2849
            2850    2851    2852    2853    2856    2857    2858    2859    2861    2862    2863    2864    2865    2867    2868
            2870    2871    2874    2877    2878    2879    2880    2881    2882    2883    2884    2885    2886    2887    2888
            2889    2890    2891    2892    2894    2895    2896    2897    2898    2899    2900    2903    2904    2905    2906
```

```
        2907    2908    2911    2912    2913    2916    2919    2920    2921    2922    2923    2924    2925    2926    2929
        2930    2931    2936    3444    3445    3446    3447    3448    3449    3450    3451    3452    3453    3454    3455
        3456    3457    3458    3459    3460    3461    3462    3463    3464    3465
OPEN       1#   1945#
POINTE     1#   1945#   1957
PRINTB     1#   1945#   3022    3039    3052    3066    3086    3105
PRINTF     1#   1945#   3343    3351    3389    3417    3427    3486    3546    3863    3873    3882    3927    4309    4352
        4550    4768    4810    4863    4872    4909    4924    4950    4966    5066    5138    5185    5215    5289    5338
        5355    5823    5920    5947    7285
PRINTS     1#   1945#   3532    3566    3577    3602    3633    3656    3666    3681    3695    3702    3728    3744    3759
        3776    3785    3805    3825    4123    4158
PRINTX     1#   1945#
READBU     1#   1945#   4531
READEF     1#   1945#   4481    4486    4491    4497
RFLAGS     1#   1945#
SETPRI     1#   1945#   4632    4672
SETVEC     1#   1945#   4607    4617    4624    4816    6902
SLASH      1#   1945#
STARS      1#   1945#
SVC        1#   1945#
XFER       1#   1945#   3119#   4636#   4688#   4709#   4731#   4837#   4897#
XFERF      1#   1945#   7944
XFERT      1#   1945#   7938


. ABS.  046636     000


ERRORS DETECTED:  0

CVCLHC,CVCLHC.LST/CRF/SOL=SVC34R.MLB,CVCLHC.P11
RUN-TIME: 27 34 4 SECONDS
RUN-TIME RATIO: 101/66=1.5
CORE USED:  22K  (43 PAGES)
```

1 1 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 2
B C D E F G H I J K L M N B C D E F G H I J