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NI EXERCISER DIAG
CZUACAO

AH-T228A-MC
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OCT 1983
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A large grid of technical data tables, organized into approximately 15 columns and 20 rows. Each cell contains a small table with multiple columns and rows of text, likely representing test results, component specifications, or diagnostic codes. The text is small and difficult to read, but the overall structure is a dense matrix of data.

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IDENTIFICATION

PRODUCT CODE: AC-T227A-MC
PRODUCT NAME: CZUACAO NI EXERCISER DIAGNOSTIC
PRODUCT DATE: 6-APR-83
MAINTAINER: MERRIMACK DIAGNOSTIC ENGINEERING
AUTHOR: GARY MCCOY

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1.0 GENERAL INFORMATION

1.1 PROGRAM ABSTRACT

THE NETWORK INTERCONNECT EXERCISER (NIE) PROGRAM IS MEANT TO PROVIDE FIELD SERVICE WITH A TOOL FOR DETERMINING THE CONNECTIVITY OF NODES ON THE NETWORK INTERCONNECT (NI).

THE NIE PROGRAM WILL DETERMINE THE ABILITY OF NODES ON THE NI TO COMMUNICATE WITH EACH OTHER AND PROVIDE NODE INSTALLATION VERIFICATION AND PROBLEM ISOLATION. THE NIE USES THE LOW LEVEL MAINTENANCE FEATURES OF THE DEUNA TO PROVIDE TESTING WITHOUT INTERRUPTING NORMAL OPERATION OF THE NI. THE VAX VERSION OF THE NIE CAN ALSO BE RUN CONCURRENTLY ON ANOTHER NODE, WITH EACH VERSION RUNNING INDEPENDENTLY OF EACH OTHER.

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. THERE IS A BRIEF DESCRIPTION OF THE RUNTIME SERVICES IN SECTION 2 OF THIS DOCUMENT.

1.2 SYSTEM REQUIREMENTS

IN ORDER TO RUN THE CZUAC NIE PROGRAM, THE FOLLOWING MINIMUM HARDWARE IS REQUIRED:

- A PDP-11 CPU
- MINIMUM OF 24K WORDS OF MEMORY
- A WORKING, LINE OR REAL-TIME CLOCK
- A CONSOLE TERMINAL
- ANY XXDP+ SUPPORTED LOAD MEDIA
- DEUNA-11 UNIBUS TO ETHERNET ADAPTER

1.3 RELATED DOCUMENTS AND STANDARDS

- DEUNA USER'S GUIDE EK-DEUNA-UG-001
- DEUNA TECHNICAL DESCRIPTION EK-DEUNA-TD-001
- XXDP+ USER'S MANUAL (CHQUS?.SEQ WHERE ? IS THE REV. LEVEL OF THE MANUAL - 'C' IS THE CURRENT REV.)

1.4 DIAGNOSTIC HIERARCHY PREREQUISITES

THE GOAL OF THE NIE IS TO TEST THE COMMUNICATIONS LINK AND THEREFORE ASSUMES THAT THE CPU'S, CLOCKS, AND DEUNA'S AT EACH END OF THE LINK HAVE ALREADY BEEN TESTED.

IF NO LINE OR REAL-TIME CLOCK IS FOUND, THE PROGRAM WILL CONTINUE BUT ANY OF THE PROGRAM THAT TIMES THE DEVICE WILL HANG IF THE DEVICE TIMES OUT.

IT IS NOT THE INTENTION OF THE NIE TO TEST THE DEVICE (DEUNA), BUT TO TEST THE COMMUNICATIONS LINK TO WHICH IT IS CONNECTED.

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THE PREREQUISITE DIAGNOSTICS ARE:

- CZUAAAO DEUNA REPAIR LEVEL DIAGNOSTIC
- CZUABAO DEUNA FUNCTIONAL LEVEL DIAGNOSTIC

ALSO AVAILABLE FOR TEST IS:

- CXUACAO DEUNA DEC/X-11 MODULE

1.5 ASSUMPTIONS

IT IS ASSUMED THAT THE COMMUNICATIONS DEVICE (DEUNA) HAS BEEN TESTED USING THE PREREQUISITE 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 NIE.

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)
ZFLAGS	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 "DDDD".

SWITCH	EFFECT
--------	--------

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/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

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LOE	RUNTIME SERVICES COMMAND MODE
IER*	LOOP ON ERROR
IBE*	INHIBIT ALL ERROR REPORTS
	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). YOU WILL THEN BE ASKED THE FOLLOWING QUESTIONS FOR EACH UNIT.

UNITS (D) ? 1<CR>

UNIT 0
DEVICE CSR ADDRESS : (0) 164524 ?<CR>
INTERRUPT VECTOR ADDRESS : (0) 120 ?<CR>
INTERRUPT PRIORITY : (0) 5 ?<CR>

WHEN YOU COMPLETE THE ABOVE SEQUENCE YOU WILL BE AT THE NIE> COMMAND LEVEL.

NIE> (A) ?

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2.5 NETWORK INTERCONNECT EXERCISER COMMANDS

THE 'NIE>' COMMAND LEVEL FOLLOWS THE ATTACHING OF THE DEVICE AND ISSUING THE START TO THE SUPERVISOR. THESE COMMANDS CAN BE TYPED WHEN THE 'NIE>' PROMPT IS PRINTED.

YOU ONLY HAVE TO TYPE ENOUGH CHARACTERS TO UNIQUELY SPECIFY A COMMAND. THE COMMAND LINE IS INTERPRETED FROM LEFT TO RIGHT.

HELP OR ? PRINTS OUT A BRIEF DESCRIPTION OF NIE COMMANDS.

SHOW NODES PRINTS OUT THE CONTENTS OF THE NODE TABLE.

SHOW MESSAGE PRINTS OUT THE CURRENT MESSAGE PARAMETERS FOR SIZE, TYPE AND COPIES.

SHOW COUNTERS PRINTS OUT THE CONTENTS OF THE HOST NODE DEUNA INTERNAL COUNTERS.

NODE ADR/TYPE THE NODE COMMAND ALLOWS THE OPERATOR TO ENTER NODES INTO THE NODE TABLE. NODES ARE SPECIFIED USING THEIR 12 HEX DIGIT ETHERNET PHYSICAL ADDRESS AND CAN BE SPECIFIED AS EITHER TARGET OR ASSIST (A DEFAULT OF TARGET IS ASSUMED).

MESSAGE/TYPE=/SIZE=N/COPIES=M THE MESSAGE COMMAND ALLOWS THE OPERATOR TO SELECT THE CURRENT MESSAGE PARAMETERS AS FOLLOWS. ANY OR ALL OF THE PARAMETER CAN BE CHANGED WITH THE COMMAND. THE DEFAULT PARAMETERS ARE TYPE=ALPHA,SIZE=512,COPIES=1.

TYPE ONE OF THE FOLLOWING MESSAGE TYPES:

ALPHA -- !"#%&'()*+,-./0123456789:;=?ABCDEFGH ETC.
 ONES -- MESSAGE OF ALL ONES (11111111....)
 ZEROS -- MESSAGE OF ALL ZEROS (000000....)
 1ALT -- ALTERNATING 1'S AND 0'S (10101010...)
 0ALT -- ALTERNATING 0'S AND 1'S (01010101...)
 CCITT -- "CCITT" PSEUDO-RANDOM TEST PATTERN
 OPERATOR SELECTED -- OPERATOR CHOSEN PATTERN OF LESS THAN 72 CHARACTERS USING 0-9, A-Z AND SPACES. (NOT USED IN PATTERN TEST)

SIZE THE SIZE OF THE MESSAGE BUFFER (DATA ONLY)MAY BE BETWEEN 32 AND 1466 BYTES.

COPIES THE NUMBER OF COPIES OF EACH MESSAGE SENT TO EACH NODE DURING A TEST MAY BE BETWEEN 1 AND 255.

RUN TEST/PASS=NN CAUSES EXECUTION OF THE SPECIFIED TEST FOR NN NUMBER OF PASSES. A DEFAULT VALUE OF 1 IS ASSUMED IF /PASS=NN IS NOT INCLUDED IN THE COMMAND LINE. A VALUE OF NN=-1 WILL CAUSE THE TEST TO BE RUN INDEFINATELY. NODE ADDRESSES FOR THE TESTS ARE TAKEN FROM THE NODE TABLE AND SHOULD BE ENTERED PRIOR TO RUNNING THE TEST USING THE NODE COMMAND. IN THE CASE OF THE LOOPPAIR TEST, NODE PAIRS ARE REQUIRED

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AND MUST BE SPECIFIED AS TARGET AND ASSIST NODES. THE CURRENTLY SELECTED VALUES FOR MESSAGE TYPE, SIZE AND COPIES ARE USED BY EACH TEST.

THERE ARE FOUR TEST TO CHOSE FROM:

DIRECT

THE DIRECT TEST SENDS A LOOP DIRECT MESSAGE TO ALL OF THE NODES CONTAINED IN THE NODE TABLE AND WAITS FOR A RESPONSE. THE INTEGRITY OF THE RETURNED DATA IS CHECKED AND ANY ERRORS ARE REPORTED TO THE OPERATOR.

LOOPPAIR

THE LOOPPAIR TEST SENDS ASSISTED LOOPBACK MESSAGES TO THE NODE PAIRS CONTAINED IN THE NODE TABLE. THREE TYPE OF ASSISTED MESSAGES ARE SENT:

- 1) RECEIVE ASSIST -- HOST -> TARGET -> ASSIST -> HOST
- 2) TRANSMIT ASSIST -- HOST -> ASSIST -> TARGET -> HOST
- 3) FULL ASSIST -- HOST -> ASSIST -> TARGET -> ASSIST -> HOST

IN EACH CASE A RESPONSE IS WAITED FOR AND THE DATA IS CHECKED.

PATTERN

THE PATTERN TEST SENDS SIX DIFFERENT LOOP DIRECT MESSAGES TO EACH NODE CONTAINED IN THE NODE TABLE. EACH OF THE SIX PATTERN TYPES (ALPHA, ONES, ZEROS, 1ALT, 0ALT, CCITT) IS USED FOR EACH NODE. RETURNED DATA IS CHECKED FOR ERRORS.

ALL

THE ALL NODE TEST PERFORMS THE MOST EXTENSIVE CHECK OF THE NETWORK AND IS COMPOSED OF TWO PARTS. FIRST A LOOP DIRECT MESSAGE IS SENT TO EACH NODE IN THE TABLE. IF THIS IS SUCCESSFUL, THE EXERCISER BUILDS AN ARRAY OF NODE PAIRS FROM THE TABLE AND SENDS A FULL ASSISTED LOOPBACK MESSAGE TO EACH PAIR IN THE ARRAY. A SAMPLE ARRAY OF PAIRS FOR A TABLE WITH 7 NODES IS SHOWN BELOW.

1-2	2-3	3-4	4-5	5-6	6-7
1-3	2-4	3-5	4-6	5-7	
1-4	2-5	3-6	4-7		
1-5	2-6	3-7			
1-6	2-7				
1-7					

IDENTIFY ADR

A REQUEST ID MESSAGE IS SENT TO THE NODE SPECIFIED BY ADR AND THE RESPONDED SYSTEM ID PARAMETERS ARE PRINTED.

BUILD

THE BUILD COMMAND CAUSES THE EXERCISERS TO LISTEN FOR SYSTEM ID MESSAGES WHICH ARE BROADCAST BY ALL DEUNA NODES ONCE EVERY 10 MINUTES. ALL NODES IDENTIFYING THEMSELVES ARE ADDED TO THE NODE TABLE. THE BUILD COMMAND STOPS WHEN NO NEW NODES HAVE BEEN ADDED FOR 10 MINUTES OR WHEN 40 MINUTES HAVE ELAPSED. THE AVERAGE TIME FOR THIS COMMAND SHOULD BE 15-25 MINUTES.

CLEAR NODE/ADR

THE CLEAR NODE COMMAND CLEARS THE SPECIFIED NODE FROM THE NODE TABLE. THE NODE CAN BE SPECIFIED BY EITHER ITS 12 DIGIT PHYSICAL ADDRESS OF ITS LOGICAL NAME

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(AS ASSIGNED BY NODE TABLE).

CLEAR NODE/ALL THIS COMMAND CLEARS THE NODE TABLE.

CLEAR MESSAGE THIS COMMAND SETS THE MESSAGE PARAMETERS BACK TO THE DEFAULT VALUES.

CLEAR SUMMARY THIS COMMAND CLEARS THE SUMMARY TABLE.

SUMMARY THE SUMMARY COMMAND PRINTS OUT THE SUMMARY TABLE. THE NIE MAINTAINS THE FOLLOWING INFORMATION FOR NODES WHO HAVE BEEN SENT MESSAGES:

RECEIVES NOT COMPLETE LENGTH ERRORS BYTES COMPARED	RECEIVES COMPLETE DATA COMPARE ERRORS BYTES TRANSFERED
--	--

SAVE THE SAVE COMMAND SAVES THE CONTENTS OF THE NODE TABLE. FOR THE VAX VERSION, THE TABLE IS SAVED IN A FILE CALLED NIE.TBL. THE PDP-11 VERSION CANNOT WRITE TO EXTERNAL MEDIA, SO THE CONTENTS ARE SAVE INTERNALLY.

UNSAVE THE UNSAVE COMMAND RESTORES THE CONTENTS OF THE NODE TABLE. USED. THE PDP-11 VERSION USES THE CONTENTS OF ITS INTERNALLY SAVED TABLE.

UNSAVE/FILE.EXT THE UNSAVE COMMAND WHEN USED WITH A FILE NAME WILL READ A NODE TABLE CREATED BY USING AN EDITOR FOR AN XXDP+ MEDIA.

EXIT RETURNS CONTROL TO THE DIAGNOSTIC SUPERVISOR (EITHER VDS OR DRS).

NOTES: 1) ADR IS THE PHYSICAL ADDRESS OF A NODE ON THE NI.
 2) PASS COUNT IS A DECIMAL NUMBER BETWEEN 1 AND 65534. A DEFAULT VALUE OF 1 IS ASSUMED. SPECIFYING -1 CAUSES THE TEST TO BE RUN INDEFINATELY.

2.5 SOFTWARE QUESTIONS

AFTER YOU HAVE ANSWERED THE HARDWARE QUESTIONS OR AFTER A RESTART OR CONTINUE COMMAND, THE RUNTIME SERVICES WILL ASK FOR SOFTWARE PARAMETERS. THESE PARAMETERS WILL GOVERN SOME DIAGNOSTIC SPECIFIC OPERATION MODES. YOU WILL BE PROMPTED BY "CHANGE SW (L) ?" IF YOU WISH TO CHANGE ANY PARAMETERS, ANSWER BY TYPING "Y". THE SOFTWARE QUESTIONS AND THE DEFAULT VALUES ARE DESCRIBED IN THE NEXT PARAGRAPH(S).

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

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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
7. ANSWER THE "CHANGE SW" QUESTION WITH "N"

WHEN YOU FOLLOW THIS PROCEDURE YOU WILL BE USING ONLY THE DEFAULTS FOR FLAGS AND SOFTWARE PARAMETERS. THESE DEFAULTS ARE DESCRIBED IN SECTIONS 2.3 AND 2.5.

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 "IBR" 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", "IBR" OR "IXR" 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

ERROR MESSAGE:

MEANING

?ILL CMD-BAD SYNTAX

A COMMAND WITH AN ILLEGAL CHAR WAS TYPED - RETYPE THE COMMAND. THE VAILD COMMANDS AND THEIR SYNTAX ARE SHOWN IN SECTION 2.5

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?INCOMPLETE

A REQUIRED PART OF A COMMAND WAS LEFT OUT.

?NUMBER 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 OCCURED WHEN TYPING A 'DUMP' COMMAND WHERE OCTAL ADDRESSES ARE EXPECTED.

EXAMPLE OF A LOST PACKET ERROR DURING LOOPPAIR TESTING

 CZUAC HRD ERR 00028 ON UNIT 00 TST 001 SUB 000 PC:064442

TIMEOUT OCCURED - LOOP MESSAGE TYPE - RECEIVE ASSIST
 FAILING TARGET NODE ADDRESS: AA-00-03-00-00-00
 FAILING ASSIST NODE ADDRESS: AA-00-03-00-00-02

EXAMPLE OF A LOST PACKET ERROR DURING PATTERN TESTING

 CZUAC HRD ERR 00028 ON UNIT 00 TST 001 SUB 000 PC:63730

TIMEOUT OCCURED BEFORE LOOPBACK REPLY
 FAILING NODE ADDRESS: AA-00-03-00-00-00
 DATA PATTERN: ONES

4.0 PERFORMANCE AND PROGRESS REPORTS

AT THE END OF EACH PASS, THE PASS COUNT IS GIVEN ALONG WITH THE TOTAL NUMBER OF ERRORS REPORTED SINCE THE DIAGNOSTIC WAS STARTED. THE 'EOP' SWITCH CAN BE USED TO CONTROL HOW OFTEN THE END OF PASS MESSAGE IS PRINTED. SECTION 2.2 DESCRIBES SWITCHES.

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. [6]) 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	174510	:[0] CSR ADDRESS
.WORD	120	:[2] INTERRUPT VECTOR
.WORD	240	:[6] INTERRUPT PRIORITY (5)

6.0 TEST SUMMARIES

6.1 DIRECT

THE DIRECT TEST SENDS A LOOP DIRECT MESSAGE TO ALL OF THE NODES CONTAINED IN THE NODE TABLE AND WAITS FOR A RESPONSE. THE INTEGRITY OF THE RETURNED DATA IS CHECKED AND ANY ERRORS ARE REPORTED TO THE OPERATOR.

6.2 LOOPPAIR

THE LOOPPAIR TEST SENDS ASSISTED LOOPBACK MESSAGES TO THE NODE PAIRS CONTAINED IN THE NODE TABLE. THREE TYPE OF ASSISTED MESSAGES ARE SENT:

- 1) RECEIVE ASSIST -- HOST -> TARGET -> ASSIST -> HOST
- 2) TRANSMIT ASSIST -- HOST -> ASSIST -> TARGET -> HOST
- 3) FULL ASSIST -- HOST -> ASSIST -> TARGET -> ASSIST -> HOST

IN EACH CASE A RESPONSE IS WAITED FOR AND THE DATA IS CHECKED.

6.3 PATTERN

THE PATTERN TEST SENDS SIX DIFFERENT LOOP DIRECT MESSAGES TO EACH NODE CONTAINED IN THE NODE TABLE. EACH OF THE SIX PATTERN TYPES (ALPHA, ONES, ZEROS, 1ALT, 0ALT, CCITT) IS USED FOR EACH NODE. RETURNED DATA IS CHECKED FOR ERRORS.

6.4 ALL

THE ALL NODE TEST PERFORMS THE MOST EXTENSIVE CHECK OF THE NETWORK AND IS COMPOSED OF TWO PARTS. FIRST A LOOP DIRECT MESSAGE IS SENT TO EACH NODE IN THE TABLE. IF THIS IS SUCCESSFUL, THE EXERCISER BUILDS AN ARRAY OF NODE PAIRS FROM THE TABLE AND SENDS A FULL ASSISTED LOOPBACK MESSAGE TO EACH PAIR IN THE ARRAY. A SAMPLE ARRAY OF PAIRS FOR A TABLE WITH 7 NODES IS SHOWN BELOW.

1-2	2-3	3-4	4-5	5-6	6-7
1-3	2-4	3-5	4-6	5-7	
1-4	2-5	3-6	4-7		
1-5	2-6	3-7			
1-6	2-7				
1-7					

&

627
628
629
630
631
632
633
634

002000

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.SBTTL PROGRAM HEADER
      .ENABL ABS,AMA
      = 2000
.SBTTL PROGRAM MACROS
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686
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688
689
690

```

```

:ISSTACK MACRO
:-----

:+++
:THE ISSTACK MACRO FACILITATES INITIALIZING THE R6 (HARDWARE) STACK
:AND THE R5 (PARAMETER) STACK. R5 IS SET TO THE STACK LOW LIMIT
:(STAKLO) AND THE PARAMETER STACK GROWS UPWARD. R6 IS SET TO THE
:STACK HIGH LIMIT (STAKHI) AND THE HARDWARE STACK GROWS DOWNWARD.
:IF THERE IS A STACK OVER-RUN, IT WILL BE DETECTED BY THE PREG14
:ROUTINE.
:---

.MACRO ISSTACK STAKLO,STAKHI

MOV STAKLO,R5 :INITIALIZE THE PARAMETER STACK POINTER.
MOV STAKHI,SP :INITIALIZE THE HARDWARE STACK POINTER.

.ENDM ISSTACK

:PUSH MACRO
:-----

:+++
:THE 'PUSH' MACRO FACILITATES PUSHING ITEMS ON THE HARDWARE STACK.
:UP TO SEVEN ITEMS MAY BE PLACED ON THE STACK WITH ONE MACRO.
:---

.MACRO PUSH A,B,C,D,E,F,G

:IF NB G
MOV G,-(SP)
.ENDC

:IF NB F
MOV F,-(SP)
.ENDC

:IF NB E
MOV E,-(SP)
.ENDC

:IF NB D
MOV D,-(SP)
.ENDC

:IF NB C
MOV C,-(SP)
.ENDC

:IF NB B
MOV B,-(SP)
.ENDC

:IF NB A
MOV A,-(SP)
.ENDC

```

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PROGRAM MACROS

```

691
692          .ENDM  PUSH
693
694          :POP MACRO
695          :-----
696
697          :+++
698          :THE 'POP' MACRO FACILITATES RETRIEVING ITEMS FROM THE HARDWARE STACK.
699          :UP TO SEVEN ITEMS MAY BE RETRIEVED WITH ONE MACRO.
700          :----
701
702          .MACRO  POP      A,B,C,D,E,F,G
703
704          .IF NB A
705          MOV      (SP)+,A
706          .ENDC
707
708          .IF NB B
709          MOV      (SP)+,B
710          .ENDC
711
712          .IF NB C
713          MOV      (SP)+,C
714          .ENDC
715
716          .IF NB D
717          MOV      (SP)+,D
718          .ENDC
719
720          .IF NB E
721          MOV      (SP)+,E
722          .ENDC
723
724          .IF NB F
725          MOV      (SP)+,F
726          .ENDC
727
728          .IF NB G
729          MOV      (SP)+,G
730          .ENDC
731
732          .ENDM  POP
733
734          :CALL MACRO
735          :-----
736
737          :+++
738          :THE CALL MACRO FACILITATES CALLING A SUBROUTINE VIA THE REGISTER
739          :PRESERVE ROUTINE (PREG14).  IT PLACES THE PARAMETERS TO BE PASSED ON
740          :THE PARAMETER STACK.  UP TO 7 PARAMETERS MAY BE PASSED USING THIS
741          :MACRO.
742          :----
743
744          .MACRO  CALL      S A,B,C,D,E,F,G
745
746          .IF NB G

```

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PROGRAM MACROS

```

747      MOV      G,(R5)+
748      .ENDC
749
750      .IF NB F
751      MOV      F,(R5)+
752      .ENDC
753
754      .IF NB E
755      MOV      E,(R5)+
756      .ENDC
757
758      .IF NB D
759      MOV      D,(R5)+
760      .ENDC
761
762      .IF NB C
763      MOV      C,(R5)+
764      .ENDC
765
766      .IF NB B
767      MOV      B,(R5)+
768      .ENDC
769
770      .IF NB A
771      MOV      A,(R5)+
772      .ENDC
773
774      JSR      R4,PREG14
775      .WORD   S-ANCHOR
776
777      .ENDM   CALL
778
779      ;RETURN MACRO
780      ;-----
781
782      ;+++
783      ;THE RETURN MACRO FACILITATES PASSING PARAMETERS BACK TO A CALLING
784      ;ROUTINE. UP TO 7 PARAMETERS MAY BE PASSED BACK ON THE PARAMETER
785      ;STACK.
786      ;----
787
788      .MACRO  RETURN  A,B,C,D,E,F,G
789
790      .IF NB G
791      MOV      G,(R5)+
792      .ENDC
793
794      .IF NB F
795      MOV      F,(R5)+
796      .ENDC
797
798      .IF NB E
799      MOV      E,(R5)+
800      .ENDC
801
802      .IF NB D

```


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PROGRAM MACROS

```
803      MOV     D,(R5)+
804      .ENDC
805
806      .IF NB C
807      MOV     C,(R5)+
808      .ENDC
809
810      .IF NB B
811      MOV     B,(R5)+
812      .ENDC
813
814      .IF NB A
815      MOV     A,(R5)+
816      .ENDC
817
818      RTS     PC
819
820      .ENDM   RETURN
821
822      ;PSPUSH MACRO
823      ;-----
824
825      ;+++
826      ;THE PSPUSH MACRO FACILITATES PUSHING PARAMETERS ON THE PARAMETER
827      ;STACK. UP TO SEVEN ITEMS MAY BE PUSHED WITH ONE MACRO.
828      ;---
829
830      .MACRO  PSPUSH  A,B,C,D,E,F,G
831
832      .IF NB G
833      MOV     G,(R5)+
834      .ENDC
835
836      .IF NB F
837      MOV     F,(R5)+
838      .ENDC
839
840      .IF NB E
841      MOV     E,(R5)+
842      .ENDC
843
844      .IF NB D
845      MOV     D,(R5)+
846      .ENDC
847
848      .IF NB C
849      MOV     C,(R5)+
850      .ENDC
851
852      .IF NB B
853      MOV     B,(R5)+
854      .ENDC
855
856      .IF NB A
857      MOV     A,(R5)+
858      .ENDC
```

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PROGRAM MACROS

```

859
860          .ENDM  P$PUSH
861
862          :P$POP MACRO
863          :-----
864
865
866          :+++
867          :THE P$POP MACRO FACILITATES RETRIEVING PARAMETERS FROM THE PARAMETER
868          :STACK.  UP TO 7 PARAMETERS MAY BE RETRIEVED.
869          :
870          :THE ROUTINE THAT RECEIVES THE PARAMETERS HAS THE RESPONSIBILITY OF
871          :CLEANING UP THE PARAMETER STACK.  THIS MACRO IS AN AID TO MAKING
872          :A LOCAL COPY OF PASSED PARAMETERS AND CLEANING UP THE PARAMETER STACK.
873          :---
874
875          .MACRO P$POP  A,B,C,D,E,F,G
876
877          .IF NB A
878          MOV      -(R5),A
879          .ENDC
880
881          .IF NB B
882          MOV      -(R5),B
883          .ENDC
884
885          .IF NB C
886          MOV      -(R5),C
887          .ENDC
888
889          .IF NB D
890          MOV      -(R5),D
891          .ENDC
892
893          .IF NB E
894          MOV      -(R5),E
895          .ENDC
896
897          .IF NB F
898          MOV      -(R5),F
899          .ENDC
900
901          .IF NB G
902          MOV      -(R5),G
903          .ENDC
904
905          .ENDM  P$POP
906
907
908
909          .MACRO CLI  CHAR,HITVAL,MISADR,CMPSTR
910          NODCL  CHAR,HITVAL,\X$,MISADR,CMPSTR  ;;#### PARSE TREE ####
911          .ENDM
912
913
914          .MACRO NODCL  CHAR,HITVAL,XY,MISADR,CMPSTR

```

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PROGRAM MACROS

```

915 NOD'XY: .BYTE CHAR,HITVAL ;SPECIAL CHAR. CODE OR COMPARE CHAR.
916 ; AND ACTION (HIT) VALUE FOR ACTION
917 ; ROUTINES.
918 .IF NB MISADR
919 .WORD MISADR-NOD'XY ;DISPLACEMENT TO 'MISS'' NODE (BYTES)
920 .ENDC
921 .IF NB CMPSTR
922 .WORD 1$-NOD'XY ;DISPLACEMENT TO GET TO NEXT NODE
923 .ASCIZ CMPSTR ; (ONLY IF ITS A 'CLISTR'' NODE)
924 .EVEN
925 .NLIST
926 1$:
927 .LIST
928 .ENDC
929 .NLIST
930 X$=X$+1
931 .LIST
932 .ENDM
933
934 .MACRO RNGFRM A,B,C ; MACRO TO FORM TRANSMIT AND RECIEVE
935 ; DESCRIPTOR RINGS.
936
937 .LIST
938 .WORD RPKLEN ; SEGMENT LENGTH
939 .NLIST
940 NEXT A,\B
941 B=B+1
942 .LIST
943 .WORD C ; OWNERSHIP AND STATUS BITS
944 .WORD 0 ; STATUS
945 .WORD 0 ; SEQUENCE NUMBER
946
947 .NLIST
948 .ENDM
949
950 .MACRO NEXT A,B
951 .LIST
952 .WORD A'B ; SEGMENT BUFFER ADDRESS
953 .NLIST
954 .ENDM.
955
956 :++
957 : THE PROGRAM HEADER IS THE INTERFACE BETWEEN
958 : THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
959 :--
960
961 002000 POINTER BGNRPT
962
963
964 002000 HEADER CZUAC,A,0,0,1,PRI07
965 002000
966 002000 103 LSNAME::
967 002001 132 .ASCII /C/
968 002002 125 .ASCII /Z/
969 002003 101 .ASCII /U/
970 002004 103 .ASCII /A/
. ASCII /C/

```

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PROGRAM MACROS

971	002005	000
972	002006	000
973	002007	000
974	002010	
975	002010	101
976	002011	
977	002011	060
978	002012	
979	002012	000000
980	002014	
981	002014	000000
982	002016	
983	002016	112752
984	002020	
985	002020	000000
986	002022	
987	002022	002170
988	002024	
989	002024	000000
990	002026	
991	002026	113156
992	002030	
993	002030	000000
994	002032	
995	002032	000000
996	002034	
997	002034	000001
998	002036	
999	002036	000000
1000	002040	
1001	002040	002164
1002	002042	
1003	002042	000340
1004	002044	
1005	002044	000000
1006	002046	
1007	002046	000000
1008	002050	
1009	002050	003
1010	002051	003
1011	002052	
1012	002052	000000
1013	002054	000000
1014	002056	
1015	002056	000000
1016	002060	
1017	002060	002122
1018	002062	
1019	002062	076560
1020	002064	
1021	002064	000000
1022	002066	
1023	002066	000000
1024	002070	
1025	002070	000000
1026	002072	

	.BYTE	0
	.BYTE	0
	.BYTE	0
LSREV::		
	.ASCII	/A/
LSDEPO::		
	.ASCII	/O/
LSUNIT::		
	.WORD	0
LSTIML::		
	.WORD	0
LSHPCP::		
	.WORD	LSHARD
LSSPCP::		
	.WORD	0
LSHPTP::		
	.WORD	LSHW
LSSPTP::		
	.WORD	0
LSLADP::		
	.WORD	LSLAST
LSSTA::		
	.WORD	0
LSCO::		
	.WORD	0
LSDTYP::		
	.WORD	1
LSAPT::		
	.WORD	0
LSDTP::		
	.WORD	LSDISPATCH
LSPRIO::		
	.WORD	PRI07
LSENV1::		
	.WORD	0
LSEXP1::		
	.WORD	0
LSMREV::		
	.BYTE	CSREVISION
	.BYTE	C\$EDIT
LSEF::		
	.WORD	0
	.WORD	0
LSSPC::		
	.WORD	0
LSDEVP::		
	.WORD	LSDVTYP
LSREPP::		
	.WORD	LSRPT
LSEXP4::		
	.WORD	0
LSEXP5::		
	.WORD	0
LSAUT::		
	.WORD	0
LSDUT::		

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PROGRAM MACROS

1027	002072	000000		
1028	002074			
1029	002074	000000		
1030	002076			
1031	002076	002130		
1032	002100			
1033	002100	104035		
1034	002102			
1035	002102	000000		
1036	002104			
1037	002104	076600		
1038	002106			
1039	002106	100142		
1040	002110			
1041	002110	100140		
1042	002112			
1043	002112	076572		
1044	002114			
1045	002114	000000		
1046	002116			
1047	002116	000000		
1048	002120			
1049	002120	000000		

LSLUN::	.WORD	0
LSDESP::	.WORD	0
LSLOAD::	.WORD	LSDESC
LSETP::	EMT	ESLOAD
LSICP::	.WORD	0
LSCCP::	.WORD	LSINIT
LSACP::	.WORD	LSCLEAN
LSPRT::	.WORD	LSAUTO
LSTEST::	.WORD	LSPROT
LSDLY::	.WORD	0
LSHIME::	.WORD	0

1050				
1051				
1052				
1053				
1054				
1055	002122			
1056	002122			
1057	002122	042504	047125	000101
1058				
1059				

```

:
: NAMES OF DEVICES SUPPORTED BY PROGRAM
:
:   DEVTYP <DEUNA>

```

LSDVTYP::	.ASCIZ	/DEUNA/
	.EVEN	

1060				
1061				
1062				
1063	002130			
1064	002130			
1065	002130	055103	040525	020103
1066	002136	042504	047125	020101
1067	002144	044516	042440	042530
1068	002152	041522	051511	051105
1069	002160	000		
1070		002162		

```

: TEST DESCRIPTION
:
:   DESCRIPT      <CZUAC DEUNA NI EXERCISER>
:
:
:   .EVEN

```

LSDESC::	.ASCIZ	/CZUAC DEUNA NI
	.EVEN	

1071				
1072				
1073				
1074				
1075				
1076				
1077				
1078				
1079				

```

:
: FORMAT STATEMENTS USED IN PRINT CALLS
:

```

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DISPATCH TABLE

1080
1081
1082
1083
1084
1085
1086
1087
1088
1089
1090
1091

002162
002162 000001
002164
002164 100274

.SBTTL DISPATCH TABLE

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

DISPATCH 1

.WORD 1
LSDISPATCH::
.WORD T1

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DEFAULT HARDWARE P-TABLE

.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.
:--

1092
1093
1094
1095
1096
1097
1098
1099
1100
1101
1102
1103
1104
1105
1106
1107
1108
1109
1110
1111
1112

002166
002166 000003
002170
002170
002170 174510
002172 000120
002174 000240

002176
002176

BGNHW DFPTBL

.WORD 174510
.WORD 120
.WORD PRI05

ENDHW

.WORD L10000-LSHW/2
LSHW::
DFPTBL::

: CSR
: VECTOR
: PRIORITY

L10000:

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DEFAULT HARDWARE P-TABLE

1113
1114
1115
1116
1117
1118
1119
1120
1121
1122
1123
1124
1125
1126
1127
1128
1129
1130
1131
1132
1133
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1155
1156
1157
1158
1159
1160
1161
1162
1163
1164
1165
1166
1167
1168

002176
002176 000000
002200
002200

002200
002200

002200

100000
040000
020000
010000
004000
002000
001000
000400
000200
000100
000040
000020
000010
000004
000002
000001

001000
000400
000200
000100
000040
000020

.SBTTL SOFTWARE P-TABLE

;++
: THE SOFTWARE TABLE CONTAINS VARIOUS DATA USED BY THE
: PROGRAM AS OPERATIONAL PARAMETERS. THESE PARAMETERS ARE
: SET UP AT ASSEMBLY TIME AND MAY BE VARIED BY THE OPERATOR
: AT RUN TIME.
:--

BGNSW SFPTBL

.WORD L10001-LSSW/2
LSSW::
SFPTBL::

ENDSW

L10001:

.SBTTL GLOBAL EQUATES SECTION

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

EQUALS

: BIT DIFINITIONS

:
BIT15== 100000
BIT14== 40000
BIT13== 20000
BIT12== 10000
BIT11== 4000
BIT10== 2000
BIT09== 1000
BIT08== 400
BIT07== 200
BIT06== 100
BIT05== 40
BIT04== 20
BIT03== 10
BIT02== 4
BIT01== 2
BIT00== 1
:
BIT9== BIT09
BIT8== BIT08
BIT7== BIT07
BIT6== BIT06
BIT5== BIT05
BIT4== BIT04

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GLOBAL EQUATES SECTION

1169 000010
 1170 000004
 1171 000002
 1172 000001
 1173
 1174
 1175
 1176
 1177 000040
 1178 000037
 1179 000036
 1180 000035
 1181 000034
 1182
 1183
 1184
 1185
 1186 000340
 1187 000300
 1188 000240
 1189 000200
 1190 000140
 1191 000100
 1192 000040
 1193 000000
 1194
 1195
 1196
 1197 000004
 1198 000010
 1199 000020
 1200 000040
 1201 000100
 1202 000200
 1203 000400
 1204 001000
 1205 002000
 1206 004000
 1207 010000
 1208 020000
 1209 040000
 1210 100000

BIT3== BIT03
 BIT2== BIT02
 BIT1== BIT01
 BIT0== BIT00

EVENT FLAG DEFINITIONS
 EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION

EF.START== 32. : START COMMAND WAS ISSUED
 EF.RESTART== 31. : RESTART COMMAND WAS ISSUED
 EF.CONTINUE== 30. : CONTINUE COMMAND WAS ISSUED
 EF.NEW== 29. : A NEW PASS HAS BEEN STARTED
 EF.PWR== 28. : A POWER-FAIL/POWER-UP OCCURRED

PRIORITY LEVEL DEFINITIONS

PRI07== 340
 PRI06== 300
 PRI05== 240
 PRI04== 200
 PRI03== 140
 PRI02== 100
 PRI01== 40
 PRI00== 0

OPERATOR FLAG BITS

EVL== 4
 LOT== 10
 ADR== 20
 IDU== 40
 ISR== 100
 UAM== 200
 BOE== 400
 PNT== 1000
 PRI== 2000
 IXE== 4000
 IBE== 10000
 IER== 20000
 LOE== 40000
 HOE== 100000

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GLOBAL EQUATES SECTION

1211
1212
1213
1214
1215
1216
1217
1218
1219
1220
1221
1222
1223
1224
1225
1226
1227
1228
1229
1230
1231
1232
1233
1234
1235
1236
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1253
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1255
1256
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1258
1259
1260
1261
1262
1263
1264
1265
1266

000000
000001
000002
000004
000010
000020

000100
000111
001600

000000
000001
000002
000003
000004
000005
000006
000007
000010
000011
000012

000000
000001
000002
000003
000004
000005
000006
000007
000010
000011
000012
000013
000014
000015
000016
000017
000020
000021
000022
000023
000024
000025
000026
000027

:::EQUATES FOR FLAG WORD:::;

CTARGET==0
CASIST==1
CSHCTR==2 ;ARG TYPE FOR 'SHOW COUNTERS' CMD
CCLNAD==4 ;ARG TYPE FOR 'CLEAR NODE/ADR' CMD
CCLNAL==8. ;ARG TYPE FOR 'CLEAR NODE/ALL' CMD
CEXIT==16.

:::CLOCK ENABLE VALUES TO BE LOADED IN CLK'S CSR:::

LCLKEN==100 ; L-CLOCK CSR VALUE TO ENABLE THE CLOCK
PCLKEN==111 ; P-CLOCK CSR VALUE TO ENABLE THE CLOCK
PCLKCT==1600 ; P-CLOCK COUNT SET REGISTER FOR COUNTER

: SPECIAL CLI CODES FOR 'CHAR' ARGUMENT IN CLI CALLS
(COMMAND LINE INTERPRETER DEFINITIONS)

CLIERR= 0
CLIEXI= 1
CLIBR = 2
CLIBIF= 3
CLISPA= 4
CLINUM= 5
CLIALP= 6
CLIALN= 7
CLIOCT= 8.
CLIDEC= 9.
CLISTR= 10.

:DEFS FOR COMMAND LINE INTERPRETATION ACTION VALUES

NULL=0
HELP=1
NODE=2
BUILD=3
CRUN=4
CPATRN=5
CSAVE=6
SUMMRY=7
IDENT=10
EXIT=11
NOTNUF=12
CEXADR=13
CSAVR4=14
CNODE=15
CALPHA=16
CONES=17
CZEROS=20
C1ALT=21
COALT=22
CCCITT=23
COPRSL=24
CTYPE=25
CSIZE=26
CCPYS=27

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GLOBAL EQUATES SECTION

1267 000030
1268 000031
1269 000032
1270 000033
1271 000034
1272 000035
1273 000036
1274 000037
1275 000040
1276 000041
1277 000042
1278 000043
1279 000044
1280 000045
1281
1282 000000
1283 000001
1284 000002
1285 000003
1286 000004
1287 000005
1288 000006
1289
1290
1291
1292
1293
1294
1295
1296 100000
1297 040000
1298 020000
1299 010000
1300 004000
1301 002000
1302
1303 000400
1304 000200
1305 000100
1306 000040
1307
1308
1309
1310
1311 000001
1312 000002
1313 000003
1314 000004
1315 000005
1316
1317
1318 000010
1319 000011
1320 000012
1321 000015
1322 000017

CNDADR=30
CNODAL=31
CRNALL=32
CLUPPR=33
CSHMSG=34
CCLMSG=35
CCNTR=36
CNDLOG=37
CFUNCT=40
CUNSAV=41
CCLSUM=42
CDIR=43
CDEFLT=44
CUNSVF=45

ALPHA==0
ONES==1
ZEROS==2
ONEALT==3
ZROALT==4
CCITT==5
OPRSEL==6

:MESSAGE TYPE VALUES

...
: GLOBAL EQUATES FOR THE DEUNA DRIVER
: PORT CONTROL AND STATUS REGISTER 0

SERI == BIT15 : STATUS ERROR INTERRUPT
PCEI == BIT14 : PORT COMMAND ERROR INTERRUPT
RXI == BIT13 : RECEIVE RING INTERRUPT
TXI == BIT12 : TRANSMIT RING INTERRUPT
DNI == BIT11 : DONE INTERRUPT
RCBI == BIT10 : RECEIVE BUFFER UNAVAILABLE
:
FATI == BIT08 : FATAL ERROR INTERERUPT
INTR == BIT07 : INTERRUPT SUMMARY <15:08>
INTE == BIT06 : INTERRUPT ENABLE
RSET == BIT05 : UNA RESET

: PORT COMMANDS IN BIT 3 TO BIT 0
: -----

GETPCB == BIT00 : GET ADDRESS OF PORT CONTROL BLOCK
GETFNT == BIT01 : GET COMMAND IN PORT CONTROL BLOCK
PNOP == BIT00!BIT01 : NO OPERATION PERFORMED
STRT == BIT02 : ENABLE XMIT AND RCVR
BOOT == BIT02!BIT00 : BOOT -> PRIM LOAD STATE,
: INITATE DOWNLINE LOAD
:
PDMO == BIT03 : POLLING DEMAND/WAKE UP BIT
TMRO == BIT03!BIT00 : SANITY TIMER ENABLE (=1 ITS ON)
TMRF == BIT03!BIT01 : SANITY TIMER OFF
RSTT == BIT03!BIT02!BIT00 : RESET SANITY TIMER
STOP == BIT03!BIT02!BIT01!BIT00 : SUSPEND UNA OPERATION

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```

1323
1324
1325
1326      ;PORT CONTROL AND STATUS REGISTER 1
1327
1328
1329      100000      XPWR == BIT15      ; TRANSCEIVER POWER OK
1330      040000      ICAB == BIT14      ; PORT TO LINK CABLE OK
1331
1332      ; SELF TEST ERROR CODE IN BIT 13 TO BIT 08
1333      000200      PCTO == BIT07      ; PORT COMMAND TIMEOUT
1334
1335      000010      RMTC == BIT03      ; REMOTE CONSOLE RESERVED (=1)
1336
1337      ; PORT STATE IN BIT 2 TO BIT 0
1338
1339      000000      RESET == 0          ; 000 RESET STATE
1340      000001      PRIMLD== BIT00     ; 001 PRIMARY LOAD STATE
1341      000002      READY== BIT01     ; 010 READY STATE
1342      000003      RUN == BIT01!BIT00 ; 011 RUNNING STATE
1343
1344      000005      UNIHLT == BIT02!BIT00 ; 101 UNIBUS HALTED STATE
1345      000006      NIHLT == BIT02!BIT01 ; 110 NI HALTED STATE
1346      000007      NIUNI == BIT02!BIT01!BIT00 ; 111 NI AND UNIBUS HALTED STATE
1347
1348
1349
1350      ;PORT CONTROL AND STATUS REGISTER 2
1351
1352      ; LOWER 16 ADDRESS BITS OF THE PORT CONTROL BLOCK BASE
1353      ; ADDRESS POINTER IN BIT 15 TO BIT 0
1354
1355      ;PORT CONTROL AND STATUS REGISTER 3
1356
1357      ; UPPER 2 ADDRESS BITS OF THE PORT CONTROL BLOCK BASE
1358      ; ADDRESS POINTER IN BIT 1 TO BIT 0
1359
1360      ;PORT FUNCTIONS
1361
1362      ; FUNCTION CODES ARE AS FOLLOWS
1363
1364      000000      PFNOP == 0          ; NO OPERATION PERFORMED
1365      000002      RDDEFA == BIT01     ; READ DEFAULT PHYSICAL ADDRESS
1366
1367      000004      RDPHYA == BIT02     ; READ PHYSICAL ADDRESS
1368      000005      WDPHYA == BIT02!BIT00 ; WRITE PHYSICAL ADDRESS
1369
1370      000006      RDMULA == BIT02!BIT01 ; READ LIST OF MULTICAST ADDRESSES
1371      000007      WDMULA == BIT02!BIT01!BIT00 ; WRITE LIST OF MULTICAST ADDRESSES
1372
1373      000010      RDRNGS == BIT03     ; READ BOTH THE RCVR AND XMIT RINGS
1374      000011      WDRNGS == BIT03!BIT00 ; WRITE BOTH THE RCVR AND XMIT RINGS
1375
1376      000012      RDCNTS == BIT03!BIT01 ; READ COUNTERS
1377      000013      CLRCNTS == BIT03!BIT01!BIT00 ; READ AND CLEAR COUNTERS
1378

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```

1379      000014      RDMODE == BIT03!BIT02      ; READ INTERNAL LINK MODE REGISTER
1380      000015      WDMODE == BIT03!BIT02!BIT00 ; WRITE INTERNAL LINK MODE REGISTER
1381
1382      000016      RDSTA  == BIT03!BIT02!BIT01 ; READ PORT STATUS
1383      000017      CLRSTA == BIT03!BIT02!BIT01!BIT00 ; READ AND CLEAR PORT STATUS
1384
1385
1386      000020      DMPMEM == BIT04      ; DUMP INTERNAL MEMORY
1387      000021      LDMEM  == BIT04!BIT00 ; LOAD INTERNAL MEMORY
1388
1389      000022      RDSYS  == BIT04!BIT01 ; READ SYSTEM ID PARAMETERS
1390      000023      WDSYS  == BIT04!BIT01!BIT00 ; WRITE SYSTEM ID PARAMETERS
1391
1392      :
1393      :      ETHERNET PACKET OFFSETS
1394      :
1395
1396
1397      000016      HEADER ==      14.      ; OFFSET (SIZE) TO END OF HEADER IN BYTES
1398
1399      000000      DESTIN ==      0      ; DESTINATION ADDRESS
1400      000006      SOURCC ==      6      ; SOURCE ADDRESS
1401      000014      PROTOT ==     12.      ; PROTOCOL TYPE FIELD
1402
1403      :
1404      :      ! DESTINATION ADDRESS !
1405      :      ! (6 BYTES) !
1406      :      !
1407      :
1408      :
1409      :
1410      :      +6      ! SOURCE ADDRESS !
1411      :      ! (6 BYTES) !
1412      :      !
1413      :
1414      :
1415      :
1416      :      +12.   ! PROTOCOL TYPE !
1417      :      !
1418      :      +14.   ! DATA !
1419      :      !
1420      :      ! MORE DATA !
1421      :
1422      :
1423      :+
1424      :      XMIT RING DESCRIPTOR DEFINITIONS
1425      :-
1426
1427      : TDRB+0
1428      :
1429      :      NOTHING NEEDED
1430
1431      : TDRB+2
1432      :
1433      :      NOTHING NEEDED
1434

```

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```

1435
1436      ; TDRB+4
1437      ;
1438
1439      000400      ENP      ==      BIT08      ; END OF PACKET FLAG
1440      001000      STP      ==      BIT09      ; STOP OF PACKET FLAG
1441      002000      DEF      ==      BIT10      ; DEFFERRING PACKET FLAG
1442      004000      ONE      ==      BIT11      ; XMIT SUCCESSFUL AFTER ONE RETRY
1443      010000      MORE     ==      BIT12      ; XMIT SUCCESSFUL AFTER MORE THAN
1444      ;                                     ; ONE RETRY
1445      040000      ERRS     ==      BIT14      ; ERROR SUMMARY BIT
1446      100000      OWN      ==      BIT15      ; OWNERSHIP BIT (=1 UNA, =0 HOST)
1447
1448      ; TDRB+6
1449
1450      002000      RTRY     ==      BIT10      ; RETRY ERROR BIT
1451      004000      LCAR     ==      BIT11      ; LOST CARRIER ERROR BIT
1452      010000      LCOL     ==      BIT12      ; LATE COLLISION ERROR BIT
1453
1454      040000      UBTO     ==      BIT14      ; UNIBUS TIMEOUT ERROR BIT
1455      100000      BUFL     ==      BIT15      ; BUFFER LENGTH ERROR BIT
1456
1457      ;+
1458      ; RCVR RING DESCRIPTOR DEFINITIONS
1459      ;-
1460
1461      ; RDRB+0
1462      ;
1463      ; NOTHING NEEDED
1464
1465      ; RDRB+2
1466      ;
1467      ; NOTHING NEEDED
1468
1469
1470      ; RDRB+4
1471      ;
1472
1473      ; <- INDICATES SAME AS DEFINED FOR XMIT RING
1474
1475      ;ENP      ==      BIT08      ; END OF PACKET FLAG
1476      ;STP      ==      BIT09      ; STOP OF PACKET FLAG
1477
1478      004000      CRC      ==      BIT11      ; CRC ERROR IN RECEIVED PACKET
1479      010000      OFLO     ==      BIT12      ; MESSAGE OVERFLOW
1480      020000      FRAM     ==      BIT13      ; FRAMING ERROR
1481
1482      ;ERRS     ==      BIT14      ; ERROR SUMMARY BIT
1483      ;OWN      ==      BIT15      ; OWNERSHIP BIT (=1 UNA, =0 HOST)
1484
1485      ; RDRB+6
1486
1487      020000      NCHN     ==      BIT13      ; SET TO INDICATE UNA IN NO
1488      ;                                     ; BUFFER CHAIN ON RCVR MODE
1489
1490      ;UBTO     ==      BIT14      ; UNIBUS TIMEOUT ERROR BIT

```

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```

1491          ;BUFL == BIT15          ; BUFFER LENGTH ERROR BIT
1492
1493          002756          XPKLEN == 1518.          ; TRANSMIT PACKET LENGTH
1494          002756          RPKLEN == 1518.          ; RECIEVE PACKET LENGHT
1495          000006          NO.NTR == 6              ; NUMBER OF ENTRIES IN DESCRIPTOR RINGS
1496          000050          TBLLEN == 40.           ; NODE TABLE LENGTH (CHANGE STBLEN IF
1497                                     ; THIS IS CHANGED, OR ELSE!)
1498          000132          STBLEN == 90.           ; SUMMARY TABLE LENGTH (= 2.25 X TBLLEN)
1499          000004          FRDADR == 4              ; OFFSET FOR MESSAGE HEADERS
1500
1501          ;
1502          ;: SYSTEM ID REPLY MESSAGE OFFSETS
1503          ;
1504          000022          SIRCPT == 22
1505          000027          SIVERS == 27
1506          000030          SIECO == 30
1507          000031          SIUECO == 31
1508          000035          SIFNCT == 35
1509          000042          SIADDR == 42
1510          000053          SIDEV == 53
1511
1512          ;
1513          ;: LOOP DIRECT OFFSETS
1514          ;
1515          000016          LDSKIP == 16
1516          000020          LDFCT1 == 20
1517          000022          LDADR1 == 22
1518          000030          LDFCT2 == 30
1519          000032          LDADR2 == 32
1520
1521          ;
1522          ;: FULL ASSIST OFFSETS
1523          ;
1524          000016          FASKIP == 16
1525          000020          FAFCT1 == 20
1526          000022          FAADR1 == 22
1527          000030          FAFCT2 == 30
1528          000032          FAADR2 == 32
1529          000040          FAFCT3 == 40
1530          000042          FAADR3 == 42
1531          000050          FAFCT4 == 50
1532          000052          FAADR4 == 52
1533
1534          ;
1535          ;: COUNTER OFFSETS
1536          000002          C.SECS == 2
1537          000004          C.PREC == 4
1538          000010          C.MREC == 10
1539          000014          C.RERB == 14
1540          000016          C.RERR == 16
1541          000020          C.RDAT == 20
1542          000024          C.RMDB == 24
1543          000030          C.RLIN == 30
1544          000032          C.RLEX == 32
1545          000034          C.PXMT == 34
1546          000040          C.MXMT == 40

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1547 000044
1548 000050
1549 000054
1550 000060
1551 000064
1552 000066
1553 000070
1554 000074

C.PXM3 == 44
C.PXM2 == 50
C.PXMD == 54
C.XDAT == 60
C.XMDB == 64
C.XABB == 66
C.XABT == 70
C.COLL == 74

.SBTTL GLOBAL DATA SECTION

;++

: THE GLOBAL DATA SECTION CONTAINS DATA THAT ARE USED
: IN MORE THAN ONE TEST.

--

:COMMAND LINE BUFFER, DATA LOCATIONS AND MESSAGES FOR ACTION ROUTINES

1564 002200 000110
1565 002310 000000
1566 002312 000000
1567 002314 000000
1568 002316 000000
1569 002320 000000
1570 002322 000022
1571 002344 000022
1572 002366 000000
1573 002370 000000
1574 002372 000000
1575 002374 000000
1576 002376 000000
1577 002400 000000
1578 002402 000000
1579 002404 000050
1580 002524 177777
1581 002526 177777
1582 002530 000050
1583 002650 177777
1584 002652 177777
1585 002654 177777
1586 002656 000132
1587 003142 177777

CMDBUF: .BLKB 72. ;BUFFER FOR OPERATOR COMMANDS
KEYWD1: .WORD 0
KEYWD2: .WORD 0
ADRBUF: .WORD 0 ;BUFFER FOR NODE ADDRESS
.WORD 0
.WORD 0
STRBUF: .BLKB 18. ;BUFFER FOR ALPHANUM. ADDRESS STRING
STRBU1: .BLKB 18.
CBOADR: .WORD 0 ;POINTER FOR BEGINING OF ADDRESS STRING
P\$TYPE: .WORD 0 ;LOC. TO HOLD MESSAGE TYPE
P\$SIZE: .WORD 0 ;LOC. TO HOLD MESSAGE SIZE
P\$CPYS: .WORD 0 ;LOC. TO HOLD NO. OF MESSAGE COPIES
P\$PASS: .WORD 0 ;LOC. TO HOLD NO. OF PASSES
NODTY: .WORD 0 ;LOC. TO HOLD NODE TYPE FOR NODE TABLE SETUP
SLOT:: .WORD 0 ;USED BY NODE TABLE SUBROUTINES
NODTBL: .BLKW TBLLEN ; SPACE FOR NODE TABLE
.WORD 177777 ;FILL LAST FOUR BYTES OF TABLE WITH ONES
.WORD 177777
SAVTBL: .BLKW TBLLEN ;SPACE FOR SAVE TABLE
ILLADR: .WORD 177777 ;ILLEGAL ADDRESS FOR COMPARISON
.WORD 177777 ; (MUST NOT BE PHYSICALLY SEPARATED FROM
.WORD 177777 ; END OF SAVTBL)
STATBL: .BLKW STBLEN ;SPACE FOR SUMMARY TABLE
.WORD 177777

:COMMAND LINE TRAVERSE LOCATIONS (USED BY 'P\$TRV')

1591 003144 000000
1592 003146 000000
1593 003150 000000
1594 003152 000000
1595 003154 000000
1596 003156 000000
1597 003160 000
1598 003161 000
1599 003162 000
1600 003163 000
1601
1602 003164 056060

P\$BUFA: .WORD 0 ;LOC. TO HOLD ADDR. OF CMD LINE BUFFER
P\$TREE: .WORD 0 ;LOC. TO HOLD ADDR. OF PARSING TREE
P\$ACT: .WORD 0 ;LOC. TO HOLD ADDR. OF ACTION ROUTINE
P\$CNT: .WORD 0 ;LOC. TO BE A COUNTER LOCATION
P\$NUM: .WORD 0 ;LOC. TO HOLD NUMERIC VALUE FROM PARSE
P\$RADX: .WORD 0 ;LOC. TO HOLD RADIX(LO) & +/- (HI BYTE)
P\$NNUF: .BYTE 0 ;RETURN =0 IF ENOUGH OF COMMAND FOUND
P\$GDBD: .BYTE 0 ;RETURN CODE 0 IF NO ERROR FOUND
P\$AERR: .BYTE 0 ;RETURN 0 IF 12 DIGIT ADDRESS ENTERED
P\$MERR: .BYTE 0 ;RETURN -1 IF ERROR IN OPERATOR SELECTED
MESSAGE INPUT OCCURED, 0 FOR GOOD INPUT
HLPTAB: .WORD HELP1

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1603	003166	056161	.WORD	HELP2
1604	003170	056254	.WORD	HELP3
1605	003172	056325	.WORD	HELP4
1606	003174	056376	.WORD	HELP5
1607	003176	056476	.WORD	HELP6
1608	003200	056611	.WORD	HELP7
1609	003202	056722	.WORD	HELP8
1610	003204	057012	.WORD	HELP9
1611	003206	057101	.WORD	HELP10
1612	003210	057172	.WORD	HELP11
1613	003212	057270	.WORD	HELP12
1614	003214	057375	.WORD	HELP13
1615	003216	057474	.WORD	HELP14
1616	003220	057573	.WORD	HELP15
1617	003222	057676	.WORD	HELP16
1618	003224	057765	.WORD	HELP17
1619	003226	060070	.WORD	HELP18
1620	003230	060140	.WORD	HELP19
1621	003232	060243	.WORD	HELP20
1622	003234	060321	.WORD	HELP21
1623	003236	060404	.WORD	HELP22
1624	003240	060505	.WORD	HELP23
1625	003242	060605	.WORD	HELP24
1626	003244	060735	.WORD	HELP25
1627	003246	061021	.WORD	HELP26
1628	003250	061125	.WORD	HELP27
1629	003252	061227	.WORD	HELP28
1630	003254	061346	.WORD	HELP29
1631	003256	061416	.WORD	HELP30
1632	003260	000000	HLPEND: .WORD	0
1633	003262	062372	MSGTAB: .WORD	MSGTY0
1634	003264	062400	.WORD	MSGTY1
1635	003266	062405	.WORD	MSGTY2
1636	003270	062413	.WORD	MSGTY3
1637	003272	062420	.WORD	MSGTY4
1638	003274	062425	.WORD	MSGTY5
1639	003276	062433	.WORD	MSGTY6
1640				
1641				
1642				
1643	003300		MSGCNT::	
1644	003300	000130	MSG0C: .WORD	EMSG0-MSG00
1645	003302	000001	MSG1C: .WORD	EMSG1-MSG01
1646	003304	000001	MSG2C: .WORD	EMSG2-MSG02
1647	003306	000001	MSG3C: .WORD	EMSG3-MSG03
1648	003310	000001	MSG4C: .WORD	EMSG4-MSG04
1649	003312	000100	MSG5C: .WORD	EMSG5-MSG05
1650	003314	000000	MSG6C: .WORD	0
1651				
1652	003316		MSGAD::	
1653	003316	003334	.WORD	MSG00
1654	003320	003464	.WORD	MSG01
1655	003322	003465	.WORD	MSG02
1656	003324	003466	.WORD	MSG03
1657	003326	003467	.WORD	MSG04
1658	003330	003470	.WORD	MSG05

;MESSAGE TYPE ASCII ADDRESS TABLE

; THIS SECTION DEFINES THE DATA PATTERNS USED BY THE EXERCISER

; THE NUMBER OF BYTES IN EACH MESSAGE

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1659	003332	003570			.WORD	OPSLBF	
1660							
1661	003334	020440	021442	022444	MSG00::	.ASCII	\ !'#\$%&'()*+,-/0123456789:;<=>?@ABCDEFGHIJKLMN OPQRSTUVWXYZ\
1662	003342	023446	024450	025452			
1663	003350	026454	030057	031061			
1664	003356	032063	033065	034067			
1665	003364	035071	036073	037075			
1666	003372	040077	041101	042103			
1667	003400	043105	044107	045111			
1668	003406	046113	047115	050117			
1669	003414	051121	052123	053125			
1670	003422	054127	055131				
1671	003426	056533	026536	041101	.ASCII	\[]^~ABCDEFGHIJKLMN OPQRSTUVWXYZ\	; ALPHANUMERIC
1672	003434	042103	043105	044107			
1673	003442	045111	046113	047115			
1674	003450	050117	051121	052123			
1675	003456	053125	054127	055131			
1676	003464				EMSG0::		
1677	003464	377			MSG01::	.BYTE	377 ; MESSAGE OF ALL ONES
1678	003465				EMSG1::		
1679	003465	000			MSG02::	.BYTE	0 ; MESSAGE OF ALL ZEROS
1680	003466				EMSG2::		
1681	003466	252			MSG03::	.BYTE	252 ; MESSAGE OF ALTERNATING ONES
1682	003467				EMSG3::		
1683	003467	125			MSG04::	.BYTE	125 ; MESSAGE OF ALTERNATING ZEROS
1684	003470				EMSG4::		
1685	003470				MSG05::		; CCITT 511 BIT TEST PATTERN
1686	003470	177603	157427	031011	.WORD	177603,157427,031011,047321,163715,105221	
1687	003476	047321	163715	105221	.WORD	143325,142304,040041,104116,052606,172334	
1688	003504	143325	142304	040041	.WORD	105025,123754,111337,111523,030030,145064	
1689	003512	104116	052606	172334	.WORD	137642,143531,063617,135075,066730,026575	
1690	003520	105025	123754	111337	.WORD	052012,053627,070071,151172,165044,031605	
1691	003526	111523	030030	145064	.WORD	166632,016147	
1692	003534	137642	143531	063617	.WORD		
1693	003542	135075	066730	026575	.WORD		
1694	003550	052012	053627	070071	.WORD		
1695	003556	151172	165044	031605	.WORD		
1696	003564	166632	016147		.WORD		
1697	003570				EMSG5::		
1698	003570	000102			OPSLBF:	.BLKB	66. ;BUFFER FOR OPERATOR SELECTED MESSAGE TYPE
1699							
1700							
1701	003672	000000			CFLAG:	.WORD	0 ;ACTION ROUTINE CMD ARGUMENT FLAG
1702							
1703					::	CLOCK TABLES, EVENT LOG AND POINTERS	
1704	003674	000000			CLKCSR:	.WORD	0 ; CLOCK CSR ADDRESS
1705	003676	000000			CLKBR:	.WORD	0 ; CLOCK INTERRUPT LEVEL
1706	003700	000000			CLKVEC:	.WORD	0 ; CLOCK INTERRUPT VECTOR
1707	003702	000074			CLKHZ:	.WORD	60. ; CLOCK'S FREQUENCY IN HERTZ
1708	003704	000000			CLKEN:	.WORD	0 ; CLOCK'S CSR VALUE TO INTRPT. ENABLE IT
1709							
1710	003706	000000			TIMMIN:	.WORD	0 ; PLACE TO KEEP TIME-SINCE-START
1711	003710	000000			TIMSEC:	.WORD	0
1712	003712	000000			TIMTCK:	.WORD	0 ; PLACE TO KEEP NO. OF TICKS/SEC.
1713							
1714	003714	000000			TIMER1:	.WORD	0 ; EVENT TIMER #1 (TICKS)

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1715 003716 000000
1716 003720 000000
1717
1718
1719
1720
1721
1722
1723
1724 003722
1725
1726 003722 026006
1727 003724 030764
1728 003726 033742
1729 003730 036720
1730 003732 041676
1731 003734 044654
1732
1733
1734
1735
1736
1737 003736
1738
1739 003736 004162
1740 003740 007140
1741 003742 012116
1742 003744 015074
1743 003746 020052
1744 003750 023030
1745
1746
1747
1748 003752 003772
1749 003754 004066
1750 003756 003772
1751 003760 004066
1752 003762 003772
1753 003764 004066
1754 003766 004054
1755 003770 004150
1756
1757
1758
1759 003772 000006
1760
1761
1762
1763
1764 003772 002756
1765 003774 004162
1766 003776 000000
1767 004000 000000
1768 004002 000000
1769
1770 004004 002756

TIMER2: .WORD 0 ; EVENT TIMER #2 (TICKS)
TIMERS: .WORD 0 ; EVENT TIMER #3 (SECONDS)
.EVEN

:
: TABLE OF START ADDRESS OF RECIEVE RING BUFFERS
:

RRNGTB::
.WORD RRG001
.WORD RRG002
.WORD RRG003
.WORD RRG004
.WORD RRG005
.WORD RRG006

:
: TABLE OF START ADDRESS OF TRANSMIT RING BUFFERS
:

XRNGTB::
.WORD XRG001
.WORD XRG002
.WORD XRG003
.WORD XRG004
.WORD XRG005
.WORD XRG006

:
: POINTERS TO DESCRIPTOR RING ENTRIES

XRGSRT::.WORD XRING ; FIRST ENTRY IN TRANSMIT RING
RRGSRT::.WORD RRING ; FIRST ENTRY IN RECIEVE RING
XRGCUR::.WORD XRING ; CURRENT ENTRY IN TRANSMIT RING
RRGCUR::.WORD RRING ; CURRENT ENTRY IN RECIEVE RING
XRGNXT::.WORD XRING ; NEXT ENTRY IN TRANSMIT RING
RRGNXT::.WORD RRING ; NEXT ENTRY IN RECIEVE RING
XRGLST::.WORD XRING+50. ; LAST ENTRY IN TRANSMIT RING
RRGLST::.WORD RRING+50. ; LAST ENTRY IN RECEIVE RING
: VALUE = NO.NTR X 10.

XRING:: .REPT 6
.NLIST
RNGFRM XRG00,B,0
.LIST
.ENDR
.WORD RPKLEN ; SEGMENT LENGTH
.WORD XRG001 ; SEGMENT BUFFER ADDRESS
.WORD 0 ; OWNERSHIP AND STATUS BITS
.WORD 0 ; STATUS
.WORD 0 ; SEQUENCE NUMBER
.WORD RPKLEN ; SEGMENT LENGTH

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1771	004006	007140	.WORD	XRG002	:	SEGMENT BUFFER ADDRESS
1772	004010	000000	.WORD	0	:	OWNERSHIP AND STATUS BITS
1773	004012	000000	.WORD	0	:	STATUS
1774	004014	000000	.WORD	0	:	SEQUENCE NUMBER
1775						
1776	004016	002756	.WORD	RPKLEN	:	SEGMENT LENGTH
1777	004020	012116	.WORD	XRG003	:	SEGMENT BUFFER ADDRESS
1778	004022	000000	.WORD	0	:	OWNERSHIP AND STATUS BITS
1779	004024	000000	.WORD	0	:	STATUS
1780	004026	000000	.WORD	0	:	SEQUENCE NUMBER
1781						
1782	004030	002756	.WORD	RPKLEN	:	SEGMENT LENGTH
1783	004032	015074	.WORD	XRG004	:	SEGMENT BUFFER ADDRESS
1784	004034	000000	.WORD	0	:	OWNERSHIP AND STATUS BITS
1785	004036	000000	.WORD	0	:	STATUS
1786	004040	000000	.WORD	0	:	SEQUENCE NUMBER
1787						
1788	004042	002756	.WORD	RPKLEN	:	SEGMENT LENGTH
1789	004044	020052	.WORD	XRG005	:	SEGMENT BUFFER ADDRESS
1790	004046	000000	.WORD	0	:	OWNERSHIP AND STATUS BITS
1791	004050	000000	.WORD	0	:	STATUS
1792	004052	000000	.WORD	0	:	SEQUENCE NUMBER
1793						
1794	004054	002756	.WORD	RPKLEN	:	SEGMENT LENGTH
1795	004056	023030	.WORD	XRG006	:	SEGMENT BUFFER ADDRESS
1796	004060	000000	.WORD	0	:	OWNERSHIP AND STATUS BITS
1797	004062	000000	.WORD	0	:	STATUS
1798	004064	000000	.WORD	0	:	SEQUENCE NUMBER
1799						
1800						
1801						
1802	004066	000006	RRING::	.REPT 6		
1803				.NLIST		
1804				RNGFRM RRG00,B,100000		
1805				.LIST		
1806				.ENDR		
1807	004066	002756	.WORD	RPKLEN	:	SEGMENT LENGTH
1808	004070	026006	.WORD	RRG001	:	SEGMENT BUFFER ADDRESS
1809	004072	100000	.WORD	100000	:	OWNERSHIP AND STATUS BITS
1810	004074	000000	.WORD	0	:	STATUS
1811	004076	000000	.WORD	0	:	SEQUENCE NUMBER
1812						
1813	004100	002756	.WORD	RPKLEN	:	SEGMENT LENGTH
1814	004102	030764	.WORD	RRG002	:	SEGMENT BUFFER ADDRESS
1815	004104	100000	.WORD	100000	:	OWNERSHIP AND STATUS BITS
1816	004106	000000	.WORD	0	:	STATUS
1817	004110	000000	.WORD	0	:	SEQUENCE NUMBER
1818						
1819	004112	002756	.WORD	RPKLEN	:	SEGMENT LENGTH
1820	004114	033742	.WORD	RRG003	:	SEGMENT BUFFER ADDRESS
1821	004116	100000	.WORD	100000	:	OWNERSHIP AND STATUS BITS
1822	004120	000000	.WORD	0	:	STATUS
1823	004122	000000	.WORD	0	:	SEQUENCE NUMBER
1824						
1825	004124	002756	.WORD	RPKLEN	:	SEGMENT LENGTH
1826	004126	036720	.WORD	RRG004	:	SEGMENT BUFFER ADDRESS

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1827	004130	100000	.WORD	100000	: OWNERSHIP AND STATUS BITS
1828	004132	000000	.WORD	0	: STATUS
1829	004134	000000	.WORD	0	: SEQUENCE NUMBER
1830					
1831	004136	002756	.WORD	RPKLEN	: SEGMENT LENGTH
1832	004140	041676	.WORD	RRG005	: SEGMENT BUFFER ADDRESS
1833	004142	100000	.WORD	100000	: OWNERSHIP AND STATUS BITS
1834	004144	000000	.WORD	0	: STATUS
1835	004146	000000	.WORD	0	: SEQUENCE NUMBER
1836					
1837	004150	002756	.WORD	RPKLEN	: SEGMENT LENGTH
1838	004152	044654	.WORD	RRG006	: SEGMENT BUFFER ADDRESS
1839	004154	100000	.WORD	100000	: OWNERSHIP AND STATUS BITS
1840	004156	000000	.WORD	0	: STATUS
1841	004160	000000	.WORD	0	: SEQUENCE NUMBER

1842					
1843					
1844					
1845	004162	002756	XRG001::.BLKB	XPKLEN	: XMIT RING BUFFERS
1846	007140	002756	XRG002::.BLKB	XPKLEN	
1847	012116	002756	XRG003::.BLKB	XPKLEN	
1848	015074	002756	XRG004::.BLKB	XPKLEN	
1849	020052	002756	XRG005::.BLKB	XPKLEN	
1850	023030	002756	XRG006::.BLKB	XPKLEN	

1851					
1852	026006	002756	RRG001::.BLKB	RPKLEN	: RECIEVE RING BUFFERS
1853	030764	002756	RRG002::.BLKB	RPKLEN	
1854	033742	002756	RRG003::.BLKB	RPKLEN	
1855	036720	002756	RRG004::.BLKB	RPKLEN	
1856	041676	002756	RRG005::.BLKB	RPKLEN	
1857	044654	002756	RRG006::.BLKB	RPKLEN	

1858
1859
1860
1861
1862
1863
1864
1865
1866
1867

```

:*****8
: INFORMATION ABOUT THE CURRENT UNIT AS OBTAINED FROM THE HARDWARE P-TABLE
:*****

```

1868	047632	000000	PCSR0:: .WORD	: PCSRS OF CURRENT SLOT	
1869	047634	000000	PCSR1:: .WORD	: ADDRESS OF PCSR0	(PORT COMMAND FIELD
1870	047636	000000	PCSR2:: .WORD	: 1	(STATE & SELF TEST FIELDS
1871	047640	000000	PCSR3:: .WORD	: 2	(PCB ADDRESS LO 15 BITS
1872				: 3	(PCB ADDRESS HI 2 BITS
1873	047642	000000	PCSR0C::.WORD	0	:PCSR0 CONTENTS
1874	047644	000000	PCSR1C::.WORD	0	:PCSR1 CONTENTS
1875	047646	000000	PCSR2C::.WORD	0	:PCSR2 CONTENTS
1876	047650	000000	PCSR3C::.WORD	0	:PCSR3 CONTENTS
1877					
1878					
1879	047652	000000	UNACSR::.WORD	0	:CSR
1880	047654	000000	UNAVEC::.WORD	0	:VECTOR
1881	047656	000000	UNAPRI::.WORD	0	:PRIORITY
1882					

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```

1883 047660 000000 FRESIZ::.WORD 0 ; POINTER TO WORD CONTAINING SIZE OF FREE MEMORY
1884 047662 000000 FREMEM::.WORD 0 ; POINTER TO FREE MEMORY SPACE
1885
1886 047664 000000 UNIT::.WORD 0 ; CURRENT UNIT NUMBER BEING TESTED
1887
1888 ; PORT CONTROL BLOCK FUNCTION STRUCTURES
1889
1890 ; PORT CONTROL BLOCK
1891 047666 000000 PCBB0::.WORD 0 ; PORT FUNCTION
1892 047670 000000 PCBB2::.WORD 0 ; PORT FUNCTION DEPENDENT PARAMETERS
1893 047672 000000 PCBB4::.WORD 0 ; PORT FUNCTION DEPENDENT PARAMETERS
1894 047674 000000 PCBB6::.WORD 0 ; PORT FUNCTION DEPENDENT PARAMETERS
1895
1896 ; FUNCTION TABLE
1897
1898 047676 047746 FUNTAB::.WORD $PNOP ; NO OP
1899 047700 000000 .WORD 0 ; FILL IN THE HOLE
1900 047702 047750 .WORD $RDDE ; READ DEFAULT PHYSICAL ADDRESS
1901 047704 000000 .WORD 0 ; FILL IN ANOTHER HOLE
1902 047706 047760 .WORD $RDPH ; READ PHYSICAL ADDRESS
1903 047710 047770 .WORD $WDPH ; WRITE PHYSICAL ADDRESS
1904 047712 050000 .WORD $RDMC ; READ MULTICAST ADDRESS LIST
1905 047714 050040 .WORD $WDMC ; WRITE MULTICAST ADDRESS LIST
1906 047716 050100 .WORD $RDRN ; READ DESCRIPTOR RINGS
1907 047720 050124 .WORD $WDRN ; WRITE DESCRIPTOR RINGS
1908 047722 050150 .WORD $RDCA ; READ COUNTERS
1909 047724 050260 .WORD $CLRC ; READ AND CLEAR COUNTERS
1910 047726 050270 .WORD $RDMO ; READ MODE
1911 047730 050300 .WORD $WDMO ; WRITE MODE
1912 047732 050310 .WORD $RDST ; READ STATUS
1913 047734 050320 .WORD $CLRS ; READ AND CLEAR STATUS
1914 047736 050330 .WORD $DMEM ; DUMP INTERNAL MEMORY
1915 047740 050350 .WORD $LMEM ; LOAD INTERNAL MEMORY
1916 047742 050360 .WORD $RDSY ; READ SYS ID PARAMETERS
1917 047744 050370 .WORD $WTSY ; WRITE SYS ID PARAMETERS
1918
1919 :=
1920 ; PNOP == 0 ; PORT NO-OPERATION
1921 :=
1922 .EVEN
1923 047746 000000 $PNOP::.WORD 0 ; NO-OP
1924
1925 :=
1926 ; RDDEFA == BIT01 ; READ DEFAULT PHYSICAL ADDRESS
1927 :=
1928 .EVEN
1929
1930 047750 000002 $RDDE::.WORD 2 ; PCBB+0 FUNCTION READ DEFAULT
1931 047752 000000 DEPADR::.WORD 0 ; PCBB+2 PHYSICAL ADDRESS
1932 047754 000000 .WORD 0 ; PCBB+4
1933 047756 000000 .WORD 0 ; PCBB+6
1934
1935 :=
1936 ; RDPHYA == BIT02 ; READ PHYSICAL ADDRESS
1937 :=
1938 .EVEN

```

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```

1939
1940 047760 000004      $RDPH::      .WORD  4      : PCBB+0 READ CURRENT (ACTIVE)
1941 047762 000000      PHYADR::     .WORD  0      : PCBB+2   PHYSICAL ADDRESS
1942 047764 000000      .WORD  0      : PCBB+4
1943 047766 000000      .WORD  0      : PCBB+6
1944
1945      :+
1946      : WDPHYA == BIT02!BIT00      : WRITE PHYSICAL ADDRESS
1947      :-
1948      .EVEN
1949 047770 000005      $WDPH::     .WORD  5      : PCBB+0 WRITE PHYSICAL ADDRESS
1950 047772 000000      .WORD  0      : PCBB+2
1951 047774 000000      .WORD  0      : PCBB+4
1952 047776 000000      .WORD  0      : PCBB+6
1953
1954      :+
1955      : RDMULA == BIT02!BIT01      : READ MULTICAST ADDRESS LIST
1956      :-
1957      .EVEN
1958
1959 050000 000006      $RDMC::     .WORD  6      : FUNCTION CODE
1960 050002 050010      .WORD  UCB6   : UCBB ADDRESS
1961 050004 000000      .WORD  0      : PCBB+4
1962 050006 000000      .WORD  0      : PCBB+6
1963
1964 050010 000014      UCB6::      .BLKW  12.    : ENOUGH ROOM FOR 4 ADDRESSES
1965
1966      :+
1967      : WDMULA == BIT02!BIT01!BIT00 : WRITE MULTICAST ADDRESS LIST
1968      :-
1969      .EVEN
1970
1971 050040 000007      $WDMC::     .WORD  7      : FUNCTION CODE
1972 050042 050050      .WORD  UCB7   : UCBB ADDRESS
1973 050044 000400      .WORD  400    : LENGTH OF LIST = 1
1974 050046 000000      .WORD  0      : PCBB+6
1975
1976 050050 000253      UCB7::      .WORD  253    : MULTICAST ADDRESS FOR LOOPBACK
1977 050052 001000      .WORD  1000   :
1978 050054 000000      .WORD  0      :
1979 050056 000011      .BLKW  9.     : ROOM FOR THREE MORE ADDRESSES
1980
1981      :+
1982      : RDRNGS == BIT03           : READ BOTH THE RCVR AND XMIT RINGS
1983      :-
1984      .EVEN
1985
1986 050100 000010      $RDRN::     .WORD  10     : FUNCTION CODE
1987 050102 050110      .WORD  UCB10  : UCBB ADDRESS
1988 050104 000000      .WORD  0      : NULL
1989 050106 000000      .WORD  0      : NULL
1990
1991      .EVEN
1992
1993 050110 003772      UCB10::     .WORD  XRING  : UCBB
1994 050112 002000      .WORD  2000  : UCBB+2

```

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```

1995 050114 000000          .WORD 0          : UCBB+4
1996 050116 004066          .WORD RRING      : UCBB+6
1997 050120 002000          .WORD 2000       : UCBB+10
1998 050122 000000          .WORD 0          : UCBB+12
1999
2000
2001
2002      :+
           :      WDRNGS == BIT03!BIT00      ; WRITE BOTH THE RCVR AND XMIT RINGS
           :-
2003
2004
2005      .EVEN
2006
2007      050124 000011      $WDRN::          .WORD 11         : FUNCTION CODE
2008      050126 050134          .WORD UCB11      : UCBB ADDRESS
2009      050130 000000          .WORD 0          : NULL
2010      050132 000000          .WORD 0          : NULL
2011
2012      .EVEN
2013
2014      050134          UCB11::
2015      050134 003772          .WORD XRING      : TRANSMIT RING BASE ADDRESS
2016      050136 000          .BYTE 0          : HI BITS OF TRANSMIT RING BASE ADDRESS
2017      050137 005          .BYTE 5          : FIVE WORDS PER RING ENTRY (1 FOR PORT DR
2018      050140 000006          .WORD NO.NTR     : EIGHT TRANSMIT DESCRIPTORS IN THE RING
2019
2020      050142 004066          .WORD RRING      : RECEIVE RING BASE ADDRESS
2021      050144 000          .BYTE 0          : HI BITS OF RECEIVE RING BASE ADDRESS
2022      050145 005          .BYTE 5          : FIVE WORDS PER RING ENTRY (1 FOR PORT DR
2023      050146 000006          .WORD NO.NTR     : EIGHT RECEIVE DESCRIPTORS IN THE RING
2024
2025
2026
2027
2028      :+
           :      RDCNTS == BIT03!BIT01      ; READ COUNTERS
           :-
2029
2030
2031      .EVEN
2032      050150 000012      $RDCN::          .WORD 12         : FUNCTION
2033      050152 050160          .WORD UCB12      : UCBB ADDRESS
2034
2035          : DEFAULT COUNT OF COUNTER LIST
2036          :      ;      40 (OCTAL)
2037      050154 000000          .WORD 0          : NULL
2038
2039      050156 000100          .WORD 100        : (# OF WORDS IN LIST = UPPER BYTE)
2040          : MAX NUMBER VALUE = 32 (DECIMAL) =
2041
2042      .EVEN
2043
2044      050160          UCB13::
2045      050160 000000          UCB12::          .WORD 0          : UCBB
2046      050162 000000          .WORD 0          : UCBB+2
2047      050164 000000          .WORD 0          : UCBB+4
2048      050166 000000          .WORD 0          : UCBB+6
2049      050170 000000          .WORD 0          : UCBB+10
2050      050172 000000          .WORD 0          : UCBB+12

```


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```

2051 050174 000000      .WORD 0      : UCBB+14
2052 050176 000000      .WORD 0      : UCBB+16
2053 050200 000000      .WORD 0      : UCBB+20
2054 050202 000000      .WORD 0      : UCBB+22
2055 050204 000000      .WORD 0      : UCBB+24
2056 050206 000000      .WORD 0      : UCBB+26
2057 050210 000000      .WORD 0      : UCBB+30
2058 050212 000000      .WORD 0      : UCBB+32
2059 050214 000000      .WORD 0      : UCBB+34
2060 050216 000000      .WORD 0      : UCBB+36
2061 050220 000000      .WORD 0      : UCBB+40
2062 050222 000000      .WORD 0      : UCBB+42
2063 050224 000000      .WORD 0      : UCBB+44
2064 050226 000000      .WORD 0      : UCBB+46
2065 050230 000000      .WORD 0      : UCBB+50
2066 050232 000000      .WORD 0      : UCBB+52
2067 050234 000000      .WORD 0      : UCBB+54
2068 050236 000000      .WORD 0      : UCBB+56
2069 050240 000000      .WORD 0      : UCBB+60
2070 050242 000000      .WORD 0      : UCBB+62
2071 050244 000000      .WORD 0      : UCBB+64
2072 050246 000000      .WORD 0      : UCBB+66
2073 050250 000000      .WORD 0      : UCBB+70
2074 050252 000000      .WORD 0      : UCBB+72
2075 050254 000000      .WORD 0      : UCBB+74
2076 050256 000000      .WORD 0      : UCBB+76
2077
2078
2079      :+
2080      :
2081      :-
2082      .EVEN
2083
2084 050260 000013      $CLRC::      .WORD 13      : FUNCTION
2085 050262 050160      .WORD UC13    : UCBB ADDRESS
2086      .WORD 0      : DEFAULT COUNT OF COUNTER LIST
2087 050264 000000      .WORD 0      : NULL
2088 050266 000040      .WORD 40      : (# OF WORDS IN LIST = UPPER BYTE)
2089      : MAX NUMBER VALUE = 32 (DECIMAL) =
2090      : 40 (OCTAL)
2091
2092
2093      :( FOR UC13:: SEE UCB 12 ABOVE)
2094
2095
2096      :+
2097      :
2098      :-
2099      .EVEN
2100
2101 050270 000014      $RDMO::      .WORD 14      : FUNCTION CODE
2102 050272 000000      .WORD 0      : A 16 BIT COPY OF THE
2103      : BITS TO READ THE UNA INTERNAL
2104      : MODE REGISTER
2105 050274 000000      .WORD 0      : NULL
2106 050276 000000      .WORD 0      : NULL

```

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```

2107
2108
2109      :+
2110      :      WDMODE == BIT03!BIT02!BIT00 ; WRITE INTERNAL LINK MODE REGISTER
2111      :-
2112      .EVEN
2113      050300 000015      $WDMO::      .WORD 15      ; FUNCTION CODE
2114      050302 000000      .WORD 0      ; A 16 BIT COPY OF THE
2115      .WORD 0      ; BITS TO WRITE THE UNA INTERNAL
2116      .WORD 0      ; MODE REGISTER
2117      050304 000000      .WORD 0      ; NULL
2118      050306 000000      .WORD 0      ; NULL
2119
2120
2121      :+
2122      :      RDSTA == BIT03!BIT02!BIT01 ; READ PORT STATUS
2123      :-
2124
2125      .EVEN
2126      050310 000016      $RDST::      .WORD 16      ; FUNCTION CODE
2127      050312 000000      STATUS::      .WORD 0      ; A LIST OF ERRORS AND STATUS
2128      050314 000000      .WORD 0      ; LOWER BYTE = # OF MULTICAST ADRS
2129      .WORD 0      ; MAXIMUM SUPPORTED BY UNA
2130      .WORD 0      ; UPPER BYTE = # OF MULTICAST ADRS
2131      .WORD 0      ; CURRENTLY SUPPORTED BY UNA
2132      050316 000000      .WORD 0      ; WORD = MAXIMUM # OF WORDS IN
2133      .WORD 0      ; UCB FOR COUNTERS
2134      .WORD 0      ; AS CURRENTLY PERCEIVED
2135      .WORD 0      ; BY THE UNA
2136
2137      :+
2138      :      CLRSTA == BIT03!BIT02!BIT01!BIT0
2139      :-      ; READ AND CLEAR WRITE PORT STATUS
2140
2141      .EVEN
2142      050320 000017      $CLRS::      .WORD 17      ; FUNCTION CODE
2143      050322 000000      .WORD 0      ; A LIST OF ERRORS AND STATUS
2144      050324 000000      .WORD 0      ; LOWER BYTE = # OF MULTICAST ADRS
2145      .WORD 0      ; MAXIMUM SUPPORTED BY UNA
2146      .WORD 0      ; UPPER BYTE = # OF MULTICAST ADRS
2147      .WORD 0      ; CURRENTLY SUPPORTED BY UNA
2148      050326 000000      .WORD 0      ; WORD = MAXIMUM # OF WORDS IN
2149      .WORD 0      ; UCB FOR COUNTERS
2150      .WORD 0      ; AS CURRENTLY PERCEIVED
2151      .WORD 0      ; BY THE UNA
2152
2153      :+
2154      :      DMPMEM == BIT04
2155      :-      ; DUMP INTERNAL MEMORY
2156
2157      .EVEN
2158      050330 000020      $DMEM::      .WORD 20      ; FUNCTION CODE
2159      050332 050340      .WORD UCB20 ; UCBB ADDRESS
2160      050334 000000      .WORD 0
2161      050336 000000      .WORD 0
2162

```

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```

2163 050340          UCB20::
2164 050340 000000  UCB21::          .WORD 0      ; FUNCTION LENGTH (NO OF WORDS TO XFER)
2165 050342 000000          .WORD 0      ; HDBB - HOST MEMORY DATA BLOCK ADDRESS
2166 050344 000000          .WORD 0      ; MUST BE ZERO
2167 050346 000000          .WORD 0      ; IDBB - INTERNAL DATA BLOCK BASE ADDRESS
2168
2169                :+
2170                : LDMEM == BIT04!BIT00      ; LOAD UNA INTERNAL MEMORY
2171                :-
2172
2173                .EVEN
2174 050350 000021  $LMEM::          .WORD 21     ; FUNCTION CODE
2175 050352 050340          .WORD UCB21  ; UCBB ADDRESS
2176 050354 000000          .WORD 0
2177 050356 000000          .WORD 0
2178
2179                :+
2180                : RDSYS == BIT04!BIT01      ; READ SYSTEM ID
2181                :-
2182
2183                .EVEN
2184 050360 000022  $RDSY::          .WORD 22     ; FUNCTION CODE
2185 050362 050400          .WORD UCB22  ; UCBB ADDRESS
2186 050364 000000          .WORD 0
2187 050366 000033          .WORD 27.    ; LENGTH OF ID MESSAGE
2188
2189                :+
2190                : WTSYS == BIT04!BIT01!BIT00 ; WRITE SYSTEM ID
2191                :-
2192
2193                .EVEN
2194 050370 000023  $WTSY::          .WORD 23     ; FUNCTION CODE
2195 050372 050400          .WORD UCB23  ; UCBB ADDRESS
2196 050374 000000          .WORD 0
2197 050376 000033          .WORD 27.    ; LENGTH OF ID MESSAGE
2198
2199 050400          UCB22:          .WORD 0      ;:UDBB+0
2200 050400 000000  UCB23:          .WORD 0      ;:UDBB+2
2201 050402 000000          .WORD 0      ;:UDBB+4
2202 050404 000000          .WORD 0      ;:UDBB+6
2203 050406 000000          .WORD 0      ;:UDBB+10
2204 050410 000000         .WORD 0      ;:UDBB+12
2205 050412 000000         .WORD 0      ;:UDBB+14
2206 050414 000000         .WORD 0      ;:UDBB+16
2207 050416 000000         .WORD 0      ;:UDBB+20
2208 050420 000000         .WORD 0      ;:UDBB+22
2209 050422 000000         .WORD 0      ;:UDBB+24
2210 050424 000000         .WORD 0      ;:UDBB+26
2211 050426 000000         .WORD 0      ;:UDBB+30
2212 050430 000000         .WORD 0      ;:UDBB+32
2213 050432 000000         .WORD 0      ;:UDBB+34
2214 050434 000000         .WORD 0      ;:UDBB+36
2215 050436 000000         .WORD 0      ;:UDBB+40
2216 050440 000000         .WORD 0      ;:UDBB+42
2217 050442 000000         .WORD 0      ;:UDBB+44
2218 050444 000000         .WORD 0      ;:UDBB+46

```

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```

2219 050450 000000          .WORD 0          :UDBB+50
2220 050452 000000          .WORD 0          :UDBB+52
2221 050454 000000          .WORD 0          :UDBB+54
2222 050456 000000          .WORD 0          :UDBB+56
2223 050460 000000          .WORD 0          :UDBB+60
2224 050462 000000          .WORD 0          :UDBB+62
2225 050464 000000          .WORD 0          :UDBB+64
2226
2227 050466 000000          UDBB:: .WORD 0          ;UNIBUS DATA BLOCK BASE
2228 050470 000000          .WORD 0          ;+2
2229 050472 000000          .WORD 0          ;+4
2230 050474 000000          .WORD 0          ;+6
2231
2232
2233          ;
2234          ; SUMMARY DATA COUNTERS
2235          ;
2236 050476 000000          S.REC:: .WORD 0          ; MESSAGES RECEIVED
2237 050500 000000          S.NREC:: .WORD 0          ; MESSAGES NOT RECEIVED
2238 050502 000000          S.LEN:: .WORD 0          ; LENGTH ERRORS
2239 050504 000000          S.COMP:: .WORD 0          ; COMPARE ERRORS
2240 050506 000000          S.BYTE:: .WORD 0          ; BYTES COMPARED
2241 050510 000000          S.XFER:: .WORD 0          ; BYTES TRANSFERED
2242
2243          ;
2244          ; DEUNA DRIVER AND ASSOCIATED SUBROUTINES DATA
2245          ;
2246
2247 050512 000000          FATFLG:: .WORD 0          ; FATAL ERROR FLAG
2248 050514 000000          PCEFLG:: .WORD 0          ; PORT COMMAND ERROR FLAG
2249 050516 000000          NIRCNT:: .WORD 0          ; UNA RECIEVE MESSAGE COUNTER
2250 050520 000000          XFLAG:: .WORD 0          ; FRAME TRANSMITTED FLAG
2251 050522 000000          DNIFLG:: .WORD 0          ; DONE INTERRUPT FLAG
2252 050524 000000          RBFcnt:: .WORD 0          ; RECIEVE BUFFERS LOST COUNTER
2253 050526 000000          BCOUNT:: .WORD 0          ; UNEXPLAINED INTERRUPTS COUNTER
2254 050530 000000          ERRFLG:: .WORD 0          ; ERROR FLAG
2255 050532 000000          TIMEOUT:: .WORD 0          ; TIME OUT COUNTER
2256 050534 000000          RETRYS:: .WORD 0          ; COUNTER FOR FRAMES FAILING DUE TO RTRY ERROR
2257 050536 000000          RCVERR:: .WORD 0          ; COUNTS NO. OF BUFFERS RECEIVED WITH ERRORS
2258 050540 000000          RCVBUF:: .WORD 0          ; COUNTS NO. OF GOOD BUFFERS RECEIVED
2259 050542 000000          COUNT:: .WORD 0          ; USED IN BLDBUF SUBROUTINE AS COUNTER
2260 050544 000220          PROT00:: .WORD 000220    ; PROTOCOL TYPE FOR LOOPBACK MESSAGES
2261 050546 001140          PROT02:: .WORD 001140    ; PROTOCOL TYPE FOR REMOTE CONSOLE
2262 050550 000000          TEMP:: .WORD 0          ; USED IN XMIT AS TEMPORARY STORAGE
2263 050552 000000          TEMP1:: .WORD 0          ; USED FOR TEMPORARY STORAGE
2264 050554 000000          TEMP2:: .WORD 0          ; USED FOR TEMPORARY STORAGE
2265 050556 000000          TEMP3:: .WORD 0          ; USED FOR TEMPORARY STORAGE
2266 050560 000000          XFER:: .WORD 0          ; STORES 'BYTES TRANSFERED'
2267 050562 000000          CPYCNT:: .WORD 0          ; 'NO. OF COPIES' COUNTER FOR LOOPING
2268 050564 000000          PCCALL:: .WORD 0          ; STORES PC OF CALLING ROUTINE FOR ERROR REPORTS
2269 050566 000000          BUFLen:: .WORD 0          ; STORES TRANSMIT BUFFER LENGTH
2270 050570 000000          CMPBUF:: .WORD 0          ; STORES LOCATION OF DATA BUFFER TO BE COMPARED
2271 050572 000050          PATCH:: .BLKW 40.      ; 40 WORDS FOR PROGRAM PATCH
2272
2273          ;
2274          ; REQUEST ID MESSAGE FORMAT

```

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```

2275 ;
2276 ;
2277 050712 REQID::
2278 050712 000003 .WORD 3 ; BYTE COUNT (=3 FOR REQUEST ID)
2279 050714 000005 .WORD 5 ; FUNCTION CODE FOR REQUEST ID
2280 050716 051115 .WORD 'MR ; RECIPT NUMBER
2281 ;
2282 ;
2283 ; LOOP DIRECT MESSAGE
2284 ;
2285 ;
2286 .EVEN
2287 ;
2288 050720 LOPDIR::
2289 050720 000000 .WORD 0 ; SKIP COUNT
2290 050722 000002 .WORD 2 ; FUNCTION = FORWARD DATA
2291 050724 000000 000000 000000 .WORD 0,0,0 ; LOCAL NODE ADDRESS
2292 050732 000001 .WORD 1 ; FUNCTION = REPLY
2293 050734 000000 000000 000000 .WORD 0,0,0 ; LOCAL NODE ADDRESS
2294 ;
2295 ;
2296 ; TRANSMIT ASSIST MESSAGE
2297 ;
2298 ;
2299 050742 TASIST::
2300 050742 000000 .WORD 0 ; SKIP COUNT
2301 050744 000002 .WORD 2 ; FUNCTION = FORWARD DATA
2302 050746 000000 000000 000000 .WORD 0,0,0 ; TRANSMIT ASSIST ADDRESS
2303 050754 000002 .WORD 2 ; FUNCTION = FORWARD DATA
2304 050756 000000 000000 000000 .WORD 0,0,0 ; LOCAL NODE ADDRESS
2305 050764 000001 .WORD 1 ; FUNCTION = REPLY
2306 050766 000000 000000 000000 .WORD 0,0,0 ; LOCAL NODE ADDRESS
2307 ;
2308 ;
2309 ; RECIEVE ASSIST MESSAGE
2310 ;
2311 ;
2312 050774 RASIST::
2313 050774 000000 .WORD 0 ; SKIP COUNT
2314 050776 000002 .WORD 2 ; FUNCTION = FORWARD DATA
2315 051000 000000 000000 000000 .WORD 0,0,0 ; TRANSMIT ASSIST ADDRESS
2316 051006 000002 .WORD 2 ; FUNCTION = FORWARD DATA
2317 051010 000000 000000 000000 .WORD 0,0,0 ; LOCAL NODE ADDRESS
2318 051016 000001 .WORD 1 ; FUNCTION = REPLY
2319 051020 000000 000000 000000 .WORD 0,0,0 ; LOCAL NODE ADDRESS
2320 ;
2321 ;
2322 ; FULL ASSIST MESSAGE
2323 ;
2324 ;
2325 051026 FASIST::
2326 051026 000000 .WORD 0 ; SKIP COUNT
2327 051030 000002 .WORD 2 ; FUNCTION = FORWARD DATA
2328 051032 000000 000000 000000 .WORD 0,0,0 ; TARGET NODE ADDRESS
2329 051040 000002 .WORD 2 ; FUNCTION = FORWARD DATA
2330 051042 000000 000000 000000 .WORD 0,0,0 ; ASSIST NODE ADDRESS

```

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```

2331 051050 000002          .WORD 2          ; FUNCTION = FORWARD DATA
2332 051052 000000 000000 000000 .WORD 0,0,0     ; LOCAL NODE ADDRESS
2333 051060 000001          .WORD 1          ; FUNCTION = REPLY
2334 051062 000000 000000 000000 .WORD 0,0,0     ; LOCAL NODE ADDRESS
2335
2336
2337
2338
2339
2340
2341
2342
2343
2344
2345
2346
2347
2348
2349
2350
2351

```

.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 MODE DISPLMNT !         ONLY IF 'ASCII' ARGUMENT DEFINED
:-----:
: ! ASCIZ MATCH STRING !         ONLY IF 'ASCII' ARGUMENT DEFINED
: (.EVEN) !
:-----:

```

```

2352 051070
2353
2354
2355 051070
2356 051074
2357 051100
2358 051102
2359 051116
2360 051120
2361 051134
2362 051140
2363 051154
2364 051156
2365 051170
2366 051174
2367 051200
2368 051212
2369 051216
2370 051234
2371 051236
2372 051250
2373 051252
2374 051254
2375 051256
2376 051272
2377 051276
2378 051316
2379 051322
2380 051340
2381 051344
2382 051362
2383 051366
2384 051402
2385 051404
2386 051424

```

CLITRE:

;FIRST KEYWORD

```

N10$: CLI CLISPA,0,N10$          ;SKIP ANY LEADING SPACES
      CLI <'?'>,HELP,N12$       ;IS THE FIRST NON-SP CHAR. A "'?"
      CLI CLIEXI,0              ; IF YES DO 'HLP' AND EXIT
N12$: CLI CLISTR,HELP,N14$,<'HELP'> ;ELSE IS FIRST WORD A 'HELP'
      CLI CLIEXI,0              ; IF YES DO 'HLP' AND EXIT
N14$: CLI CLISTR,NOTNUF,N16$,<'NODE'> ;ELSE IS FIRST WORD A 'NODE'
      CLI CLIBR,0,N80$          ; IF YES, BR N80$
N16$: CLI CLISTR,BUILD,N18$,<'BUILD'> ;ELSE IS FIRST WORD A 'BUILD'
      CLI CLIEXI,0              ; IF YES DO 'BUILD' AND EXIT
N18$: CLI CLISTR,NOTNUF,N20$,<'RUN'>  ;ELSE IS FIRST WORD A 'RUN'
      CLI CLIBR,0,N180$        ; IF YES, BR N180$
N20$: CLI <'S'>,NOTNUF,N25$       ;ELSE IS FIRST CHAR. A 'S'
      CLI CLISTR,0,N22$,<'HOW'>    ; IF YES IS REST OF WORD 'HOW'
      CLI CLIBR,0,N100$        ; IF YES, BR N100$
N22$: CLI CLISTR,SUMMARY,N23$,<'UMMARY'> ; ELSE IS REST OF WORD 'UMMARY'
      CLI CLIEXI,0              ; IF YES, DO 'SUMM' AND EXIT
N23$: CLI CLISTR,CSAVE,N24$,<'AVE'>   ; ELSE IS REST OF WORD 'AVE'
      CLI CLIEXI,0              ; IF YES, DO 'SAVE' AND EXIT
N24$: CLI CLIERR,0             ; ELSE 'ILL COMMAND'
      CLI CLIEXI,0             ; EXIT
N25$: CLI CLISTR,NOTNUF,N26$,<'CLEAR'> ;ELSE IS FIRST WORD A 'CLEAR'
      CLI CLIBR,0,N120$        ; IF YES, BR N120$
N26$: CLI CLISTR,NOTNUF,N28$,<'IDENTIFY'> ;ELSE IS FIRST WORD 'IDENTIFY'
      CLI CLIBP,0,N140$        ; IF YES, GET ADDR, BR N140$
N28$: CLI CLISTR,NOTNUF,N29$,<'MESSAGE'> ;ELSE IS FIRST WORD 'MESSAGE'
      CLI CLIBR,0,N160$        ; IF YES, BR N160$
N29$: CLI CLISTR,CUNSAV,N30$,<'UNSAVE'> ;ELSE IS FIRST WORD 'UNSAVE'
      CLI CLIBR,0,N210$        ; IF YES, BR TO N210$
N30$: CLI CLISTR,EXIT,N31$,<'EXIT'>   ;ELSE IS FIRST WORD 'EXIT'
      CLI CLIEXI,0             ; IF YES EXIT
N31$: CLI CLISTR,NOTNUF,N32$,<'FUNCTION'> ;ELSE IS FIRST WORD 'FUNCTION'
      CLI CLIBR,0,N200$        ; IF YES, BR N200$

```

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```

2387 051430 N32$: CLI CLIERR,0 ;OTHERWISE 'ILL CMD',
2388 051432 CLI CLIEXI,0 ; EXIT
2389
2390 ;SECOND KEYWORD (ADR/TYPE) FOR NODE COMMAND
2391
2392 051434 N80$: CLI CLISPA,0,N81$ ;SKIP ANY LEADING SPACES
2393 051440 N81$: CLI CLIBR,CSAVR4,N82$ ;SAVE STRING POINTER LOCATION
2394 051444 N82$: CLI CLIBR,NODE,N90$ ;PARSE THROUGH ADDRESS,CHECK
2395 ;FOR TARGET OR ASSIST, DO NODE
2396 051450 N90$: CLI CLIBIF,0,N32$ ;TAKE ERROR BRANCH IF ERROR EXISTS
2397 051454 N95$: CLI CLIEXI,0 ;EXIT
2398
2399 ;SECOND KEYWORD FOR SHOW COMMAND
2400
2401 051456 N100$: CLI CLISPA,0,N101$ ;SKIP LEADING SPACES
2402 051462 N101$: CLI CLISTR,CNODE,N102$,<'NODES'> ;IS NEXT WORD 'NODES'
2403 051476 CLI CLIBR,0,N110$ ; IF YES, SET FLAG, BR N110$
2404 051502 N102$: CLI CLISTR,CSHMSG,N104$,<'MESSAGE'> ;ELSE IS NEXT WORD 'MESSAGE'
2405 051520 CLI CLIBR,0,N110$ ; IF YES, SET FLAG, BR N110$
2406 051524 N104$: CLI CLISTR,CCNTR,N106$,<'COUNTERS'> ;ELSE IS NEXT WORD 'COUNTERS'
2407 051544 CLI CLIBR,0,N110$ ; GO TO COUNTERS ROUTINE
2408 051550 N106$: CLI CLIBR,0,N32$ ;ELSE 'ILL COMMAND'
2409 051554 N110$: CLI CLIEXI,0 ;EXIT
2410
2411 ;SECOND KEYWORD FOR CLEAR COMMAND
2412
2413 051556 N120$: CLI CLISPA,0,N121$ ;SKIP LEADING SPACES
2414 051562 N121$: CLI CLISTR,0,N130$,<'NODE'> ;IS NEXT WORD 'NODE'
2415 051576 CLI CLISPA,0,N122$ ; IF YES SKIP SPACES
2416 051602 N122$: CLI <'/'>,CSAVR4,N32$ ; LOOK FOR DELIMETER, ELSE 'ILL COM'
2417 051606 CLI <'A'>,0,N123$ ; IS NEXT CHAR. AN 'A'
2418 051612 CLI CLISTR,CNODAL,N124$,<'LL'> ; IF YES, IS WORD 'ALL'
2419 051624 CLI CLIBR,0,N135$ ; IF YES, SET FLAG, BR N135$
2420 051630 N123$: CLI <'N'>,0,N124$ ; ELSE IS NEXT CHAR. AN 'N'
2421 051634 CLI CLIDEC,0,N32$ ; IF YES, STORE NODE LOGICAL NAME
2422 051640 CLI CLIBR,CNDLOG,N135$ ; BR TO CLR. NODE LOGICAL ROUTINE
2423 051644 N124$: CLI CLIBR,CEXADR,N126$ ; ELSE, EXTRACT ADDRESS
2424 051650 N126$: CLI CLIBR,CNDADR,N135$ ; SET FLAG, BR N135$
2425 051654 N130$: CLI CLISTR,CCLMSG,N132$,<'MESSAGE'> ;ELSE IS NEXT WORD 'MESSAGE'
2426 051672 CLI CLIBR,0,N135$ ; IF YES, SET FLAG, BR N135$
2427 051676 N132$: CLI CLISTR,CCLSUM,N134$,<'SUMMARY'> ;ELSE IS NEXT WORD 'SUMMARY'
2428 051714 CLI CLIBR,0,N135$ ; IF YES, CLEAR TABLE AND EXIT
2429 051720 N134$: CLI CLIERR,0 ;ELSE, 'ILL COMMAND',
2430 051722 N135$: CLI CLIEXI,0 ;EXIT
2431
2432 ;ADDRESS FOR IDENTIFY COMMAND
2433
2434 051724 N140$: CLI CLISPA,0,N141$ ;SKIP LEADING SPACES
2435 051730 N141$: CLI CLIBR,CSAVR4,N142$ ;SAVE POINTER TO FIRST CHAR. OF ADDRESS
2436 051734 N142$: CLI CLIALN,0,N32$ ;CHECK THAT ADDRESS HAS LEGAL CHAR.S
2437 051740 CLI CLIBR,CEXADR,N143$ ;GET ADDRESS
2438 051744 N143$: CLI CLIEXI,IDENT ;DO 'IDENTIFY', EXIT
2439
2440 ;REMAINING COMMAND LINE FOR MESSAGE COMMAND
2441
2442 051746 N160$: CLI CLISPA,0,N161$ ;SKIP LEADING SPACES

```

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```

2443 051752 N161$: CLI <' />,0,N178$ ;IF CHAR. '/' , CONT., ELSE BR N178$
2444 051756 CLI CLISTR,0,N170$,<'TYPE'> ;IS NEXT WORD 'TYPE'
2445 051772 CLI <'=>,0,N32$ ; IF YES, FOLLOWED BY '='?
2446 051776 CLI CLISTR,CALPHA,N162$,<'ALPHA'> ; IF 'ALPHA', SET FLAG
2447 052012 CLI CLIBR,0,N168$ ; CONTINUE AT N168$
2448 052016 N162$: CLI CLISTR,CONES,N163$,<'ONES'> ; IF 'ONES', SET FLAG
2449 052032 CLI CLIBR,0,N168$ ; CONTINUE AT N168$
2450 052036 N163$: CLI CLISTR,CZEROS,N164$,<'ZEROS'> ; IF 'ZEROS', SET FLAG
2451 052052 CLI CLIBR,0,N168$ ; CONTINUE AT N168$
2452 052056 N164$: CLI CLISTR,C1ALT,N165$,<'1ALT'> ; IF '1ALT', SET FLAG
2453 052072 CLI CLIBR,0,N168$ ; CONTINUE AT N168$
2454 052076 N165$: CLI CLISTR,COALT,N166$,<'0ALT'> ; IF '0ALT', SET FLAG
2455 052112 CLI CLIBR,0,N168$ ; CONTINUE AT N168$
2456 052116 N166$: CLI CLISTR,CCITT,N167$,<'CCITT'> ; IF 'CCITT', SET FLAG
2457 052132 CLI CLIBR,0,N168$ ; CONTINUE AT N168$
2458 052136 N167$: CLI <'>,CSAVR4,N32$ ; IF 'OPERATOR', SET FLAG
2459 052142 CLI CLIBR,COPRSL,N168$ ; AND INPUT SPECIFIED STRING
2460 052146 N168$: CLI CLIBR,CTYPE,N160$ ; DO 'TYPE', CHECK FOR MORE INPUT
2461 052152 N170$: CLI CLISTR,0,N175$,<'SIZE'> ; ELSE IS WORD 'SIZE'
2462 052166 CLI <'=>,0,N32$ ; IF YES, FOLLOWED BY '='?
2463 052172 CLI CLIDEC,Csize,N32$ ; STORE NUMBER IN MSSIZE
2464 052176 CLI CLIBR,0,N160$ ; CHECK FOR MORE INFO
2465 052202 N175$: CLI CLISTR,0,N32$,<'COPIES'> ; ELSE IS WORD 'COPIES'
2466 052220 CLI <'=>,0,N32$ ; IF YES, FOLLOWED BY '='?
2467 052224 CLI CLIDEC,CCPYS,N32$ ; STORE NUMBER IN MSCPYS
2468 052230 CLI CLIBR,0,N160$ ; CHECK FOR MORE INFO
2469 052234 N178$: CLI CLIBR,0,N32$ ; ELSE 'ILL COMMAND'
2470
2471 ;SECOND KEYWORD FOR RUN COMMAND
2472
2473 052240 N180$: CLI CLISPA,0,N181$ ;SKIP LEADING SPACES
2474 052244 N181$: CLI CLISTR,CLUPPR,N182$,<'LOOPPAIR'> ;IS NEXT WORD 'LOOPPAIR'
2475 052264 CLI CLIBR,0,N185$ ; IF YES, SET 'LOOPPAIR' FLAG
2476 052270 N182$: CLI CLISTR,CRNALL,N183$,<'ALL'> ;ELSE IS NEXT WORD 'ALL'
2477 052302 CLI CLIBR,0,N185$ ; IF YES, SET 'ALL' FLAG
2478 052306 N183$: CLI CLISTR,CDIR,N184$,<'DIRECT'> ;ELSE IS NEXT WORD 'DIRECT'
2479 052324 CLI CLIBR,0,N185$ ; IF YES, SET 'DIRECT' FLAG
2480 052330 N184$: CLI CLISTR,CPATRN,N32$,<'PATTERN'> ;ELSE IS NEXT WORD 'PATTERN'
2481 052346 N185$: CLI CLIBR,CDEFLT,N186$ ;SEE IF DEFAULT OF 1 PASS
2482 052352 N186$: CLI CLISTR,0,N32$,<' /PASS'> ;PARSE THROUGH SWITCH
2483 052366 CLI <'=>,0,N32$ ;PARSE THROUGH '='
2484 052372 CLI CLIDEC,0,N32$ ;GET PASS COUNT
2485 052376 N190$: CLI CLIEXI,CRUN ;RUN TEST AND EXIT
2486
2487 ;REMAINING COMMAND LINE FOR FUNCTION COMMAND
2488
2489 052400 N200$: CLI CLISPA,0,N201$ ; SKIP SPACES
2490 052404 N201$: CLI CLIOCT,CFUNCT,N32$ ; GET OCTAL NUMBER AND DO FUNCT
2491 052410 CLI CLIEXI,0 ; EXIT
2492
2493 ;REMAINING COMMAND LINE FOR UNSAVE COMMAND
2494
2495 052412 N210$: CLI CLISPA,0,N212$ ;SKIP SPACES
2496 052416 N212$: CLI <' />,0,N215$ ;PARSE THROUGH '/'
2497 052422 CLI CLIEXI,CUNSVF ;SAVE POINTER TO FILE NAME
2498 052424 N215$: CLI CLIEXI,0

```


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2499
2500
2501
2502
2503
2504
2505
2506
2507
2508
2509
2510
2511
2512
2513
2514
2515
2516

052426
052426
052426 000000
052430 000000
052432 000000
052434 000000

```
:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
: THE ERRTBL MACRO IS REQUIRED IF YOU INTEND TO REPORT ERRORS USING
: THE 'ERROR' MACRO. THE ERRTBL MACRO EXPANDS INTO FOUR WORDS THAT
: ARE USED BY THE RUNTIME SERVICES DURING AN ERROR CALL: ERROR TYPE,
: ERROR NUMBER, ADDRESS OF ERROR MESSAGE AND ADDRESS OF MESSAGE
: BLOCK. THERE MUST BE ONLY ONE ERRTBL IN ANY PROGRAM. THIS SECTION
: IS OPTIONAL. REMOVE IT IF YOU ARE NOT GOING TO USE THE ERROR
: MACRO. CHANGE THE POINTER MACRO TO REFLECT THIS SECTION'S DEL-
: ETION IF YOU REMOVE IT.
:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

ERRTBL

L\$ERRTBL::

```
ERRTYP:: .WORD 0
ERRNBR:: .WORD 0
ERRMSG:: .WORD 0
ERRBLK:: .WORD 0
```

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```

2517
2518
2519
2520
2521
2522
2523
2524 052436 006412 044516 037105
2525 052444 000
2526 052445 045 022516 037501
2527 052452 046111 020114 046503
2528 052460 026504 040502 020104
2529 052466 054523 052116 054101
2530 052474 000077
2531 052476 047045 040445 044477
2532 052504 041516 046517 046120
2533 052512 052105 020105 047503
2534 052520 046515 047101 037504
2535 052526 000
2536 052527 045 022516 037501
2537 052534 052516 041115 051105
2538 052542 052040 047517 041040
2539 052550 043511 000077
2540 052554 047045 040445 041077
2541 052562 042101 051040 042101
2542 052570 054111 000077
2543 052574 047045 040445 047516
2544 052602 042504 022440 022524
2545 052610 020101 040510 020123
2546 052616 042522 050123 047117
2547 052624 042504 027104 000
2548 052631 045 022516 050101
2549 052636 041501 042513 020124
2550 052644 042522 042503 053111
2551 052652 042105 053440 052111
2552 052660 020110 047125 020101
2553 052666 051105 047522 027122
2554 052674 000
2555 052675 045 022516 052101
2556 052702 040522 051516 044515
2557 052710 051523 047511 020116
2558 052716 041101 051117 042524
2559 052724 020104 026455 042440
2560 052732 041530 051505 044523
2561 052740 042526 041440 046117
2562 052746 044514 044523 047117
2563 052754 027123 000
2564 052757 045 022516 031104
2565 052764 040445 047040 042117
2566 052772 020105 042101 051104
2567 053000 051505 042523 020123
2568 053006 042101 042504 026104
2569 053014 042440 040514 051520
2570 053022 042105 052040 046511
2571 053030 035105 022440 031104
2572 053036 040445 046440 047111

```

.SBTTL GLOBAL TEXT SECTION

```

:++
: THE GLOBAL TEXT SECTION CONTAINS FORMAT STATEMENTS,
: MESSAGES, AND ASCII INFORMATION THAT ARE USED IN
: MORE THAN ONE TEST.
:--
CLISPM: .ASCIZ <12><15>/NIE>/ ;NIE PROMPT
CLIERM: .ASCIZ /%N%A?ILL CMD-BAD SYNTAX?/
CLINUF: .ASCIZ /%N%A?INCOMPLETE COMMAND?/
CLINBG: .ASCIZ /%N%A?NUMBER TOO BIG?/
CLIBRX: .ASCIZ /%N%A?BAD RADIX?/
LDRESP: .ASCIZ /%N%ANODE %T%A HAS RESPONDED./
RECERR: .ASCIZ /%N%APACKET RECEIVED WITH UNA ERROR./
RTRYER: .ASCIZ /%N%ATRANSMISSION ABORTED -- EXCESSIVE COLLISIONS./
BLDMSG: .ASCIZ /%N%D2%A NODE ADDRESSES ADDED, ELAPSED TIME: %D2%A MINUTE./

```

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2573	053044	052125	027105	000	
2574	053051	045	022516	041501	ILADMS: .ASCII /%N%ACANNOT USE BROADCAST ADDRESS (FF-FF-FF-FF-FF-FF)/
2575	053056	047101	047516	020124	
2576	053064	051525	020105	051102	
2577	053072	040517	041504	051501	
2578	053100	020124	042101	051104	
2579	053106	051505	020123	043050	
2580	053114	026506	043106	043055	
2581	053122	026506	043106	043055	
2582	053130	026506	043106	051	
2583	053135	045	022516	043101	ILADM1: .ASCIZ /%N%AFOR LOOP TESTING. ADDRESS WAS NOT ADDED TO NODE TABLE.%N/
2584	053142	051117	046040	047517	
2585	053150	020120	042524	052123	
2586	053156	047111	027107	040440	
2587	053164	042104	042522	051523	
2588	053172	053440	051501	047040	
2589	053200	052117	040440	042104	
2590	053206	042105	052040	020117	
2591	053214	047516	042504	052040	
2592	053222	041101	042514	022456	
2593	053230	000116			
2594	053232	047045	040445	046120	CADRER: .ASCIZ /%N%PLEASE ENTER TWELVE HEXADECIMAL DIGITS./
2595	053240	040505	042523	042440	
2596	053246	052116	051105	052040	
2597	053254	042527	053114	020105	
2598	053262	042510	040530	042504	
2599	053270	044503	040515	020114	
2600	053276	044504	044507	051524	
2601	053304	000056			
2602	053306	047045	040445	053524	CADERR: .ASCIZ /%N%ATWELVE HEX-DIGITS REQUIRED FOR ADDRESS./
2603	053314	046105	042526	044040	
2604	053322	054105	042055	043511	
2605	053330	052111	020123	042522	
2606	053336	052521	051111	042105	
2607	053344	043040	051117	040440	
2608	053352	042104	042522	051523	
2609	053360	000056			
2610	053362	047045	040445	020101	NULSTR: .ASCIZ /%N%AA ZERO LENGTH STRING WAS ENTERED./
2611	053370	042532	047522	046040	
2612	053376	047105	052107	020110	
2613	053404	052123	044522	043516	
2614	053412	053440	051501	042440	
2615	053420	052116	051105	042105	
2616	053426	000056			
2617	053430	047045	051445	022462	NODADR: .ASCIZ /%N%S2%T/
2618	053436	000124			
2619	053440	051445	032061	040445	LOGNAM: .ASCIZ /%S14%AN%D2/
2620	053446	022516	031104	000	
2621	053453	045	030523	022464	NODTYP: .ASCIZ /%S14%T/
2622	053460	000124			
2623	053462	047045	040445	047516	NTBHDR: .ASCIZ \%N%ANODE PHYSICAL ADDRESS NODE LOGICAL NAME TYPE(A/T)\
2624	053470	042504	050040	054510	
2625	053476	044523	040503	020114	
2626	053504	042101	051104	051505	
2627	053512	020123	020040	020040	
2628	053520	047516	042504	046040	

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2629	053526	043517	041511	046101
2630	053534	047040	046501	020105
2631	053542	020040	020040	054524
2632	053550	042520	040450	052057
2633	053556	000051		
2634	053560	047045	040445	044124
2635	053566	020105	052045	040445
2636	053574	052040	041101	042514
2637	053602	044440	020123	044506
2638	053610	046114	042105	052040
2639	053616	020117	040503	040520
2640	053624	044503	054524	000041
2641	053632	047045	040445	044124
2642	053640	020105	052045	040445
2643	053646	052040	041101	042514
2644	053654	044440	020123	052503
2645	053662	051122	047105	046124
2646	053670	020131	046505	052120
2647	053676	020531	000	
2648	053701	116	042117	000105
2649	053706	052523	046515	051101
2650	053714	000131		
2651	053716	047045	040445	044124
2652	053724	020105	042515	051523
2653	053732	043501	020105	040520
2654	053740	040522	042515	042524
2655	053746	051522	044040	053101
2656	053754	020105	042502	047105
2657	053762	051040	051505	052105
2658	053770	052040	035117	000
2659	053775	045	022516	052101
2660	054002	042510	047040	046525
2661	054010	042502	020122	043117
2662	054016	041440	050117	042511
2663	054024	020123	052515	052123
2664	054032	041040	020105	042502
2665	054040	053524	042505	020116
2666	054046	020061	047101	020104
2667	054054	032462	027065	000
2668	054061	045	022516	052101
2669	054066	042510	046440	051505
2670	054074	040523	042507	051440
2671	054102	055111	020105	042133
2672	054110	052101	056501	046440
2673	054116	051525	020124	042502
2674	054124	041040	052105	042527
2675	054132	047105	051440	020062
2676	054140	047101	020104	032061
2677	054146	033066	041040	052131
2678	054154	051505	000056	
2679	054160	047045	040445	044124
2680	054166	020105	042101	051104
2681	054174	051505	020123	040515
2682	054202	045522	042105	043040
2683	054210	051117	042040	046105
2684	054216	052105	047511	020116

TABFUL: .ASCIZ /%N%ATHE %T% TABLE IS FILLED TO CAPACITY!//

TABEMT: .ASCIZ /%N%ATHE %T% TABLE IS CURRENTLY EMPTY!//

NOD: .ASCIZ /NODE/
SUMM: .ASCIZ /SUMMARY/

CLRMSG: .ASCIZ /%N%ATHE MESSAGE PARAMETERS HAVE BEEN RESET TO://

CPYLMT: .ASCIZ /%N%ATHE NUMBER OF COPIES MUST BE BETWEEN 1 AND 255.//

SIZLMT: .ASCIZ /%N%ATHE MESSAGE SIZE [DATA] MUST BE BETWEEN 32 AND 1466 BYTES.//

NOCMPR: .ASCIZ /%N%ATHE ADDRESS MARKED FOR DELETION WAS NOT IN THE TABLE.//

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2685	054224	040527	020123	047516	
2686	054232	020124	047111	052040	
2687	054240	042510	052040	041101	
2688	054246	042514	000056		
2689	054252	047045	040445	047101	UNBOND: .ASCIZ /%N%AN UNBOUNDED "OPERATOR INPUT" STRING WAS ENTERED./
2690	054260	052440	041116	052517	
2691	054266	042116	042105	021040	
2692	054274	050117	051105	052101	
2693	054302	051117	044440	050116	
2694	054310	052125	020042	052123	
2695	054316	044522	043516	053440	
2696	054324	051501	042440	052116	
2697	054332	051105	042105	000056	
2698	054340	047045	040445	044124	ADRDEL: .ASCIZ /%N%ATHE ADDRESS HAS BEEN DELETED FROM THE NODE TABLE./
2699	054346	020105	042101	051104	
2700	054354	051505	020123	040510	
2701	054362	020123	042502	047105	
2702	054370	042040	046105	052105	
2703	054376	042105	043040	047522	
2704	054404	020115	044124	020105	
2705	054412	047516	042504	052040	
2706	054420	041101	042514	000056	
2707	054426	047045	040445	047516	LOGDEL: .ASCIZ /%N%ANODE N%D1%A HAS BEEN DELETED FROM THE NODE TABLE./
2708	054434	042504	047040	042045	
2709	054442	022461	020101	040510	
2710	054450	020123	042502	047105	
2711	054456	042040	046105	052105	
2712	054464	042105	043040	047522	
2713	054472	020115	044124	020105	
2714	054500	047516	042504	052040	
2715	054506	041101	042514	000056	
2716	054514	047045	040445	044124	TABCLR: .ASCIZ /%N%ATHE %T%A TABLE HAS BEEN CLEARED./
2717	054522	020105	052045	040445	
2718	054530	052040	041101	042514	
2719	054536	044040	051501	041040	
2720	054544	042505	020116	046103	
2721	054552	040505	042522	027104	
2722	054560	000			
2723	054561	045	022516	052101	UNSMMSG: .ASCIZ /%N%ATHE NODE TABLE HAS BEEN %T/
2724	054566	042510	047040	042117	
2725	054574	020105	040524	046102	
2726	054602	020105	040510	020123	
2727	054610	042502	047105	022440	
2728	054616	000124			
2729	054620	040523	042526	027104	SAVED: .ASCIZ /SAVED./
2730	054626	000			
2731	054627	122	051505	047524	RESTOR: .ASCIZ /RESTORED./
2732	054634	042522	027104	000	
2733	054641	045	022516	052101	MSGPRM: .ASCIZ /%N%ATHE CURRENT MESSAGE PARAMETERS ARE: /
2734	054646	042510	041440	051125	
2735	054654	042522	052116	046440	
2736	054662	051505	040523	042507	
2737	054670	050040	051101	046501	
2738	054676	052105	051105	020123	
2739	054704	051101	035105	000	
2740	054711	045	022516	052101	MSG1: .ASCIZ /%N%ATHE COLLECTION OF ALL NODE ADDRESSES COULD TAKE AS LONG AS 40 MINUT

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2741	054716	042510	041440	046117
2742	054724	042514	052103	047511
2743	054732	020116	043117	040440
2744	054740	046114	047040	042117
2745	054746	020105	042101	051104
2746	054754	051505	042523	020123
2747	054762	047503	046125	020104
2748	054770	040524	042513	040440
2749	054776	020123	047514	043516
2750	055004	040440	020123	030064
2751	055012	046440	047111	052125
2752	055020	051505	000054	
2753	055024	047045	040445	047510
2754	055032	042527	042526	026122
2755	055040	044440	020106	047516
2756	055046	047040	053505	047040
2757	055054	042117	051505	040440
2758	055062	042522	040440	042104
2759	055070	042105	052040	020117
2760	055076	044124	020105	040524
2761	055104	046102	020105	047506
2762	055112	020122	020101	030061
2763	055120	046440	047111	052125
2764	055126	020105	042520	044522
2765	055134	042117	000	
2766	055137	045	022516	052101
2767	055144	042510	041440	046117
2768	055152	042514	052103	047511
2769	055160	020116	044527	046114
2770	055166	051440	047524	027120
2771	055174	047045	000	
2772	055177	045	022516	054501
2773	055204	052517	042440	052116
2774	055212	051105	042105	022440
2775	055220	022524	020101	047516
2776	055226	042504	020072	052045
2777	055234	000		
2778	055235	045	022516	052101
2779	055242	042510	051440	042520
2780	055250	044503	044506	042105
2781	055256	040440	042104	042522
2782	055264	051523	044440	035123
2783	055272	022440	000124	
2784	055276	047045	040445	054524
2785	055304	042520	022475	022524
2786	055312	026101	044523	042532
2787	055320	022475	032104	040445
2788	055326	041454	050117	042511
2789	055334	036523	042045	000063
2790				
2791	055342	047045	040445	042440
2792	055350	044124	051105	042516
2793	055356	020124	042504	040506
2794	055364	046125	020124	042101
2795	055372	051104	051505	020123
2796	055400	044050	054105	035051

MSG11: .ASCIZ /%N%HOWEVER, IF NO NEW NODES ARE ADDED TO THE TABLE FOR A 10 MINUTE PER

MSG12: .ASCIZ /%N%ATHE COLLECTION WILL STOP.%N/

MSG2: .ASCIZ /%N%AYOU ENTERED %T%A NODE: %T/

MSG3: .ASCIZ /%N%ATHE SPECIFIED ADDRESS IS: %T/

MSG4: .ASCIZ /%N%ATYPE=%T%A,SIZE=%D4%A,COPIES=%D3/

HDMSG1: .EVEN
.ASCIZ /%N% ETHERNET DEFAULT ADDRESS (HEX): %T/

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2797	055406	020040	052045	000	
2798	055413	045	031116	040445	HDMSG2: .ASCIZ /%N2% ROM MICROCODE VERSION (DECIMAL): %D3/
2799	055420	051040	046517	046440	
2800	055426	041511	047522	047503	
2801	055434	042504	053040	051105	
2802	055442	044523	047117	024040	
2803	055450	042504	044503	040515	
2804	055456	024514	020072	042045	
2805	055464	000063			
2806	055466	047045	022462	020101	HDMSG3: .ASCIZ /%N2% SWITCH PACK SET FOR :/
2807	055474	053523	052111	044103	
2808	055502	050040	041501	020113	
2809	055510	042523	020124	047506	
2810	055516	020122	000072		
2811	055522	047045	040445	020040	HDMSG4: .ASCIZ /%N% REMOTE AND POWER UP BOOT ENABLED/
2812	055530	020040	020040	020040	
2813	055536	042522	047515	042524	
2814	055544	040440	042116	050040	
2815	055552	053517	051105	052440	
2816	055560	020120	047502	052117	
2817	055566	042440	040516	046102	
2818	055574	042105	000		
2819	055577	045	022516	020101	HDMSG5: .ASCIZ /%N% REMOTE BOOT ENABLED WITH ROM/
2820	055604	020040	020040	020040	
2821	055612	051040	046505	052117	
2822	055620	020105	047502	052117	
2823	055626	042440	040516	046102	
2824	055634	042105	053440	052111	
2825	055642	020110	047522	000115	
2826	055650	047045	040445	020040	HDMSG6: .ASCIZ /%N% REMOTE BOOT ENABLED/
2827	055656	020040	020040	020040	
2828	055664	042522	047515	042524	
2829	055672	041040	047517	020124	
2830	055700	047105	041101	042514	
2831	055706	000104			
2832	055710	047045	040445	020040	HDMSG7: .ASCIZ /%N% REMOTE BOOT DISABLED/
2833	055716	020040	020040	020040	
2834	055724	042522	047515	042524	
2835	055732	041040	047517	020124	
2836	055740	044504	040523	046102	
2837	055746	042105	000		
2838	055751	045	022516	020101	HDMSG8: .ASCIZ /%N% SELF TEST LOOP ENABLED/
2839	055756	020040	020040	020040	
2840	055764	051440	046105	020106	
2841	055772	042524	052123	046040	
2842	056000	047517	020120	047105	
2843	056006	041101	042514	000104	
2844	056014	047045	040445	020040	HDMSG9: .ASCIZ /%N% SELF TEST LOOP DISABLED/
2845	056022	020040	020040	020040	
2846	056030	042523	043114	052040	
2847	056036	051505	020124	047514	
2848	056044	050117	042040	051511	
2849	056052	041101	042514	000104	
2850					
2851	056060	047045	040445	047503	HELP1: .EVEN .ASCIZ \%N%ACOMMAND SUMMARY FOR THE NETWORK INTERCONNECT EXERCISER (NIE)\
2852	056066	046515	047101	020104	

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2853	056074	052523	046515	051101
2854	056102	020131	047506	020122
2855	056110	044124	020105	042516
2856	056116	053524	051117	020113
2857	056124	047111	042524	041522
2858	056132	047117	042516	052103
2859	056140	042440	042530	041522
2860	056146	051511	051105	024040
2861	056154	044516	024505	000
2862	056161	045	022516	024101
2863	056166	052111	044440	020123
2864	056174	047117	054514	047040
2865	056202	041505	051505	040523
2866	056210	054522	052040	020117
2867	056216	054524	042520	052040
2868	056224	042510	046040	052105
2869	056232	042524	051522	044440
2870	056240	020116	051102	041501
2871	056246	042513	051524	000051
2872	056254	047045	022462	055501
2873	056262	056510	046105	020120
2874	056270	051117	037440	026411
2875	056276	052040	050131	051505
2876	056304	052040	044510	020123
2877	056312	042510	050114	052040
2878	056320	054105	027124	000
2879	056325	045	031116	040445
2880	056332	042533	054135	052111
2881	056340	004411	020055	042522
2882	056346	052524	047122	052040
2883	056354	020117	044124	020105
2884	056362	052523	042520	053122
2885	056370	051511	051117	000056
2886	056376	047045	022462	055501
2887	056404	044123	047535	020127
2888	056412	047133	047535	042504
2889	056420	004523	020055	051120
2890	056426	047111	051524	044440
2891	056434	043116	051117	040515
2892	056442	044524	047117	044440
2893	056450	020116	052503	051122
2894	056456	047105	020124	047516
2895	056464	042504	052040	041101
2896	056472	042514	000056	
2897	056476	047045	022462	055501
2898	056504	044123	047535	020127
2899	056512	046533	042535	051523
2900	056520	043501	004505	020055
2901	056526	051120	047111	051524
2902	056534	052040	042510	051440
2903	056542	046105	041505	042524
2904	056550	020104	042515	051523
2905	056556	043501	020105	054524
2906	056564	042520	020054	044523
2907	056572	042532	040440	042116
2908	056600	041440	050117	042511

HELP2: .ASCIZ \%N%A(IT IS ONLY NECESSARY TO TYPE THE LETTERS IN BRACKETS)\

HELP3: .ASCIZ \%N2%A[H]JELP OR ? - TYPES THIS HELP TEXT.\

HELP4: .ASCIZ \%N2%A[E]XIT - RETURN TO THE SUPERVISOR.\

HELP5: .ASCIZ \%N2%A[S]H]OW [N]ODES - PRINTS INFORMATION IN CURRENT NODE TABLE.\

HELP6: .ASCIZ \%N2%A[S]H]OW [M]ESSAGE - PRINTS THE SELECTED MESSAGE TYPE, SIZE AND COP

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2909	056606	027123	000		
2910	056611	045	031116	040445	HELP7: .ASCIZ \N2%A[SH]OW [C]OUNTERS - PRINTS THE LOW LEVEL COUNTERS OF THE HOST NODE
2911	056616	051533	056510	053517	
2912	056624	055440	056503	052517	
2913	056632	052116	051105	020123	
2914	056640	020055	051120	047111	
2915	056646	051524	052040	042510	
2916	056654	046040	053517	046040	
2917	056662	053105	046105	041440	
2918	056670	052517	052116	051105	
2919	056676	020123	043117	052040	
2920	056704	042510	044040	051517	
2921	056712	020124	047516	042504	
2922	056720	000056			
2923	056722	047045	022462	055501	HELP8: .ASCIZ \N2%A[R]UN [L]OOPPAIR/PASS=NN - RUNS THE LOOPPAIR TEST.\
2924	056730	056522	047125	055440	
2925	056736	056514	047517	050120	
2926	056744	044501	027522	040520	
2927	056752	051523	047075	020116	
2928	056760	020055	052522	051516	
2929	056766	052040	042510	046040	
2930	056774	047517	050120	044501	
2931	057002	020122	042524	052123	
2932	057010	000056			
2933	057012	047045	022462	055501	HELP9: .ASCIZ \N2%A[R]UN [A]LL/PASS=NN - RUNS THE NODE-TO-NODE TEST.\
2934	057020	056522	047125	055440	
2935	057026	056501	046114	050057	
2936	057034	051501	036523	047116	
2937	057042	026440	051040	047125	
2938	057050	020123	044124	020105	
2939	057056	047516	042504	052055	
2940	057064	026517	047516	042504	
2941	057072	052040	051505	027124	
2942	057100	000			
2943	057101	045	031116	040445	HELP10: .ASCIZ \N2%A[R]UN [D]IRECT/PASS=NN - RUNS THE LOOP DIRECT TEST.\
2944	057106	051133	052535	020116	
2945	057114	042133	044535	042522	
2946	057122	052103	050057	051501	
2947	057130	036523	047116	026440	
2948	057136	051040	047125	020123	
2949	057144	044124	020105	047514	
2950	057152	050117	042040	051111	
2951	057160	041505	020124	042524	
2952	057166	052123	000056		
2953	057172	047045	022462	055501	HELP11: .ASCIZ \N2%A[R]UN [P]ATTERN/PASS=NN - RUNS THE MESSAGE PATTERN TEST.\
2954	057200	056522	047125	055440	
2955	057206	056520	052101	042524	
2956	057214	047122	050057	051501	
2957	057222	036523	047116	026440	
2958	057230	051040	047125	020123	
2959	057236	044124	020105	042515	
2960	057244	051523	043501	020105	
2961	057252	040520	052124	051105	
2962	057260	020116	042524	052123	
2963	057266	000056			
2964	057270	047045	022462	055501	HELP12: .ASCIZ \N2%A[M]ESSAGE/[T]YPE=A/[S]IZE=N/[C]OPIES=M - ALLOWS THE OPERATOR TO\

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2965	057276	056515	051505	040523
2966	057304	042507	055457	056524
2967	057312	050131	036505	027501
2968	057320	051533	044535	042532
2969	057326	047075	055457	056503
2970	057334	050117	042511	036523
2971	057342	020115	020055	046101
2972	057350	047514	051527	052040
2973	057356	042510	047440	042520
2974	057364	040522	047524	020122
2975	057372	047524	000	
2976	057375	045	022516	046501
2977	057402	042117	043111	020131
2978	057410	044124	020105	042504
2979	057416	040506	046125	020124
2980	057424	042515	051523	043501
2981	057432	020105	054524	042520
2982	057440	020054	044523	042532
2983	057446	040440	042116	041440
2984	057454	050117	020131	040520
2985	057462	040522	042515	042524
2986	057470	051522	000056	
2987	057474	047045	022462	055501
2988	057502	056516	042117	020105
2989	057510	042101	027522	054524
2990	057516	042520	026440	042440
2991	057524	052116	051105	020123
2992	057532	020101	044120	051531
2993	057540	041511	046101	040440
2994	057546	042104	042522	051523
2995	057554	044440	052116	020117
2996	057562	044124	020105	047516
2997	057570	042504	000	
2998	057573	045	022516	052101
2999	057600	041101	042514	020056
3000	057606	052040	042510	052040
3001	057614	050131	020105	040503
3002	057622	020116	042502	042440
3003	057630	052111	042510	020122
3004	057636	052133	040535	043522
3005	057644	052105	024040	042504
3006	057652	040506	046125	024524
3007	057660	047440	020122	040533
3008	057666	051535	044523	052123
3009	057674	000056		
3010	057676	047045	022462	055501
3011	057704	052523	046535	040515
3012	057712	054522	026440	050040
3013	057720	044522	052116	020123
3014	057726	020101	052523	046515
3015	057734	051101	020131	043117
3016	057742	052040	042510	052040
3017	057750	051505	020124	042522
3018	057756	052523	052114	027123
3019	057764	000		
3020	057765	045	031116	040445

HELP13: .ASCIZ \%N%AMODIFY THE DEFAULT MESSAGE TYPE, SIZE AND COPY PARAMETERS.\

HELP14: .ASCIZ \%N2%A[N]ODE ADR/TYPE - ENTERS A PHYSICAL ADDRESS INTO THE NODE\

HELP15: .ASCIZ \%N%ATABLE. THE TYPE CAN BE EITHER [T]ARGET (DEFAULT) OR [A]SSIST.\

HELP16: .ASCIZ \%N2%A[SU]MMARY - PRINTS A SUMMARY OF THE TEST RESULTS.\

HELP17: .ASCIZ \%N2%A[B]UILD - BUILDS A TABLE OF REMOTE NODE PHYSICAL ADDRESSES BY\

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3021	057772	041133	052535	046111
3022	060000	020104	020055	052502
3023	060006	046111	051504	040440
3024	060014	052040	041101	042514
3025	060022	047440	020106	042522
3026	060030	047515	042524	047040
3027	060036	042117	020105	044120
3028	060044	051531	041511	046101
3029	060052	040440	042104	042522
3030	060060	051523	051505	041040
3031	060066	000131		
3032	060070	047045	040445	044514
3033	060076	052123	047105	047111
3034	060104	020107	047524	044440
3035	060112	020104	042515	051523
3036	060120	043501	051505	047440
3037	060126	020116	044124	020105
3038	060134	044516	000056	
3039	060140	047045	022462	055501
3040	060146	056503	042514	051101
3041	060154	055440	056516	042117
3042	060162	027505	042101	020122
3043	060170	020055	042522	047515
3044	060176	042526	020123	044124
3045	060204	020105	047516	042504
3046	060212	051440	042520	044503
3047	060220	044506	042105	041040
3048	060226	020131	044505	044124
3049	060234	051105	040440	051104
3050	060242	000		
3051	060243	045	022516	047501
3052	060250	020122	047516	042504
3053	060256	046040	043517	041511
3054	060264	046101	047040	046501
3055	060272	020105	051106	046517
3056	060300	052040	042510	047040
3057	060306	042117	020105	040524
3058	060314	046102	027105	000
3059	060321	045	031116	040445
3060	060326	041533	046135	040505
3061	060334	020122	047133	047535
3062	060342	042504	055457	046101
3063	060350	046135	026440	041440
3064	060356	042514	051101	020123
3065	060364	044124	020105	047516
3066	060372	042504	052040	041101
3067	060400	042514	000056	
3068	060404	047045	022462	055501
3069	060412	056503	042514	051101
3070	060420	055440	056515	051505
3071	060426	040523	042507	026440
3072	060434	051440	052105	020123
3073	060442	046101	020114	042515
3074	060450	051523	043501	020105
3075	060456	040520	040522	042515
3076	060464	042524	051522	052040

HELP18: .ASCIZ \%N%ALISTENING TO ID MESSAGES ON THE NI.\

HELP19: .ASCIZ \%N2%A[C]LEAR [N]ODE/ADR - REMOVES THE NODE SPECIFIED BY EITHER ADR\

HELP20: .ASCIZ \%N%AOR NODE LOGICAL NAME FROM THE NODE TABLE.\

HELP21: .ASCIZ \%N2%A[C]LEAR [N]ODE/[AL]L - CLEARS THE NODE TABLE.\

HELP22: .ASCIZ \%N2%A[C]LEAR [M]ESSAGE - SETS ALL MESSAGE PARAMETERS TO DEFAULT.\

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3077	060472	020117	042504	040506
3078	060500	046125	027124	000
3079	060505	045	031116	040445
3080	060512	041533	046135	040505
3081	060520	020122	051533	052535
3082	060526	046515	051101	020131
3083	060534	020055	046103	040505
3084	060542	051522	052040	042510
3085	060550	052040	041101	042514
3086	060556	047440	020106	052523
3087	060564	046515	051101	020131
3088	060572	042524	052123	042040
3089	060600	052101	027101	000
3090	060605	045	031116	040445
3091	060612	044533	042135	047105
3092	060620	044524	054506	040440
3093	060626	051104	026440	052440
3094	060634	042523	020123	044124
3095	060642	020105	042522	052521
3096	060650	051505	020124	042111
3097	060656	043040	047125	052103
3098	060664	047511	020116	047524
3099	060672	044440	042504	052116
3100	060700	043111	020131	020101
3101	060706	042522	047515	042524
3102	060714	047040	042117	020105
3103	060722	047117	052040	042510
3104	060730	047040	027111	000
3105	060735	045	031116	040445
3106	060742	051533	056501	042526
3107	060750	026440	051440	053101
3108	060756	051505	052040	042510
3109	060764	041440	047117	042524
3110	060772	052116	020123	043117
3111	061000	052040	042510	047040
3112	061006	042117	020105	040524
3113	061014	046102	027105	000
3114	061021	045	031116	040445
3115	061026	052533	047135	040523
3116	061034	042526	026440	051040
3117	061042	050105	040514	042503
3118	061050	020123	044124	020105
3119	061056	052503	051122	047105
3120	061064	020124	047516	042504
3121	061072	052040	041101	042514
3122	061100	053440	052111	020110
3123	061106	044124	020105	040523
3124	061114	042526	020104	047117
3125	061122	027105	000	
3126	061125	045	022516	034123
3127	061132	040445	047516	042524
3128	061140	035123	030440	020051
3129	061146	042101	020122	051511
3130	061154	052040	042510	050040
3131	061162	054510	044523	040503
3132	061170	020114	042101	051104

HELP23: .ASCIZ \%N2%A[C]LEAR [S]UMMARY - CLEARS THE TABLE OF SUMMARY TEST DATA.\

HELP24: .ASCIZ \%N2%A[I]DENTIFY ADR - USES THE REQUEST ID FUNCTION TO IDENTIFY A REMOTE

HELP25: .ASCIZ \%N2%A[SA]VE - SAVES THE CONTENTS OF THE NODE TABLE.\

HELP26: .ASCIZ \%N2%A[U]NSAVE - REPLACES THE CURRENT NODE TABLE WITH THE SAVED ONE.\

HELP27: .ASCIZ \%N%S8%ANOTES: 1) ADR IS THE PHYSICAL ADDRESS OF A NODE ON THE NI.\

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3133	061176	051505	020123	043117		
3134	061204	040440	047040	042117		
3135	061212	020105	047117	052040		
3136	061220	042510	047040	027111		
3137	061226	000				
3138	061227	045	022516	034123	HELP28: .ASCIZ \N%S8%	2) PASS COUNT IS A DECIMAL NUMBER BETWEEN 1 AND 65534. A
3139	061234	040445	020040	020040		
3140	061242	020040	031040	020051		
3141	061250	040520	051523	041440		
3142	061256	052517	052116	044440		
3143	061264	020123	020101	042504		
3144	061272	044503	040515	020114		
3145	061300	052516	041115	051105		
3146	061306	041040	052105	042527		
3147	061314	047105	030440	040440		
3148	061322	042116	033040	032465		
3149	061330	032063	020056	020101		
3150	061336	042504	040506	046125		
3151	061344	000124				
3152	061346	047045	051445	022470	HELP29: .ASCIZ \N%S8%	VALUE OF 1 IS ASSUMED.\
3153	061354	020101	020040	020040		
3154	061362	020040	020040	053040		
3155	061370	046101	042525	047440		
3156	061376	020106	020061	051511		
3157	061404	040440	051523	046525		
3158	061412	042105	000056			
3159	061416	047045	051445	022470	HELP30: .ASCIZ \N%S8%	SPECIFYING -1 CAUSES THE TEST TO BE RUN INDEFINATELY.\
3160	061424	020101	020040	020040		
3161	061432	020040	020040	051440		
3162	061440	042520	044503	054506		
3163	061446	047111	020107	030455		
3164	061454	041440	052501	042523		
3165	061462	020123	044124	020105		
3166	061470	042524	052123	052040		
3167	061476	020117	042502	051040		
3168	061504	047125	044440	042116		
3169	061512	043105	047111	052101		
3170	061520	046105	027131	000		
3171		061526				
3172					.EVEN	
3173					:	
3174					:	TEST MESSAGES AND ARGUMENTS
3175					:	
3176	061526	047045	040445	050040	PASABT: .ASCIZ /%N% PASS ABORTED! /	
3177	061534	051501	020123	041101		
3178	061542	051117	042524	020504		
3179	061550	000				
3180	061551	045	022516	022524	TSTMS1: .ASCIZ /%N%T% TEST -- /	
3181	061556	020101	042524	052123		
3182	061564	026440	020055	000		
3183	061571	045	022516	022524	TSTMS2: .ASCIZ /%N%T% NODE: %T /	
3184	061576	020101	047516	042504		
3185	061604	020072	052045	000		
3186	061611	045	022524	020101	TSTMS3: .ASCIZ /%T% ERROR /	
3187	061616	051105	047522	000122		
3188	061624	047045	052045	040445	TSTMS4: .ASCIZ /%N%T% NODE: %T%T% NODE: %T /	

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3189	061632	047040	042117	035105	
3190	061640	022440	022524	022524	
3191	061646	020101	047516	042504	
3192	061654	020072	052045	000	
3193	061661	045	020101	020055	OK: .ASCIZ /%A - RESPONSE OK/
3194	061666	042522	050123	047117	
3195	061674	042523	047440	000113	
3196	061702	047045	040445	026440	OKRE: .ASCIZ /%N%A - RECEIVE ASSIST - RESPONSE OK/
3197	061710	051040	041505	044505	
3198	061716	042526	040440	051523	
3199	061724	051511	020124	020055	
3200	061732	042522	050123	047117	
3201	061740	042523	047440	000113	
3202	061746	047045	040445	026440	OKTR: .ASCIZ /%N%A - TRANSMIT ASSIST - RESPONSE OK/
3203	061754	052040	040522	051516	
3204	061762	044515	020124	051501	
3205	061770	044523	052123	026440	
3206	061776	051040	051505	047520	
3207	062004	051516	020105	045517	
3208	062012	000			
3209	062013	045	022516	020101	OKFU: .ASCIZ /%N%A - FULL ASSIST - RESPONSE OK/
3210	062020	020055	052506	046114	
3211	062026	040440	051523	051511	
3212	062034	020124	020055	042522	
3213	062042	050123	047117	042523	
3214	062050	047440	000113		
3215	062054	047045	040445	051105	MESPAT: .ASCIZ /%N%AERROR OCCURED WITH %T%A MESSAGE TYPE/
3216	062062	047522	020122	041517	
3217	062070	052503	042522	020104	
3218	062076	044527	044124	022440	
3219	062104	022524	020101	042515	
3220	062112	051523	043501	020105	
3221	062120	054524	042520	000	
3222	062125	045	020101	040504	MESPA1: .ASCIZ /%A DATA PATTERN: %T/
3223	062132	040524	050040	052101	
3224	062140	042524	047122	020072	
3225	062146	052045	000		
3226	062151	101	046114	047040	ALLNOD: .ASCIZ /ALL NODE/
3227	062156	042117	000105		
3228	062162	047514	050117	040520	LUPAIR: .ASCIZ /LOOPPAIR/
3229	062170	051111	000		
3230	062173	114	047517	020120	DIRECT: .ASCIZ /LOOP DIRECT/
3231	062200	044504	042522	052103	
3232	062206	000			
3233	062207	106	046125	020114	FULAST: .ASCIZ /FULL ASSIST/
3234	062214	051501	044523	052123	
3235	062222	000			
3236	062223	124	040522	051516	TRAST: .ASCIZ /TRANSMIT ASSIST/
3237	062230	044515	020124	051501	
3238	062236	044523	052123	000	
3239	062243	122	041505	044505	RECAST: .ASCIZ /RECEIVE ASSIST/
3240	062250	042526	040440	051523	
3241	062256	051511	000124		
3242	062262	042515	051523	043501	PATTRN: .ASCIZ /MESSAGE PATTERN/
3243	062270	020105	040520	052124	
3244	062276	051105	000116		

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3245	062302	047516	051040	051505	NORESP: .ASCIZ	/NO RESPONSE/	
3246	062310	047520	051516	000105			
3247	062316	054105	042503	051523	RETRY: .ASCIZ	/EXCESSIVE COLLISION/	
3248	062324	053111	020105	047503			
3249	062332	046114	051511	047511			
3250	062340	000116					
3251	062342	042514	043516	044124	LENGTH: .ASCIZ	/LENGTH/	
3252	062350	000					
3253	062351	104	052101	020101	COMPAR: .ASCIZ	/DATA COMPARISON/	
3254	062356	047503	050115	051101			
3255	062364	051511	047117	000			
3256		062372			.EVEN		
3257							
3258	062372	046101	044120	000101	MSGTY0: .ASCIZ	/ALPHA/	:MESSAGE TYPES
3259	062400	047117	051505	000	MSGTY1: .ASCIZ	/ONES/	
3260	062405	132	051105	051517	MSGTY2: .ASCIZ	/ZEROS/	
3261	062412	000					
3262	062413	061	043101	000124	MSGTY3: .ASCIZ	/1ALT/	
3263	062420	040460	052114	000	MSGTY4: .ASCIZ	/OALT/	
3264	062425	103	044503	052124	MSGTY5: .ASCIZ	/CCITT/	
3265	062432	000					
3266	062433	117	042520	020122	MSGTY6: .ASCIZ	/OPER SEL/	
3267	062440	042523	000114				
3268	062444	054105	052111	000	CMDTY1: .ASCIZ	/EXIT/	:COMMAND TYPES
3269	062451	123	046525	040515	CMDTY2: .ASCIZ	/SUMMARY/	
3270	062456	054522	000				
3271	062461	102	044525	042114	CMDTY3: .ASCIZ	/BUILD/	
3272	062466	000					
3273	062467	123	047510	000127	CMDTY4: .ASCIZ	/SHOW/	
3274	062474	052522	000116		CMDTY5: .ASCIZ	/RUN/	
3275	062500	042515	051523	043501	CMDTY6: .ASCIZ	/MESSAGE/	
3276	062506	000105					
3277	062510	047516	042504	000	CMDTY7: .ASCIZ	/NODE/	
3278	062515	103	042514	051101	CMDTY8: .ASCIZ	/CLEAR/	
3279	062522	000					
3280	062523	122	050505	042525	CMDTY9: .ASCIZ	/REQUEST ID/	
3281	062530	052123	044440	000104			
3282	062536	047516	042504	000123	ARGTY1: .ASCIZ	/NODES/	:ARGUMENT TYPES
3283	062544	042515	051523	043501	ARGTY2: .ASCIZ	/MESSAGES/	
3284	062552	051505	000				
3285	062555	103	052517	052116	ARGTY3: .ASCIZ	/COUNTERS/	
3286	062562	051105	000123				
3287	062566	047514	050117	040520	ARGTY4: .ASCIZ	/LOOPPAIR/	
3288	062574	051111	000				
3289	062577	101	046114	000	ARGTY5: .ASCIZ	/ALL/	
3290	062603	040	051501	044523	ARGTY6: .ASCIZ	/ASSIST/	
3291	062610	052123	000				
3292	062613	124	051101	042507	ARGTY7: .ASCIZ	/TARGET/	
3293	062620	000124					
3294					.EVEN		
3295	062622	047045	040445	040502	NOCLK: .ASCIZ	/N%ABAD CLOCK - PROGRAM WILL HANG ON "TIMEOUT"!!!/	
3296	062630	020104	046103	041517			
3297	062636	020113	020055	051120			
3298	062644	043517	040522	020115			
3299	062652	044527	046114	044040			
3300	062660	047101	020107	047117			

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3301	062666	021040	044524	042515
3302	062674	052517	021124	020441
3303	062702	000		
3304				
3305				
3306				
3307				
3308				
3309	062703	045	022516	032523
3310	062710	040445	047503	052116
3311	062716	047105	051524	047440
3312	062724	020106	047516	042504
3313	062732	022440	022524	020101
3314	062740	047111	042524	047122
3315	062746	046101	041440	052517
3316	062754	052116	051105	035123
3317	062762	000		
3318	062763	045	031116	040445
3319	062770	042523	047503	042116
3320	062776	020123	044523	041516
3321	063004	020105	040514	052123
3322	063012	055040	051105	042517
3323	063020	035104	051445	032461
3324	063026	055045	000065	
3325	063032	047045	040445	040520
3326	063040	045503	052105	020123
3327	063046	042522	042503	053111
3328	063054	042105	022472	030523
3329	063062	022471	000124	
3330	063066	047045	040445	052515
3331	063074	052114	041511	051501
3332	063102	020124	040520	045503
3333	063110	052105	020123	042522
3334	063116	042503	053111	042105
3335	063124	022472	034523	052045
3336	063132	000		
3337	063133	045	022516	050101
3338	063140	041501	042513	051524
3339	063146	051040	041505	042047
3340	063154	053440	052111	020110
3341	063162	051105	047522	020122
3342	063170	020055	044502	046524
3343	063176	050101	022472	034523
3344	063204	041045	000063	
3345	063210	047045	040445	040520
3346	063216	045503	052105	020123
3347	063224	042522	042503	053111
3348	063232	042105	053440	052111
3349	063240	020110	051105	047522
3350	063246	035122	051445	031461
3351	063254	055045	000065	
3352	063260	047045	040445	040504
3353	063266	040524	041040	052131
3354	063274	051505	051040	041505
3355	063302	044505	042526	035104
3356	063310	051445	033061	052045

⋮
⋮
⋮

UNA COUNTER INFORMATION MESSAGES

CNTR00: .ASCIZ /%N%S5%ACONTENTS OF NODE %T%A INTERNAL COUNTERS:/

CNTR01: .ASCIZ /%N2%ASECONDS SINCE LAST ZEROED:%S15%Z5/

CNTR02: .ASCIZ /%N%APACKETS RECEIVED:%S19%T/

CNTR03: .ASCIZ /%N%AMULTICAST PACKETS RECEIVED:%S9%T/

CNTR04: .ASCIZ /%N%APACKETS REC'D WITH ERROR - BITMAP:%S9%B3/

CNTR05: .ASCIZ /%N%APACKETS RECEIVED WITH ERROR:%S13%Z5/

CNTR06: .ASCIZ /%N%ADATA BYTES RECEIVED:%S16%T/

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3357	063316	000				
3358	063317	045	022516	046501	CNTR07: .ASCIZ	/%N%MULTICAST DATA BYTES RECEIVED:%S6%T/
3359	063324	046125	044524	040503		
3360	063332	052123	042040	052101		
3361	063340	020101	054502	042524		
3362	063346	020123	042522	042503		
3363	063354	053111	042105	022472		
3364	063362	033123	052045	000		
3365	063367	045	022516	051101	CNTR08: .ASCIZ	/%N%RECEIVED PACKETS LOST-INTERNAL:%S10%Z5/
3366	063374	041505	044505	042526		
3367	063402	020104	040520	045503		
3368	063410	052105	020123	047514		
3369	063416	052123	044455	052116		
3370	063424	051105	040516	035114		
3371	063432	051445	030061	055045		
3372	063440	000065				
3373	063442	047045	040445	042522	CNTR09: .ASCIZ	/%N%RECEIVED PACKETS LOST -LOCAL:%S12%Z5/
3374	063450	042503	053111	042105		
3375	063456	050040	041501	042513		
3376	063464	051524	046040	051517		
3377	063472	020124	046055	041517		
3378	063500	046101	022472	030523		
3379	063506	022462	032532	000		
3380	063513	045	022516	050101	CNTR10: .ASCIZ	/%N%APACKETS TRANSMITTED:%S16%T/
3381	063520	041501	042513	051524		
3382	063526	052040	040522	051516		
3383	063534	044515	052124	042105		
3384	063542	022472	030523	022466		
3385	063550	000124				
3386	063552	047045	040445	052515	CNTR11: .ASCIZ	/%N%MULTICAST PACKETS TRANSMITTED:%S6%T/
3387	063560	052114	041511	051501		
3388	063566	020124	040520	045503		
3389	063574	052105	020123	051124		
3390	063602	047101	046523	052111		
3391	063610	042524	035104	051445		
3392	063616	022466	000124			
3393	063622	047045	040445	040520	CNTR12: .ASCIZ	/%N%APACKETS TRANSMITTED 3+ TRYS:%S8%T/
3394	063630	045503	052105	020123		
3395	063636	051124	047101	046523		
3396	063644	052111	042524	020104		
3397	063652	025463	052040	054522		
3398	063660	035123	051445	022470		
3399	063666	000124				
3400	063670	047045	040445	040520	CNTR13: .ASCIZ	/%N%APACKETS TRANSMITTED 2 TRYS:%S9%T/
3401	063676	045503	052105	020123		
3402	063704	051124	047101	046523		
3403	063712	052111	042524	020104		
3404	063720	020062	051124	051531		
3405	063726	022472	034523	052045		
3406	063734	000				
3407	063735	045	022516	050101	CNTR14: .ASCIZ	/%N%APACKETS DEFERRED:%S19%T/
3408	063742	041501	042513	051524		
3409	063750	042040	043105	042506		
3410	063756	042522	035104	051445		
3411	063764	034461	052045	000		
3412	063771	045	022516	042101	CNTR15: .ASCIZ	/%N%ADATA BYTES TRANSMITTED:%S13%T/

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3413	063776	052101	020101	054502	
3414	064004	042524	020123	051124	
3415	064012	047101	046523	052111	
3416	064020	042524	035104	051445	
3417	064026	031461	052045	000	
3418	064033	045	022516	046501	CNTR16: .ASCIZ /%N%AMULTICAST BYTES TRANSMITTED:%S8%T/
3419	064040	046125	044524	040503	
3420	064046	052123	041040	052131	
3421	064054	051505	052040	040522	
3422	064062	051516	044515	052124	
3423	064070	042105	022472	034123	
3424	064076	052045	000		
3425	064101	045	022516	052101	CNTR17: .ASCIZ /%N%ATRANSMIT PACKETS ABORTED-BITMAP:%S8%B6/
3426	064106	040522	051516	044515	
3427	064114	020124	040520	045503	
3428	064122	052105	020123	041101	
3429	064130	051117	042524	026504	
3430	064136	044502	046524	050101	
3431	064144	022472	034123	041045	
3432	064152	000066			
3433	064154	047045	040445	051124	CNTR18: .ASCIZ /%N%ATRANSMIT PACKETS ABORTED:%S16%Z5/
3434	064162	047101	046523	052111	
3435	064170	050040	041501	042513	
3436	064176	051524	040440	047502	
3437	064204	052122	042105	022472	
3438	064212	030523	022466	032532	
3439	064220	000			
3440	064221	045	022516	054101	CNTR19: .ASCIZ /%N%AXMIT COLLISION CHECK FAILURE:%S12%Z5/
3441	064226	044515	020124	047503	
3442	064234	046114	051511	047511	
3443	064242	020116	044103	041505	
3444	064250	020113	040506	046111	
3445	064256	051125	035105	051445	
3446	064264	031061	055045	000065	
3447					
3448					
3449					...
3450					ERROR MESSAGES FOR DEUNA DRIVER
3451					...
3452	064272	047125	020101	047520	EMSG01: .ASCIZ /UNA PURT COMMAND ERROR/
3453	064300	052122	041440	046517	
3454	064306	040515	042116	042440	
3455	064314	051122	051117	000	
3456	064321	125	040516	043040	EMSG02: .ASCIZ /UNA FATAL ERROR/
3457	064326	052101	046101	042440	
3458	064334	051122	051117	000	
3459	064341	125	042516	050130	EMSG03: .ASCIZ /UNEXPLAINED UNA INTERRUPT/
3460	064346	040514	047111	042105	
3461	064354	052440	040516	044440	
3462	064362	052116	051105	052522	
3463	064370	052120	000		
3464	064373	125	045516	047516	EMSG04: .ASCIZ /UNKNOWN UNA ERROR/
3465	064400	047127	052440	040516	
3466	064406	042440	051122	051117	
3467	064414	000			
3468	064415	125	040516	053440	EMSG05: .ASCIZ /UNA WON'T READ PCB ADDRESS/

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3469	064422	047117	052047	051040	
3470	064430	040505	020104	041520	
3471	064436	020102	042101	051104	
3472	064444	051505	000123		
3473	064450	047125	041101	042514	EMSG06: .ASCIZ /UNABLE TO READ PHYSICAL ADDRESS/
3474	064456	052040	020117	042522	
3475	064464	042101	050040	054510	
3476	064472	044523	040503	020114	
3477	064500	042101	051104	051505	
3478	064506	000123			
3479	064510	047125	020101	044527	EMSG07: .ASCIZ /UNA WILL NOT GO INTO RUNNING STATE/
3480	064516	046114	047040	052117	
3481	064524	043440	020117	047111	
3482	064532	047524	051040	047125	
3483	064540	044516	043516	051440	
3484	064546	040524	042524	000	
3485	064553	124	046511	047505	EMSG08: .ASCIZ /TIMEOUT!--TRANSMIT FLAG NOT SET/
3486	064560	052125	026441	052055	
3487	064566	040522	051516	044515	
3488	064574	020124	046106	043501	
3489	064602	047040	052117	051440	
3490	064610	052105	000		
3491	064613	105	051122	051117	EMSG09: .ASCIZ /ERROR DURING TRANSMIT PDMD COMMAND/
3492	064620	042040	051125	047111	
3493	064626	020107	051124	047101	
3494	064634	046523	052111	050040	
3495	064642	046504	020104	047503	
3496	064650	046515	047101	000104	
3497	064656	051124	047101	046523	EMSG10: .ASCIZ /TRANSMIT RING BOOKKEEPING ERROR/
3498	064664	052111	051040	047111	
3499	064672	020107	047502	045517	
3500	064700	042513	050105	047111	
3501	064706	020107	051105	047522	
3502	064714	000122			
3503	064716	042522	042503	053111	EMSG11: .ASCIZ /RECEIVE RING BOOKKEEPING ERROR/
3504	064724	020105	044522	043516	
3505	064732	041040	047517	045513	
3506	064740	042505	044520	043516	
3507	064746	042440	051122	051117	
3508	064754	000			
3509	064755	115	051505	040523	EMSG14: .ASCIZ /MESSAGE SIZE TOO BIG FOR MAX. PACKET LENGTH/
3510	064762	042507	051440	055111	
3511	064770	020105	047524	020117	
3512	064776	044502	020107	047506	
3513	065004	020122	040515	027130	
3514	065012	050040	041501	042513	
3515	065020	020124	042514	043516	
3516	065026	044124	000		
3517	065031	104	044516	042040	EMSG15: .ASCIZ /DNI DID NOT SET FROM RESET/
3518	065036	042111	047040	052117	
3519	065044	051440	052105	043040	
3520	065052	047522	020115	042522	
3521	065060	042523	000124		
3522	065064	047125	020101	044527	EMSG16: .ASCIZ /UNA WILL NOT READ DESCRIPTOR RINGS/
3523	065072	046114	047040	052117	
3524	065100	051040	040505	020104	

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3525	065106	042504	041523	044522	
3526	065114	052120	051117	051040	
3527	065122	047111	051507	000	
3528	065127	103	047101	052047	EMSG18: .ASCIZ /CAN'T GET INITIAL STATUS INFO FROM UNA/
3529	065134	043440	052105	044440	
3530	065142	044516	044524	046101	
3531	065150	051440	040524	052524	
3532	065156	020123	047111	047506	
3533	065164	043040	047522	020115	
3534	065172	047125	000101		
3535	065176	042515	051523	043501	EMSG19: .ASCIZ /MESSAGE DATA COMPARISON ERROR/
3536	065204	020105	040504	040524	
3537	065212	041440	046517	040520	
3538	065220	044522	047523	020116	
3539	065226	051105	047522	000122	
3540	065234	047524	040524	020114	EMSG20: .ASCIZ /TOTAL DATA COMPARE ERRORS/
3541	065242	040504	040524	041440	
3542	065250	046517	040520	042522	
3543	065256	042440	051122	051117	
3544	065264	000123			
3545	065266	047045	040445	047516	EMSG22: .ASCIZ /%N%ANO RESPONSE FROM NODE./
3546	065274	051040	051505	047520	
3547	065302	051516	020105	051106	
3548	065310	046517	047040	042117	
3549	065316	027105	000		
3550	065321	105	051122	051117	EMSG23: .ASCIZ /ERROR WHILE ATTEMPTING TO WRITE MODE/
3551	065326	053440	044510	042514	
3552	065334	040440	052124	046505	
3553	065342	052120	047111	020107	
3554	065350	047524	053440	044522	
3555	065356	042524	046440	042117	
3556	065364	000105			
3557	065366	051124	047101	046523	EMSG24: .ASCIZ /TRANSMIT ERROR, ALL PACKETS NOT TRANSMITTED/
3558	065374	052111	042440	051122	
3559	065402	051117	020054	046101	
3560	065410	020114	040520	045503	
3561	065416	052105	020123	047516	
3562	065424	020124	051124	047101	
3563	065432	046523	052111	042524	
3564	065440	000104			
3565	065442	051105	047522	020122	EMSG25: .ASCIZ /ERROR WHILE ATTEMPTING TO WRITE MULTICAST ADDRESS LIST/
3566	065450	044127	046111	020105	
3567	065456	052101	042524	050115	
3568	065464	044524	043516	052040	
3569	065472	020117	051127	052111	
3570	065500	020105	052515	052114	
3571	065506	041511	051501	020124	
3572	065514	042101	051104	051505	
3573	065522	020123	044514	052123	
3574	065530	000			
3575	065531	105	051122	051117	EMSG30: .ASCIZ /ERROR WHILE ATTEMPTING PORT FUNCTION/
3576	065536	053440	044510	042514	
3577	065544	040440	052124	046505	
3578	065552	052120	047111	020107	
3579	065560	047520	052122	043040	
3580	065566	047125	052103	047511	

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3581	065574	000116			
3582	065576	047125	041101	042514	EMSG31: .ASCIZ /UNABLE TO READ INTERNAL COUNTERS/
3583	065604	052040	020117	042522	
3584	065612	042101	044440	052116	
3585	065620	051105	040516	020114	
3586	065626	047503	047125	042524	
3587	065634	051522	000		
3588	065637	045	022516	044501	EMSG32: .ASCIZ \XN%AILLEGAL TARGET/ASSIST PAIR IN NODE TABLE\
3589	065644	046114	043505	046101	
3590	065652	052040	051101	042507	
3591	065660	027524	051501	044523	
3592	065666	052123	050040	044501	
3593	065674	020122	047111	047040	
3594	065702	042117	020105	040524	
3595	065710	046102	000105		
3596	065714	044524	042515	052517	EMSG33: .ASCIZ /TIMEOUT ERROR/
3597	065722	020124	051105	047522	
3598	065730	000122			
3599	065732	005015	044524	042515	EMSG34: .ASCIZ <15><12>/TIMEOUT OCCURED BEFORE LOOPBACK REPLY/
3600	065740	052517	020124	041517	
3601	065746	052503	042522	020104	
3602	065754	042502	047506	042522	
3603	065762	046040	047517	041120	
3604	065770	041501	020113	042522	
3605	065776	046120	000131		
3606	066002	040445	040506	046111	EMSG35: .ASCIZ /%AFAILING NODE ADDRESS: %T%N/
3607	066010	047111	020107	047516	
3608	066016	042504	040440	042104	
3609	066024	042522	051523	020072	
3610	066032	052045	047045	000	
3611	066037	045	042101	052101	EMSG36: .ASCIZ /%ADATA PATTERN: %T%N/
3612	066044	020101	040520	052124	
3613	066052	051105	035116	022440	
3614	066060	022524	000116		
3615	066064	040445	040506	046111	EMSG37: .ASCIZ /%AFAILING TARGET NODE ADDRESS: %T%N/
3616	066072	047111	020107	040524	
3617	066100	043522	052105	047040	
3618	066106	042117	020105	042101	
3619	066114	051104	051505	035123	
3620	066122	022440	022524	000116	
3621	066130	040445	040506	046111	EMSG38: .ASCIZ /%AFAILING ASSIST NODE ADDRESS: %T%N/
3622	066136	047111	020107	051501	
3623	066144	044523	052123	047040	
3624	066152	042117	020105	042101	
3625	066160	051104	051505	035123	
3626	066166	022440	022524	000116	
3627	066174	005015	044524	042515	EMSG40: .ASCIZ <15><12>/TIMEOUT OCCURED - LOOP MESSAGE TYPE - RECEIVE ASSIST/
3628	066202	052517	020124	041517	
3629	066210	052503	042522	020104	
3630	066216	020055	047514	050117	
3631	066224	046440	051505	040523	
3632	066232	042507	052040	050131	
3633	066240	020105	020055	042522	
3634	066246	042503	053111	020105	
3635	066254	051501	044523	052123	
3636	066262	000			

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3637	066263	015	052012	046511	EMSG41: .ASCIZ <15><12>/TIMEOUT OCCURED - LOOP MESSAGE TYPE - TRANSMIT ASSIST/
3638	066270	047505	052125	047440	
3639	066276	041503	051125	042105	
3640	066304	026440	046040	047517	
3641	066312	020120	042515	051523	
3642	066320	043501	020105	054524	
3643	066326	042520	026440	052040	
3644	066334	040522	051516	044515	
3645	066342	020124	051501	044523	
3646	066350	052123	000		
3647	066353	015	052012	046511	EMSG42: .ASCIZ <15><12>/TIMEOUT OCCURED - LOOP MESSAGE TYPE - FULL ASSIST/
3648	066360	047505	052125	047440	
3649	066366	041503	051125	042105	
3650	066374	026440	046040	047517	
3651	066402	020120	042515	051523	
3652	066410	043501	020105	054524	
3653	066416	042520	026440	043040	
3654	066424	046125	020114	051501	
3655	066432	044523	052123	000	
3656					
3657		066440			.EVEN
3658	066440	047045	040445	020040	SIMSG1: .ASCIZ /%N%A NODE DEFAULT ADDRESS: %T/
3659	066446	047516	042504	042040	
3660	066454	043105	052501	052114	
3661	066462	040440	042104	042522	
3662	066470	051523	020072	052045	
3663	066476	000			
3664	066477	045	022516	034123	SIMSG2: .ASCIZ /%N%S8%ARECEIPT NUMBER: %06/
3665	066504	040445	042522	042503	
3666	066512	050111	020124	052516	
3667	066520	041115	051105	020072	
3668	066526	047445	000066		
3669	066532	047045	040445	020040	SIMSG3: .ASCIZ /%N%A MAINTENANCE VERSION: %Z2/
3670	066540	046440	044501	052116	
3671	066546	047105	047101	042503	
3672	066554	053040	051105	044523	
3673	066562	047117	020072	055045	
3674	066570	000062			
3675	066572	047045	051445	034461	SIMSG4: .ASCIZ /%N%S19%AECO: %Z2/
3676	066600	040445	041505	035117	
3677	066606	022440	031132	000	
3678	066613	045	022516	030523	SIMSG5: .ASCIZ /%N%S14%AUSER ECO: %Z2/
3679	066620	022464	052501	042523	
3680	066626	020122	041505	035117	
3681	066634	022440	031132	000	
3682	066641	045	022516	030523	SIMSG6: .ASCIZ /%N%S14%AFUNCTION: %02/
3683	066646	022464	043101	047125	
3684	066654	052103	047511	035116	
3685	066662	022440	031117	000	
3686	066667	045	022516	030523	SIMSG7: .ASCIZ /%N%S16%ADEVICE: %02/
3687	066674	022466	042101	053105	
3688	066702	041511	035105	022440	
3689	066710	031117	000		
3690					
3691		066714			.EVEN
3692	066714	047045	040445	041520	PCMSG:: .ASCIZ /%N%APC OF CALLING ROUTINE = %06/

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3693	066722	047440	020106	040503
3694	066730	046114	047111	020107
3695	066736	047522	052125	047111
3696	066744	020105	020075	047445
3697	066752	000066		
3698				
3699	066754	047045	040445	054502
3700	066762	042524	047040	046525
3701	066770	042502	035122	042045
3702	066776	022464	024101	024504
3703	067004	042440	050130	041505
3704	067012	042524	036504	047445
3705	067020	022466	024101	024517
3706	067026	051040	041505	042511
3707	067034	042526	036504	047445
3708	067042	022466	024101	024517
3709	067050	000		
3710	067051	045	022516	052101
3711	067056	052117	046101	046440
3712	067064	051511	040515	041524
3713	067072	042510	020123	047111
3714	067100	046440	051505	040523
3715	067106	042507	036440	022440
3716	067114	032104	000	
3717	067117	045	022516	046101
3718	067124	047105	052107	020110
3719	067132	051105	047522	020122
3720	067140	026455	041040	052131
3721	067146	051505	042440	050130
3722	067154	041505	042524	035104
3723	067162	022440	033117	040445
3724	067170	041040	052131	051505
3725	067176	051040	041505	044505
3726	067204	042526	035104	022440
3727	067212	033117	000	
3728	067215	045	031116	051445
3729	067222	022470	047101	042117
3730	067230	035105	022440	000124
3731	067236	047045	040445	054122
3732	067244	047040	052117	041440
3733	067252	046517	046120	052105
3734	067260	020105	020040	051040
3735	067266	020130	047503	050115
3736	067274	042514	042524	020040
3737	067302	020040	042514	043516
3738	067310	044124	042440	051122
3739	067316	051117	000123	
3740	067322	047045	051445	022466
3741	067330	032532	051445	031061
3742	067336	055045	022465	030523
3743	067344	022460	032532	000
3744	067351	045	022516	041501
3745	067356	046517	040520	042522
3746	067364	042440	051122	051117
3747	067372	020123	020040	041040
3748	067400	052131	051505	041440

.EVEN
CMPER1: .ASCIZ /%N%ABYTE NUMBER:%D4%A(D) EXPECTED=%06%A(O) RECIEVED=%06%A(O)/

CMPER2: .ASCIZ /%N%ATOTAL MISMATCHES IN MESSAGE = %D4/

LGERMS: .ASCIZ /%N%ALENGTH ERROR -- BYTES EXPECTED: %06%A BYTES RECEIVED: %06/

SUMMS1: .ASCIZ /%N2%S8%ANODE: %T/

SUMMS2: .ASCIZ /%N%ARX NOT COMPLETE RX COMPLETE LENGTH ERRORS/

SUMMS3: .ASCIZ /%N%S6%Z5%S12%Z5%S10%Z5/

SUMMS4: .ASCIZ /%N%ACOMPARE ERRORS BYTES COMPARED BYTES XFER/

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GLOBAL TEXT SECTION

3749	067406	046517	040520	042522
3750	067414	020104	020040	041040
3751	067422	052131	051505	054040
3752	067430	042506	000122	
3753	067434	047045	051445	022466
3754	067442	032532	051445	022470
3755	067450	000124		
3756	067452	051445	022465	000124
3757				
3758				
3759				

SUMMS5: .ASCIZ /%N%56%Z5%S8%T/

SUMMS6: .ASCIZ /%S5%T/
.EVEN

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GLOBAL ERROR REPORT SECTION

.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.
:--
    
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3802
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3808
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067460
067460
067460 012737 000020 003672
067466
067466 013746 050564
067472 012746 066714
067476 012746 000002
067502 010600
067504 104415
067506 062706 000006
067512
104444
067512 104444
067514
067514 104423
067516
067516
067516 010146
067520 013701 002370
067524 006301
067526 062701 003262
067532
067532 012746 002322
067536 012746 066002
067542 012746 000002
067546 010600
067550 104415
067552 062706 000006
067556
067556 011146
067560 012746 066037
067564 012746 000002
067570 010600
067572 104415
067574 062706 000006
067600 012601
067602
067602
067602 104423
067604
067604
067604
067604 012746 002322
067610 012746 066064
067614 012746 000002

```

BGNMSG ERR1
MOV #CEXIT,CFLAG
PRINTX #PCMSG,PCCALL
DOCLN
ENDMSG
BGNMSG ERR2
MOV R1,-(SP)
MOV P$TYPE,R1
ASL R1
ADD #MSGTAB,R1
PRINTX #EMSG35,#STRBUF
PRINTX #EMSG36,(R1)
MOV (R1),-(SP)
ENDMSG
MOV (R1),-(SP)
ENDMSG
MOV (R1),-(SP)
PRINTX #EMSG37,#STRBUF
    
```

```

ERR1::
MOV PCCALL,-(SP)
MOV #PCMSG,-(SP)
MOV #2,-(SP)
MOV SP,R0
TRAP C$PNTX
ADD #6,SP
TRAP C$DCLN
L10002:
TRAP C$MSG
ERR2::
MOV #STRBUF,-(SP)
MOV #EMSG35,-(SP)
MOV #2,-(SP)
MOV SP,R0
TRAP C$PNTX
ADD #6,SP
MOV (R1),-(SP)
MOV #EMSG36,-(SP)
MOV #2,-(SP)
MOV SP,R0
TRAP C$PNTX
ADD #6,SP
L10003:
TRAP C$MSG
ERR3::
MOV #STRBUF,-(SP)
MOV #EMSG37,-(SP)
MOV #2,-(SP)
    
```


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GLOBAL SUBROUTINES SECTION

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: CALLING SEQUENCE:
:XX
: GIVE THE EXACT CALLING SEQUENCE USED TO ACCESS THIS SUBROUTINE.
: FOR EXAMPLE: MOV COUNT,R1 ;MOVE INPUT TO R1
: JSR PC,ROUTINE ;GO TO ROUTINE
: BCS ERROR ;CARRY SET IF ROUTINE HAD ERROR
:XX
:--
:XX
: INSERT THE CODE FOR THIS SUBROUTINE. THE NAME OF THE SUBROUTINE SHOULD
: BE DEFINED WITH A DOUBLE-COLON (::); THIS WILL MAKE THE SUBROUTINE GLOBAL.
:XX
:XX
: BEGIN EACH SUBROUTINE AT THE TOP OF A NEW PAGE.
:XX

.SBTTL CLKSET 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, THE
: 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
: OUTPUTS - "CLKCSR" GETS LOADED WITH THE CLOCK'D 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. (IN HERTZ)

: CALLING PROCEDURE:
: JSR PC,CLKSET ; CALL CLOCK SETUP WITH R1 AND R2 SETUP

---+
CLKSET:
MOV (R1)+,(R2)+ ; LOAD CLOCK'S CSR ADDR. INTO "CLKCSR"
MOV (R1)+,(R2) ; LOAD CLOCK'S INTR. LEVEL INTO "CLKBR"
ASL (R2) ; ADJUST THE INTR. LEVEL FOR LOADING
ASL (R2) ; INTO THE PSW WITH A "SETVEC" CALL
ASL (R2)
ASL (R2)
ASL (R2)+
MOV (R1)+,(R2)+ ; LOAD CLOCK'S INTR. VECTOR INTO "CLKVEC"
MOV (R1)+,(R2)+ ; LOAD CLOCK'S FREQ. INTO "CLKHZ"
RTS PC

067656
067656 012122
067660 012112
067662 006312
067664 006312
067666 006312
067670 006312
067672 006322
067674 012122
067676 012122
067700 000207

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CLKSET CLOCK SETUP SUBROUTINE

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3990
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3994
3995
3996
3997
3998
3999
4000
4001
4002
4003
4004
4005
4006
4007
4008

.SBTTL CLKINT 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 AND SECONDS
:                   TIMER 1,2 AND S - CURRENT VALUES OF "EVENT TIMERS"
:
: IMPLICIT OUTPUTS - NEW VALUE OF EVENT TIMER "1" & "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
:
: SIDE EFFECTS -    THE CLOCK IS DISABLED UPON ENTRY AND REENABLED WHEN LEAVING
:
: CALLING PROCEDURE - THIS ROUTINE IS CALLED WHEN THE CLODK INTERRUPTS THRU
:                   "CLKVEC".  THE ADDRESS OF THIS ROUTINE WAS LOADED
:                   INTO THE CLOCK'S INTERRUPT VECTOR WITH A "SETVEC" CALL
:--+
```

067702
067702
067702
067706
067712
067714
067722
067726
067734
067736
067742
067746
067752
067754
067760
067764
067766
067772
067776
070000
070006
070010

005077 113766
005337 003712
001015
013737 003702 003712
005237 003710
022737 000074 003710
001004
005237 003706
005037 003710
005737 003714
001402
005337 003714
005737 003716
001402
005337 003716
005737 003720
001406
023737 003702 003712
001002
005337 003720

```

BGNSRV  CLKINT
:
: CLKINT::
:
: CLR @CLKCSR ; DISABLE THE CLOCK FROM INTERRUPTING
: DEC TIMTCK ; DECREMENT THE NO. OF TICKS/SEC
: BNE 1$ ; GO CHECK TIMERS
: MOV CLKHZ,TIMTCK ; RESET THE NO. OF TICKS/SEC.
: INC TIMSEC ; INC. NO OF SECS-SINCE-START
: CMP #60.,TIMSEC ; SEE IF WE'VE COUNTED 60 SEC.S YET
: BNE 1$ ; IF NOT, GO CHECK TIMERS
: INC TIMMIN ; ELSE, INC. MINUTES-SINCE-START
: CLR TIMSEC ; AND RESTART SECOND COUNTER
:
: 1$: TST TIMER1 ; SEE IF TIMER1 TIMING ANYTHING
: BEQ 2$ ; IF=0, NO, CHECK NEXT TIMER
: DEC TIMER1 ; ELSE DECREMENT THE TIMER VALUE (BY 1 TICK)
: 2$: TST TIMER2 ; SEE IF TIMER2 TIMING ANYTHING
: BEQ 3$ ; IF=0, NO, CHECK NEXT TIMER
: DEC TIMER2 ; ELSE DECREMENT TIMER VALUE (BY 1 TICK)
: 3$: TST TIMERS ; SEE IF TIMERS TIMING ANYTHING
: BEQ 4$ ; IF=0, NOTHING BE TIMED, LEAVE
: CMP CLKHZ,TIMTCK ; SEE IF A SECOND HAS BEEN COUNTED OFF
: BNE 4$ ; BR IF NO
: DEC TIMERS ; ELSE, DECREMENT TIMER VALUE (BY 1 SEC.)
```

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CLKINT CLOCK INTERRUPT SERVIDE ROUTINE

```

4009 070014 013777 003704 113652 4$:  MOV   CLKEN,@CLKCSR           ; REENABLE THE CLOCK TO INTERRUPT
4010 070022                                     ENDSRV
4011 070022                                     L10005:
4012 070022 000002                                     RTI

```

```

4015 .SBTTL PREG14 PRESERVE REGISTERS 1 THROUGH 4 ACROSS SUBROUTINE CALLS
4016 :*****
4017 :INPUTS: THE RELATIVE ADDRESS OF THE CALLED ROUTINE MUST FOLLOW THE
4018 :        CALL TO THIS ROUTINE (SEE CALLING SEQUENCE).
4019 :
4020 :OUTPUTS: -REGISTERS 1 THROUGH 4 ARE PRESERVED ACROSS THE CALLED ROUTINE.
4021 :        -A CHECK IS MADE TO ENSURE THE HARDWARE STACK HASN'T OVER-RUN
4022 :        THE PARAMETER STACK.
4023 :
4024 :CALLING SEQUENCE: THIS IS BEST HANDLED BY THE "CALL" MACRO. THE ACTUAL
4025 :        CALL IS:
4026 :                   JSR   R4,PREG14
4027 :                   .WORD [SUBROUTINE NAME]-ANCHOR
4028 :
4029 :COMMENTS: THIS ROUTINE IS RE-ENTRANT AND RELOCATABLE.
4030 :        THIS ROUTINE IS DRS COMPATIBLE.
4031 :
4032 :SUBORDINATE ROUTINES CALLED: THE ROUTINE SPECIFIED IN THE CALL.
4033 :*****

```

```

4035 :R4 IS ALREADY ON THE R6 STACK.
4036 070024 010346 PREG14: MOV   R3,-(SP)           ;PUSH R3, R2, R1
4037 070026 010246      MOV   R2,-(SP)           ;
4038 070030 010146      MOV   R1,-(SP)           ;
4039 :
4040 070032 010437 050564      MOV   R4, PCCALI
4041 070036 012401      MOV   (R4)+,R1           ;GET THE RELATIVE ADDRESS OF THE CALLED
4042 :                               ;ROUTINE.
4043 070040 060701      ADD    PC,R1           ;MAKE IT AN ABSOLUTE ADDRESS.
4044 :
4045 070042 010446 ANCHOR: MOV   R4,-(SP)           ;SAVE THE RETURN TO THE CALLING ROUTINE,
4046 :
4047 070044 020506      CMP   R5,SP           ;CHECK FOR STACK OVER-RUN.
4048 070046 103401      BLO  1$
4049 070050 000000      HALT          ;HANDLE STACK OVER-RUN CONDITION.
4050 :
4051 070052 004711 1$:  JSR   PC,(R1)           ;CALL THE SPECIFIED ROUTINE.
4052 :
4053 070054 012604      MOV   (SP)+,R4           ;RESTORE THE RETURN TO THE CALLING ROUTINE.
4054 :
4055 070056 012601      MOV   (SP)+,R1           ;RESTORE THE REGISTERS.
4056 070060 012602      MOV   (SP)+,R2           ;
4057 070062 012603      MOV   (SP)+,R3           ;
4058 070064 000204      RTS   R4              ;BACK TO THE CALLING ROUTINE.
4059 :
4060 :

```

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PREG14 PRESERVE REGISTERS 1 THROUGH 4 ACROSS SUBROUTINE CALLS

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.SBTTL WAIT WAIT FOR DEUNA INTERRUPT WITH TIMEOUT

```

:++
: FUNCTIONAL DESCRIPTION:
: THIS SUBROUTINE WAITS FOR DNI INTERRUPTS FROM THE DEUNA
: OR REPORTS A TIMEOUT. IF A UNA INTERRUPT HAS OCCURED,
: THE SUBROUTINE ERROR IS CALLED TO HANDLE IT.
:
: SUCCESS OR FAILURE IS REPORTED VIA P1.

```

```

: INPUTS -
: NONE

```

```

: OUTPUTS-
: P1: SUCCESS/FAILURE 0=SUCCESS/-1=FAILURE

```

```

: CALLING SEQUENCE:
: CALL WAIT
: P$POP P1

```

```

--
WAIT:: MOV #10,R3 ; MOVE NO. OF COUNTS TO R3
      MOV #TIMER1,R4 ; AND TIMER TO BE USED TO R4
      CLR R2 ; LOCAL STATUS PARAMETER
      MOV R3,(R4) ; SET NUMBER OF TICKS. (GLOBAL)
1$: TST ERRFLG ; CHECK IF ERROR OCCURED
   BNE 3$ ; BR IF YES
   TST DNIFLG ; CHECK FOR DNI INTERRUPT
   BEQ 2$ ; BR IF INTERRUPT RECEIVED
   CLR DNIFLG
   BR 6$
2$: TST (R4) ; HAS TIMER EXPIRED?
   BNE 1$ ; BR IF NO TO WAIT FOR INTERRUPT
   BR 5$ ; BR TO 5$
3$: CALL ERROR ; CALL ERROR ROUTINE.
5$: MOV #-1,R2 ; INDICATE FAILURE
6$: RETURN R2 ; RETURN WITH SUCCESS/FAILURE INDICATION

```

.SBTTL ERROR HANDLE UNA INTERRUPT ERRORS

```

--+
: FUNCTIONAL DESCRIPTION:
: THIS SUBROUTINE CHECKS THE ERROR FLAGS SET BY
: UNAI SR THE INTERRUPT SERVICE ROUTINE AND PRINTS
: OUT THE APPROPRIATE ERROR MESSSAGES.
:
: INPUTS -
: IMPLICIT: ERROR FLAGS SHOULD BE SET BY UNAI SR ROUTINES.
: OUTPUTS -
: IMPLICIT: ERROR MESSAGES ARE PRINTED OUT TO THE OPERATOR CONSOLE.
:
: CALLING SEQUENCE:
: CALL ERROR

```

--+

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ERROR HANDLE UNA INTERRUPT ERRORS

```

4117
4118 070150 005337 050530      ERROR:: DEC      ERRFLG      :DECRIMENT ERROR COUNTER TO SHOW
4119                                :THAT IT HAS BEEN HANDLED
4120 070154 005737 050514      TST      PCEFLG      :SEE IF PORT COMMAND ERROR
4121 070160 001013                                BNE      5$          : IF YES, BRANCH
4122 070162 005737 050512      TST      FATFLG      :SEE IF UNA FATAL ERROR
4123 070166 001017                                BNE      10$         : IF YES, BRANCH
4124 070170 005737 050526      TST      BCOUNT     :SEE IF UNEXPLAINED INTERRUPT
4125 070174 001023                                BNE      15$         : IF YES, BRANCH
4126 070176                                ERRDF    4,EMSG04,ERR1 :ELSE UNKNOWN ERROR
4127 070176 104455                                TRAP     C$ERDF
4128 070200 000004                                .WORD   4
4129 070202 064373                                .WORD   EMSG04
4130 070204 067460                                .WORD   ERR1
4131 070206 000424
4132 070210      5$:      BR      20$          : EXIT
4133 070210 104455      ERRDF    1,EMSG01,ERR1 :PORT COMMAND ERROR
4134 070212 000001                                TRAP     C$ERDF
4135 070214 064272                                .WORD   1
4136 070216 067460                                .WORD   EMSG01
4137 070220 005337 050514      DEC      PCEFLG      : INDICATE THAT IT WAS HANDLED
4138 070224 000415      BR      20$          : EXIT
4139 070226      10$:      ERRDF    2,EMSG02,ERR1 :UNA FATAL ERROR
4140 070226 104455                                TRAP     C$ERDF
4141 070230 000002                                .WORD   2
4142 070232 064321                                .WORD   EMSG02
4143 070234 067460                                .WORD   ERR1
4144 070236 005337 050512      DEC      FATFLG      : KEEP UP ON BOOK KEEPING
4145 070242 000406      BR      20$          : EXIT
4146 070244      15$:      ERRDF    3,EMSG03,ERR1 :UNEXPLAINED INTERRUPT
4147 070244 104455                                TRAP     C$ERDF
4148 070246 000003                                .WORD   3
4149 070250 064341                                .WORD   EMSG03
4150 070252 067460                                .WORD   ERR1
4151 070254 005337 050526      DEC      BCOUNT     : BOOK KEEPING
4152 070260      20$:      RETURN     :RETURN

```

.SBTTL UNAINI INITIALIZE THE UNA

```

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4172

```

```

:*****
: SUBROUTINE TO
:      1) SETS UNA IN THE READY STATE
:      2) INITIALIZES ALL UNA GLOBAL DATA LOCATIONS
:         TO DEFAULT VALUES.
:
: CALLED BY:
:      CALL UNAINI
:
: INPUTS:
:      NONE
:
: OUTPUTS:
:      NONE
:
: SIDEEFFECTS: ALL GLOBAL LOCATIONS ARE ZEROED
:

```


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UNAINI INITIALIZE THE UNA

```

4229
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4231
4232
4233
4234
4235 070410 012737 003772 003756      MOV    #XRING,XRGCUR      ; SET POINTERS TO BEGINING OF RING
4236 070416 012737 003772 003762      MOV    #XRING,XRGNXT
4237 070424 012737 004066 003760      MOV    #RRING,RRGCUR
4238 070432 012737 004066 003764      MOV    #RRING,RRGNXT
4239
4240 070440 012702 000006                MOV    #NO.NTR,R2        ; RESET OWNERSHIP AND STATUS OF
4241 070444 013701 003756                MOV    XRGCUR,R1        ; RING ENTRIES
4242 070450 012761 000000 000004 12$:  MOV    #0,4(R1)        ; FOR TRANSMIT RING...
4243 070456                CALL   GETXNX #XRGCUR
4244 070470 005302                DEC    R2
4245 070472 001364                BNE   12$
4246
4247 070474 012702 000006                MOV    #NO.NTR,R2        ; ...AND RECIEVE RING
4248 070500 013701 003760                MOV    RRGCUR,R1
4249 070504 012761 100000 000004 13$:  MOV    #10000,4(R1)
4250 070512                CALL   GETRNX #RRGCUR
4251 070524 005302                DEC    R2
4252 070526 001364                BNE   13$
4253
4254
4255
4256
4257
4258
4259
4260 070530 012701 047750                MOV    #SRDDE, R1        ; READ DEF PHY ADDR PCB
4261 070534 005061 000002                CLR   2(R1)
4262 070540 005061 000004                CLR   4(R1)
4263 070544 005061 000006                CLR   6(R1)
4264
4265 070550 012701 047760                MOV    #SRDPH, R1        ; READ CURRENT PHY ADDR PCB
4266 070554 005061 000002                CLR   2(R1)
4267 070560 005061 000004                CLR   4(R1)
4268 070564 005061 000006                CLR   6(R1)
4269
4270 070570 012701 047770                MOV    #SWDPH, R1        ; WRITE CURRENT PHY ADDR PCB
4271 070574 005061 000002                CLR   2(R1)
4272 070600 005061 000004                CLR   4(R1)
4273 070604 005061 000006                CLR   6(R1)
4274
4275 070610 012701 050100                MOV    #SRDRN, R1        ; READ RING FORMAT
4276 070614 005061 000004                CLR   4(R1)
4277 070620 005061 000006                CLR   6(R1)
4278
4279 070624 012701 050110                MOV    #UCB10, R1        ; RING ENTRIES:
4280                .REPT 6
4281                CLR   (R1)+        ; INIT TO 0
4282                .ENDR
4283
4284 070644 012701 050124                MOV    #SWDRN, R1        ; WRITE RING FORMAT

```

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UNAINI INITIALIZE THE UNA

```

4285 070650 005061 000004          CLR      4(R1)
4286 070654 005061 000006          CLR      6(R1)
4287
4288 070660 012701 050150          MOV      #SRDCN, R1          ; READ COUNTERS
4289 070664 005061 000004          CLR      4(R1)
4290
4291 070670 012701 050160          MOV      #UCB12, R1        ; COUNTER ENTRIES
4292 070674 012702 000040          MOV      #40, R2
4293 070700 005021          14$:  CLR      (R1)+
4294 070702 005302          DEC      R2
4295 070704 001375          BNE      14$
4296
4297 070706 012701 050260          MOV      #SCLRC, R1       ; CLEAR COUNTERS
4298 070712 005061 000004          CLR      4(R1)
4299
4300 070716 012701 050270          MOV      #SRDMO, R1       ; READ MODE
4301 070722 005061 000002          CLR      2(R1)
4302 070726 005061 000004          CLR      4(R1)
4303 070732 005061 000006          CLR      6(R1)
4304
4305 070736 012701 050300          MOV      #SWDMO, R1       ; WRITE MODE
4306 070742 005061 000002          CLR      2(R1)
4307 070746 005061 000004          CLR      4(R1)
4308 070752 005061 000006          CLR      6(R1)
4309
4310 070756 012701 050310          MOV      #SRDST, R1      ; READ STATUS
4311 070762 005061 000002          CLR      2(R1)
4312 070766 005061 000004          CLR      4(R1)
4313 070772 005061 000006          CLR      6(R1)
4314
4315 070776 012701 050320          MOV      #SCLRS, R1      ; READ AND CLEAR STATUS
4316 071002 005061 000002          CLR      2(R1)
4317 071006 005061 000004          CLR      4(R1)
4318 071012 005061 000006          CLR      6(R1)
4319
4320 071016 005037 050516          CLR      NIRCNT          ; CLEAR BUFFERS RECEIVED COUNTER
4321 071022          CALL     FUNCT #WDRNGS   ; WRITE DESCRIPTOR RINGS
4322 071034          P$POP   R2              ; CHECK FOR ERROR
4323 071036 001404          BEQ     15$             ; IF OK, CONTINUE
4324 071040          ERRDF  16,EMSG16,ERR1 ; ELSE REPORT ERROR
4325 071040 104455          TRAP   C$ERDF
4326 071042 000020          .WORD  16
4327 071044 065064          .WORD  EMSG16
4328 071046 067460          .WORD  ERR1
4329
4330 071050          15$:  CALL     COMAND #STRT    ; PUT UNA IN RUNNING STATE
4331 071062          P$POP   R2              ; CHECK FOR ERROR
4332 071064 001404          BEQ     20$             ; IF OK, CONTINUE
4333 071066          ERRDF  7,EMSG07,ERR1 ; ELSE REPORT ERROR
4334 071066 104455          TRAP   C$ERDF
4335 071070 000007          .WORD  7
4336 071072 064510          .WORD  EMSG07
4337 071074 067460          .WORD  ERR1
4338
4339 071076          20$:  CALL     FUNCT #RDPHYA   ; READ UNA PHYSICAL ADDRESS
4340 071110          P$POP   R2              ; CHECK FOR ERROR

```

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UNAINI INITIALIZE THE UNA

```

4341 071112 001404      BEQ      25$      ; IF OK, CONTINUE
4342 071114      ERRDF  6,MSG06,ERR1 ; ELSE, REPORT ERROR
4343 071114 104455      TRAP      C$ERDF
4344 071116 000006      .WORD    6
4345 071120 064450      .WORD    MSG06
4346 071122 067460      .WORD    ERR1
4347
4348 071124 012701 047670 25$:  MOV      #PCBB2, R1      ; STORE PHYSICAL ADDRESS
4349 071130 012704 047762      MOV      #PHYADR, R4
4350 071134 012124      MOV      (R1)+, (R4)+    ; MOVE FIRST TWO BYTES
4351 071136 012124      MOV      (R1)+, (R4)+    ; AND SECOND TWO
4352 071140 011114      MOV      (R1), (R4)      ; AND DONE
4353
4354 071142      RETURN
4355
4356      .SBTTL  UNAIISR  UNA INTERRUPT SERVICE ROUTINE
4357      +
4358      :
4359      : THIS INTERRUPT ROUTINE WILL BE THE ONLY INTERRUPT ROUTINE
4360      : WHICH THE UNA HARDWARE WILL VECTOR TO UPON HARDWARE INTERRUPT.
4361      :
4362      : THE REASON FOR SUCH INTERRUPTS ARE TO BE DETERMINED
4363      : FROM THE APPROPRIATE BITS IN THE PCSRO.
4364      :
4365      : IN ADDITION ALL WRITE ONE TO CLEAR BITS OF THE PCSRO
4366      : ARE CLEARED FROM THIS ROUTINE.
4367      -
4368
4368 071144      UNAIISR::
4369 071144 010146      MOV      R1, -(SP)      ;SAVE R1
4370 071146 010246      MOV      R2, -(SP)      :...
4371 071150 010346      MOV      R3, -(SP)      :...
4372
4373 071152 005003      CLR      R3              ;SETUP WRITE 1 TO CLR MASK
4374 071154 013701 047632  MOV      PCSRO, R1      ;GET PCSRO ADDRESS
4375
4376 071160 011103      MOV      (R1), R3        ;AND ITS CONTENTS
4377
4378 071162 012137 047642  MOV      (R1)+, PCSROC   ;SAVE PCSR'S FOR DEBUG
4379 071166 012137 047644  MOV      (R1)+, PCSR1C
4380 071172 012137 047646  MOV      (R1)+, PCSR2C
4381 071176 011137 047650  MOV      (R1), PCSR3C
4382 071202 013701 047632  MOV      PCSRO, P1
4383
4384 071206 000303      SWAB    R3              ;REORIENT CONTENTS OF PCSRO
4385 071210 110361 000001  MOVB    R3, 1(R1)      ;WRITE ONE TO CLEAR
4386      : ONLY CLEAR UPPER BYTE
4387 071214 000303      SWAB    R3              ;REORIENT CONTENTS OF PCSRO
4388
4389
4390 071216 032703 100400  BIT      #SERI!FATI, R3 ;ANY FATAL STATUS ??
4391 071222 001403      BEQ      10$
4392
4393 071224 005237 050512  INC      FATFLG         ;SET FLAG
4394 071230 000443      BR      90$           ;EXIT
4395
4396 071232 032703 040000  10$:  BIT      #PCEI, R3   ;PORT COMMAND ERROR INTERRUPT?

```

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UNAI SR UNA INTERRUPT SERVICE ROUTINE

```

4397 071236 001402          BEQ      20$          :NO
4398
4399 071240 005237 050514          INC      PCEFLG          :YES, INCREMENT FLAG
4400
4401 071244 032703 020000    20$:  BIT      #RXI,R3          :RECV INTERRUPT ??
4402 071250 001402          BEQ      30$          :NO
4403 071252 005237 050516          INC      NIRCNT          :YES, SET FLAG
4404
4405 071256 032703 010000    30$:  BIT      #TXI,R3          :TRANSMIT INTERRUPT ??
4406 071262 001402          BEQ      40$          :NO
4407 071264 005037 050520          CLR      XFLAG          :YES, SET FLAG
4408
4409 071270 032703 004000    40$:  BIT      #DNI,R3          :COMMAND DONE ??
4410 071274 001402          BEQ      45$          :NO
4411 071276 005237 050522          INC      DNIFLG          :YES, COUNT EACH DNI
4412
4413 071302 032703 002000    45$:  BIT      #RCBI,R3         :RECIEVE BUFFER UNAVAILABLE?
4414 071306 001402          BEQ      50$          :NO
4415 071310 005237 050524          INC      RBF CNT        : COUNT THEM
4416
4417 071314 032703 034000    50$:  BIT      #RXI!TXI!DNI,R3   :CHECK FOR NON-ERROR INTERRUPT
4418 071320 001007          BNE      90$          :EXIT IF ONE OCCURED
4419 071322 032703 142000          BIT      #SERI!PCEI!RCBI,R3   :CHECK FOR ERROR INTERRUPT
4420 071326 001002          BNE      80$          :IF ONE OCCURED, INCR. ERRFLG
4421 071330 005237 050526          INC      BCOUNT         :ELSE, NONSENSE INTERRUPT
4422 071334 005237 050530    80$:  INC      ERRFLG
4423 071340 012603    90$:  MOV      (SP)+,R3         :RESTORE REGISTERS
4424 071342 012602          MOV      (SP)+,R2         :RESTORE REGISTERS
4425 071344 012601          MOV      (SP)+,R1         :RESTORE REGISTERS
4426 071346 000002          RTI                      :AUF WIEDERSEHEN
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```

.SBTTL COMAND SUBR TO ISSUE A UNA PORT COMMAND

```

:--+
: FUNCTIONAL DESCRIPTION
: THIS SUBROUTINE ISSUES A UNA PORT COMMAND. ERRORS
: ARE HANDLED BY THE SUBROUTINE ERROR AND REPORTED IN
: P2 IF ONE OCCURED.
:
: INPUTS - P1 - THE UNA PORT COMMAND MNEMONIC OF THE
: DESIRED COMMAND.
: OUTPUTS - P2 - SUCCESS REPORT. CONTAINS 0 FOR SUCCESS
: -1 IF A UNA ERROR OCCURED. THIS PARAMETER
: IS PASSED DIRECTLY FROM THE WAIT
: ROUTINE AND IS UNTOUCHED BY COMAND.
:
: CALLING PROCEDURE - CALL COMAND #<COMMAND TYPE>
: SIDE EFFECTS - IF AN ERROR HAS OCCURED, THE ROUTINE ERROR WILL
: BE CALLED.
: REGISTER USAGE - R1 CONTAINS THE COMMAND TYPE.
:--+
COMAND::

```

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COMAND SUBR TO ISSUE A UNA PORT COMMAND

4453 071350
4454 071352 052701 000100
4455 071356 010177 156250
4456 071362
4457 071370

```

P$POP R1 ;MOVE COMMAND TYPE TO R1
BIS #INTE,R1 ;ADD INTERRUPT TO COMMAND
MOV R1,@PCSR0 ;MOV COMMAND TO PCSRO
CALL WAIT ;WAIT FOR DONE INTERRUPT
10$: RETURN ;RETURN - ERROR INFO STILL ON
; PARAMETER STACK FROM WAIT SUB.

```

.SBTTL FUNCT SUBR TO PERFORM A UNA PORT FUNCTION

```

:---+
: FUNCTIONAL DESCRIPTION:
: THIS SUBROUTINE PERFORMS A UNA PORT FUNCTION. THE
: FUNCTION SPECIFIC PCB IS MOVED INTO THE UNA PCB.
:
: INPUTS - P1 - THE UNA PORT FUNCTION MNEMONIC OF THE
: DESIRED FUNCTION.
: OUTPUTS - P2 - SUCCESS REPORT. CONTAINS 0 FOR SUCCESS
: -1 IF A UNA ERROR OCCURED.
: THIS PARAMETER IS PASSED DIRECTLY FROM THE
: COMAND SUB AND IS NOT AFFECTED BY FUNCT.
:
: CALLING PROCEDURE - CALL FUNCT #<FUNCTION TYPE>
: SIDE EFFECTS - IF AN ERROR HAS OCCURED, THE ROUTINE ERROR WILL
: BE CALLED.
: REGISTER USAGE - R1 CONTAINS THE FUNCTION TYPE, WHICH IS TRANSFORMED
: TO THE ADDRESS OF THE FUNCTION SPECIFIC PCB.
: R2 CONTAINS THE ADDRESS OF THE UNA PCB.

```

4483
4484 071372
4485 071374 006301
4486 071376 062701 047676
4487
4488
4489 071402 012702 047666
4490 071406 011101
4491 071410 012122
4492 071412 012122
4493 071414 012122
4494 071416 012122
4495 071420
4496 071432

```

FUNCT:: P$POP R1 ; GET FUNCTION TYPE INTO R1
ASL R1 ; MULTIPLY BY TWO
ADD #FUNTAB,R1 ; ADD FUNCTION TABLE OFFSET
; R1 NOW CONTAINS ADDRESS OF ADDRESS
; OF FUNCTION SPECIFIC PCB
MOV #PCB80, R2 ; PUT UNA PCB INTO R2
MOV (R1),R1 ; PUT ADDRESS OF PCB INTO R1
MOV (R1)+,(R2)+ ; MOV PCB'S
MOV (R1)+,(R2)+ ; MOV PCB'S
MOV (R1)+,(R2)+ ; MOV PCB'S
MOV (R1)+,(R2)+ ; MOV PCB'S
CALL COMAND #GETFNT ; ISSUE GET PORT FUNCTION COMMAND
RETURN ; SUCCESS INFO FROM COMAND SUBROUTINE

```

.SBTTL XMIT TRANSMIT UNA PACKETS

```

:---+
: FUNCTIONAL DESCRIPTION:
: THIS SUBROUTINE SETS UP THE TRANSMIT DESCRIPTOR
: RING ENTRIES AND ISSUES A POLL DEMAND COMMAND TO
: THE UNA.
:
: INPUTS - NONE

```

4497
4498
4499
4500
4501
4502
4503
4504
4505
4506
4507
4508

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XMIT TRANSMIT UNA PACKETS

```

4509 : OUTPUTS - P1 - SUCCESS REPORT. 0 FOR SUCCESS, -1 FOR FAILURE
4510 :
4511 : CALL PROCEDURE - CALL XMIT
4512 : P$POP P1
4513 :
4514 : SIDE EFFECTS - THE RING POINTER XRGNEXT WILL BE UPDATED TO POINT THE NEXT
4515 : AVAILABLE ENTRY AFTER THE TRANSMIT OPERATION.
4516 :
4517 : REGISTER USAGE - R1 POINTS TO TIMEOUT TIMER LOCATION
4518 : R2 IS USED AS A POINTER IF RETRYS IS SET
4519 : R3 IS USED TO PASS THE SUCCESS/FAILURE MESSAGE BACK
4520 : R4 IS USED AS A POINTER TO RING ENTRIES OR STATUS INFO.
4521 :--+
4522 :
4523 071434 005037 050534 XMIT:: CLR RETRYS
4524 071440 013704 003756 1$: MOV XRGCUR,R4 : MOVE RING ENTRY LOCATION INTO R4
4525 071444 032764 100000 000004 BIT #OWN,4(R4) : MAKE SURE WE OWN THIS
4526 071452 001125 BNE 40$ : ELSE, BOOKKEEPING ERROR
4527 071454 013714 050566 MOV BUFLN,(R4) : MOVE BUFFER LENGTH INTO FIRST WORD OF
4528 : NEXT AVAILABLE RING ENTRY
4529 071460 052764 101400 000004 BIS #OWN!STP!ENP,4(R4) : SET OWNERSHIP, START AND END OF PACKET BITS
4530 071466 012737 000001 050520 20$: MOV #1,XFLAG : SET TRANSMIT FLAG
4531 071474 CALL COMAND #PDMD : ISSUE PDMD COMMAND
4532 071506 P$POP R3 : CHECK FOR ERRORS
4533 071510 001126 BNE 50$ : IF YES, EXIT
4534 071512 012701 003716 22$: MOV #TIMER2,R1 : SET UP TO WAIT FOR TRANSMIT TO COMPLETE
4535 071516 012711 000100 MOV #100,(R1)
4536 071522 005737 050520 23$: TST XFLAG : SEE IF TRANSMIT DONE BIT SET
4537 071526 001403 BEQ 24$ : IF SET, SKIP WAIT LOOP
4538 071530 005711 TST (R1) : ELSE, SEE IF TIMEOUT YET
4539 071532 001373 BNE 23$ : NO, WAIT
4540 071534 000506 BR 45$ : YES, EXIT
4541 071536 032764 100000 000004 24$: BIT #OWN,4(R4) : SEE WHO OWNS THIS ENTRY
4542 071544 001070 BNE 40$ : IF UNA STILL OWNS THIS, SOMETHINGS WRONG
4543 071546 032764 040000 000004 BIT #ERRS,4(R4) : SEE IF ANY ERRORS
4544 071554 001013 BNE 30$ : IF YES, BRANCH AND TAKE CARE OF THEM
4545 071556 26$: CALL GETXNX #XRGCUR : UPDATE "TRANSMIT RING CURRENT" POINTER
4546 071570 005003 CLR R3 : INDICATE SUCCESS
4547 071572 023737 003756 003762 CMP XRGCUR,XRGNEXT : SEE IF CURRENT POINTER = NEXT POINTER
4548 071600 001057 BNE 42$ : IF NO, ERROR
4549 071602 000473 BR 55$ : RETURN
4550 071604 032764 016000 000004 30$: BIT #DEF!ONE!MORE,4(R4) : WAS MESSAGE STILL SENT?
4551 071612 001361 BNE 26$ : IF YES, GO TO NEXT ONE
4552 071614 032764 002000 000006 BIT #RTRY,6(R4) : ELSE, DID UNA GIVE UP AFTER 16 TRIES
4553 071622 001434 BEQ 32$ : IF NOT, FATAL DEVICE ERROR, EXIT
4554 071624 005237 050534 INC RETRYS : IF YES, KEEP COUNT OF THEM
4555 071630 022737 000003 050534 CMP #3,RETRYS : GIVE UP AFTER 3 TIMES
4556 071636 100747 BMI 26$ : ELSE, SET UP TO RETRANSMIT
4557 071640 CALL GETXNX #XRGCUR : UPDATE POINTERS
4558 071652 CALL GETXNX #XRGNEXT
4559 071664 016402 000002 MOV 2(R4),R2 : SET UP TO COPY DATA BUFFER
4560 071670 013704 003756 MOV XRGCUR,R4 : R2 POINTS TO OLD BUFFER
4561 071674 016403 000002 MOV 2(R4),R3 : R3 POINTS TO NEW BUFFER
4562 071700 013704 050566 MOV BUFLN,R4 : R4 COUNTS NUMBER OF BYTES TO COPY
4563 071704 112223 31$: MOV (R2)+,(R3)+ : COPY DATA
4564 071706 005304 DEC R4

```

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XMIT TRANSMIT UNA PACKETS

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4565 071710 001375          BNE      31$          : HAVE WE COPIED ALL OF IT
4566 071712 000652          BR       1$          : IF YES, TRY AGAIN
4567 071714          32$:  ERRDF  9,MSG09,ERR1 : ELSE, FATAL DEVICE ERROR
4568 071714 104455          TRAP    C$ERDF
4569 071716 000011          .WORD  9
4570 071720 064613          .WORD  MSG09
4571 071722 067460          .WORD  ERR1
4572 071724 000420          BR       50$
4573 071726          40$:  ERRDF 10,MSG10,ERR1 : EXIT
4574 071726 104455          TRAP    C$ERDF
4575 071730 000012          .WORD  10
4576 071732 064656          .WORD  MSG10
4577 071734 067460          .WORD  ERR1
4578 071736 000413          BR       50$
4579 071740          42$:  ERRDF 12,MSG10,ERR1 : BOOKKEEPING ERROR, XRGNEXT SHOULD = XRGCUR
4580 071740 104455          TRAP    C$ERDF
4581 071742 000014          .WORD  12
4582 071744 064656          .WORD  MSG10
4583 071746 067460          .WORD  ERR1
4584 071750 000406          BR       50$
4585 071752 005237 050532      INC      TIMEOUT
4586 071756          45$:  ERRHRD 8,MSG08,ERR1 : REPORT ERROR
4587 071756 104456          TRAP    C$ERHRD
4588 071760 000010          .WORD  8
4589 071762 064553          .WORD  MSG08
4590 071764 067460          .WORD  ERR1
4591 071766 012703 177777      50$:  MOV     #-1,R3          : ERROR INDICATOR
4592 071772          55$:  RETURN  R3          : RETURN
4593
4594          .SBTTL  RECEVE  RECEIVE UNA RING BUFFERS
4595
4596          :---+
4597          : FUNCTIONAL DESCRIPTION
4598          : THIS SUBROUTINE TAKES INCOMING DATA BUFFERS FROM
4599          : THE UNA AND CHECKS FOR ERRORS. THIS PROCESS CONTINUES
4600          : FOR ALL PENDING BUFFERS.
4601
4602          : INPUTS - NONE
4603          : OUTPUTS - P1 - THE NUMBER OF PACKETS HANDLED BY THIS CALL TO RECEVE
4604
4605          : CALLING PROCEDURE - CALL RECEVE
4606          : P$POP P1
4607
4608          : SIDE EFFECTS - THE POINTERS RRGCUR AND RRGNEXT ARE UPDATED.
4609
4610          : REGISTER USAGE - R1 IS USED TO HOLD CURRENT PACKET STATUS INFORMATION
4611          : R2 COUNTS THE NUMBER OF PACKETS HANDLED
4612          : R4 POINTS TO THE RING DESCRIPTOR ENTRY
4613          :---+
4614
4615          RECEVE::
4616          CLR     R2          : CLEAR PACKETS HANDLED COUNTER
4617 071776 005002          1$:  TST     NIRCNT         : SEE IF ANY PACKETS TO RECEIVE
4618 072000 005737 050516      BEQ     60$          : IF NO, EXIT
4619 072004 001476          MOV     RRGCUR,R4      : MOVE CURRENT RECEIVE RING POINTER TO R4
4620 072006 013704 003760

```


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EDPACK ETHERNET DATA PACKING ROUTINE

```

4677      :      IMPLIED OUTPUTS      THE BUFFER AT P2 WILL CONTAIN A RIGHT
4678      :      :                      JUSTIFIED BINARY STREAM W/ LEADING ZEROS
4679      :      :                      AND CORRESPONDING TO HEX STRING AT R5.
4680      :      SUBORDINATE PROCEDURES  HXFORM. (STRIP NONHEX CHARACTERS)
4681      :      :                      HEXBIN. (HEX TO BINARY CONVERSION)
4682      :      CALLING PROCEDURE        CALL EDPACK P1,P2,P3  ;INPUT P1-P3 PARAMETERS
4683      :      :                      P$POP  P4      ;OUTPUT  P4 PARAMETER
4684      :      :                      :-----
4685      :
4686      072206 000112      LOCDST: .BLKB 74.      ;MAX NUMBER OF CHARACTERS THAT MAY BE ENTERED
4687      072320 000000      SOURCE: .WORD      ;SOURCE ADDRESS
4688      :
4689      072322      EDPACK: P$POP SOURCE,R4,R3      ;R4-DESTINATION, R3-NUMBER OF CHARS RQD
4690      :                      ;SOURCE-SRC ADDRESS, ORIENT-WORD/BYTE?
4691      072332 005002      CLR R2      ;ASSUME NO ERRORS, VALUE RETURNED
4692      072334 006303      ASL R3      ;NUMBER OF CHARACTERS REQUIRED W/ '0'S
4693      072336      CALL HXFORM SOURCE,#LOCDST,R3
4694      072356      P$POP R1,R2      ;R1=ADDRESS OF LAST CHAR
4695      :                      ;R2=SUCCESS/FAIL CODE (0/-1)
4696      072362 005702      TST R2      ;R1 WILL POINT TO RIGHTMOST CHARACTER
4697      072364 001010      BNE 9$      ;RIGHT JUSTIFY BUFFER
4698      :                      ;CONVERT HEX AT LOCDST TO BINARY
4699      072366 006203      ASR R3      ;R3 BYTES IN OUTPUT BIT STREAM
4700      072370      CALL HEXBIN #LOCDST,R4,R3
4701      :
4702      072406      9$: RETURN R2      ;RETURN WITH SUCCESS/FAILURE INDICATION
4703      :
4704      :      :-----+
4705      :      HXFORM      HEX FORMAT ROUTINE
4706      :
4707      :      THIS ROUTINE WILL ACCEPT A HEX STRING, AND STRIP OUT THE NON-HEX
4708      :      CHARACTERS (WITHOUT FLAGGING AN ERROR FOR THE NON-HEX CHARACTERS).
4709      :      A NULL WILL BE LEFT AS THE END OF STRING DELIMITER.
4710      :
4711      :      INPUT ARGUMENTS  P1- ADDRESS OF THE SOURCE ASCII STRING (NULL
4712      :      :                      DELIMITER AT END OF STRING)
4713      :      :                      P2- ADDRESS OF THE DESTINATION ASCII HEX STRING
4714      :      :                      (STRIPPED OF NON-HEX AND RIGHT JUSTIFIED)
4715      :      :                      P3- THE NUMBER OF HEX CHARACTERS DESIRED @R4
4716      :      :                      P4- WILL CONTAIN THE ADDRESS OF THE LAST
4717      :      :                      CHARACTER IN THE OUTPUT BUFFER.
4718      :      :                      P5- THE SUCCESS/FAILURE (0/-1) INDICATOR
4719      :
4720      :      IMPLICIT OUTPUTS  THE BUFFER AT R4 WILL CONTAIN FORMATTED
4721      :      :                      HEX (ASCII) STRING.
4722      :      CALLING PROCEDURE  CALL HXFORM P1,P2,P3
4723      :      :                      P$POP P4,P5
4724      :      :                      :-----
4725      072412 000000      HXN: .WORD
4726      072414      HXFORM: P$POP R3,R2,HXN      ;ADDRESS OF SOURCE STRING
4727      :                      ;ADDRESS OF DESTINATION STRING
4728      :                      ;NUMBER OF HEX CHARACTERS DESIRED
4729      :
4730      072424 010204      MOV R2,R4      ;DESTINATION ADDRESS, R2: DESTINATION POINTER
4731      072426 063704 072412  ADD HXN,R4      ;POINT TO END OF OUTPUT BUFFER (DESTINATION)
4732      :                      ;DO WHILE NO NULL FOUND IN SOURCE STRING

```

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HXFORM HEX FORMAT ROUTINE

4733	072432	112301		1\$:	MOVB	(R3)+,R1	:GET BYTE IN QUESTION (& POINT TO NEXT BYTE)
4734	072434	142701	000200	2\$:	BICB	#200,R1	:ENSURE HI BIT IS LO (SEVEN BIT ASCII)
4735							:CHECK FOR VALID HEX CHARACTER
4736	072440	001414			BEQ	4\$:THE NULL IS A VALID CHARACTER (BUT THE LAST)
4737	072442	120127	000060		CMPB	R1,#60	:IF GREATER THAN '0' THEN RANGE OK
4738	072446	100413			BMI	6\$:6\$-OUT OF RANGE, BYTE VALUE TOO SMALL
4739	072450	120127	000072		CMPB	R1,#72	:IF BYTE IS LESS THAN 72 AND >=60 THEN RANGE OK
4740	072454	100406			BMI	4\$:RANGE OK IF >=60 AND <72 ELSE, CONTINUE CHECK
4741	072456	120127	000101		CMPB	R1,#101	:BYTE MUST BE >=101 TO CONTINUE CHECK
4742	072462	100405			BMI	6\$:IF BYTE >71 AND <101 THEN BYTE OUT OF RANGE.
4743	072464	122701	000106		CMPB	#106,R1	:BYTE MUST BE <=106 TO BE OK, ELSE: NOT OK.
4744	072470	100402			BMI	6\$:BYTE NOT OK, DON'T PLACE THIS BYTE IN OUTPUT.
4745							:PLACE THE HEX BYTE IN THE OUTPUT BUFFER.
4746	072472	110122		4\$:	MOVB	R1,(R2)+	:BYTE IN RANGE. CONFIRMED. BYTE OK. POINT TO
4747	072474	001405			BEQ	9\$:NEXT BYTE DEST ADDRESS. IF NULL, THEN EXIT.
4748							: (NO ERRORS)
4749							:IF NOT NULL, THEN CHECK FOR BUFFER OVERFLOW.
4750							:R4 POINTS TO LAST CHARACTER POSITION (OUTPUT)
4751	072476	020402		6\$:	CMP	R4,R2	:R2 - PRESENT WRITE ADDRESS
4752	072500	100354			BPL	1\$: (SHOULD BE POSITIVE RESULT OR 0) (MORE TO DO)
4753	072502	012704	177777	7\$:	MOV	#-1,R4	:SET ERROR CONDITION (EXIT WITH ERROR)
4754	072506	000404			BR	11\$:ERROR DETECTED EXIT PATH -> (TOO MANY CHARS)
4755							
4756							:SUCCESSFUL EXIT PATH
4757	072510	005302		9\$:	DEC	R2	:POINT TO THE LAST ACTUAL CHARACTER AT DEST BFR
4758	072512	020402			CMP	R4,R2	:CHECK FOR MINIMUM OF 12 CHARACTERS.
4759	072514	001372			BNE	7\$:BRANCH IF LESS THAN 12, ERROR.
4760	072516	005004			CLR	R4	:INDICATE SUCCESS
4761	072520			11\$:	RETURN	R2,R4	:ADDRESS OF LAST CHARACTER (R2) IS P4
4762							:ERROR INDICATOR (R4) IS P5
4763							
4764							
4765							
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4778							
4779							
4780							
4781							
4782							
4783	072526	000000					
4784	072530	030460	031462	032464	HN:	.WORD	
4785	072536	033466	034470	041101	CMPSTR:	.ASCIZ /0123456789ABCDEF/	
4786	072544	042103	043105	000			
4787		072552					
4788						.EVEN	

HEXBIN

HEX TO BINARY CONVERSION PROCEDURE

THIS PROCEDURE WILL CONVERT A STRING OF HEX (ASCII) CHARACTERS DIRECTLY TO A BINARY STREAM. THE DESTINATION BINARY STREAM WILL REQUIRE ONLY HALF AS MANY BYTES AS THE HEX STRING BECAUSE TWO HEX CHARACTERS ARE REQUIRED TO REPRESENT A SINGLE BINARY BYTE.

INPUTS

P1 - SOURCE STRING ADDRESS (DELIMITTED BY A NULL)
P2 - DESTINATION ADDRESS FOR THE BINARY DATA.
P3 - THE NUMBER OF BINARY BYTES REQUIRED (HALF THE NUMBER OF CHARACTERS AT P1.

OUTPUTS
IMPLIED OUTPUTS

NO EXPLICIT OUTPUTS
THE BUFFER AT P2 WILL CONTAIN THE BINARY STREAM, CONVERTED DIRECTLY FROM THE BUFFER AT P1.

SUBORDINATE PROCEDURES
CALLING PROCEDURE

NONE
CALL HEXBIN P1,P2,P3

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BINHEX BINARY TO HEX CONVERSION PROCEDURE

4845
4846 072672
4847
4848
4849 072702 060137 072670
4850 072706 112103
4851 072710 110304
4852 072712 042703 177760
4853 072716 006204
4854 072720 006204
4855 072722 006204
4856 072724 006204
4857 072726 042704 177760
4858
4859
4860 072732 116422 072650
4861 072736 116322 072650
4862 072742 112722 000055
4863 072746 020137 072670
4864 072752 103755
4865 072754 105042
4866 072756
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4898
4899 072760
4900 072760

```

BINHEX: P$POP R1,LST,R2 ;R1 HAS THE INPUT BUFFER ADDRESS
;LST: HAS THE NUMBER OF BYTES IN INPUT BUFFER
;R2 HAS THE OUTPUT BUFFER ADDRESS
1$: ADD R1,LST ;LST IS NOW ADDRESS OF LAST SOURCE BYTE + 1
MOV B (R1)+,R3 ;GET THE CURRENT BYTE AND POINT TO NEXT BYTE
MOV B R3,R4 ;SEPARATE NIBBLES AND GET CHARACTERS SEPARATELY
BIC #177760,R3 ;ONLY RIGHT BINARY NIBBLE REMAINS IN R3
ASR R4 ;SHIFT OVER FOR LEFT BINARY NIBBLE IN R4
ASR R4
ASR R4
ASR R4
BIC #177760,R4 ;ONLY LEFT BINARY NIBBLE REMAINS IN R4
;R4 IS THE MOST SIGNIFICANT NIBBLE (FIRST)
;R3 IS THE LEAST SIGNIFICANT NIBBLE (SECOND)
MOV B HEXC(R4),(R2)+ ;PUT THE ASCII BYTE INTO THE BUFFER HI POSITION
MOV B HEXC(R3),(R2)+ ;PUT THE ASCII BYTE INTO THE BUFFER LO POSITION
MOV B #'-',(R2)+ ;PUT - BETWEEN HEX PAIRS
CMP R1,LST ;RESULT IS NEGATIVE UNTIL R1=LST
BLO 1$ ;UNTIL R1=LST. (TRANSFER ALL SOURCE BYTES)
CLRB -(R2) ;TERMINATE OUTPUT BUFFER WITH A NULL
RETURN
    
```

.SBTTL BLDLD BUILD LOOP DIRECT DATA BUFFERS FOR TRANSMIT.

```

:---+
: FUNCTIONAL DESCRIPTION:
: THIS SUBROUTINE BUILDS LOOP DIRECT PACKETS FOR TRANSMISSION
: FROM THE UNA. SOURCE ADDRESS, DESTINATION ADDRESS,
: PROT. TYPE, AND LOOP DIRECT HEADER INFO ARE ADDED
: TO THE MESSAGE BUFFER. THE MESSAGE BUFFER IS BUILT
: BY A CALL TO BLDBUF.
:
: INPUTS - P1 - THE ADDRESS OF THE DESTINATION ADDRESS (FROM NODE TABLE)
: IMPLICIT - P$SIZE CONTAINS THE SIZE OF THE MESSAGE BUFFER DATA
: XRGNXT POINTS TO THE NEXT AVAILABLE RING ENTRY
: PHYADR HOLDS THE CURRENT LOCAL UNA PHYSICAL ADDRESS
:
: OUTPUTS - BUILT MESSAGE PACKET.
:
: CALLING PROCEDURE - CALL BLDLD P1
:
: SIDE EFFECTS - THE MESSAGE PACKET IS BUILT AND CONTAINED IN THE
: BUFFER POINTED TO BY XRGNXT WHEN THE ROUTINE WAS ENTERED.
: XRGNXT IS UPDATED TO POINT TO THE NEXT RING ENTRY
:
: REGISTER USAGE - R1 HOLDS ADDRESS OF DESTINATION ADDRESS
: R2 IS A POINTER FOR THE LOOP DIRECT HEADER INFO
: R3 HOLDS THE PACKET LENGTH
: R4 HOLDS ADDRESS OF NEXT RING ENTRY DATA BUFFER
:---+
    
```

```

BLDLD:: P$POP R1 ; PUT ADDRESS OF DEST. ADDRESS IN R1
    
```


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BLDFAS BUILD PACKET FOR FULL ASSIST TRANSMISSION.

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4984
4985
4986
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4990
4991
4992
4993
4994
4995
4996
4997
4998
4999
5000
5001
5002

073242			
073242			
073246	013704	003762	
073252	032764	100000	000004
073260	001140		
073262	016404	000002	
073266	013703	002372	
073272	062703	000060	
073276	010337	050560	
073302	162737	000016	050560
073310	022703	002756	
073314	002527		
073316	010337	050566	
073322	011264	000000	
073326	016264	000002	000002
073334	016264	000004	000004
073342	005064	000006	
073346	005064	000010	
073352	005064	000012	
073356	013764	050544	000014
073364	012764	000000	000016
073372	012764	000002	000020
073400	011164	000022	
073404	016164	000002	000024
073412	016164	000004	000026
073420	012764	000002	000030
073426	011264	000032	
073432	016264	000002	000034

.SBTTL BLDFAS BUILD PACKET FOR FULL ASSIST TRANSMISSION.

```

--+
FUNCTIONAL DESCRIPTION:
    THIS SUBROUTINE BUILDS FULL ASSIST PACKETS FOR TRANSMISSION
    FROM THE UNA. SOURCE ADDRESS, DESTINATION ADDRESS, PROT. TYPE
    AND FULL ASSIST HEADER INFO ARE ADDED TO THE MESSAGE BUFFER.
    THE MESSAGE BUFFER IS BUILT BY A CALL TO BLDBUF.

INPUTS -
    P1 - THE ADDRESS OF THE DESTINATION ADDRESS (FROM NODE TABLE)
    IMPLICIT - P$SIZE CONTAINS THE SIZE OF THE MESSAGE BUFFER DATA
    XRGXNT POINTS TO THE NEXT AVAILABLE RING ENTRY
    PHYADR HOLDS THE CURRENT LOCAL NODE ADDRESS

OUTPUTS -
    THE BUILT BUFFER

CALLING PROCEDURE - CALL BLDFAS P1

SIDE EFFECTS - XRGXNT SI UPDATED TO POINT TO THE NEXT RING ENTRY

REGISTER USAGE - R1 HOLDS ADDRESS OF TARGET NODE ADDRESS
                  R2 HOLDS ADDRESS OF ASSIST NODE ADDRESS
                  R3 HOLDS THE PACKET LENGTH
                  R4 HOLDS ADDRESS OF NEXT RING ENTRY DATA BUFFER
--+
```

```

BLDFAS::
    P$POP    R1,R2
    MOV      XRGXNT,R4
    BIT      #OWN,4(R4)
    BNE      40$
    MOV      2(R4),R4
    MOV      P$SIZE,R3
    ADD      #60,R3
    MOV      R3,XFER
    SUB      #16,XFER
    CMP      #XPKLEN,R3
    BLT      45$
    MOV      R3,BUFLEN
    MOV      (R2),DESTIN(R4)
    MOV      2(R2),DESTIN+2(R4)
    MOV      4(R2),DESTIN+4(R4)
    CLR      SOURCC(R4)
    CLR      SOURCC+2(R4)
    CLR      SOURCC+4(R4)
    MOV      PROTO,PROTOT(R4)
    MOV      #0,FASKIP(R4)
    MOV      #2,FAFCT1(R4)
    MOV      (R1),FAADR1(R4)
    MOV      2(R1),FAADR1+2(R4)
    MOV      4(R1),FAADR1+4(R4)
    MOV      #2,FAFCT2(R4)
    MOV      (R2),FAADR2(R4)
    MOV      2(R2),FAADR2+2(R4)
    ; PUT ADDRESS OF TARGET ADDRESS INTO R1
    ; AND ADDRESS OF ASSIST ADDRESS INTO R2
    ; MOVE NEXT PACKET ADDRESS TO R4
    ; CHECK OWNERSHIP BIT
    ; IF DON'T OWN, BOOKKEEPING ERROR,
    ; POINT R4 TO DATA BLOCK
    ; PUT MESSAGE SIZE INTO R3
    ; ADD HEADER INFO TO LENGTH
    ; PUT 'BYTES TRANSFERED' INTO WORD
    ; AND CORRECT FOR HEADER
    ; SEE IF LONGER THAN ONE PACKET
    ; IF YES, ERROR
    ; PUT PACKET LENGTH IN BUFLN
    ; MOVE FIRST TWO BYTES OF ADDRESS
    ; MOVE BYTES THREE AND FOUR
    ; MOVE BYTES FIVE AND SIX
    ; LEAVE BLANK SPACE FOR SOURCE ADDRESS
    ; SIX BYTES WORTH
    ; MOVE PROTOCALL TYPE INTO HEADER
    ; SKIP COUNT
    ; FUNCTION CODE (FORWARD)
    ; TARGET NODE ADDRESS
    ; SIX BYTES
    ; FUNCTION CODE (FORWARD)
    ; ASSIST NODE ADDRESS
    ; SIX BYTES
```

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BLDFAS BUILD PACKET FOR FULL ASSIST TRANSMISSION.

5003	073440	016264	000004	000036	MOV	4(R2),FAADR2+4(R4)	:		
5004	073446	012764	000002	000040	MOV	#2,FAFCT3(R4)	:	FUNCTION CODE (FORWARD)	
5005	073454	013764	047762	000042	MOV	PHYADR,FAADR3(R4)	:	LOCAL NODE ADDRESS	
5006	073462	013764	047764	000044	MOV	PHYADR+2,FAADR3+2(R4)	:	SIX BYTES	
5007	073470	013764	047766	000046	MOV	PHYADR+4,FAADR3+4(R4)	:		
5008	073476	012764	000001	000050	MOV	#1,FAFCT4(R4)	:	FUNCTION CODE (REPLY)	
5009	073504	013764	047762	000052	MOV	PHYADR,FAADR4(R4)	:	LOCAL NODE ADDRESS	
5010	073512	013764	047764	000054	MOV	PHYADR+2,FAADR4+2(R4)	:	SIX BYTES	
5011	073520	013764	047766	000056	MOV	PHYADR+4,FAADR4+4(R4)	:		
5012	073526	062704	000060		ADD	#FAADR4+6,R4	:	POINT R4 TO FIRST DATA BYTE	
5013	073532	010437	050570		MOV	R4,CMPBUF	:	STORE BUFFER LOCATION FOR DATA COMPARE	
5014	073536				CALL	BLDBUF R4	:	BUILD DATA BUFFER	
5015	073546				CALL	GETXNX #XRGNXT	:	UPDATE POINTER TO NEXT RING ENTRY	
5016	073560	000411			BR	50\$:	EXIT	
5017	073562				ERRDF	40\$: 28,MSG10,ERR1	:	TRANSMIT RING BOOKKEEPING ERROR	
5018	073562	104455					:	TRAP	C\$ERDF
5019	073564	000034					:	.WORD	28
5020	073566	064656					:	.WORD	MSG10
5021	073570	067460					:	.WORD	ERR1
5022	073572	000404					:		
5023	073574				BR	50\$:	EXIT	
5024	073574	104455			ERRDF	45\$: 29,MSG14,ERR1	:	MESSAGE SIZE TOO BIG	
5025	073576	000035					:	TRAP	C\$ERDF
5026	073600	064755					:	.WORD	29
5027	073602	067460					:	.WORD	MSG14
5028	073604						:	.WORD	ERR1
5029					50\$:	RETURN	:		

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BLDAST BUILD TRANSMIT AND RECEIVE ASSIST PACKETS

```

5030 .SBTTL BLDAST BUILD TRANSMIT AND RECEIVE ASSIST PACKETS
5031
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5033 073606
5034 073606
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5036 073612 013704 003762
5037 073616 032764 100000 000004
5038 073624 001125
5039 073626 016404 000002
5040 073632 013703 002372
5041 073636 062703 000050
5042 073642 010337 050560
5043 073646 162737 000016 050560
5044 073654 022703 002756
5045 073660 002514
5046 073662 010337 050566
5047 073666 011164 000000
5048 073672 016164 000002 000002
5049 073700 016164 000004 000004
5050 073706 005064 000006
5051 073712 005064 000010
5052 073716 005064 000012
5053 073722 013764 050544 000014
5054 073730 012764 000000 000016
5055 073736 012764 000002 000020
5056 073744 011264 000022
5057 073750 016264 000002 000024
5058 073756 016264 000004 000026
5059 073764 012764 000002 000030
5060 073772 013764 047762 000032
5061 074000 013764 047764 000034
5062 074006 013764 047766 000036
5063 074014 012764 000001 000040
5064 074022 013764 047762 000042
5065 074030 013764 047764 000044
5066 074036 013764 047766 000046
5067 074044 062704 000050
5068 074050 010437 050570
5069 074054
5070 074064
5071 074076 000411
5072 074100 40$:
5073 074100 104455
5074 074102 000043
5075 074104 064656
5076 074106 067460
5077 074110 000404
5078 074112 45$:
5079 074112 104455
5080 074114 000044
5081 074116 064755
5082 074120 067460
5083 074122 50$:
5084
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```

```

BLDAST::
P$POP R1,R2
MOV XRG NXT,R4
BIT #OWN,4(R4)
BNE 40$
MOV 2(R4),R4
MOV P$SIZE,R3
ADD #50,R3
MOV R3,XFER
SUB #16,XFER
CMP #XPKLEN,R3
BLT 45$
MOV R3,BUFLEN
MOV (R1),DESTIN(R4)
MOV 2(R1),DESTIN+2(R4)
MOV 4(R1),DESTIN+4(R4)
CLR SOURCC(R4)
CLR SOURCC+2(R4)
CLR SOURCC+4(R4)
MOV PROT00,PROTOT(R4)
MOV #0,FASKIP(R4)
MOV #2,FAFCT1(R4)
MOV (R2),FAADR1(R4)
MOV 2(R2),FAADR1+2(R4)
MOV 4(R2),FAADR1+4(R4)
MOV #2,FAFCT2(R4)
MOV PHYADR,FAADR2(R4)
MOV PHYADR+2,FAADR2+2(R4)
MOV PHYADR+4,FAADR2+4(R4)
MOV #1,FAFCT3(R4)
MOV PHYADR,FAADR3(R4)
MOV PHYADR+2,FAADR3+2(R4)
MOV PHYADR+4,FAADR3+4(R4)
ADD #FAADR3+6,R4
MOV R4,CMPBUF
CALL BLDBUF R4
CALL GETXNX #XRG NXT
BR 50$
ERRDF 35,MSG10,ERR1
BR 50$
ERRDF 36,MSG14,ERR1
RETURN

```

```

: PUT DESTINATION ADDRESS INTO R1
: ASSIST ADDRESS INTO R2
: MOVE NEXT PACKET ADDRESS TO R4
: CHECK OWNERSHIP BIT
: IF DON'T OWN, BOOKKEEPING ERROR
: POINT R4 TO DATA BLOCK
: PUT MESSAGE SIZE INTO R3
: ADD HEADER INFO INTO LENGTH
: PUT 'BYTES TRANSFERED' INTO WORD
: AND CORRECT FOR HEADER
: SEE IF LONGER THAN ONE PACKET
: IF YES, ERROR
: PUT PACKET LENGTH INTO BUFLN
: MOVE DESTINATION ADDRESS INTO HEADER
: SIX BYTES WORTH
: LEAVE BLANK SPACE FOR SOURCE ADDRESS
: SIX BYTES WORTH
: MOVE PROTOCOL TYPE INTO HEADER
: SKIP COUNT
: FUNCTION CODE (FORWARD)
: TARGET NODE ADDRESS
: SIX BYTES
: FUNCTION CODE (FORWARD)
: LOCAL NODE ADDRESS
: SIX BYTES WORTH
: FUNCTION CODE (REPLY)
: LOCAL NODE ADDRESS
: POINT R4 TO FIRST DATA BYTE
: STORE BUFFER LOCATION FOR DATA COMPARE
: BUILD DATA BUFFER
: UPDATE RING POINTER
: TRANSMIT RING BOOKKEEPING ERROR
TRAP C$ERDF
.WORD 35
.WORD MSG10
.WORD ERR1
: MESSAGE SIZE TOO BIG ERROR
TRAP C$ERDF
.WORD 36
.WORD MSG14
.WORD ERR1

```

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BLDREQ BUILD REQUEST ID PACKETS FOR TRANSMIT.

.SBTTL BLDREQ BUILD REQUEST ID PACKETS FOR TRANSMIT.

```

:--+
: FUNCTIONAL DESCRIPTION:
: THIS SUBROUTINE BUILDS REQUEST ID PACKETS FOR TRANSMISSION
: FROM THE UNA. SOURCE ADDRESS, DESTINATION ADDRESS,
: PROTOCOL TYPE, SEQUENCE NUMBER AND REQUEST ID
: HEADER INFO ARE BUILT IN THIS SUBROUTINE.

```

```

: INPUTS - IMPLICIT - THE DESTINATION ADDRESS IS CONTAINED IN ADRBUF.

```

```

: OUTPUTS - BUILT MESSAGE PACKET

```

```

: CALLING PROCEDURE - CALL BLDREQ

```

```

: SIDE EFFECTS - THE MESSAGE PACKET IS BUILT AND CONTAINED IN THE
: BUFFER POINTED TO BY XRGXNT WHEN THE ROUTINE WAS
: ENTERED. XRGXNT IS UPDATED TO POINT TO THE NEXT ENTRY.

```

```

: REGISTER USAGE - R1 HOLDS ADDRESS OF DESTINATION ADDRESS.
: R2 IS A POINTER FOR REQUEST ID HEADER INFO.
: R4 HOLDS ADDRESS OF NEXT RING ENTRY DATA BUFFER.

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074124
074124 013704 003762
074130 032764 100000 000004
074136 001044
074140 016404 000002
074144 012737 000100 050566
074152 012701 002314
074156 012164 000000
074162 012164 000002
074166 011164 000004
074172 005064 000006
074176 005064 000010
074202 005064 000012
074206 013764 050546 000014
074214 012702 050712
074220 012264 000016
074224 012264 000020
074230 011264 000022
074234
074246 000404
074250
074250 104455
074252 000025
074254 064656
074256 067460
074260

```

```

BLDREQ::
MOV XRGXNT,R4 ; MOVE NEXT PACKET ADDRESS TO R4
BIT #OWN,4(R4) ; CHECK OWNERSHIP BIT
BNE 40$ ; IF DON'T OWN, BOOKKEEPING ERROR
MOV 2(R4),R4 ; POINT R4 TO DATA BLOCK
MOV #100,BUFLEN ; MOVE BUFFER SIZE TO BUFLEN
MOV #ADRFUF,R1 ; MOVE ADDRESS OF DEST. ADR. TO R1
MOV (R1)+,DESTIN(R4) ; MOVE FIRST TWO BYTE OF DEST. ADR.
MOV (R1)+,DESTIN+2(R4) ; AND BYTES THREE AND FOUR
MOV (R1),DESTIN+4(R4) ; AND LAST TWO BYTES
CLR SOURCC(R4) ; LEAVE BLANK SPACE FOR SOURCE ADDR.
CLR SOURCC+2(R4) ; SIX BYTES WORTH
CLR SOURCC+4(R4)
MOV PROT02,PROTOT(R4) ; MOVE PROTOCOL TYPE INTO HEADER
MOV #REQID,R2 ; MOVE REQUEST ID HEADER LOC. TO R2
MOV (R2)+,HEADER(R4) ; BYTE COUNT
MOV (R2)+,HEADER+2(R4) ; FUNCTION CODE (REQUEST ID)
MOV (R2),HEADER+4(R4) ; RECEIPT NO.
CALL GETXNX #XRGXNT ; UPDATE POINTER TO NEXT RING ENTRY
BR 50$ ; EXIT
40$: ERRDF 21,MSG10,ERR1 ; TRANSMIT RING BOOKKEEPING ERROR
TRAP C$ERDF
.WORD 21
.WORD MSG10
.WORD ERR1
50$: RETURN

```

.SBTTL GET?NX GET NEXT TRANSMIT OR RECIEVE RING ENTRY

```

:--+

```

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GET?NX GET NEXT TRANSMIT OR RECIEVE RING ENTRY

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074262
074262 013701 003754
074266 013702 003770
074272 000404

074274
074274 013701 003752
074300 013702 003766
074304
074306 021302
074310 001403
074312 062713 000012
074316 000401
074320 010113
074322

```

: FUNCTIONAL DESCRIPTION
: THIS SUBROUTINE GETS THE NEXT TRANSMIT OR RECIEVE RING
: ENTRY. IT IS ENTERED AT SEPERATE POINTS DEPENDING ON
: WHICH RING IS BEING USED.
:
: INPUTS - P1 - THE ADDRESS OF THE RING POINTER TO BE UPDATED.
:
: OUTPUTS - THE RING POINTER IS UPDATED TO POINT TO THE NEXT AVAILABLE
: ENTRY.
:
: CALLING PROCEDURE - CALL GETXNX #P1 ; FOR TRANSMIT UPDATES
: CALL GETRXN #P1 ; FOR RECIEVE UPDATES
:
: SIDE EFFECTS - NONE
:
: REGISTER USAGE - R1 POINTS TO THE FIRST ENTRY IN THE RING
: R2 POINTS TO THE LAST ENTRY IN THE RING
: R3 IS THE ADDRESS OF THE RING POINTER TO BE UPDATED
:
:--+
GETRXN::
MOV RRGSR,R1 ; MOVE FIRST RING ENTRY TO R1
MOV RRGLST,R2 ; MOVE LAST RING ENTRY TO R2
BR GETCOM ; GO TO COMMON CODE

GETXNX::
MOV XRGSR,R1 ; MOVE FIRST RING ENTRY TO R1
MOV XRGLST,R2 ; MOVE LAST RING ENTRY TO R2
GETCOM: P$POP R3 ; GET ADDRESS OF RING POINTER IN R3
CMP (R3),R2 ; SEE IF POINTER POINTS TO LAST RING
BEQ 15$ ; IF YES, BRANCH
ADD #10.,(R3) ; ELSE, ADD ENTRY LENGTH TO POINTER
BR 25$ ; EXIT
15$: MOV R1,(R3) ; POINT POINTER TO FIRST ENTRY IN RING
25$: RETURN

```

.SBTTL BLDBUF BUILD MESSAGE BUFFERS

```

:--+
: FUNCTIONAL DESCRIPTION
: THIS SUBROUTINE CREATES A MESSAGE BUFFER TO BE USED
: FOR TRANSMISSION.
:
: INPUTS - P1 - BUFFER LOCATION TO PUT BUILT MESSAGE
: IMPLICIT - P$SIZE CONTAINS THE SIZE THE BUFFER IS TO BE
: P$TYPE CONTAINS THE MESSAGE TYPE
:
: OUTPUTS - IMPLICIT - BUFFER STARTING AT LOCATION P1 CONTAINS A
: MESSAGE P$SIZE BYTES LONG USING THE MESSAGE
: TYPE SPECIFIED BY P$TYPE.
:
: CALLING PROCEEDURE - CALL BLDBUF P1
:
: SIDE EFFECTS - NONE

```

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BLDBUF BUILD MESSAGE BUFFERS

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074324
074324
074326 013702 002370
074332 006302
074334 013704 002372
074340 060304
074342 016201 003316
074346 005037 050542
074352 005237 050542
074356 112123
074360 026237 003300 050542
074366 001004
074370 016201 003316
074374 005037 050542
074400 020304
074402 001363
074404

```

: REGISTER USAGE - R1 POINTS TO THE NEXT BYTE OF STORED MESSAGE TO BE BUILT
: IN THE MESSAGE BUFFER.
: R2 = (MESSAGE TYPE X 2), USED AS OFFSET FOR POINTERS
: R3 POINTS TO THE NEXT BYTE OF THE BUFFER UNDER CONSTRUCTION
: R4 POINTS TO THE LAST BYTE OF THE BUFFER UNDER CONSTRUCTION
:
:---+

```

```

BLDBUF ::
      P$POP      R3          : PUT BUFFER ADDRESS INTO R3
      MOV        P$TYPE,R2  : PUT MESSAGE TYPE INTO R2
      ASL        R2          : MULTIPLY BY 2
      MOV        P$SIZE,R4  : PUT SIZE INTO R4
      ADD        R3,R4      : MAKE R4 = LAST BYTE OF BUFFER
      MOV        MSGAD(R2),R1 : POINT R1 TO FIRST BYTE OF STORED MESSAGE
      CLR        COUNT      : CLEAR BYTE COUNTER
10$:  INC        COUNT      : COUNT NO. OF BYTES COPIED
      MOVB       (R1)+,(R3)+ : PUT BYTE IN BUFFER
      CMP        MSGCNT(R2),COUNT : ARE WE AT END OF STORED MESSAGE
      BNE        20$        : IF NO, CHECK IF DONE
      MOV        MSGAD(R2),R1 : ELSE, POINT R1 TO BEGINING
      CLR        COUNT      : AND CLEAR COUNTER
20$:  CMP        R3,R4      : IS BUFFER FILLED?
      BNE        10$        : IF NO, LOOP
      RETURN              : ELSE, RETURN

```

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BLDBUF BUILD MESSAGE BUFFERS

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074406
074406

074414 005004
074416 005037 050550

074422 005204
074424 121213
074426 001421
074430 005237 050550
074434 022737 000005 050550
074442 002413
074444 011346
074446 011246
074450 010446
074452 012746 066754
074456 012746 000004
074462 010600
074464 104415
074466 062706 000012
074472 005202
074474 005203
074476 005301
074500 001350
074502 022737 000000 050550
074510 001412

.SBTTL DATCMP COMPARE DATA BUFFERS

```

---+
: FUNCTIONAL DESCRIPTION
: THIS SUBROUTINE COMPARES TWO DATA BUFFERS BYTE BY BYTE.
: IF COMPARISON ERRORS OCCURED, LOCATION, EXPECTED DATA
: AND RECIEVED DATA ARE PRINTED OUT FOR THE FIRST FIVE
: ERRORS. THE TOTAL NUMBER OF ERRORS IS ALSO PRINTED.
:
: INPUTS - P1 - THE SIZE (IN BYTES) OF THE BUFFER TO BE COMPARED.
: P2 - THE ADDRESS OF BUFFER 1 COMPARE OTHER BUFFER AGAINST.
: P3 - THE ADDRESS OF THE SECOND BUFFER.
:
: OUTPUTS - P4 - THE NUMBER OF COMPARISON ERRORS.
:
: CALLING PROCEDURE - CALL DATCMP P1,P2,P3
: P$POP P4
:
: SIDE EFFECTS - NONE.
:
: REGISTER USAGE - R1 CONTAINS THE COMPARE SIZE
: R2 CONTAINS THE ADDRESS OF THE BYTE BEING COMPARED IN BUFFER 1
: R3 CONTAINS THE ADDRESS OF THE BYTE BEING COMPARED IN BUFFER 2
: R4 CONTAINS THE BYTE OFFSET (BYTES FROM BEGINING OF BUFFER
---+

```

```

DATCMP::
P$POP R1,R2,R3          : PUT COMPARE SIZE IN R1
                        : BUFFER 1 ADDRESS IN R2 AND
                        : BUFFER 2 ADDRESS IN R3
                        : INITIALIZE BYTE OFFSET
                        : AND ERROR COUNTER
                        :
10$: INC R4              : INCREMENT OFFSET COUNTER
      CMPB (R2),(R3)     : COMPARE BUFFERS
      BEQ 20$           : IF SAME, BRANCH
      INC TEMP          : INCREMENT ERROR COUNTER
      CMP #5,TEMP       : IF MORE THAN 5 ERRORS,
      BLT 20$           : DON'T PRINT MESSAGE
      PRINTX #CMPER1,R4,(R2),(R3) : PRINT ERROR MESSAGE
                        :
                        : MOV (R3),-(SP)
                        : MOV (R2),-(SP)
                        : MOV R4, -(SP)
                        : MOV #CMPER1, -(SP)
                        : MOV #4, -(SP)
                        : MOV SP,R0
                        : TRAP C$PNTX
                        : ADD #12,SP
                        :
20$: INC R2              : INCREMENT BUFFER 1 POINTER
      INC R3              : INCREMENT BUFFER 2 POINTER
      DEC R1              : DECREMENT COMPARE SIZE
      BNE 10$            : IF NOT FINISHED, GO BACK FOR MORE
      CMP #0,TEMP        : WERE THERE ANY ERRORS?
      BEQ 30$            : IF NO, EXIT
30$:

```

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DATCMP COMPARE DATA BUFFERS

5281 074512
5282 074512 013746 050550
5283 074516 012746 067051
5284 074522 012746 000002
5285 074526 010600
5286 074530 104415
5287 074532 062706 000006
5288 074536

PRINTX #CMPE2,TEMP

MOV TEMP,-(SP)
MOV #CMPE2,-(SP)
MOV #2,-(SP)
MOV SP,R0
TRAP C\$PNTX
ADD #6,SP

30\$: RETURN TEMP ; RETURN WITH ERROR COUNT ON STACK

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5301
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.SBTTL WRITES WRITE DATA ONTO SUMMARY TABLE

---+
: FUNCTIONAL DESCRIPTION:
: THIS SUBROUTINE UPDATES THE SUMMARY TABLE DATA FOR
: THE NODES SPECIFIED IN THE CALL STATEMENT. EITHER ONE
: OR TWO NODES CAN UPDATED PER CALL. AFTER THE CALL,
: THE SUMMARY DATA COUNTERS ARE CLEARED. THE SUMMARY TABLE
: IS CHECKED FOR A MATCHING NODE ADDRESS AND UPDATES THE
: DATE FOR THAT NODE, OR ADDS THE NODE TO THE TABLE IF IT
: DOESN'T EXIT. AN ERROR IS REPORTED IF THE END OF THE TABLE
: IS REACHED.

: INPUTS - P1 - THE NUMBER OF NODES TO UPDATE (1 OR 2).
: P2 - THE ADDRESS OF THE FIRST NODE ADDRESS.
: P3 - THE ADDRESS OF THE SECOND NODE ADDRESS IF P1 = 2 OR
: BLANK IF P1 = 1.

: OUTPUTS - THE SUMMARY TABLE IS UPDATED.

: CALLING PROCEDURE - CALL WRITES P1,P2(,P3)

: SIDE EFFECTS - THE SUMMARY COUNTERS ARE CLEARED.

: REGISTER USAGE - R1 POINTS TO THE CURRENT LOCATION IN THE SUMMARY TABLE.
: R2 POINTS TO THE NODE TO BE UPDATED'S ADDRESS.
: R3 IS SCRATCH
: R4 HOLDS THE SECOND NODE TO BE UPDATED ADDRESS.

---+

5322 074544
5323 074550 023727 050550 000001
5324 074556 001002
5325 074560
5326 074562 000402
5327 074564
5328 074570 012701 002656
5329 074574 005711
5330 074576 001415
5331 074600 021127 177777
5332 074604 001454
5333 074606
5334 074620
5335 074622 001412
5336 074624 062701 000026

WRITES: P\$POP TEMP ; SEE HOW MANY NODES TO WRITE
CMP TEMP,#1 ; IF ONLY ONE, GET ADDRESS
BNE 5\$
P\$POP R2
BR 6\$
5\$: P\$POP R2,R4 ; IF TWO, GET BOTH ADDRESSES
6\$: MOV #STATBL,R1 ; MOVE STATISTICAL TABLE ADDRESS INTO R1
7\$: TST (R1) ; SEE IF SLOT IS EMPTY
BEQ 15\$; IF YES, BR
CMP (R1),#-1 ; SEE IF TABLE FULL
BEQ 25\$; IF YES, ERROR
CALL CMPADR R1,R2 ; LOOK FOR MATCHING ADDRESS
P\$POP R3
BEQ 20\$; IF YES, BR
ADD #26,R1 ; ELSE, POINT R1 TO NEXT ENTRY

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WRITES WRITE DATA ONTO SUMMARY TABLE

```

5337 074630 000761          BR      7$          : AND CHECK AGAIN
5338 074632 011211          MOV     (R2), (R1)  : ADD NEW ADDRESS TO TABLE
5339 074634 016261 000002 000002 15$: MOV     2(R2), 2(R1) : SIX BYTES WORTH
5340 074642 016261 000004 000004      MOV     4(R2), 4(R1)
5341 074650 062701 000006          20$: ADD     #6, R1      : POINT R1 TO DATA
5342 074654 063721 050500          ADD     S.NREC, (R1)+ : UPDATE SUMMARY DATA, RECEIVES NOT COMPLETE
5343 074660 063721 050476          ADD     S.REC, (R1)+  : RECEIVES COMPLETE
5344 074664 063721 050502          ADD     S.LEN, (R1)+  : LENGTH ERRORS
5345 074670 063721 050504          ADD     S.COMP, (R1)+ : COMPARE ERRORS
5346 074674 063721 050506          ADD     S.BYTE, (R1)+ : BYTES COMPARED
5347 074700 103001          BCC     22$          : IF OVERFLOW, INCREMENT NEXT WORD
5348 074702 005511          ADC     (R1)
5349 074704 062701 000002 22$: ADD     #2, R1      : POINT R1 TO NEXT DATA
5350 074710 063721 050510          ADD     S.XFER, (R1)+ : BYTES TRANSFERED
5351 074714 103001          BCC     23$          : IF OVERFLOW, INCREMENT NEXT WORD
5352 074716 005511          ADC     (R1)
5353 074720 062701 000002 23$: ADD     #2, R1      : POINT R1 TO NEXT DATA
5354 074724 005337 050550          DEC     TEMP        : DECR NO OF NODES COUNTER
5355 074730 001414          BEQ     30$          : IF NO MORE, EXIT
5356 074732 010402          MOV     R4, R2      : POINT R2 TO NEXT NODE
5357 074734 000715          BR      6$          : AND UPDATE SUMMARY DATA
5358 074736          25$: PRINTF #TABFUL, #SUMM : PRINT TABLE FULL MESSAGE
5359 074736 012746 053706          MOV     #SUMM, -(SP)
5360 074742 012746 053560          MOV     #TABFUL, -(SP)
5361 074746 012746 000002          MOV     #2, -(SP)
5362 074752 010600          MOV     SP, R0
5363 074754 104417          TRAP   C$PNTF
5364 074756 062706 000006          ADD     #6, SP
5365 074762 005037 050500 30$: CLR     S.NREC      : CLEAR SUMMARY DATA COUNTERS
5366 074766 005037 050476          CLR     S.REC
5367 074772 005037 050502          CLR     S.LEN
5368 074776 005037 050504          CLR     S.COMP
5369 075002 005037 050506          CLR     S.BYTE
5370 075006 005037 050510          CLR     S.XFER
5371 075012          RETURN
5372

```

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WRITES WRITE DATA ONTO SUMMARY TABLE

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075014
075014
075016 010546
075020 010102
075022 062702 000002
075026 012703 075200
075032 012704 075130
075036 012705 075132
075042 012737 000012 075116
075050 005037 075214
075054 161411
075056 005612
075060 161512
075062 002403
075064 005237 075214
075070 000771
075072 062411
075074 005512
075076 062412
075100 022525
075102 052737 000060 075214
075110 113723 075214
075114 005327
075116 000000
075120 001353
075122 105023
075124 012605
075126
075130 145000
075132 035632
075134 160400
075136 002765

.SBTTL BINDEC CONVERT A 32 BIT BINARY NUMBER TO DECIMAL

```

:--+
: FUNCTIONAL DESCRIPTION:
: THIS SUBROUTINE CONVERTS A 32 BIT BINARY NUMBER TO
: A DECIMAL NUMBER REPRESENTED AS AN ASCIZ STRING.
:
: INPUTS - P1 - THE ADDRESS OF THE FIRST WORD OF BINARY DATA
:          BITS 0-15. THE SECOND WORD, BITS 16-31, IS
:          EXPECTED TO IMMEDIATELY FOLLOW THE FIRST WORD.
:
: OUTPUTS - THE ASCII STRING WILL BE LOCATED STARTING AT DECSTR
:
: SIDE EFFECTS - NONE
:
: REGISTER USAGE - R1 POINTS TO BITS 0-15 OF BINARY DATA
:                  R2 POINTS TO BITS 16-31 OF BINARY DATA
:                  R3 POINTS TO THE OUTPUT STRING
:                  R4 POINTS TO THE POWERS OF 10 TABLE
:--+
```

```

BINDEC::
P$POP R1 ; PUT ADDRESS OF BINARY WORD INTO R1
MOV R5, -(SP)
MOV R1, R2 ; PUT ADDRESS OF SECOND WORD INTO R2
ADD #2, R2
MOV #DECSTR, R3 ; PUT ADDRESS OF OUPUT STRING INTO R3
MOV #TENPWR, R4 ; ADDRESS OF TEN POWER TABLE
MOV #TENPWR+2, R5
MOV #10, 4$
1$: CLR PART ; CLEAR PARTIAL COUNTER
2$: SUB (R4), (R1) ; SUBTRACT 10 POWER
SBC (R2)
SUB (R5), (R2)
BLT 3$ ; BRANCH IF 10 POWER TOO LARGE
INC PART ; ELSE ADD 1 TO PARTIAL
BR 2$ ; LOOP
3$: ADD (R4)+, (R1) ; RESTORE BINARY WORDS
ADC (R2) ; AND POINT R4 TO NEXT TABLE ENTRIES
ADD (R4)+, (R2)
CMP (R5)+, (R5)+
BIS #'0, PART ; CHANGE PARTIAL TO ASCII
MOVB PART, (R3)+ ; AND PUT INTO OUTPUT STRING
DEC (PC)+ ; HAVE WE DONE ALL 10 DIGITS
4$: .WORD 0
BNE 1$ ; IF NO, BRANCH
CLRB (R3)+ ; IF YES, TERMINATE WITH ZERO
MOV (SP)+, R5
RETURN

TENPWR: 145000 ; 1.0 E09
        35632
        160400 ; 1.0 E08
        2765
```


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BINDEC CONVERT A 32 BIT BINARY NUMBER TO DECIMAL

5429	075140	113200	113200	: 1.0 E07
5430	075142	000230	230	
5431	075144	041100	041100	: 1.0 E06
5432	075146	000017	17	
5433	075150	103240	103240	: 1.0 E05
5434	075152	000001	1	
5435	075154	023420	23420	: 1.0 E04
5436	075156	000000	0	
5437	075160	001750	1750	: 1.0 E03
5438	075162	000000	0	
5439	075164	000144	144	: 1.0 E02
5440	075166	000000	0	
5441	075170	000012	12	: 1.0 E01
5442	075172	000000	0	
5443	075174	000001	1	: 1.0 E00
5444	075176	000000	0	

5445
5446 075200 000014
5447 075214 000000
5448

DECSTR:: .BLKB 12.
PART:: .WORD 0

: 12 BYTES FOR ASCIZ OUTPUT STRING
: PARTIAL COUNTER

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COMMAND LINE TRAVERSE ROUTINES

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5505 075334 062703 000004          ADD    #4,R3          ; ACTION CODE IN CLI NODE, THEN
5506                                ; ADJUST PTR TO NEXT CLI NODE
5507 075340 000732          BR     P$TR5
5508
5509 075342 000207          P$EXIT: RTS    PC          ;RETURN FROM PARSER
5510
5511                                ;-----
5512                                ;GOTO USER ACTION ROUTINE
5513                                TRVACT: MOV    1(R3),R2          ;GET ACTION CODE FROM CLI NODE
5514 075344 116302 000001          BIC    #177400,R2        ;CLEAR ANY SIGN EXTENSION
5515 075350 042702 177400          MOV    P$ACT,R1         ;GET ADDRESS OF CLI ACTION ROUTINE
5516 075354 013701 003150          JSR    PC,(R1)          ;DO ACTION DEFINED BY CODE
5517 075360 004711          RTS    PC              ;RETURN TO CALLING CODE
5518 075362 000207
5519
5520                                ;TAKE BRANCH IN TREE
5521 075364 016301 000002          TRVBRC: MOV 2(R3),R1        ;GET BRANCH DISPLACEMENT FROM TREE
5522 075370 060103          ADD    R1,R3           ; AND POINT R3 TO THE 'MISS' NODE
5523 075372 000207          RTS    PC              ; RETURN TO P$TRV
5524
5525                                ;NO BRANCH TAKEN
5526 075374 062703 000004          TRVNOB: ADD #4,R3         ;THINGS OK, UPDATE R3 TO POINT TO NEXT
5527 075400 000207          RTS    PC              ; NODE AND RETURN TO P$TRV
5528
5529                                ;-----
5530                                ;ERROR HANDLING
5531 075402 004737 075344          TRVERR: JSR PC,TRVACT      ;TAKE ERROR ACTION
5532 075406 112737 177777 003161  MOV    #-1,P$GDBD        ;SET ERROR RETURN FLAG
5533 075414 005726          TST    (SP)+            ;GET RID OF "JSR PUSH TO TRVERR"
5534 075416 000137 075342          JMP    P$EXIT          ;RETURN DIRECT TO EXIT OF P$TRV ROUTINE
5535
5536                                ;EXIT ACTION CODE
5537 075422 004737 075344          TRVEXI: JSR PC,TRVACT      ;TAKE EXIT ACTION
5538 075426 105037 003161          CLRB  P$GDBD           ;SET GOOD/BAD FLAG TO "SUCCESS (0)"
5539 075432 005726          TST    (SP)+            ;GET RID OF "JSR PUSH TO TRVEXI"
5540 075434 000137 075342          JMP    P$EXIT          ;RETURN DIRECT TO EXIT OF P$TRV ROUTINE
5541
5542                                ;BRANCH ACTION CODE
5543 075440 004737 075344          TRVBR: JSR PC,TRVACT      ;GO TAKE BRANCH ACTION
5544 075444 000137 075364          JMP    TRVBRC
5545
5546                                ;BRANCH-IF ACTION CODE
5547 075450 004737 075344          TRVBIF: JSR PC,TRVACT
5548 075454 105737 003161          TSTB  P$GDBD           ;SEE IF P$GDBD SET OR CLEARED BY ACTION
5549 075460 001402          BEQ    1$              ;IF CLEAR FALL THRU TO NEXT NODE
5550 075462 000137 075364          JMP    TRVBRC          ;ELSE TAKE THE 'MISS' BRANCH
5551 075466 000137 075374          1$:   JMP    TRVNOB     ;JUST UPDATE TO NEXT NODE IF THINGS OK
5552
5553                                ;SPACE ACTION CODE
5554 075472 005001          TRVSPA: CLR    R1         ;CLEAR "SPACE OR TAB FOUND" FLAG
5555 075474 121427 000011          1$:   CMPB   (R4),#11     ;SEE IF CHAR. IN CMD LINE= TAB
5556 075500 001003          BNE    2$              ;BR IF NO, NOT A TAB
5557 075502 005204          INC    R4              ;INC INPUT STRING POINTER
5558 075504 005201          INC    R1              ;INDICATE A TAB FOUND
5559 075506 000772          BR     1$              ;GO CHECK NEXT CHAR
5560

```

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5561 075510 121427 000040      2$:  CMPB  (R4),#40      ;SEE IF CHAR. IN CMD LINE= SPACE
5562 075514 001003              BNE  10$              ;BR IF NO, NON-SPACE OR NON-TAB CHAR.
5563 075516 005204              INC  R4               ;INC INPUT STRING POINTER
5564 075520 005201              INC  R1               ;INDICATE A SPACE FOUND
5565 075522 000764              BR   1$              ;GO CHECK NEXT CHAR
5566 075524 005701      10$:  TST  R1              ;SEE IF ANY SPACES OR TABS FOUND
5567 075526 001404              BEQ  15$              ;BR IF NO, TAKE NO ACTION
5568 075530 004737 075344      JSR  PC,TRVACT        ;GO TAKE ACTION IF ANY FOUND
5569 075534 000137 075374      JMP  TRVNOB           ;JUST GO UPDATE R3 TO NEXT NODE IF OK
5570 075540 000137 075364      15$:  JMP  TRVBRC          ;TAKE BRANCH (MISS) IF NONE FOUND
5571
5572
5573 075544 012737 000012 003156 TRVDEC: MOV  #10.,P$RADX      ;USE DECIMAL AS RADIX AND ASSUME +
5574 075552 000137 075564              JMP  TRVNMA
5575 075556              TRVOCT: ;(SAME AS TRVNUM SINCE DEFAULT RADIX IS OCTAL)
5576 075556 012737 000010 003156 TRVNUM: MOV  #8.,P$RADX      ;USE OCTAL AS RADIX AND ASSUME +
5577 075564              TRVNMA: PUSH R5
5578 075566 005001              CLR  R1               ;CLEAR DIGIT COUNTER
5579 075570 121427 000053              CMPB (R4),#'+'         ;SEE IF THERE'S A + SIGN THERE
5580 075574 001001              BNE  10$              ; BR IF NO
5581 075576 000406              BR   11$              ; ELSE P$RADX ALREADY SAYS +, JUST BR
5582 075600 121427 000055      10$:  CMPB (R4),#'-'         ;SEE IF THERE'S A - SIGN THERE
5583 075604 001004              BNE  1$               ; BR IF NO
5584 075606 112737 177777 003157 11$:  MOVB #-1,P$RADX+1      ;SET 'MINUS FLAG' (HI BYTE OF P$RADX)
5585 075614 005204              INC  R4               ;BUMP R4 TO POINT TO FIRST CHAR
5586
5587 075616 121427 000060      1$:  CMPB (R4),#60         ;SEE IF CHAR. LESS THAN A '0'
5588 075622 002434              BLT  2$               ;BR IF YES (NOT NUMERIC)
5589 075624 121427 000067              CMPB (R4),#67         ;SEE IF CHAR. GREATER THAN A '7'
5590 075630 003426              BLE  13$              ; BR IF YES
5591 075632 123727 003156 000012 12$:  CMPB P$RADX,#10.      ;SEE IF IN DECIMAL MODE
5592 075640 001417              BEQ  12$              ; BR IF YES (CAN USE HIGHER LIMIT)
5593 075642 121427 000071              CMPB (R4),#71         ;SEE IF DIGIT WAS A 8 OR 9
5594 075646 003022              BGT  2$               ;BR IF NON-NUMERIC
5595 075650              PRINTF #CLIBRX       ;ELSE WAS A 8 OR 9 WHEN IN OCTAL RADIX
5596 075650 012746 052554              MOV  #CLIBRX,-(SP)
5597 075654 012746 000001              MOV  #1,-(SP)
5598 075660 010600              MOV  SP,R0
5599 075662 104417              TRAP C$PNTF
5600 075664 062706 000004              ADD  #4,SP
5601 075670 112737 177777 003161 13$:  MOVB #-1,P$GDBD      ;SET ERROR RETURN FLAG
5602 075676 000475              BR   5$               ; PRINT ERROR AND TAKE MISS
5603
5604 075700 121427 000071      12$:  CMPB (R4),#71         ;SEE IF CHAR. GREATER THAN A '9'
5605 075704 003003              BGT  2$               ;BR IF YES (NOT NUMERIC)
5606 075706 005204      13$:  INC  R4               ;UPDATE CMD LINE PTR TO NEXT CHAR.
5607 075710 005201              INC  R1               ;INDICATE A NUMERIC FOUND
5608 075712 000741              BR   1$               ;GO LOOK AT NEXT CHAR.
5609
5610 075714 005701      2$:  TST  R1               ;SEE IF FOUND ANY NUMERICS
5611 075716 001465              BEQ  5$               ;BR IF NO, TAKE 'MISS' BRANCH
5612 075720 010405              MOV  R4,R5            ;GET POINTER TO START OF NUMERIC STRING
5613 075722 160105              SUB  R1,R5
5614 075724 005037 003154              CLR  P$NUM            ;CLEAR LOC. WHERE VALUE WILL BE STORED
5615 075730 112502      3$:  MOVB (R5)+,R2        ;GET ASCII CHAR AND CONVERT IT TO A #
5616 075732 162702 000060              SUB  #60,R2

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5617	075736	006337	003154		ASL	PSNUM			:SHIFT CURRENT VALUE TO MAKE ROOM
5618	075742	103440			BCS	7\$:ERROR IF NUMBER TOO BIG
5619	075744	013737	003154	003152	MOV	PSNUM, P\$CNT			:SAVE FOR LATER IN CASE DECIMAL RADIX
5620	075752	006337	003154		ASL	PSNUM			
5621	075756	103432			BCS	7\$:ERROR IF NUMBER TOO BIG
5622	075760	006337	003154		ASL	PSNUM			
5623	075764	103427			BCS	7\$:ERROR IF NUMBER TOO BIG
5624	075766	123727	003156	000012	CMPB	PSRADX, #10.			:SEE IF DECIMAL RADIX
5625	075774	001004			BNE	4\$:BR IF NOT EQUAL
5626	075776	063737	003152	003154	ADD	P\$CNT, PSNUM			
5627	076004	103417			BCS	7\$:ERROR IF NUMBER TOO BIG
5628	076006	060237	003154		4\$:	ADD	R2, PSNUM		
5629	076012	103414			BCS	7\$:ERROR IF NUMBER TOO BIG
5630	076014	005301			DEC	R1			
5631	076016	001344			BNE	3\$			
5632	076020	105737	003157		TSTB	PSRADX+1			:SEE IF NUM WAS PRECEDED BY A - SIGN
5633	076024	001402			BEQ	15\$: BR IF NO
5634	076026	005437	003154		NEG	PSNUM			: ELSE NEGATE THE NUMBER BEFORE LEAVING
5635	076032				15\$:	POP	R5		:RESTORE R5
5636	076034	004737	075344		JSR	PC, TRVACT			:SINCE NUMERIC FOUND, GO TAKE ACTION
5637	076040	000137	075374		JMP	TRVNOB			:GO POINT R3 TO NEXT NODE
5638									
5639	076044				7\$:	PRINTF	#CLINBG		:PRINT NUMBER TOO BIG ERROR
5640	076044	012746	052527						
5641	076050	012746	000001						MOV #CLINBG, -(SP)
5642	076054	010600							MOV #1, -(SP)
5643	076056	104417							MOV SP, R0
5644	076060	062706	000004						TRAP C\$PNTF
5645	076064	112737	177777	003161					ADD #4, SP
5646	076072				5\$:	MOVB	#-1, P\$GDBD		:SET ERROR RETURN FLAG
5647	076074	000137	075364		POP	R5			:RESTORE R5
5648					JMP	TRVBRC			:TAKE "MISS" BRANCH
5649									
5650	076100	005001			TRVALP:	CLR	R1		:CLEAR ALPHA FOUND FLAG
5651	076102	121427	000101		1\$:	CMPB	(R4), #101		:SEE IF CHAR. LESS THAN A "A"
5652	076106	002406			BLT	2\$:BR IF YES (NOT ALPHA)
5653	076110	121427	000132		CMPB	(R4), #132			:SEE IF CHAR. GREATER THAN A "Z"
5654	076114	003003			BGT	2\$:BR IF YES (NOT ALPHA)
5655	076116	005204			INC	R4			:UPDATE CMD LINE PTR TO NEXT CHAR
5656	076120	005201			INC	R1			:INDICATE AN ALPHA WAS FOUND
5657	076122	000767			BR	1\$:GO LOOK AT NEXT CHAR.
5658	076124	005701			2\$:	TST	R1		:SEE IF ANY ALPHA'S WERE FOUND
5659	076126	001404			BEQ	3\$:BR IF NO
5660	076130	004737	075344		JSR	PC, TRVACT			:IF ANY FOUND TAKE ACTION
5661	076134	000137	075374		JMP	TRVNOB			:THEN UPDATE R3 TO NEXT NODE -NO BRANCH
5662	076140	000137	075364		3\$:	JMP	TRVBRC		:NONE FOUND, TAKE MISS BRANCH
5663									
5664	076144	005001			TRVALN:	CLR	R1		:CLEAR ALPHANUM FOUND FLAG
5665	076146	121427	000060		10\$:	CMPB	(R4), #60		:SEE IF CHAR. LESS THAN A "0"
5666	076152	002417			BLT	2\$:BR IF YES (NOT NUMERIC OR ALPHA)
5667	076154	121427	000072		CMPB	(R4), #72			:SEE IF CHAR. GREATER THAN A "9"
5668	076160	003003			BGT	1\$:BR IF YES (NOT NUMERIC)
5669	076162	005204			INC	R4			:UPDATE CMD LINE PTR TO NEXT CHAR.
5670	076164	005201			INC	R1			:INDICATE A NUMERIC FOUND
5671	076166	000767			BR	10\$:GO LOOK AT NEXT CHAR.
5672	076170	121427	000101		1\$:	CMPB	(R4), #101		:SEE IF CHAR. LESS THAN A "A"

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INPUTS - R4 - POINTS TO THE BEGINING OF THE ADDRESS
OR MESSAGE IN THE COMMAND LINE
OUTPUTS - SUMMARIZED IN TABLE BELOW

COMMAND LINE INPUT CONDITION	PSGDBD	R4 POINTS TO	CFLAG CONTAINS	PSMERR
ILLEGAL CHAR.	-1	ILL. CHAR.		N/A
ADR./ASSIST	0	END OF LINE	CASIST	N/A
ADR./TARGET				
ADR./	0	END OF LINE	CTARGET	N/A
ADR.				
ADR./CHAR. OR 'OPR SEL/CHAR.				
OTHER THAN 'A'	-1	/	CTARGET	N/A
'T' OR BLANK				
'OPR SEL'	0	CHAR. AFTER ''	OPRSEL	-1 0

CALLING PROCEDURE - JSR PC,TRVADR
REGISTER USAGE - R1 IS USED AS A COUNTER TO REPORT ERROR MESSAGES
IF NULL STRINGS ARE ENTERED.
R4 POINTS TO THE NEXT CHAR. IN THE COMMAND LINE

5755 076330 005001
5756 076332 121427 000000
5757 076336 001423
5758 076340 121427 000040
5759 076344 002414
5760 076346 121427 000042
5761 076352 001454
5762 076354 121427 000057
5763 076360 001420
5764 076362 121427 000132
5765 076366 003003
5766 076370 005204
5767 076372 005201
5768 076374 000756
5769 076376 112737 177777 003161 10\$:
5770 076404 000464
5771 076406 005701 20\$:
5772 076410 001772
5773 076412 012737 000000 003672 25\$:
5774 076420 000456
5775 076422 005701 30\$:
5776 076424 001764
5777 076426 112714 000000
5778 076432 005204
5779 076434 121427 000000
5780 076440 001764
5781 076442 121427 000101
5782 076446 001412
5783 076450 121427 000124
5784 076454 001756

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TRVADR: CLR R1 ;CLEAR HEX DIGIT FOUND FLAG
1$: CMPB (R4),#0 ;SEE IF NUL CHAR.
BEQ 20$ ; IF YES, RETURN
CMPB (R4),#40 ;SEE IF ILLEGAL CHARACTER
BLT 10$ ;IF YES; BRANCH TO ERROR ROUTINE
CMPB (R4),#42 ;SEE IF CHAR. IS A ' '
BEQ 40$ ;IF YES ,BRANCH TO 40$
CMPB (R4),#57 ;SEE IF CHAR. IS A '/'
BEQ 30$ ;BRANCH IF YES
CMPB (R4),#132 ;SEE IF CHAR. GREATER THAN 'F'
BGT 10$ ; IF YES, ILLEGAL CHAR.
INC R4 ;UPDATE CMD LINE POINTER TO NEXT CHAR.
INC R1 ;INCIDATE A VALID CHAR. FOUND
BR 1$ ;LOOK AT NEXT CHAR.
MOV B #-1,PSGDBD ;SET ERROR FLAG
BR 50$ ;RETURN
TST R1 ;SEE IF VALID CHARACTERS FOUND
BEQ 10$ ; IF NO, ILLEGAL CHAR.
MOV #CTARGET,CFLAG ;SET TARGET FLAG
BR 50$ ;RETURN
TST R1 ;SEE IF VALID CHARACTERS FOUND
BEQ 10$ ; IF NO, ILLEGAL CHAR.
MOV B #0,(R4) ; IF YES, REPLACE '/' WITH NULL CHAR.
INC R4 ;UPDATE CMD. LINE POINTER TO NEXT CHAR.
CMPB (R4),#0 ;IS NEXT CHAR. NULL
BEQ 25$ ; IF YES, TAKE DEFAULT OF TARGET
CMPB (R4),#'A' ;IS NEXT CHAR. 'A'
BEQ 35$ ; IF YES, BR 35$
CMPB (R4),#'T' ;IS NEXT CHAR. 'T'
BEQ 25$ ; IF YES, SET TARGET FLAG
    
```

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COMMAND LINE TRAVERSE ROUTINES

```

5785 076456 112737 177777 003161      MOVB  #-1,P$GDBD      ; ELSE, SET ERROR FLAG,
5786 076464 005304                      DEC   R4              ; READJUST COMMAND LINE POINTER
5787 076466 112714 000057              MOVB  #'/(R4)         ; AND REPLACE / IN CMD LINE TO FIX ERROR
5788 076472 000747                      BR    25$            ; SET TARGET FLAG AND RETURN
5789 076474 012737 000001 003672 35$:  MOV   #CASIST,CFLAG  ;SET ASSIST FLAG
5790 076502 000425                      BR    50$
5791 076504 005701                      40$:  TST  R1          ;SEE IF ANY CHARACTERS TYPED
5792 076506 001407                      BEQ   45$            ;IF NO, BRANCH TO 45$
5793 076510 112714 000000              MOVB  #0,(R4)        ;ELSE, REPLACE "" WITH NULL
5794 076514 012737 000006 003672      MOV   #OPRSEL,CFLAG  ;SET OPERATOR SELECTED FLAG
5795 076522 005204                      INC   R4
5796 076524 000414                      BR    50$            ;RETURN
5797 076526                      45$:  PRINTF #NULSTR  ;PRINT NULL STRING ERROR MESSAGE
5798 076526 012746 053362                      MOV   #NULSTR,-(SP)
5799 076532 012746 000001                      MOV   #1,-(SP)
5800 076536 010600                      MOV   SP,R0
5801 076540 104417                      TRAP  C$PNTF
5802 076542 062706 000004                      ADD   #4,SP
5803 076546 112737 177777 003163      MOVB  #-1,PSMERR     ;SET OPER. SELECTED MSG. ERROR FLAG
5804 076554 005204                      INC   R4             ;MOVE CMD. LINE POINTER TO NEXT CHAR.
5805 076556 000207                      50$:  RTS    PC       ;RETURN

```

.SBTTL REPORT CODING SECTION

```

:++
: THE REPORT CODING SECTION CONTAINS THE
: 'PRINTS' CALLS THAT GENERATE STATISTICAL REPORTS.
:--

```

BGNRPT

LSRPT::

```

:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
: THIS SECTION, WHICH IS OPTIONAL, CONTAINS THE CODE FOR PRINTING
: STATISTICAL INFORMATION GATHERED BY THE DIAGNOSTIC. IT IS
: EXECUTED BY THE OPERATOR COMMAND 'PRINT' OR BY THE MACRO CALL
: 'DORPT'. USE THE PRINTS MACRO TO PRINT THE INFORMATION.
: USE FORMAT STATEMENTS AS IN THE PRINTB/PRINTX MACROS. IT IS
: THE PROGRAMMER'S RESPONSIBILTY TO DEVISE AND IMPLEMENT THE
: FORM AND CONTENT OF THE STATISTICS.
:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

```

```

5830 076560 004737 101710
5831 076564
5832 076564 000167
5833 076566 000000

```

```

JSR   PC,ACTSUM
EXIT  RPT

```

```

.WORD JSJMP
.WORD L10006-2-.

```

```

:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
: INSERT LOCAL STORAGE THAT IS USED ONLY
: DURING THE REPORT SECTION.
:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

```

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REPORT CODING SECTION

5841
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5847 076570
5848 076570
5849 076570 104425

: INSERT MESSAGES THAT ARE USED ONLY
: DURING THE REPORT SECTION.
:XX

.EVEN
ENDRPT

L10006: TRAP CSRPT

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INITIALIZE SECTION

.SBTTL INITIALIZE SECTION

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

BGNINIT

LSINIT::

XX
: THE INITIALIZE CODE IS EXECUTED UNDER FIVE CONDITIONS. THERE
: ARE SUPERVISOR EVENT FLAGS THAT ARE USED TO LET THE
: DIAGNOSTIC KNOW UNDER WHICH CONDITION THE EXECUTION IS TAKING
: PLACE. THE EVENT FLAGS ARE READ USING THE 'READEF' MACRO.
: THE CONDITIONS UNDER WHICH THE INIT CODE IS EXECUTED AND THE
: CORRESPONDING EVENT FLAGS ARE:
: START COMMAND EF.START
: RESTART COMMAND EF.RESTART
: CONTINUE COMMAND EF.CONTINUE
: POWERDOWN/POWERUP EF.PWR
: NEW PASS EF.NEW
: EXAMPLE OF EVENT FLAG USE:
: READEF #EF.START
: BCOMPLETE STARTCODE
: DURING THE INIT CODE, USE THE 'GPHARD' MACRO TO OBTAIN P-TABLE
: INFORMATION FOR DEVICE TESTING. GET ONE UNIT'S INFORMATION IF
: THIS IS A SEQUENTIAL DIAGNOSTIC. GET INFORMATION ON ALL
: UNITS AVAILABLE FOR TESTING IF THIS IS AN EXERCISER. THE NUMBER
: OF UNITS AVAILABLE IS IN A HEADER LOCATION: 'LSUNIT'.
:XX

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076600
076600

022737 000020 003672
001004
005037 003672
000137 100130
012700 000040
104447
103424
012700 000037
104447
103002
000137 100046
076644
012700 000036
104447
103002
000137 100046
076660
012700 000035
104447

INIT: CMP #CEXIT,CFLAG ;SEE IF EXIT COMMAND TYPED
BNE INIT1 ; IF NO, DO INIT CODE
CLR CFLAG ; ELSE, CLEAR EXIT FLAG
JMP INICLN ; AND DO CLEANUP
INIT1: READEF #EF.START ;IF HERE BECAUSE OF "START". DO INIT
MOV #EF.START,RO
TRAP CSREFG
BCOMPLETE START
BCS START
READEF #EF.RESTART ;IF HERE BECAUSE OF "RESTART", DO SOME INIT
MOV #EF.RESTART,RO
TRAP CSREFG
BNCOMPLETE 5\$
BCC 5\$
5\$: JMP RESTRT
READEF #EF.CONTINUE ;IF HERE BECAUSE OF "CONTINUE", EXIT
MOV #EF.CONTINUE,RO
TRAP CSREFG
BNCOMPLETE 10\$
BCC 10\$
10\$: JMP RESTRT
READEF #EF.NEW ;IF HERE ON NEW PASS, SKIP SOME INIT
MOV #EF.NEW,RO
TRAP CSREFG

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INITIALIZE SECTION

```

5933 076666          BNCOMPLETE      15$
5934 076666 103002          BCC      15$
5935 076670 000137 100112
5936 076674 000137 100132
5937 076700
5938 076706
5939 076706 104431
5940 076710 010037 047660
5941 076714 013737 047660 047662
5942 076722 062737 000002 047662
5943 076730 012702 003674
5944 076734
5945 076734 012700 000114
5946 076740 104462
5947 076742 010001
5948 076744
5949 076744 103006
5950 076746 004737 067656
5951 076752 012737 000100 003704
5952 076760 000436
5953 076762
5954 076762 012700 000120
5955 076766 104462
5956 076770 010001
5957 076772
5958 076772 103017
5959 076774 004737 067656
5960 077000 062737 000002 003674
5961 077006 012777 001600 104660
5962 077014 162737 000002 003674
5963 077022 012737 000111 003704
5964 077030 000412
5965 077032
5966 077032 012746 062622
5967 077036 012746 000001
5968 077042 010600
5969 077044 104417
5970 077046 062706 000004
5971 077052 000137 100130
5972 077056
5973 077056 012700 000000
5974 077062 104442
5975 077064 010001
5976 077066
5977 077066 103402
5978 077070 000137 100130
5979 077074 012137 047652
5980 077100 012137 047654
5981 077104 012137 047656
5982 077110
5983 077110 013746 047656
5984 077114 012746 071144
5985 077120 013746 047654
5986 077124 012746 000003
5987 077130 104437
5988 077132 062706 000010

```

```

          JMP      NEW
15$:      JMP      INIEXI
START:   ISSTACK #1000,SP
          MEMORY  FRESIZ

          TRAP     C$MEM
          MOV      R0,FRESIZ
          ;SIZE OF FREE MEMORY IN FRESIZ
          ;START OF FREE MEMORY IN FREMEM
          MOV      #CLKCSR,R2
          ;SETUP R2 AS A PRT. TO CLOCK INFO. BLOCK
          CLOCK   L,R1
          ;GET LINE CLOCK INFO

          MOV      #'L,R0
          TRAP    C$CLCK
          MOV      R0,R1
          ;IF NONE, SEE IF P CLOCK PRESENT
          BCC     1$
          ;SET UP CLOCK INFO TABLE AND VECTOR
          ;SET UP THE ENABLE LINE CLOCK DATA
1$:      JSR      PC,CLKSET
          MOV     #LCLKEN,CLKEN
          BR      3$
          ;GET P CLOCK INFO
          MOV     #'P,R0
          TRAP   C$CLCK
          MOV     R0,R1
          ;IF NO CLOCK, ERROR
          BCC    2$
          ; ELSE SET UP CLOCK INFO AND VECTOR
          ; POINT CLKCSR TO P-CLK COUNT SET REG.
          ;LOAD CLK SET REG. WITH COUNT VALUE
          ;POINT CLKCSR BACK TO P-CLK CSR
          ;SETUP TO ENABLE P-CLK DATA
2$:      JSR      PC,CLKSET
          ADD     #2,CLKCSR
          MOV     #PCLKCT,@CLKCSR
          SUB     #2,CLKCSR
          MOV     #PCLKEN,CLKEN
          BR      3$
          ;ERROR MESSAGE
          PRINTF #NOCLK
          MOV     #NOCLK,-(SP)
          MOV     #1,-(SP)
          MOV     SP,R0
          TRAP   C$PNTF
          ADD     #4,SP
          ;CANNOT CONTINUE, DO CLEANUP
          ;GET P-TAB POINTER FOR THIS UNIT
3$:      JMP      INICLN
          GPHARD #0,R1
          MOV     #0,R0
          TRAP   C$GPHRD
          MOV     R0,R1
          ;THIS ONE IS NOT AVAILABLE
          BCS    4$
          ;SAVE CSR
          ;SAVE VECTOR
          ;SAVE PRIORITY
          ;SETUP UNA INTERRUPT VECTOR
4$:      JMP      INICLN
          MOV     (R1)+,UNACSR
          MOV     (R1)+,UNAVEC
          MOV     (R1)+,UNAPRI
          SETVEC UNAVEC,#UNAIISR,UNAPRI
          MOV     UNAPRI,-(SP)
          MOV     #UNAIISR,-(SP)
          MOV     UNAVEC,-(SP)
          MOV     #3,-(SP)
          TRAP   C$SVEC
          ADD     #10,SP

```

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INITIALIZE SECTION

```

5989 077136 013737 047652 047632      MOV      UNACSR,PCSR0      :PCSR0
5990 077144 013737 047632 047634      MOV      PCSR0,PCSR1
5991 077152 062737 000002 047634      ADD      #2,PCSR1        :PCSR1
5992 077160 013737 047634 047636      MOV      PCSR1,PCSR2
5993 077166 062737 000002 047636      ADD      #2,PCSR2        :PCSR2
5994 077174 013737 047636 047640      MOV      PCSR2,PCSR3
5995 077202 062737 000002 047640      ADD      #2,PCSR3        :PCSR3
5996 077210 012703 000050                MOV      #TBLEN,R3        :CLEAR NODE TABLE
5997 077214 012702 002404                MOV      #NODTBL,R2
5998 077220 005022                5$: CLR      (R2)+
5999 077222 005303                DEC      R3
6000 077224 001375                BNE     5$
6001 077226 012703 000132                MOV      #STBLN,R3        :CLEAR SUMMARY TABLE
6002 077232 012702 002656                MOV      #STATBL,R2
6003 077236 005022                6$: CLR      (R2)+
6004 077240 005303                DEC      R3
6005 077242 001375                BNE     6$
6006 077244 005037 050500                CLR      S.NREC          : CLEAR SUMMARY DATA COUNTERS
6007 077250 005037 050476                CLR      S.REC
6008 077254 005037 050502                CLR      S.LEN
6009 077260 005037 050504                CLR      S.COMP
6010 077264 005037 050506                CLR      S.BYTE
6011 077270 005037 050510                CLR      S.XFER
6012 077274 005037 003706                CLR      TIMMIN          :CLEAR TIME SINCE-START-LOCATIONS
6013 077300 005037 003710                CLR      TIMSEC
6014 077304 013737 003702 003712                MOV      CLKHZ,TIMTCK    :LOAD TICKS/SEC
6015 077312                SETVEC  CLKVEC,#CLKINT,CLKBR :SETUP CLOCK INTERRUPT VECTOR
6016 077312 013746 003676                MOV      CLKBR,-(SP)
6017 077316 012746 067702                MOV      #CLKINT,-(SP)
6018 077322 013746 003700                MOV      CLKVEC,-(SP)
6019 077326 012746 000003                MOV      #3,-(SP)
6020 077332 104437                TRAP    C$$VEC
6021 077334 062706 000010                ADD      #10,SP
6022 077340 013777 003704 104326                MOV      CLKEN,@CLKCSR   :SET ENABLE BITS IN THE CLOCK TO START
6023 077346                SETPRI #PRI0            :SET PRIORITY=0 SO CLOCK CAN INTERRUPT
6024 077346 012700 000000                MOV      #PRI0,R0
6025 077352 104441                TRAP    C$$PRI
6026 077354                CALL    UNAINI          :INITIALIZE THE UNA
6027 077362                CALL    FUNCT #RDDEFA  :READ UNA DEFAULT PHYSICAL ADDRESS
6028 077374                P$POP  R2              :CHECK FOR ERROR
6029 077376 001402                BEQ     8$
6030 077400 000137 100034                JMP     20$
6031 077404                8$: CALL    BINHEX #PCBB2,#6,#STRBUF :PUT ADDRESS INTO HEX FORMAT
6032 077426                PRINTS #HMSG1,#STRBUF  :PRINT ADDRESS
6033 077426 012746 002322                MOV      #STRBUF,-(SP)
6034 077432 012746 055342                MOV      #HMSG1,-(SP)
6035 077436 012746 000002                MOV      #2,-(SP)
6036 077442 010600                MOV      SP,R0
6037 077444 104416                TRAP    C$PNTS
6038 077446 062706 000006                ADD      #6,SP
6039 077452                CALL    FUNCT #RDSTA    :READ STATUS TO GET ROM VERSION
6040 077464                P$POP  R2              :CHECK FOR ERROR
6041 077466 001162                BNE     20$
6042 077470 113702 047670                MOV      PCBB2,R2        :ONLY WANT LOWEST 6 BITS
6043 077474 142702 000300                BICB   #300,R2
6044 077500                PRINTS #HMSG2,R2        :PRINT ROM VERSION

```


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INITIALIZE SECTION

6157 100136
6158 100136
6159 100136 104411

ENDINIT

L10010: TRAP CSINIT

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CLEANUP CODING SECTION

6236 100256 104412

TRAP CSCLEAN

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DROP UNIT SECTION

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6238
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6243
6244 100260
6245 100260
6246
6247
6248
6249
6250
6251
6252
6253
6254 100260
6255 100260 000167
6256 100262 000000
6257
6258
6259
6260
6261
6262
6263
6264
6265
6266
6267
6268
6269
6270 100264
6271 100264
6272 100264 104453

.SBTTL DROP UNIT SECTION

:++
: THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
: TO NO LONGER BE TESTED.
:--

BGNDU

L\$DU::

:XX
: INSERT DROP CODE HERE. THIS CODE WILL BE EXECUTED AFTER
: A 'DROP' COMMAND OR A 'DODU' MACRO EXECUTION. THE PURPOSE
: OF THIS CODE IS TO DO ANY NECESSARY HOUSEKEEPING AFTER A
: UNIT HAS BEEN DROPPED. THIS SECTION IS OPTIONAL.
:XX

EXIT DU

.WORD JSJMP
.WORD L10013-2-

:XX
: INSERT LOCAL STORAGE THAT IS USED ONLY
: DURING THE DROP-UNIT SECTION.
:XX

:XX
: INSERT MESSAGES THAT ARE USED ONLY
: DURING THE DROP-UNIT SECTION.
:XX

.EVEN

ENDDU

L10013: TRAP C\$DU

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TEST 1:

```

6329 ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
6330 : INSERT PROGRAM EQUATES THAT ARE USED ONLY IN THIS TEST.
6331 ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
6332
6333 100274 BGNTST
6334 100274 T1::
6335
6336 ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
6337 : INSERT THE CODING FOR THIS HARDWARE TEST.
6338 ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
6339 .SBTTL GETCL COMMAND LINE FETCH & INTERPRETATION SECTION
6340
6341 100274 105037 003161 GETCL: CLR B PSGDBD ;CLEAR CMD LINE PARSING ERROR FLAG
6342 100300 105037 003160 CLR B PSNUF
6343 100304 GMANID CLISPM,CMDBUF,A,0,1,72.,NO ;GET CMD LINE FROM OPERATOR
6344 100304 104443 TRAP CSGMAN
6345 100306 000406 BR 10000$
6346 100310 002200 .WORD CMDBUF
6347 100312 000142 .WORD TSCODE
6348 100314 052436 .WORD CLISPM
6349 100316 000000 .WORD 0
6350 100320 000001 .WORD TSLOLIM
6351 100322 000110 .WORD TSHILIM
6352 100324 10000$:
6353 100324 012737 002200 003144 MOV #CMDBUF,PSBUFA
6354 100332 012737 051070 003146 MOV #CLITRE,PSTREE
6355 100340 012737 100456 003150 MOV #CLIACT,PSACT
6356 100346 005037 003672 CLR CFLAG ;CLEAR QUALIFIER FLAG
6357 100352 004737 075216 JSR PC,PSTRV ;GO PARSE COMMAND TREE
6358 100356 105737 003161 TSTB PSGDBD ;SEE IF PARSED OK, OR AN ERROR
6359 100362 001412 BEQ 1$
6360 100364 PRINTF #CLIERM ;IF NOT PRINT ERROR MESSAGE
6361 100364 012746 052445 MOV #CLIERM,-(SP)
6362 100370 012746 000001 MOV #1,-(SP)
6363 100374 010600 MOV SP,RO
6364 100376 104417 TRAP C$PNTF
6365 100400 062706 000004 ADD #4,SP
6366 100404 000137 100274 JMP GETCL
6367 100410 105737 003160 1$: TSTB PSNUF ;SEE IF INCOMPLETE COMMAND TYPED
6368 100414 001412 BEQ 10$
6369 100416 PRINTF #CLINUF ;IF NOT PRINT ERROR MESSAGE
6370 100416 012746 052476 MOV #CLINUF,-(SP)
6371 100422 012746 000001 MOV #1,-(SP)
6372 100426 010600 MOV SP,RO
6373 100430 104417 TRAP C$PNTF
6374 100432 062706 000004 ADD #4,SP
6375 100436 000137 100274 JMP GETCL
6376 100442 022737 000020 003672 10$: CMP #CEXIT,CFLAG ;WAS EXIT COMMAND TYPED?
6377 100450 001311 BNE GETCL ; IF NOT GET NEW COMMAND LINE
6378 100452 EXIT TST ; ELSE EXIT
6379 100452 104432 TRAP C$EXIT
6380 100454 012272 .WORD L10015-.
6381
6382 .SBTTL CLI ACTION TABLE AND ROUTINES
6383 : USER MUST CLEAR/SET PSGDBD IF USE "CLIBIF" IN CONNECTION WITH ACTION
6384 : R2 WILL HOLD ACTION CODE FROM PARSING (CLI) NODE

```

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CLI ACTION TABLE AND ROUTINES

Line	Code	Address	Label	Operation	Register	Description
6385	100456			ASL	R2	:MULTIPLY ACTION CODE BY 2
6386	100456	006302		MOV	10\$(R2),R2	:OFFSET VALUE
6387	100460	016202	100474	ADD	#10\$,R2	:ADD BASE VALUE
6388	100464	062702	100474	JSR	PC,(R2)	:GO DO ACTION
6389	100470	004712		RTS	PC	:RETURN TO TRVACT
6390	100472	000207				
6391						
6392						:BRIEF DESCRIPTION OF ACTION TAKEN
6393	100474	000122	10\$:	.WORD	ACTNUL-10\$:0-NULL
6394	100476	000124		.WORD	ACTHLP-10\$:1-HELP
6395	100500	000162		.WORD	ACTNOD-10\$:2-NODE
6396	100502	000472		.WORD	ACTBLD-10\$:3-BUILD
6397	100504	003542		.WORD	ACTRUN-10\$:4-RUN SPECIFIED TEST
6398	100506	006326		.WORD	ACTPAT-10\$:5-SET 'MESSAGE PATTERN' TEST FLAG
6399	100510	010164		.WORD	ACTSAV-10\$:6-SAVE NODE TABLE
6400	100512	001214		.WORD	ACTSUM-10\$:7-PRINT SUMMARY TABLE
6401	100514	001570		.WORD	ACTIDT-10\$:10-REQUEST ID
6402	100516	002654		.WORD	ACTEXT-10\$:11-EXIT
6403	100520	000114		.WORD	ACTNUF-10\$:12-NOT ENOUGH INFO
6404	100522	002664		.WORD	ACTXAD-10\$:13-EXTRACT NI NODE ADDRESS FROM INPUT LINE
6405	100524	002746		.WORD	ACTSR4-10\$:14-SAVE POINTER TO BEGINING OF ADDRESS STRING
6406	100526	007670		.WORD	ACTSND-10\$:15-SET 'NODE' FLAG FOR SHOW COMMAND
6407	100530	002754		.WORD	ACTALP-10\$:16-SET 'ALPHA' FLAG
6408	100532	002764		.WORD	ACTONE-10\$:17-SET 'ONES' FLAG
6409	100534	002774		.WORD	ACTZRO-10\$:20-SET 'ZEROS' FLAG
6410	100536	003004		.WORD	ACTIAL-10\$:21-SET '1ALT' FLAG
6411	100540	003014		.WORD	ACTOAL-10\$:22-SET 'OALT' FLAG
6412	100542	003024		.WORD	ACTCTT-10\$:23-SET 'CCITT' FLAG
6413	100544	003034		.WORD	ACTOPR-10\$:24-SET 'OPER SEL' FLAG
6414	100546	003162		.WORD	ACTTYP-10\$:25-DETERMINE MESSAGE TYPE
6415	100550	003170		.WORD	ACTSZE-10\$:26-DETERMINE MESSAGE SIZE
6416	100552	003246		.WORD	ACTCPY-10\$:27-DETERMINE MESSAGE COPIES
6417	100554	003324		.WORD	ACTNAD-10\$:30-SET 'NODE/ADDRESS' FLAG
6418	100556	003462		.WORD	ACTNAL-10\$:31-SET 'NODE/ALL' FLAG
6419	100560	003662		.WORD	ACTRNA-10\$:32-SET 'ALL' FLAG FOR RUN COMMAND
6420	100562	004724		.WORD	ACTRNL-10\$:33-SET 'LOOPPAIR' FLAG FOR RUN CMD
6421	100564	006410		.WORD	ACTSMS-10\$:34-SHOW CURRENT MESSAGE PARAMETERS
6422	100566	006502		.WORD	ACTCMS-10\$:35-RESET MESSAGE PARAMETERS TO DEFAULT
6423	100570	006606		.WORD	ACTCNT-10\$:36-SET 'COUNTER' FLAG FOR SHOW COMMAND
6424	100572	010044		.WORD	ACTCNL-10\$:37-CLEAR LOGICAL NODE NAMED FROM TABLE
6425	100574	010130		.WORD	ACTFCT-10\$:40-INITIATE UNA PORT COMMAND FUNCTION
6426	100576	010230		.WORD	ACTUNS-10\$:41-UNSAVE NODE TABLE
6427	100600	010332		.WORD	ACTCSU-10\$:42-CLEAR SUMMARY TABLE
6428	100602	004276		.WORD	ACTDIR-10\$:43-SET 'LOOP DIRECT' FLAG FOR RUN COMMAND
6429	100604	010406		.WORD	ACTDFT-10\$:44-LOOK FOR PASS COUNT DEFAULT
6430	100606	010454		.WORD	ACTUSF-10\$:45-UNSAVE NODE TABLE FROM A FILE
6431						

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6432
6433
6434      ;ACTION ROUTINE TO INDICATE THAT NOT ENOUGH COMMAND
6435      ;INFORMATION HAS BEEN ENTERED
6436      ;
6437
6438 100610 112737 177777 003160 ACTNUF: MOVB    #-1,P$NNUF          ;SET FLAG TO SAY NEED MORE OF COMMAND
6439
6440      ;
6441      ;ACTION ROUTINE TO DO NOTHING
6442      ;
6443
6444 100616 000207 ACTNUL: RTS      PC          ;RETURN TO PARSER
6445
6446      ;
6447      ;ACTION ROUTINE TO PRINT OUT HELP FILE
6448      ;
6449
6450
6451 100620 ACTHLP: P$PUSH  R2          ;SAVE R2
6452 100622 012702 003164      MOV      #HLPTAB,R2      ;MOVE POINTER TO BEGINING OF HELP FILE
6453 100626      10$: PRINTF  (R2)+      ;PRINT LINE AND INCREMENT POINTER
6454 100626 012246      MOV      (R2)+,-(SP)
6455 100630 012746 000001      MOV      #1,-(SP)
6456 100634 010600      MOV      SP,R0
6457 100636 104417      TRAP   C$PNTF
6458 100640 062706 000004      ADD      #4,SP
6459 100644 020227 003260      CMP      R2,#HLPEND      ;SEE IF ENTIRE FILE PRINTED
6460 100650 001366      BNE     10$              ;IF NOT, PRINT MORE
6461 100652      P$POP   R2          ;ELSE, RESTORE R2 AND RETURN
6462 100654 000207      RTS      PC
6463
6464      ;
6465      ;ACTION ROUTINE TO READ IN NODE PHY. ADDRESS, STORE IT IN ADRBUF
6466      ;AND ENTER IT INTO THE NODE TABLE
6467      ;
6468      ;
6469
6470 100656 105037 003160 ACTNOD: CLRB    P$NNUF          ;CLEAR NOTNUF FLAG
6471 100662 004737 076330      JSR     PC,TRVADR        ;TRAVERSE ADDRESS, CHECK IF TARGET OR ASSIST
6472 100666 105737 003161      TSTB   P$GDBD          ;CHECK IF RESULTS OK
6473 100672 001134      BNE     50$              ;IF NOT, RETURN WITH -1 IN P$GDBD
6474 100674      10$: CALL    EDPACK CBOADR,#ADRBUF,#6      ;GET ADDRESS INTO BUFFER
6475 100716      P$POP   R1          ;CHECK RESULTS FOR NUMBER OF CHAR.S
6476 100720 001411      BEQ    15$              ;IF OK, BRANCH TO 15$
6477 100722      PRINTF  #CADRER        ;ELSE PRINT ERROR MESSAGE
6478 100722 012746 053232      MOV      #CADRER,-(SP)
6479 100726 012746 000001      MOV      #1,-(SP)
6480 100732 010600      MOV      SP,R0
6481 100734 104417      TRAP   C$PNTF
6482 100736 062706 000004      ADD      #4,SP
6483 100742 000510
6484 100744      15$: BR      50$          ;AND RETURN
6485 100762      CALL    CMPADR #ADRBUF,#ILLADR      ;SEE IF ILLEGAL ADDRESS
6486 100764 001021      P$POP   R1
6487 100766      BNE     17$              ;IF YES, PRINT ERROR MESSAGE
        PRINTF  #ILADMS

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6488	100766	012746	053051					MOV	#ILADMS,-(SP)
6489	100772	012746	000001					MOV	#1,-(SP)
6490	100776	010600						MOV	SP,R0
6491	101000	104417						TRAP	C\$PNTF
6492	101002	062706	000004					ADD	#4,SP
6493	101006					PRINTF	#ILADM1		
6494	101006	012746	053135					MOV	#ILADM1,-(SP)
6495	101012	012746	000001					MOV	#1,-(SP)
6496	101016	010600						MOV	SP,R0
6497	101020	104417						TRAP	C\$PNTF
6498	101022	062706	000004					ADD	#4,SP
6499	101026	000456							
6500	101030			17\$:		BR	50\$		
6501						CALL	BINHEX #ADRBUF,#6,#STRBUF		
6502	101052	022737	000001	003672					
6503	101060	001407				CMP	#CASIST,CFLAG		:SEE IF TARGET OR ASSIST
6504	101062	012737	062613	002312		BEQ	20\$		
6505	101070	012737	000000	002400		MOV	#ARGTY7,KEYWD2		:MOVE 'TARGET' INTO KEYWD2
6506	101076	000406				MOV	#CTARGT,NODTY		:MOVE TARGET INTO NODE TYPE
6507	101100	012737	062603	002312	20\$:	BR	25\$		
6508	101106	012737	000001	002400		MOV	#ARGTY6,KEYWD2		:MOVE 'ASSIST' INTO KEYWD2
6509	101114				25\$:	MOV	#CASIST,NODTY		
6510	101122					CALL	ENTRND		:CALL ROUTINE TO ENTER NODE ON TABLE
6511	101124	001017				P\$POP	R1		:CHECK RESULTS
6512	101126	012737	062510	002310		BNE	50\$:IF NODE TABLE FULL, RETURN
6513	101134					MOV	#CMDTY7,KEYWD1		:ELSE, MOVE 'NODE' INTO KEYWD1
6514	101134	012746	002322			PRINTS	#MSG2,KEYWD2,#STRBUF		:INDICATE IF TARGET OR ASSIST
6515	101140	013746	002312					MOV	#STRBUF,-(SP)
6516	101144	012746	055177					MOV	KEYWD2,-(SP)
6517	101150	012746	000003					MOV	#MSG2,-(SP)
6518	101154	010600						MOV	#3,-(SP)
6519	101156	104416						MOV	SP,R0
6520	101160	062706	000010					TRAP	C\$PNTS
6521	101164	000207			50\$:	RTS	PC	ADD	#10,SP
6522									
6523									
6524									
6525									
6526									
6527									
6528									
6529	101166					ACTBLD:	PRINTS #MSG1		: PRINT 'BUILD' COMMAND MESSAGE
6530	101166	012746	054711					MOV	#MSG1,-(SP)
6531	101172	012746	000001					MOV	#1,-(SP)
6532	101176	010600						MOV	SP,R0
6533	101200	104416						TRAP	C\$PNTS
6534	101202	062706	000004					ADD	#4,SP
6535	101206					PRINTS	#MSG11		
6536	101206	012746	055024					MOV	#MSG11,-(SP)
6537	101212	012746	000001					MOV	#1,-(SP)
6538	101216	010600						MOV	SP,R0
6539	101220	104416						TRAP	C\$PNTS
6540	101222	062706	000004					ADD	#4,SP
6541	101226					PRINTS	#MSG12		
6542	101226	012746	055137					MOV	#MSG12,-(SP)
6543	101232	012746	000001					MOV	#1,-(SP)

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6600 101544 062706 000006                                ADD #6,SP
6601 101550 000430
6602 101552 005337 050556                                40$: BR 50$
6603 101556 001425                                DEC TEMP3
6604 101560 005237 050554                                BEQ 50$
6605 101564 023727 050554 000050                                INC TEMP2
6606 101572 001417                                CMP TEMP2,#40.
6607 101574                                BEQ 50$
6608 101574 013746 050554                                PRINTS #BLDMSG,TEMP,TEMP2
6609 101600 013746 050550                                : SEE IF 10 MINS SINCE LAST NODE
6610 101604 012746 052757                                : IF YES, EXIT
6611 101610 012746 000003                                : SEE IF TIME IS UP
6612 101614 010600
6613 101616 104416
6614 101620 062706 000010                                : IF YES, EXIT
6615 101624 005037 050550                                : ELSE, PRINT "STILL WORKING" MESSAGE
6616 101630 000642
6617 101632 012737 000000 050044 50$: MOV TEMP2,-(SP)
6618 101640                                MOV TEMP,-(SP)
6619 101652                                MOV #BLDMSG,-(SP)
6620 101654 001404                                MOV #3,-(SP)
6621 101656                                MOV SP,R0
6622 101656 104456                                TRAP C$PNTS
6623 101660 000042                                ADD #10,SP
6624 101662 065442
6625 101664 000000
6626 101666 004737 110364                                CLR TEMP
6627 101672 012737 000400 050044 54$: BR 19$
6628 101700                                MOV #0,$WDMC+4
6629 101706 000207                                CALL FUNCT #WDMULA
6630
6631
6632
6633 : ACTION ROUTINE TO PRINT OUT THE SUMMARY DATA
6634 :
6635
6636 101710 105037 003160                                ACTSUM: CLR# P$NNUF
6637 101714                                P$PUSH R2,R3,R4
6638 101722 012701 002656                                MOV #STATBL,R1
6639 101726 005711                                TST (R1)
6640 101730 001013                                BNE 5$
6641 101732                                PRINTF #TABEMT,#SUMM
6642 101732 012746 053706                                : CLEAR NOTNUF FLAG
6643 101736 012746 053632                                : MOVE ADDRESS OF TABLE TO R1
6644 101742 012746 000002                                : SEE IF TABLE EMPTY
6645 101746 010600                                : IF NOT, CONT.
6646 101750 104417                                : ELSE PRINT "TABLE EMPTY" MESSAGE
6647 101752 062706 000006                                MOV #SUMM,-(SP)
6648 101756 000536                                MOV #TABEMT,-(SP)
6649 101760 021127 177777                                5$: BR 30$
6650 101764 001533                                CMP (R1),#-1
6651 101766 005711                                BEQ 30$
6652 101770 001531                                TST (R1)
6653 101772                                BEQ 30$
6654 102012                                CALL BINHEX R1,#6,#STRBUF
6655 102012 012746 002322                                PRINTF #SUMMS1,#STRBUF
                                : EXIT
                                : SEE IF AT END OF TABLE
                                : IF YES, EXIT
                                : SEE IF REST OF TABLE EMPTY
                                : IF YES, EXIT
                                : PRINT SUMMARY DATA
                                : NODE ADDRESS
                                MOV #STRBUF,-(SP)

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6656	102016	012746	067215			MOV	#SUMMS1,-(SP)
6657	102022	012746	000002			MOV	#2,-(SP)
6658	102026	010600				MOV	SP,R0
6659	102030	104417				TRAP	C\$PNTF
6660	102032	062706	000006			ADD	#6,SP
6661	102036			PRINTF	#SUMMS2	:	FIRST HEADER
6662	102036	012746	067236			MOV	#SUMMS2,-(SP)
6663	102042	012746	000001			MOV	#1,-(SP)
6664	102046	010600				MOV	SP,R0
6665	102050	104417				TRAP	C\$PNTF
6666	102052	062706	000004			ADD	#4,SP
6667	102056	016102	000006	MOV	6(R1),R2	:	RX NOT COMPLETE
6668	102062	016103	000010	MOV	10(R1),R3	:	RX COMPLETE
6669	102066	016104	000012	MOV	12(R1),R4	:	LENGTH ERRORS
6670	102072			PRINTF	#SUMMS3,R2,R3,R4	:	PRINT THEM OUT
6671	102072	010446				MOV	R4,-(SP)
6672	102074	010346				MOV	R3,-(SP)
6673	102076	010246				MOV	R2,-(SP)
6674	102100	012746	067322			MOV	#SUMMS3,-(SP)
6675	102104	012746	000004			MOV	#4,-(SP)
6676	102110	010600				MOV	SP,R0
6677	102112	104417				TRAP	C\$PNTF
6678	102114	062706	000012			ADD	#12,SP
6679	102120			PRINTF	#SUMMS4	:	SECOND HEADER
6680	102120	012746	067351			MOV	#SUMMS4,-(SP)
6681	102124	012746	000001			MOV	#1,-(SP)
6682	102130	010600				MOV	SP,R0
6683	102132	104417				TRAP	C\$PNTF
6684	102134	062706	000004			ADD	#4,SP
6685	102140	016102	000014	MOV	14(R1),R2	:	COMPARE ERRORS
6686	102144	062701	000016	ADD	#16,R1	:	BYTES COMPARED
6687	102150			CALL	BINDEC R1	:	PUT INTO ASCII STRING
6688	102160			PRINTF	#SUMMS5,R2,#DECSTR	:	PRINT THEM OUT
6689	102160	012746	075200			MOV	#DECSTR,-(SP)
6690	102164	010246				MOV	R2,-(SP)
6691	102166	012746	067434			MOV	#SUMMS5,-(SP)
6692	102172	012746	000003			MOV	#3,-(SP)
6693	102176	010600				MOV	SP,R0
6694	102200	104417				TRAP	C\$PNTF
6695	102202	062706	000010			ADD	#10,SP
6696	102206	062701	000004	ADD	#4,R1	:	BYTES TRANSFERED
6697	102212			CALL	BINDEC R1	:	PUT INTO ASCII STRING
6698	102222			PRINTF	#SUMMS6,#DECSTR	:	PRINT
6699	102222	012746	075200			MOV	#DECSTR,-(SP)
6700	102226	012746	067452			MOV	#SUMMS6,-(SP)
6701	102232	012746	000002			MOV	#2,-(SP)
6702	102236	010600				MOV	SP,R0
6703	102240	104417				TRAP	C\$PNTF
6704	102242	062706	000006			ADD	#6,SP
6705	102246	062701	000004	ADD	#4,R1	:	POINT R1 TO NEXT TABLE ENTRY
6706	102252	000642		BR	5\$:	DO IT ALL AGAIN
6707	102254			P\$POP	R2,R3,R4		
6708	102262	000207		RTS	PC		
6709							
6710							
6711							

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;ACTION ROUTINE TO INITIATE THE REQUEST ID TEST TO THE SPECIFIED NODE

---+
FUNCTIONAL DESCRIPTION

THIS SUBROUTINE BUILDS AND TRANSMITS REQUEST ID PACKETS TO THE NODE SPECIFIED BY THE OPERATOR IN THE COMMAND LINE. THE SYSTEM ID INFO OF THE SPECIFIED NODE IS THEN DISPLAYED. IF THE NODE DOES NOT RESPOND BEFORE 60 SECONDS HAVE PASSED AN ERROR IS REPORTED TO THE OPERATOR.

INPUTS - IMPLICIT - THE SPECIFIED NODE ADDRESS IS LOCATED IN ADRBUF.

OUTPUTS - SYSTEM ID INFO OR ERROR MESSAGE PRINTED TO OPERATOR.

CALLING PROCEDURE - JSR PC, ACTIDT

SIDE EFFECTS - XRGXNT POINTER IS UPDATED BY A CALL TO BLDREQ SUB.

REGISTER USAGE - R1 POINTS TO \$WDMO FOR WRITE MODE OPERATIONS.
R2 IS SCRATCH.
R3 POINTS TO THE RECEIVED MESSAGE BUFFER.
R4 POINTS TO TIMEOUT TIMER

---+
ACTIDT: TSTB P\$AERR ;SEE IF ADDRESS ENTERED WAS VALID
 BEQ 1\$; IF NOT, EXIT ACTION ROUTINE
 JMP 55\$
1\$: CLR P\$NUF ;CLEAR NOTNUF FLAG
 CALL CMPADR #ADRBUF,#ILLADR ; SEE IF ILLEGAL ADDRESS
 P\$POP R1
 BNE 2\$; IF NO, CONTINUE
 PRINTF #ILADMS ; ELSE PRINT ILLEGAL ADDRESS MESSAGE
 MOV #ILADMS,-(SP)
 MOV #1,-(SP)
 MOV SP,R0
 TRAP C\$PNTF
 ADD #4,SP
2\$: JMP 55\$
 P\$PUSH R1,R2,R3,R4 ; SAVE REGISTERS
 CALL CMPADR #ADRBUF,#PHYADR ; SEE IF ADDRESS IS OWN (HOST NODE)
 P\$POP R1
 BEQ 27\$;
 MOV #-2,TEMP2 ; SET COUNTER FOR NO. OF TIMES TRIED
 MOV #\$WDMO,R1 ; SET UP TO WRITE MODE
 MOV #10000,2(R1) ; 10000: TPAD =1 (PAD TRANSMIT BUFFERS)
 CALL FUNCT #WDMODE ; WRITE MODE
 P\$POP R2 ; CHECK FOR ERROR
 BEQ 3\$; BR IF ERROR
3\$: JMP 40\$
 CALL BLDREQ ; BUILD REQUEST ID MESSAGE PACKET
 CALL XMIT ; TRANSMIT REQUEST
 P\$POP R2 ; GET RESULTS, R2 = SUCCESS/FAILURE
 BEQ 4\$; IF OK BRANCH
 JMP 45\$; ELSE JUMP TO 45\$

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6768 102470 005737 050534      4$:  TST      RETRYS      ; SEE IF FAILED DUE TO EXCESSIVE COLLISIONS
6769 102474 001412                BEQ      5$              ; IF NO, CONT.
6770 102476                PRINTF  #RTRYER             ; YES, PRINT 'EXCESSIVE COLLISIONS' MESSAGE
6771 102476 012746 052675                MOV      #RTRYER,-(SP)
6772 102502 012746 000001                MOV      #1,-(SP)
6773 102506 010600                MOV      SP,R0
6774 102510 104417                TRAP    C$PNTF
6775 102512 062706 000004                ADD     #4,SP
6776 102516 000137 103206                JMP     52$              ; EXIT
6777 102522 012704 003720      5$:  MOV      #TIMERS,R4      ; SET UP FOR 10 SECOND TIMOUT
6778 102526 012714 000012      MOV     #10.,(R4)
6779 102532                15$:  BREAK
6780 102532 104422                TRAP    C$BRK
6781 102534 005714                TST     (R4)             ; SEE IF TIME HAS EXPIRED
6782 102536 001425                BEQ     20$              ; IF YES, BRANCH
6783 102540                CALL    RECEVE           ; CHECK FOR ANSWER
6784 102546                P$POP  R2               ; R2 HOLDS NO. OF BUFFERS RECEIVED
6785 102550 001770                BEQ     15$              ; IF NO BUFFERS RECIEVED, LOOP
6786 102552 013703 003764      MOV     RRGNXT,R3        ; GET RECEIVE RING POINTER
6787 102556                CALL    GETRNX,#RRGNXT  ; UPDATE POINTER
6788 102570 016303 000002      MOV     2(R3),R3         ; POINT R3 TO MESSAGE BUFFER
6789 102574 026327 000022 051115  CMP     SIRCPT(R3),#'MR  ; SEE IF MESSAGE RECIEVED IS IN REPLY TO ONE SEN
6790 102602 001424                BEQ     25$              ; IF YES, BRANCH TO 25$
6791 102604 005237 050554      INC     TEMP2            ; INCREMENT RETRY COUNTER
6792 102610 001350                BNE     15$              ; IF NO, LOOK FOR CORRECT REPLY MESSAGE
6793
6794 102612                20$:  PRINTF  #EMSG22        ; ELSE, REPORT ERROR
6795 102612 012746 065266                MOV     #EMSG22,-(SP)
6796 102616 012746 000001                MOV     #1,-(SP)
6797 102622 010600                MOV     SP,R0
6798 102624 104417                TRAP    C$PNTF
6799 102626 062706 000004                ADD     #4,SP
6800 102632 005237 050500                INC     S.NREC           ; UPDATE SUMMARY DATA
6801 102636 000137 103170      JMP     51$              ; AND EXIT
6802
6803 102642 012703 050413      22$:  MOV     #UCB22+13,R3    ; POINT R3 TO SAME PLACE IN MESSAGE AS
6804 102646 012702 050454      MOV     #UCB22+54,R2    ; IF IT WERE RECEIVED SYS ID, R2 TO
6805 102652 000410                BR      27$              ; NODE ADDRESS
6806
6807 102654 005237 050476      25$:  INC     S.REC           ; INCREMENT 'RECEIVED MESSAGES' COUNTER
6808 102660 062737 000056 050510  ADD     #46.,S.XFER      ; UPDATE 'BYTES TRANSFERED' COUNTER
6809 102666 010302                MOV     R3,R2           ; PUT POINTER INTO R2
6810 102670 062702 000042      ADD     #SIADDR,R2      ; POINT R2 TO ADDRESS
6811 102674                27$:  CALL    BINHEX R2,#6,#STRBUF ; PUT ADDRESS INTO STRBUF
6812 102714                PRINTF #SIMSG1,#STRBUF  ; PRINT REMOTE NODE ADDRESS
6813 102714 012746 002322                MOV     #STRBUF,-(SP)
6814 102720 012746 066440                MOV     #SIMSG1,-(SP)
6815 102724 012746 000002                MOV     #2,-(SP)
6816 102730 010600                MOV     SP,R0
6817 102732 104417                TRAP    C$PNTF
6818 102734 062706 000006                ADD     #6,SP
6819 102740 016302 000022      MOV     SIRCPT(R3),R2   ; GET RECEIPT NUMBER
6820 102744                PRINTF #SIMSG2,R2      ; PRINT RECEIPT NUMBER
6821 102744 010246                MOV     R2,-(SP)
6822 102746 012746 066477                MOV     #SIMSG2,-(SP)
6823 102752 012746 000002                MOV     #2,-(SP)

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6824	102756	010600				MOV	SP,R0
6825	102760	104417				TRAP	C\$PNTF
6826	102762	062706	000006			ADD	#6,SP
6827	102766	116302	000027				
6828	102772			MOVB	SIVERS(R3),R2		; GET VERSION NO. AND PRINT
6829	102772	010246		PRINTF	#SIMSG3,R2		
6830	102774	012746	066532			MOV	R2,-(SP)
6831	103000	012746	000002			MOV	#SIMSG3,-(SP)
6832	103004	010600				MOV	#2,-(SP)
6833	103006	104417				MOV	SP,R0
6834	103010	062706	000006			TRAP	C\$PNTF
6835	103014	116302	000030			ADD	#6,SP
6836	103020			MOVB	SIECO(R3),R2		; GET ECO NO. AND PRINT
6837	103020	010246		PRINTF	#SIMSG4,R2		
6838	103022	012746	066572			MOV	R2,-(SP)
6839	103026	012746	000002			MOV	#SIMSG4,-(SP)
6840	103032	010600				MOV	#2,-(SP)
6841	103034	104417				MOV	SP,R0
6842	103036	062706	000006			TRAP	C\$PNTF
6843	103042	116302	000031			ADD	#6,SP
6844	103046			MOVB	SIUECO(R3),R2		; GET USER ECO NO. AND PRINT
6845	103046	010246		PRINTF	#SIMSG5,R2		
6846	103050	012746	066613			MOV	R2,-(SP)
6847	103054	012746	000002			MOV	#SIMSG5,-(SP)
6848	103060	010600				MOV	#2,-(SP)
6849	103062	104417				MOV	SP,R0
6850	103064	062706	000006			TRAP	C\$PNTF
6851	103070	116302	000035			ADD	#6,SP
6852	103074			MOVB	SIFNCT(R3),R2		; GET FUNCTON CODE AND PRINT
6853	103074	010246		PRINTF	#SIMSG6,R2		
6854	103076	012746	066641			MOV	R2,-(SP)
6855	103102	012746	000002			MOV	#SIMSG6,-(SP)
6856	103106	010600				MOV	#2,-(SP)
6857	103110	104417				MOV	SP,R0
6858	103112	062706	000006			TRAP	C\$PNTF
6859	103116	116302	000053			ADD	#6,SP
6860	103122			MOVB	SIDEV(R3),R2		; GET DEVICE TYPE AND PRINT
6861	103122	010246		PRINTF	#SIMSG7,R2		
6862	103124	012746	066667			MOV	R2,-(SP)
6863	103130	012746	000002			MOV	#SIMSG7,-(SP)
6864	103134	010600				MOV	#2,-(SP)
6865	103136	104417				MOV	SP,R0
6866	103140	062706	000006			TRAP	C\$PNTF
6867	103144	000411		BR	51\$		ADD #6,SP
6868							; EXIT
6869	103146			40\$:	ERRDF 23,EMSG23,ERR1		; ERROR -- CAN'T WRITE MODE
6870	103146	104455				TRAP	C\$ERDF
6871	103150	000027				.WORD	23
6872	103152	065321				.WORD	EMSG23
6873	103154	067460				.WORD	ERR1
6874	103156	000424		BR	54\$		
6875							
6876	103160			45\$:	ERRDF 24,EMSG24,ERR1		; ERROR -- CAN'T TRANSMIT PACKETS
6877	103160	104455				TRAP	C\$ERDF
6878	103162	000030				.WORD	24
6879	103164	065366				.WORD	EMSG24

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```

6880 103166 067460                                .WORD  ERR1
6881
6882 103170
6883 103206 005061 000002      51$:  CALL  WRITES #1,#ADRBUF      ; UPDATE SUMMARY TABLE
6884 103212                                52$:  CLR   2(R1)                    ; DISABLE TRANSMIT PADDING
6885 103224                                CALL  FUNCT #WDMODE
6886 103226 001347                                P$POP R2                          ; CHECK FOR ERROR
6887 103230                                BNE  40$                          ; IF ONE, REPORT IT
6888 103240 000207      54$:  P$POP R1,R2,R3,R4          ; RESTORE REGISTERS
6889                                55$:  RTS   PC
6890
6891
6892      ;ACTION ROUTINE TO CHECK FOR ADDITION PARAMETER CHANGE INPUTS
6893      ;AND PRINT OUT NEW PARAMETER INFO WHEN ALL INPUT ARE PROCESSED
6894
6895
6896 103242 105714      ACTMSG: TSTB  (R4)                ;CHECK FOR ADDITIONAL INPUT
6897 103244 001401      BEQ   12$                    ;BR IF NO
6898 103246 000437      BR    50$                    ;IF YES RETURN
6899 103250 012737 062500 002310 12$:  MOV   #CMDTY6,KEYWD1
6900 103256 013701 002370      MOV   P$TYPE,R1                ;GET MESSAGE TYPE ASCII STRING ADDRESS
6901 103262 006301      ASL   R1                      ;INTO R1
6902 103264 062701 003262      ADD   #MSGTAB,R1
6903 103270                                PRINTF #MSGPRM                    ;PRINT 'MESSAGE' COMMAND MESSAGE
6904 103270 012746 054641      MOV   #MSGPRM,-(SP)
6905 103274 012746 000001      MOV   #1,-(SP)
6906 103300 010600      MOV   SP,R0
6907 103302 104417      TRAP  C$PNTF
6908 103304 062706 000004      ADD   #4,SP
6909 103310                                PRINTF #MSG4,(R1),P$SIZE,P$CPYS    ;PRINT MSG PARAMETERS
6910 103310 013746 002374      MOV   P$CPYS,-(SP)
6911 103314 013746 002372      MOV   P$SIZE,-(SP)
6912 103320 011146      MOV   (R1),-(SP)
6913 103322 012746 055276      MOV   #MSG4,-(SP)
6914 103326 012746 000004      MOV   #4,-(SP)
6915 103332 010600      MOV   SP,R0
6916 103334 104417      TRAP  C$PNTF
6917 103336 062706 000012      ADD   #12,SP
6918 103342 105037 003160      50$:  CLRB  P$NNUF                ;CLEAR NOTNUF FLAG
6919 103346 000207      RTS   PC
6920
6921
6922      ;ACTION ROUTINE TO RETURN CONTROL TO THE SUPERVISOR
6923      ;
6924
6925
6926 103350 012737 000020 003672  ACTEXT: MOV   #CEXIT,CFLAG          ;SET EXIT FLAG
6927 103356 000207      RTS   PC
6928
6929
6930      ;ACTION ROUTINE TO TAKE NI NODE ADDRESS FROM INPUT STRING BUFFER
6931      ;AND STORE IT IN THE BUFFER CALLED ADRBUF
6932      ;
6933
6934
6935 103360      ACTXAD: CALL  EDPACK CBOADR,#ADRBUF,#6      ;PUT NODE ADDRESS INTO ADRBUF

```


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```

6936 103402          P$POP  PSAERR      ;SET ADDRESS=12 CHAR. GOOD/BAD FLAG
6937 103406 105737 003162 TSTB  PSAERR      ;IF GOOD, RETURN
6938 103412 001412          BEQ    10$          ;ELSE, PRINT ERROR MESSAGE
6939 103414          PRINTF #CADRER
6940 103414 012746 053232          MOV    #CADRER,-(SP)
6941 103420 012746 000001          MOV    #1,-(SP)
6942 103424 010600          MOV    SP,R0
6943 103426 104417          TRAP  C$PNTF
6944 103430 062706 000004          ADD   #4,SP
6945 103434 105037 003160          ; AND CLEAR 'NOT ENOUGH' FLAG
6946 103440 000207          10$:  CLRB  P$NUF
6947          RTS    PC
6948
6949          ;ACTION ROUTINE TO STORE POINTER TO BEGINING OF OPERATOR INPUT ADDRESS
6950          ;IN COMMAND INPUT BUFFER
6951          ;
6952
6953 103442 010437 002366 ACTSR4: MOV    R4,CBOADR      ;SAVE STRING POINTER
6954 103446 000207          10$:  RTS    PC
6955
6956
6957          ;ACTION ROUTINE TO SET MESSAGE TYPE = ALPHA FLAG
6958          ;
6959
6960
6961 103450 012737 000000 002370 ACTALP: MOV    #ALPHA,P$TYPE  ;SET MESSAGE TYPE
6962 103456 000207          RTS    PC
6963
6964
6965          ;ACTION ROUTINE TO SET MESSAGE TYPE = ALL ONES FLAG
6966          ;
6967
6968
6969 103460 012737 000001 002370 ACTONE: MOV    #ONES,P$TYPE  ;SET MESSAGE TYPE
6970 103466 000207          RTS    PC
6971
6972
6973          ;ACTION ROUTINE TO SET MESSAGE TYPE = ALL ZEROS FLAG
6974          ;
6975
6976
6977
6978 103470 012737 000002 002370 ACTZRO: MOV    #ZEROS,P$TYPE ;SET MESSAGE TYPE
6979 103476 000207          RTS    PC
6980
6981
6982          ;ACTION ROUTINE TO SET MESSAGE TYPE = ALTERNATING ONES FLAG
6983          ;
6984
6985
6986 103500 012737 000003 002370 ACT1AL: MOV   #ONEALT,P$TYPE ;SET MESSAGE TYPE
6987 103506 000207          RTS    PC
6988
6989
6990          ;ACTION ROUTINE TO SET MESSAGE TYPE = ALTERNATING ZEROS FLAG
6991

```

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```

6992      ;
6993
6994 103510 012737 000004 002370 ACTOAL: MOV      #ZROALT,P$TYPE      ;SET MESSAGE TYPE
6995 103516 000207
6996
6997
6998      ;
6999      ;ACTION ROUTINE TO SET MESSAGE TYPE = CC!TT FLAG
7000      ;
7001
7002 103520 012737 000005 002370 ACTCTT: MOV      #CCITT,P$TYPE      ;SET MESSAGE TYPE
7003 103526 000207
7004
7005
7006      ;
7007      ;ACTION ROUTINE TO SET MESSAGE TYPE = OPERATOR SELECTED INPUT
7008      ;
7009
7010 103530 105037 003163      ACTOPR: CLRB      P$MERR      ;CLEAR MESSAGE ERROR FLAG
7011 103534 004737 076330      JSR      PC,TRVADR      ;PARSE THROUGH INPUT STRING
7012 103540 105737 003161      TSTB     P$GDBD      ;TEST GOOD/BAD FLAG
7013 103544 001403      BEQ      10$      ;IF GOOD, BR 10$
7014 103546 105037 003161      CLRB     P$GDBD      ;CLEAR FLAG
7015 103552 000415      BR       20$      ;SET CTARGT FLAG AND RETURN
7016 103554 022737 000006 003672 10$:  CMP      #OPRSEL,CFLAG      ;CHECK TO SEE IF STRING VALID
7017 103562 001011      BNE      20$      ;IF NOT OK, RETURN WITH ERROR FLAG SET
7018 103564 012737 000006 002370      MOV      #OPRSEL,P$TYPE      ;SET MESSAGE TYPE
7019 103572      CALL     SELMSG CBOADR      ;PUT OPERATOR SELECTED STRING INTO BUFFER
7020 103604 000423      BR       50$      ;RETURN
7021 103606 022737 000000 003672 20$:  CMP      #CTARGT,CFLAG      ;SEE IF CTARGT FLAG SET, IF YES ERROR
7022 103614 001011      BNE      30$      ;IF NOT SET, BR 30$
7023 103616      PRINTF  #UNBOND      ;ELSE PRINT UNBOUNDED INPUT STRING ERR. MSG.
7024 103616 012746 054252      MOV      #UNBOND,-(SP)
7025 103622 012746 000001      MOV      #1,-(SP)
7026 103626 010600      MOV      SP,R0
7027 103630 104417      TRAP     C$PNTF
7028 103632 062706 000004      ADD      #4,SP
7029 103636 000406
7030 103640 105737 003163      30$:  BR       50$      ;RETURN
7031 103644 001003      TSTB     P$MERR      ;IF P$MERR FLAG SET, UNBOUNDED STRING
7032 103646 112737 177777 003161      BNE      50$      ;WAS ENTERED, ERROR ALREADY HANDLED
7033 103654 000207      MOVB     #-1,P$GDBD      ;SET ERROR FLAG AND RETURN
7034
7035      50$:  RTS      PC      ;RETURN
7036
7037      ;
7038      ;ACTION ROUTINE TO CHECK FOR MORE INPUT AFTER MESSAGE TYPE HAS BEEN
7039      ;ALTERED
7040      ;
7041 103656 004737 103242      ACTTYP: JSR      PC,ACTMSG      ;CHECK FOR ADDITIONAL COMMANDS
7042 103662 000207
7043
7044
7045      ;
7046      ;ACTION ROUTINE TO INPUT MESSAGE SIZE PARAMETER, CHECK TO SEE IF
7047      ;IT IS WITHIN LEGAL LIMITS, CHANGE PARAMETER AND THEN RETURN TO

```

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```

7048 ;SEE IF MORE INPUT EXISTA
7049 ;
7050
7051 103664 023727 003154 000037 ACTSIZE: CMP PSNUM,#31. ;CHECK FOR VALID SIZE RANGE
7052 103672 003410 BLE 10$
7053 103674 022737 002673 003154 CMP #1467.,PSNUM
7054 103702 003404 BLE 10$ ;IF VALID CONTINUE
7055 103704 013737 003154 002372 MOV PSNUM,PSSIZE ;SET MESSAGE SIZE
7056 103712 000410 BR 20$
7057 103714 10$: PRINTF #SIZLMT ;PRINT SIZE LIMITS EXCEEDED MESSAGE
7058 103714 012746 054061 MOV #SIZLMT,-(SP)
7059 103720 012746 000001 MOV #1,-(SP)
7060 103724 010600 MOV SP,R0
7061 103726 104417 TRAP C$PNTF
7062 103730 062706 000004 ADD #4,SP
7063 103734 004737 103242 20$: JSR PC,ACTMSG ;CHECK FOR ADDITIONAL COMMANDS
7064 103740 000207 RTS PC
7065
7066
7067 ;
7068 ;ACTION ROUTINE TO INPUT COPIES PARAMETER, CHECK TO SEE IF IT IS
7069 ;WITHIN LEGAL LIMITS, CHANGE PARAMETER AND THEN RETURN TO SEE IF
7070 ;MORE INPUT PARAMETERS EXIST
7071 ;
7072
7073 103742 023727 003154 000000 ACTCPY: CMP PSNUM,#0 ;CHECK FOR VALID COPIES RANGE
7074 103750 003410 BLE 10$
7075 103752 022737 000400 003154 CMP #256.,PSNUM
7076 103760 003404 BLE 10$ ;IF VALID, CONTINUE
7077 103762 013737 003154 002374 MOV PSNUM,P$CPYS ;SET MESSAGE COPIES
7078 103770 000410 BR 10$
7079 103772 10$: PRINTF #CPYLMT ;PRINT COPY LIMIT EXCEEDED MESSAGE
7080 103772 012746 053775 MOV #CPYLMT,-(SP)
7081 103776 012746 000001 MOV #1,-(SP)
7082 104002 010600 MOV SP,R0
7083 104004 104417 TRAP C$PNTF
7084 104006 062706 000004 ADD #4,SP
7085 104012 004737 103242 20$: JSR PC,ACTMSG ;CHECK FOR ADDITIONAL COMMANDS
7086 104016 000207 RTS PC
7087
7088
7089 ;
7090 ;ACTION ROUTINE TO CLEAR NODE SPECIFIED BY PHYSICAL ADDRESS FROM NODE TABLE
7091 ;
7092
7093 104020 105037 003160 ACTNAD: CLRB P$NNUF ;CLEAR NOTNUF FLAG
7094 104024 105737 003162 TSTB P$AERR ;SEE IF ADDRESS ENTERED WAS VALID
7095 104030 001051 BNE 35$ ;IF NOT, EXIT ACTION ROUTINE
7096 104032 P$PUSH R2,R3 ;SAVE R2 AND R3
7097 104036 012702 002314 MOV #ADRBUF,R2 ;MOVE ADDRESS OF ADDRESS INTO R2
7098 104042 012703 002404 MOV #NODTBL,R3 ;MOVE ADDRESS OF NODE TABLE INTO R3
7099 104046 21$: CALL CMPADR R2,R3 ;SEE IF ADDRESSES MATCH
7100 104060 P$POP R1
7101 104062 001416 BEQ 25$ ;IF YES, BR 25$
7102 104064 062703 000010 ADD #10,R3 ;ELSE POINT R3 TO NEXT ENTRY
7103 104070 022713 177777 CMP #-1,(R3) ;SEE IF END OF TABLE

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7104 104074 001364          BNE      21$          :IF NOT, COMPARE NEXT ENTRY
7105 104076          PRINTF  #NOCMPR      :ELSE, PRINT ADDRESS DOESN'T COMPARE MSG.
7106 104076 012746 054160          MOV      #NOCMPR,-(SP)
7107 104102 012746 000001          MOV      #1,-(SP)
7108 104106 010600          MOV      SP,R0
7109 104110 104417          TRAP    C$PNTF
7110 104112 062706 000004          ADD     #4,SP
7111 104116 000414          BR      30$
7112 104120 005023 25$:      CLR     (R3)+      :RETURN
7113 104122 005023          CLR     (R3)+      :ELSE, CLEAR NODE FROM TABLE
7114 104124 005023          CLR     (R3)+
7115 104126 005013          CLR     (R3)
7116 104130          PRINTF  #ADRDEL      :PRINT NODE DELETED FROM TABLE MESSAGE
7117 104130 012746 054340          MOV      #ADRDEL,-(SP)
7118 104134 012746 000001          MOV      #1,-(SP)
7119 104140 010600          MOV      SP,R0
7120 104142 104417          TRAP    C$PNTF
7121 104144 062706 000004          ADD     #4,SP
7122 104150          30$:      P$POP   R2,R3      :RESTORE R2 AND R3
7123 104154 000207          35$:      RTS     PC
7124
7125
7126          :
7127          :ACTION ROUTINE TO CLEAR NODE TABLE
7128          :
7129
7130          ACTNAL: P$PUSH  R2,R3      :SAVE R2,R3
7131 104162 012703 000050          MOV     #TBLEN,R3  :SET INCR. COUNTER TO 40
7132 104166 012702 002404          MOV     #NODTBL,R2 :MOVE NODE TABLE ADDRESS INTO R2
7133 104172 005022          10$:    CLR     (R2)+  :CLEAR BYTE IN NODE LABEL
7134 104174 005303          DEC     R3          :DECRIMENT COUNTER
7135 104176 001375          BNE     10$         :CONTINUE UNTIL DONE
7136 104200          PRINTF  #TABCLR,#NOD :PRINT NODE TABLE CLEARED MESSAGE
7137 104200 012746 053701          MOV     #NOD,-(SP)
7138 104204 012746 054514          MOV     #TABCLR,-(SP)
7139 104210 012746 000002          MOV     #2,-(SP)
7140 104214 010600          MOV     SP,R0
7141 104216 104417          TRAP    C$PNTF
7142 104220 062706 000006          ADD     #6,SP
7143 104224 105037 003160          CLRB   P$NNUF      :CLEAR NOTNUF FLAG
7144 104230          P$POP   R2,R3      :RESTORE R2 AND R3
7145 104234 000207          RTS     PC
7146
7147
7148          :
7149          :ACTION ROUTINE TO RUN SPECIFIED TEST
7150          :
7151
7152 104236 105037 003160          ACTRUN: CLRB   P$NNUF      : CLEAR 'NOT ENOUGH' FLAG
7153 104242 013737 003154 002376          MOV     P$NUM,P$PASS
7154 104250 022737 000032 002310          5$:    CMP     #CRNALL,KEYWD1
7155 104256 001004          BNE     10$
7156 104260          CALL   RUNALL
7157 104266 000423          BR      30$
7158 104270 022737 000033 002310          10$:   CMP     #CLUPPR,KEYWD1
7159 104276 001004          BNE     15$

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7160 104300          CALL    RUNLUP          ; IF YES, DO LOOPPAIR
7161 104306 000413   BR        30$
7162 104310 022737   000043 002310 15$:  CMP      #CDIR,KEYWD1    ; IS IT 'DIRECT' TEST
7163 104316 001004   BNE      20$             ; IF NO, CONTINUE
7164 104320          CALL    RUNDIR          ; IF YES, DO DIRECT
7165 104326 000403   BR        30$
7166 104330          CALL    RUNPAT          ; ELSE, ITS 'PATTERN' TEST
7167 104336 023727   002376 177777 30$:  CMP      P$PASS,#-1     ; SEE IF PASS SET FOR INDEFINATE
7168 104344 001741   BEQ      5$             ; IF YES, LOOP
7169 104346 005337   002376   DEC      P$PASS        ; HAVE WE DONE ALL PASSES?
7170 104352 001336   BNE      5$             ; IF NO, LOOP
7171 104354 000207   RTS      PC
7172
7173
7174          ;:ACTION ROUTINE TO SET 'RUN ALL' FLAG
7175          ;:
7176
7177 104356 012737   000032 002310 ACTRNA: MOV    #CRNALL,KEYWD1 ; SET FLAG
7178 104364 000207   RTS      PC
7179
7180          RUNALL: CALL    DIRCOM          ; RUN LOOPDIRECT TEST
7181 104374          P$POP    R1             ; CHECK RESULTS
7182 104376 001415   BEQ      5$             ; IF OK, BRANCH
7183 104400 022701   000001   CMP      #1,R1         ; ELSE, WAS TABLE EMPTY?
7184 104404 001410   BEQ      3$             ; IF YES, DON'T PRINT ABORT MESSAGE
7185 104406          PRINTS  #PASABT        ; ELSE ABORT TEST AND PRINT MESSAGE
7186 104406 012746   061526          MOV      #PASABT,-(SP)
7187 104412 012746   000001          MOV      #1,-(SP)
7188 104416 010600          MOV      SP,R0
7189 104420 104416          TRAP    C$PNTS
7190 104422 062706   000004          ADD      #4,SP
7191 104426 000137   104770   3$:    JMP      32$
7192 104432 012737   002404 002402 5$:    MOV      #NODTBL,SLOT ; MOVE NODE TABLE ADDRESS TO SLOT
7193 104440          CALL    FULSLT        ; FIND FIRST ENTRY
7194 104446 013701   002402          MOV      SLOT,R1     ; AND PUT TARGET ADDRESS INTO R1
7195 104452 013737   002374 050562 10$:  MOV      P$CPYS,CPYCNT ; SET UP LOOP FOR NO. OF COPIES
7196 104460 062737   000010 002402   ADD      #10,SLOT    ; UPDATE SLOT
7197 104466 013702   002402          MOV      SLOT,R2
7198 104472          CALL    FULSLT        ; GET NEXT ASSIST NODE FROM TABLE
7199 104500 022737   177777 002402   CMP      #-1,SLOT    ; SEE IF AT END OF TABLE
7200 104506 001515   BEQ      25$           ; IF YES, BR
7201 104510          15$:  CALL    BLD$FAS R1,SLOT ; BUILD FULL ASSIST MESSAGE
7202 104524          CALL    XMIT         ; TRANSMIT MESSAGE
7203 104532          P$POP    R3         ; CHECK RESULTS
7204 104534 001404   BEQ      17$           ; IF OK, CONTINUE
7205 104536          ERRHRD  37,MSG24 ; PRINT ERROR MESSAGE
7206 104536 104456          TRAP    C$SERHRD
7207 104540 000045          .WORD  37
7208 104542 065366          .WORD  MSG24
7209 104544 000000          .WORD  0
7210 104546          17$:  CALL    BINHEX R1,#6,#STRBUF ; PRINT ERROR MESSAGE
7211 104566          CALL    BINHEX R2,#6,#STRBU1 ;
7212 104606          PRINTB #TSTMS4,#ARGTY7,#STRBUF,#ARGTY6,#STRBU1 ; ASSIST NODE =
7213 104606 012746   002344          MOV      #STRBU1,-(SP)
7214 104612 012746   062603          MOV      #ARGTY6,-(SP)
7215 104616 012746   002322          MOV      #STRBUF,-(SP)

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7216 104622 012746 062613          MOV      #ARGTY7,-(SP)
7217 104626 012746 061624          MOV      #TSTMS4,-(SP)
7218 104632 012746 000005          MOV      #5,-(SP)
7219 104636 010600                   MOV      SP,RO
7220 104640 104414                   TRAP     C$PNTB
7221 104642 062706 000014          ADD      #14,SP
7222 104646                   CALL     RUNCOM          ; DO RECEIVE LOOP
7223 104654                   P$POP   R4              ; CHECK RESULTS
7224 104656 001405                   BEQ     21$              ; IF OK, LOOP SOME MORE
7225 104660          20$:  ERRHRD  28,MSG42,ERR3  ; ELSE PRINT ERROR MESSAGE
7226 104660 104456                   TRAP     C$ERHRD
7227 104662 000034                   .WORD   28
7228 104664 066353                   .WORD   MSG42
7229 104666 067604                   .WORD   ERR3
7230 104670 000410                   BR       101$
7231 104672          21$:  PRINTB  #OKFU
7232 104672 012746 062013          MOV      #OKFU,-(SP)
7233 104676 012746 000001          MOV      #1,-(SP)
7234 104702 010600                   MOV      SP,RO
7235 104704 104414                   TRAP     C$PNTB
7236 104706 062706 000004          ADD      #4,SP
7237 104712 005337 050562          101$:  DEC      CPYCNT          ; DECREMENT 'COPIES' COUNTER
7238 104716 001274                   BNE     15$              ; IF MORE TO DO, LOOP
7239 104720                   CALL     WRITES #2,R1,SLOT ; ELSE, UPDATE SUMMARY TABLE
7240 104740 000644                   BR       10$
7241 104742 062701 000010          25$:  ADD      #10,R1          ; POINT R1 TO NEXT TARGET NODE
7242 104746 010137 002402          MOV      R1,SLOT         ; UPDATE SLOT
7243 104752                   CALL     FULSLT          ; GET ADDRESS FROM TABLE
7244 104760 022737 177777 002402    CMP      #-1,SLOT         ; SEE IF END OF TABLE
7245 104766 001231                   BNE     10$              ; IF NO, CONTINUE ELSE, FINISHED
7246 104770          32$:  RETURN
7247
7248
7249          ;:ACTION ROUTINE TO SET 'RUN LOOP DIRECT' FLAG
7250          ;
7251
7252 104772 012737 000043 002310  ACTDIR: MOV      #CDIR,KEYWD1  ; SET FLAG
7253 105000 000207                   RTS      PC
7254
7255 105002          RUNDIR: CALL     DIRCOM          ; CALL COMMON CODE
7256 105010                   P$POP   R1
7257 105012 022701 000001          CMP      #1,R1           ; WAS TABLE EMPTY?
7258 105016 001400          10$:  BEQ     10$           ; IF YES, DON'T PRINT
7259 105020                   RETURN
7260
7261 105022 005001          DIRCOM: CLR      R1          ; CLEAR RESULTS REGISTER
7262 105024 012737 002404 002402    MOV      #NODTBL,SLOT    ; MOVE NODE TABLE ADDRESS TO SLOT
7263 105032                   CALL     FULSLT          ; SEE IF TABLE EMPTY
7264 105040 022737 177777 002402    CMP      #-1,SLOT         ;
7265 105046 001015                   BNE     9$               ; IF NO CONTINUE
7266 105050                   PRINTF  #TABEMT,#NOD     ; ELSE, PRINT 'TABLE EMPTY' MESSAGE
7267 105050 012746 053701          MOV      #NOD,-(SP)
7268 105054 012746 053632          MOV      #TABEMT,-(SP)
7269 105060 012746 000002          MOV      #2,-(SP)
7270 105064 010600                   MOV      SP,RO
7271 105066 104417                   TRAP     C$PNTF

```

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```

7272 105070 062706 000006
7273 105074 012701 000001
7274 105100 000545
7275 105102 012737 002404 002402 9$:
7276 105110 013737 002374 050562 10$:
7277 105116
7278 105124 022737 177777 002402
7279 105132 001530
7280 105134
7281 105156 15$:
7282 105156 012746 002322
7283 105162 012746 062173
7284 105166 012746 061571
7285 105172 012746 000003
7286 105176 010600
7287 105200 104414
7288 105202 062706 000010
7289 105206 022737 000005 002310
7290 105214 001016
7291 105216 013701 002370
7292 105222 006301
7293 105224 062701 003262
7294 105230
7295 105230 011146
7296 105232 012746 062125
7297 105236 012746 000002
7298 105242 010600
7299 105244 104414
7300 105246 062706 000006
7301 105252 16$:
7302 105264
7303 105272
7304 105274 001405
7305 105276 25$:
7306 105276 104456
7307 105300 000032
7308 105302 065366
7309 105304 000000
7310 105306 000700
7311 105310 26$:
7312 105316
7313 105320 001407
7314 105322
7315 105322 104456
7316 105324 000033
7317 105326 065732
7318 105330 067516
7319 105332 012701 177777
7320 105336 000410 29$:
7321 105340
7322 105340 012746 061661
7323 105344 012746 000001
7324 105350 010600
7325 105352 104414
7326 105354 062706 000004
7327 105360 005337 050562 101$:

```

```

MOV #1,R1 ; PUT 'TABLE EMPTY' INDICATOR IN R1
BR 32$
MOV #NODTBL,SLOT
MOV P$CPYS,CPYCNT ; SET UP FOR NO. OF COPIES
CALL FULSLT ; GET NEXT NODE IN TABLE
CMP #-1,SLOT ; SEE IF AT END OF TABLE
BEQ 32$ ; IF YES, EXIT
CALL BINHEX SLOT,#6,#STRBUF ; PRINT ADDRESS BEING TESTED
PRINTB #TSTMS2,#DIRECT,#STRBUF ; NODE ADDRESS

MOV #STRBUF,-(SP)
MOV #DIRECT,-(SP)
MOV #TSTMS2,-(SP)
MOV #3,-(SP)
MOV SP,R0
TRAP C$PNTB
ADD #10,SP

CMP #CPATRN,KEYWD1
BNE 16$
MOV P$TYPE,R1
ASL R1
ADD #MSGTAB,R1
PRINTB #MESPA1,(R1)

MOV (R1),-(SP)
MOV #MESPA1,-(SP)
MOV #2,-(SP)
MOV SP,R0
TRAP C$PNTB
ADD #6,SP

CALL BLDLD SLOT ; CALL BUILD LOOPDIRECT SUBROUTINE
CALL XMIT ; TRANSMIT LOOPDIRECT MESSAGES
P$POP R2 ; GET RESULTS, R2 = SUCCESS/FAILURE
BEQ 26$ ; IF OK, EXIT
ERRHRD 26,EMSG24 ; ELSE PRINT ERROR MESSAGE

TRAP C$ERHRD
.WORD 26
.WORD EMSG24
.WORD 0

BR 10$
CALL RUNCOM ; DO RECIEVE LOOP
P$POP R4 ; GET RESULTS
BEQ 29$ ; IF NO ERRORS, CONTINUE
ERRHRD 27,EMSG34,ERR2

TRAP C$ERHRD
.WORD 27
.WORD EMSG34
.WORD ERR2

MOV #-1,R1 ; PUT ERROR INDICATOR INTO R1
BR 101$
PRINTB #OK ; RESPONSE OK

MOV #OK,-(SP)
MOV #1,-(SP)
MOV SP,R0
TRAP C$PNTB
ADD #4,SP

DEC CPYCNT ; DECREMENT 'COPIES' COUNTER

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7328 105364 001274          BNE      15$          ; IF MORE TO DO, LOOP
7329 105366                CALL     WRITES #1,SLOT ; ELSE,UPDATE SUMMARY TABLE
7330 105404 062737 000010 002402 30$:     ADD      #10,SLOT      ; INCREMENT TO NEXT NODE TABLE ENTRY
7331 105412 000636                BR       10$
7332 105414                32$:     RETURN  R1
7333
7334
7335
7336          ;ACTION ROUTINE TO SET 'RUN LOOPPAIR' FLAG
7337          ;
7338
7339 105420 012737 000033 002310 ACTRNL: MOV     #CLUPPR,KEYWD1 ; SET FLAG
7340 105426 000207                RTS      PC
7341
7342 105430 005037 050552                RUNLUP: CLR     TEMP1          ; CLEAR 'HEADER PRINTED' FLAG
7343 105434 012737 002404 002402        MOV     #NODTBL,SLOT      ; MOVE NODE TABLE ADDRESS TO SLOT
7344 105442                CALL     FULSLT          ; SEE IF TABLE EMPTY
7345 105450 022737 177777 002402        CMP     #-1,SLOT          ;
7346 105456 001014                BNE     9$              ; IF NO, CONTINUE
7347 105460                PRINTF  #TABEMT,#NOD      ; ELSE, PRINT 'TABLE EMPTY' MESSAGE
7348 105460 012746 053701                MOV     #NOD,-(SP)
7349 105464 012746 053632                MOV     #TABEMT,-(SP)
7350 105470 012746 000002                MOV     #2,-(SP)
7351 105474 010600                MOV     SP,R0
7352 105476 104417                TRAP   C$PNTF
7353 105500 062706 000006                ADD     #6,SP
7354 105504 000137 106514                JMP     30$
7355 105510 012737 002404 002402 9$:     MOV     #NODTBL,SLOT      ; MOVE NODE TABLE ADDRESS TO SLOT
7356 105516 013737 002374 050562 10$:     MOV     P$CPYS,CPYCNT     ; SET UP FOR NO. OF COPIES
7357 105524                CALL     FULSLT          ; GET NEXT NODE IN TABLE
7358 105532 022737 177777 002402        CMP     #-1,SLOT          ; SEE IF AT END OF TABLE
7359 105540 001002                BNE     11$            ; IF YES, EXIT
7360 105542 000137 106514                JMP     30$
7361 105546 013701 002402                11$:     MOV     SLOT,R1          ; MOVE SLOT TO R1
7362 105552 126127 000007 000000        CMPB   7(R1),#CTARCT     ; SEE IF TARGET NODE
7363 105560 001431                BEQ     18$            ; IF YES, BRANCH
7364 105562 010102                MOV     R1,R2          ; ELSE, POINT R1 TO TARGET NODE
7365 105564 062701 000010                ADD     #10,R1          ; AND R2 TO ASSIST NODE
7366
7367 105570 126127 000007 000000        15$:     CMPB   7(R1),#CTARGET     ; SEE IF TARGET NODE
7368 105576 001425                BEQ     19$            ; IF YES, OK
7369 105600                17$:     PRINTF  #MSG32          ; ELSE PRINT ERROR MESSAGE
7370 105600 012746 065637                MOV     #MSG32,-(SP)
7371 105604 012746 000001                MOV     #1,-(SP)
7372 105610 010600                MOV     SP,R0
7373 105612 104417                TRAP   C$PNTF
7374 105614 062706 000004                ADD     #4,SP
7375 105620                PRINTF  #PASABT
7376 105620 012746 061526                MOV     #PASABT,-(SP)
7377 105624 012746 000001                MOV     #1,-(SP)
7378 105630 010600                MOV     SP,R0
7379 105632 104417                TRAP   C$PNTF
7380 105634 062706 000004                ADD     #4,SP
7381 105640 000137 106514                JMP     30$          ; EXIT
7382 105644 010102                18$:     MOV     R1,R2          ; POINT R1 TO TARGET NODE
7383 105646 062702 000010                ADD     #10,R2          ; AND R2 TO ASSIST NODE

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```

7384 105652 126227 000007 000001 19$:  CMPB 7(R2),#CASIST      ; IS R2 POINTING TO AN ASSIST NODE?
7385 105660 001347                    BNE 17$                    ; IF NOT, ERROR, ELSE CONTINUE
7386 105662                    20$:  CALL BLDAST R2,R1          ; BUILD TRANSMIT ASSIST MESSAGE
7387 105674                    CALL XMIT                  ; TRANSMIT MESSAGE
7388 105702                    P$POP R4                   ; GET RESULTS, R2 = SUCCESS/FAILURE
7389 105704 0C1406                    BEQ 22$                    ; IF OK, EXIT
7390 105706                    21$:  ERRHRD 26,MSG24          ; ELSE PRINT ERROR MESSAGE
7391 105706 104456                    TRAP C$ERHRD
7392 105710 000032                    .WORD 26
7393 105712 065366                    .WORD MSG24
7394 105714 000000                    .WORD 0
7395 105716 000137 106432                    JMP 28$
7396 105722                    22$:  CALL BINHEX R1,#6,#STRBUF ; PRINT ERROR MESSAGE
7397 105742                    CALL BINHEX R2,#6,#STRBU1
7398 105762                    PRINTB #TSTMS4,#ARGTY7,#STRBUF,#ARGTY6,#STRBU1 ; ASSIST NODE =
7399 105762 012746 002344                    MOV #STRBU1,-(SP)
7400 105766 012746 062603                    MOV #ARGTY6,-(SP)
7401 105772 012746 002322                    MOV #STRBUF,-(SP)
7402 105776 012746 062613                    MOV #ARGTY7,-(SP)
7403 106002 012746 061624                    MOV #TSTMS4,-(SP)
7404 106006 012746 000005                    MOV #5,-(SP)
7405 106012 010600                    MOV SP,R0
7406 106014 104414                    TRAP C$PNTB
7407 106016 062706 000014                    ADD #14,SP
7408 106022                    CALL RUNCOM                ; DO RECIEVE LOOP
7409 106030                    P$POP R3                   ; CHECK RESULTS
7410 106032 001405                    BEQ 23$                    ; IF OK, CONT.
7411 106034                    ERRHRD 28,MSG40,ERR3
7412 106034 104456                    TRAP C$ERHRD
7413 106036 000034                    .WORD 28
7414 106040 066174                    .WORD MSG40
7415 106042 067604                    .WORD ERR3
7416 106044 000410                    BR 101$
7417 106046                    23$:  PRINTB #OKRE
7418 106046 012746 061702                    MOV #OKRE,-(SP)
7419 106052 012746 000001                    MOV #1,-(SP)
7420 106056 010600                    MOV SP,R0
7421 106060 104414                    TRAP C$PNTB
7422 106062 062706 000004                    ADD #4,SP
7423 106066                    101$: CALL BLDAST R1,R2          ; BUILD RECEIVE ASSIST MESSAGE
7424 106100                    CALL XMIT                  ; TRANSMIT MESSAGE
7425 106106                    P$POP R4                   ; CHECK RESULTS
7426 106110 001276                    BNE 21$                    ; IF OK CONTINUE, ELSE REPORT ERROR
7427 106112                    CALL BINHEX R1,#6,#STRBUF ; PRINT ERROR MESSAGE
7428 106132                    CALL BINHEX R2,#6,#STRBU1
7429 106152                    PRINTB #TSTMS4,#ARGTY7,#STRBUF,#ARGTY6,#STRBU1 ; ASSIST NODE =
7430 106152 012746 002344                    MOV #STRBU1,-(SP)
7431 106156 012746 062603                    MOV #ARGTY6,-(SP)
7432 106162 012746 002322                    MOV #STRBUF,-(SP)
7433 106166 012746 062613                    MOV #ARGTY7,-(SP)
7434 106172 012746 061624                    MOV #TSTMS4,-(SP)
7435 106176 012746 000005                    MOV #5,-(SP)
7436 106202 010600                    MOV SP,R0
7437 106204 104414                    TRAP C$PNTB
7438 106206 062706 000014                    ADD #14,SP
7439 106212                    CALL RUNCOM                ; DO RECEIVE LOOP

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7496 106524 012704 003720      MOV      #TIMERS,R4      ; SET UP FOR 10 SECOND TIMOUT
7497 106530 012714 000012      MOV      #10.,(R4)
7498 106534 005002      CLR      R2              ; CLEAR RESULTS REGISTER
7499 106536      35$:  BREAK
7500 106536 104422      TRAP     C$BRK
7501 106540 005714      TST      (R4)           ; SEE IF TIME HAS EXPIRED
7502 106542 001516      BEQ      40$           ; IF YES, BRANCH
7503 106544      CALL     RECEIVE       ; CHECK FOR ANSWER
7504 106552      P$POP   R1             ; R2 HOLDS NO. OF BUFFERS RECEIVED
7505 106554 001770      BEQ      35$           ; IF NO BUFFERS RECIEVED, LOOP
7506 106556 063737 050560 050510      ADD      XFER,S.XFER   ; UPDATE BYTES TRANSFERED SUM. COUNTER
7507 106564 005237 050476      INC      S.REC         ; UPDATE PACKETS RECEIVED SUM. COUNTER
7508 106570 013703 003764      MOV      RRGNXT,R3     ; GET RECEIVE RING POINTER
7509 106574      CALL     GETRNX #RRGNXT ; UPDATE POINTER
7510 106606 016301 000006      MOV      6(R3),R1      ; GET PACKET LENGTH FROM DISCRIPTOR
7511 106612 042701 170000      BIC      #170000,R1    ; ZERO OUT EXCESS INFOR
7512 106616 162701 000004      SUB      #4,R1         ; SUBTRACT CRC BYTES
7513 106622 020137 050566      CMP      R1,BUFLEN     ; CHECK FOR LENGTH ERROR
7514 106626 001423      BEQ      37$           ; IF OK, BR
7515 106630 005237 050502      INC      S.LEN         ; ELSE, UPDATE LENGTH ERRORS COUNTER
7516 106634 012737 062342 002312      MOV      #LENGTH,KEYWD2 ; MOVE 'LENGTH' TO ERROR INDICATOR
7517 106642 012702 177777      MOV      #-1,R2       ; INDICATE ERROR TO R2
7518 106646      PRINTX #LGERMS,BUFLEN,R1 ; PRINT LENGTH ERROR MESSAGE
7519 106646 010146      MOV      R1,-(SP)
7520 106650 013746 050566      MOV      BUFLN,-(SP)
7521 106654 012746 067117      MOV      #LGERMS,-(SP)
7522 106660 012746 000003      MOV      #3,-(SP)
7523 106664 010600      MOV      SP,R0
7524 106666 104415      TRAP     C$PNTX
7525 106670 062706 000010      ADD      #10,SP
7526 106674 000450      BR       50$           ; AND EXIT
7527 106676 016303 000002      37$:  MOV      2(R3),R3   ; POINT R3 TO MESSAGE BUFFER
7528 106702 066303 000016      ADD      16(R3),R3    ; POINT R3 TO DATA AFTER SKIP COUNT
7529 106706 062703 000030      ADD      #30,R3      ; POINT R3 TO FIRST DATA BYTE
7530 106712 063737 002372 050506      ADD      P$SIZE,S.BYTE ; UPDATE BYTES COMPARED SUMMARY COUNTER
7531 106720      CALL     DATCMP P$SIZE,CMPBUF,R3 ; CHECK FOR DATA COMPARE ERRORS
7532 106740      P$POP   R3           ; CHECK RESULTS
7533 106742 001425      BEQ      50$           ; IF ERRORS,
7534 106744 060337 050504      ADD      R3,S.COMP    ; UPDATE COMPARE ERRORS SUMMARY COUNTER
7535 106750 012737 062351 002312      MOV      #COMPAR,KEYWD2 ; MOVE 'COMPARE' TO ERROR INDICATOR
7536 106756 012702 177777      MOV      #-1,R2       ; INDICATE ERROR TO R2
7537 106762 000415      BR       50$
7538
7539 106764 012737 062316 002312 38$:  MOV      #RETRY,KEYWD2  ; MOVE 'EXCESSIVE COLLISIONS' TO ERROR INCICATOR
7540 106772 012702 177777      MOV      #-1,R2       ; INDICATE ERROR IN R2
7541 106776 000407      BR       50$
7542
7543 107000 005237 050500      40$:  INC      S.NREC      ; UPDATE MESSAGES NOT RECEIVED COUNTER
7544 107004 012737 062302 002312      MOV      #NORESP,KEYWD2 ; MOVE 'NO RESPONCE' TO ERROR INDICATOR
7545 107012 012702 177777      MOV      #-1,R2       ; INDICATE ERROR TO R2
7546
7547 107016      50$:  RETURN  R2         ; RETURN
7548
7549
7550
7551      ;ACTION ROUTINE TO SET 'RUN PATTERN' FLAG

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7608	107230	010600				MOV	SP,R0
7609	107232	104417				TRAP	C\$PNTF
7610	107234	062706	000004			ADD	#4,SP
7611	107240			PRINTF	#MSG4,MSGTAB,P\$SIZE,P\$CPYS		;PRINT PARAMETERS
7612	107240	013746	002374			MOV	P\$CPYS,-(SP)
7613	107244	013746	002372			MOV	P\$SIZE,-(SP)
7614	107250	013746	003262			MOV	MSGTAB,-(SP)
7615	107254	012746	055276			MOV	#MSG4,-(SP)
7616	107260	012746	000004			MOV	#4,-(SP)
7617	107264	010600				MOV	SP,R0
7618	107266	104417				TRAP	C\$PNTF
7619	107270	062706	000012			ADD	#12,SP
7620	107274	105037	003160				
7621	107300	000207		CLRB	P\$NNUF		;CLEAR NOTNUF FLAG
7622				RTS	PC		
7623							
7624							
7625				:			
7626				:	ACTION ROUTINE TO SET SHOW COUNTERS FLAG		
7627				:			
7628	107302			ACTCNT:	CALL	FUNCT #RDCNTS	;READ COUNTERS
7629	107314				P\$POP	R1	;CHECK RESULT
7630	107316	001402			BEQ	21\$;BRANCH IF ERROR
7631	107320	000137	110346		JMP	40\$	
7632							;PRINT COUNTER INFO
7633							
7634	107324			21\$:	CALL	BINHEX #PHYADR,#6,#STRBUF	;GET ADDRESS INTO ASCII
7635	107346				PRINTF	#CNTR00,#STRBUF	
7636	107346	012746	002322			MOV	#STRBUF,-(SP)
7637	107352	012746	062703			MOV	#CNTR00,-(SP)
7638	107356	012746	000002			MOV	#2,-(SP)
7639	107362	010600				MOV	SP,R0
7640	107364	104417				TRAP	C\$PNTF
7641	107366	062706	000006			ADD	#6,SP
7642	107372			PRINTF	#CNTR01,UCB12+2		
7643	107372	013746	050162			MOV	UCB12+2,-(SP)
7644	107376	012746	062763			MOV	#CNTR01,-(SP)
7645	107402	012746	000002			MOV	#2,-(SP)
7646	107406	010600				MOV	SP,R0
7647	107410	104417				TRAP	C\$PNTF
7648	107412	062706	000006			ADD	#6,SP
7649	107416			CALL	BINDEC #UCB12+4		
7650	107430			PRINTF	#CNTR02,#DECSTR		
7651	107430	012746	075200			MOV	#DECSTR,-(SP)
7652	107434	012746	063032			MOV	#CNTR02,-(SP)
7653	107440	012746	000002			MOV	#2,-(SP)
7654	107444	010600				MOV	SP,R0
7655	107446	104417				TRAP	C\$PNTF
7656	107450	062706	000006			ADD	#6,SP
7657	107454			CALL	BINDEC #UCB12+10		
7658	107466			PRINTF	#CNTR03,#DECSTR		
7659	107466	012746	075200			MOV	#DECSTR,-(SP)
7660	107472	012746	063066			MOV	#CNTR03,-(SP)
7661	107476	012746	000002			MOV	#2,-(SP)
7662	107502	010600				MOV	SP,R0
7663	107504	104417				TRAP	C\$PNTF

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7664	107506	062706	000006		ADD	#6,SP
7665	107512			PRINTF	#CNTR04,UCB12+14	
7666	107512	013746	050174		MOV	UCB12+14,-(SP)
7667	107516	012746	063133		MOV	#CNTR04,-(SP)
7668	107522	012746	000002		MOV	#2,-(SP)
7669	107526	010600			MOV	SP,RO
7670	107530	104417			TRAP	C\$PNTF
7671	107532	062706	000006		ADD	#6,SP
7672	107536			PRINTF	#CNTR05,UCB12+16	
7673	107536	013746	050176		MOV	UCB12+16,-(SP)
7674	107542	012746	063210		MOV	#CNTR05,-(SP)
7675	107546	012746	000002		MOV	#2,-(SP)
7676	107552	010600			MOV	SP,RO
7677	107554	104417			TRAP	C\$PNTF
7678	107556	062706	000006		ADD	#6,SP
7679	107562			CALL	BINDEC #UCB12+20	
7680	107574			PRINTF	#CNTR06,#DECSTR	
7681	107574	012746	075200		MOV	#DECSTR,-(SP)
7682	107600	012746	063260		MOV	#CNTR06,-(SP)
7683	107604	012746	000002		MOV	#2,-(SP)
7684	107610	010600			MOV	SP,RO
7685	107612	104417			TRAP	C\$PNTF
7686	107614	062706	000006		ADD	#6,SP
7687	107620			CALL	BINDEC #UCB12+24	
7688	107632			PRINTF	#CNTR07,#DECSTR	
7689	107632	012746	075200		MOV	#DECSTR,-(SP)
7690	107636	012746	063317		MOV	#CNTR07,-(SP)
7691	107642	012746	000002		MOV	#2,-(SP)
7692	107646	010600			MOV	SP,RO
7693	107650	104417			TRAP	C\$PNTF
7694	107652	062706	000006		ADD	#6,SP
7695	107656			PRINTF	#CNTR08,UCB12+30	
7696	107656	013746	050210		MOV	UCB12+30,-(SP)
7697	107662	012746	063367		MOV	#CNTR08,-(SP)
7698	107666	012746	000002		MOV	#2,-(SP)
7699	107672	010600			MOV	SP,RO
7700	107674	104417			TRAP	C\$PNTF
7701	107676	062706	000006		ADD	#6,SP
7702	107702			PRINTF	#CNTR09,UCB12+32	
7703	107702	013746	050212		MOV	UCB12+32,-(SP)
7704	107706	012746	063442		MOV	#CNTR09,-(SP)
7705	107712	012746	000002		MOV	#2,-(SP)
7706	107716	010600			MOV	SP,RO
7707	107720	104417			TRAP	C\$PNTF
7708	107722	062706	000006		ADD	#6,SP
7709	107726			CALL	BINDEC #UCB12+34	
7710	107740			PRINTF	#CNTR10,#DECSTR	
7711	107740	012746	075200		MOV	#DECSTR,-(SP)
7712	107744	012746	063513		MOV	#CNTR10,-(SP)
7713	107750	012746	000002		MOV	#2,-(SP)
7714	107754	010600			MOV	SP,RO
7715	107756	104417			TRAP	C\$PNTF
7716	107760	062706	000006		ADD	#6,SP
7717	107764			CALL	BINDEC #UCB12+40	
7718	107776			PRINTF	#CNTR11,#DECSTR	
7719	107776	012746	075200		MOV	#DECSTR,-(SP)

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7720	110002	012746	063552		MOV	#CNTR11,-(SP)
7721	110006	012746	000002		MOV	#2,-(SP)
7722	110012	010600			MOV	SP,RO
7723	110014	104417			TRAP	CSPNTF
7724	110016	062706	000006		ADD	#6,SP
7725	110022			CALL	BINDEC	#UCB12+44
7726	110034			PRINTF	#CNTR12,#DECSTR	
7727	110034	012746	075200		MOV	#DECSTR,-(SP)
7728	110040	012746	063622		MOV	#CNTR12,-(SP)
7729	110044	012746	000002		MOV	#2,-(SP)
7730	110050	010600			MOV	SP,RO
7731	110052	104417			TRAP	CSPNTF
7732	110054	062706	000006		ADD	#6,SP
7733	110060			CALL	BINDEC	#UCB12+50
7734	110072			PRINTF	#CNTR13,#DECSTR	
7735	110072	012746	075200		MOV	#DECSTR,-(SP)
7736	110076	012746	063670		MOV	#CNTR13,-(SP)
7737	110102	012746	000002		MOV	#2,-(SP)
7738	110106	010600			MOV	SP,RO
7739	110110	104417			TRAP	CSPNTF
7740	110112	062706	000006		ADD	#6,SP
7741	110116			CALL	BINDEC	#UCB12+54
7742	110130			PRINTF	#CNTR14,#DECSTR	
7743	110130	012746	075200		MOV	#DECSTR,-(SP)
7744	110134	012746	063735		MOV	#CNTR14,-(SP)
7745	110140	012746	000002		MOV	#2,-(SP)
7746	110144	010600			MOV	SP,RO
7747	110146	104417			TRAP	CSPNTF
7748	110150	062706	000006		ADD	#6,SP
7749	110154			CALL	BINDEC	#UCB12+60
7750	110166			PRINTF	#CNTR15,#DECSTR	
7751	110166	012746	075200		MOV	#DECSTR,-(SP)
7752	110172	012746	063771		MOV	#CNTR15,-(SP)
7753	110176	012746	000002		MOV	#2,-(SP)
7754	110202	010600			MOV	SP,RO
7755	110204	104417			TRAP	CSPNTF
7756	110206	062706	000006		ADD	#6,SP
7757	110212			CALL	BINDEC	#UCB12+64
7758	110224			PRINTF	#CNTR16,#DECSTR	
7759	110224	012746	075200		MOV	#DECSTR,-(SP)
7760	110230	012746	064033		MOV	#CNTR16,-(SP)
7761	110234	012746	000002		MOV	#2,-(SP)
7762	110240	010600			MOV	SP,RO
7763	110242	104417			TRAP	CSPNTF
7764	110244	062706	000006		ADD	#6,SP
7765	110250			PRINTF	#CNTR17,UCB12+70	
7766	110250	013746	050250		MOV	UCB12+70,-(SP)
7767	110254	012746	064101		MOV	#CNTR17,-(SP)
7768	110260	012746	000002		MOV	#2,-(SP)
7769	110264	010600			MOV	SP,RO
7770	110266	104417			TRAP	CSPNTF
7771	110270	062706	000006		ADD	#6,SP
7772	110274			PRINTF	#CNTR18,UCB12+72	
7773	110274	013746	050252		MOV	UCB12+72,-(SP)
7774	110300	012746	064154		MOV	#CNTR18,-(SP)
7775	110304	012746	000002		MOV	#2,-(SP)

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```

7776 110310 010600
7777 110312 104417
7778 110314 062706 000006
7779 110320
7780 110320 013746 050254
7781 110324 012746 064221
7782 110330 012746 000002
7783 110334 010600
7784 110336 104417
7785 110340 062706 000006
7786 110344 000404
7787
7788 110346
7789 110346 104456
7790 110350 000037
7791 110352 065576
7792 110354 000000
7793
7794 110356 105037 003160
7795 110362 000207
7796
7797
7798
7799
7800
7801
7802 110364 105037 003160
7803 110370 012737 002404 002402
7804 110376
7805 110404 022737 177777 002402
7806 110412 001437
7807 110414
7808 110414 012746 053462
7809 110420 012746 000001
7810 110424 010600
7811 110426 104417
7812 110430 062706 000004
7813 110434
7814 110442 022737 177777 002402
7815 110450 001432
7816 110452
7817 110474
7818 110502 062737 000010 002402
7819 110510 000751
7820 110512
7821 110512 012746 053701
7822 110516 012746 053632
7823 110522 012746 000002
7824 110526 010600
7825 110530 104417
7826 110532 062706 000006
7827 110536 000207
7828
7829
7830
7831

```

PRINTF #CNTR19,UCB12+74
 BR 50\$
 40\$: ERRHRD 31,MSG31
 50\$: CLRB PSNNUF
 RTS PC
 ;ACTION ROUTINE TO PRINT OUT THE NODE TABLE
 ;
 ACTSND: CLRB PSNNUF
 MOV #NODTBL,SLOT ;MOVE NODE TABLE ADDRESS INTO SLOT
 CALL FULSLT ;SEE IF TABLE EMPTY
 CMP #-1,SLOT ;IF YES, DON'T PRINT HEADER
 BEQ 15\$
 PRINTF #NTBHDR ;PRINT NODE TABLE HEADER
 MOV #NTBHDR,-(SP)
 MOV #1,-(SP)
 MOV SP,RO
 TRAP C\$PNTF
 ADD #4,SP
 10\$: CALL FULSLT ;FIND LOCATION IN TABLE WITH AN ADDRESS
 CMP #-1,SLOT ;CHECK IF AT END OF TABLE
 BEQ 20\$;IF YES, RETURN
 CALL BINHEX SLOT,#6,#STRBUF ;ELSE, PUT ASCII ADDRESS INTO BUFFER
 CALL PRTNOD ;PRINT NODE TABLE ENTRY
 ADD #8.,SLOT ;INCR. SLOT TO POINT TO NEXT TABLE ENTRY
 BR 10\$;CONTINUE UNTIL ALL ENTRIES PRINTED
 15\$: PRINTF #TABEMT,#NOD
 MOV #NOD,-(SP)
 MOV #TABEMT,-(SP)
 MOV #2,-(SP)
 MOV SP,RO
 TRAP C\$PNTF
 ADD #6,SP
 20\$: RTS PC ;RETURN
 ;
 ;ACTION ROUTINE TO CLEAR A NODE SPECIFIED BY NODE LOGICAL NAME

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```

7832      ;FROM THE NODE TABLE
7833      ;
7834
7835      110540      ACTCNL: P$PUSH  R2      ;SAVE R2
7836      110542      013702  003154      MOV      P$NUM,R2      ;PUT NODE LOGICAL NUMBER INTO R2
7837      110546      006302                ASL      R2      ;MULTIPLY BY 8
7838      110550      006302                ASL      R2      ;NODE TABLE ADDRESS =
7839      110552      006302                ASL      R2      ; (LOG. NO. X 8) + #NODTBL
7840      110554      062702  002404      ADD      #NODTBL,R2      ;ADD OFFSET
7841      110560      005022                CLR      (R2)+      ;CLEAR ENTRY (8 BYTES)
7842      110562      005022                CLR      (R2)+
7843      110564      005022                CLR      (R2)+
7844      110566      005012                CLR      (R2)
7845      110570                P$POP   R2      ;RESTORE R2
7846      110572      105037  003160      CLRB   P$NNUF      ;CLEAR NOTNUF FLAG
7847      110576                PRINTF #LOGDEL,P$NUM ;PRINT MESSAGE INDICATING DELETION
7848      110576      013746  003154                MOV      P$NUM,-(SP)
7849      110602      012746  054426                MOV      #LOGDEL,-(SP)
7850      110606      012746  000002                MOV      #2,-(SP)
7851      110612      010600                MOV      SP,R0
7852      110614      104417                TRAP   C$PNTF
7853      110616      062706  000006                ADD      #6,SP
7854      110622      000207                RTS     PC      ;RETURN
7855
7856      ;
7857      ;ACTION ROUTINE TO INITIATE A UNA PORT COMMAND
7858      ;
7859
7860      110624      105037  003160      ACTFCT: CLRB   P$NNUF      ;CLEAR NOTNUF FLAG
7861      110630                CALL  FUNCT P$NUM      ;CALL FUNCTION ROUTINE WITH FUNCTION CODE
7862      110642                P$POP  R1      ;CHECK RESULTS
7863      110644      001404                BEQ    1$      ; IF OK EXIT
7864      110646                ERRHRD 30,EMSG30 ; ELSE REPORT ERROR
7865      110646      104456                TRAP   C$ERHRD
7866      110650      000036                .WORD 30
7867      110652      065531                .WORD EMSG30
7868      110654      000000                .WORD 0
7869      110656      000207      1$: RTS     PC
7870
7871      ;
7872      ;ACTION ROUTINE TO SAVE NODE TABLE
7873      ;
7874
7875      110660      ACTSAV: P$PUSH  R2,R3      ;SAVE R2 AND R3
7876      110664      012702  002404      MOV      #NODTBL,R2      ;SET REGISTERS FOR COPYING
7877      110670      012703  002530      MOV      #SAVTBL,R3      ;R2 = FROM, R3 = TO
7878      110674                PRINTF #UNSMMSG,#SAVED ;PRINT 'TABLE SAVED' MESSAGE
7879      110674      012746  054620                MOV      #SAVED,-(SP)
7880      110700      012746  054561                MOV      #UNSMMSG,-(SP)
7881      110704      012746  000002                MOV      #2,-(SP)
7882      110710      010600                MOV      SP,R0
7883      110712      104417                TRAP   C$PNTF
7884      110714      062706  000006                ADD      #6,SP
7885      110720      000137  111002                JMP     SAVCOM
7886
7887      ;

```

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```

7888
7889
7890
7891 110724 105037 003160
7892 110730
7893 110734 121427 000057
7894 110740 001002
7895 110742 000137 111014
7896 110746 012703 002404
7897 110752 012702 002530
7898 110756
7899 110756 012746 054627
7900 110762 012746 054561
7901 110766 012746 000002
7902 110772 010600
7903 110774 104417
7904 110776 062706 000006
7905 111002 012701 000050
7906 111006 012223
7907 111010 005301
7908 111012 001375
7909 111014
7910 111020 105037 003160
7911 111024 000207
7912
7913
7914
7915
7916
7917 111026 105037 003160
7918 111032
7919 111034 012701 000132
7920 111040 012702 002656
7921 111044 005022
7922 111046 005301
7923 111050 001375
7924 111052
7925 111052 012746 053706
7926 111056 012746 054514
7927 111062 012746 000002
7928 111066 010600
7929 111070 104417
7930 111072 062706 000006
7931 111076
7932 111100 000207
7933
7934
7935
7936
7937
7938 111102
7939 111102 121427 000040
7940 111106 001002
7941 111110 005204
7942 111112 000773
7943 111114 121427 000000

;ACTION ROUTINE TO UNSAVE NODE TABLE
:
ACTUNS: CLRB    P$NNUF           ;CLEAR 'NOT ENOUGH' FLAG
        P$PUSH  R2,R3           ;SAVE R2 AND R3
        CMPB   (R4),#57
        BNE   5$
        JMP   QUIT
5$:     MOV    #NODTBL,R3       ;SET REGISTERS FOR COPYING
        MOV    #SAVTBL,R2      ;R2 = FROM, R3 = TO
        PRINTF #UNSMMSG,#RESTOR ;PRINT 'TABLE RESTORED' MESSAGE
                                MOV    #RESTOR,-(SP)
                                MOV    #UNSMMSG,-(SP)
                                MOV    #2,-(SP)
                                MOV    SP,R0
                                TRAP   C$PNTF
                                ADD    #6,SP
SAVCOM: MOV    #TBLEN,R1       ;MOVE TABLE LENGTH TO R1
10$:    MOV    (R2)+,(R3)+     ;MOVE WORD
        DEC   R1              ;DECREMENT COUNTER
        BNE  10$             ;IF MORE, LOOP
QUIT:   P$POP  R2,R3          ; ELSE, RESTORE COUNTERS
        CLRB  P$NNUF         ; CLEAR 'NOT ENOUGH' FLAG
        RTS   PC

;ACTION ROUTINE TO CLEAR SUMMARY TABLE
:
ACTCSU: CLRB    P$NNUF           ;CLEAR 'NOT ENOUGH' COUNTER
        P$PUSH  R2           ;SAVE R2
        MOV    #STBLN,R1      ;MOVE TABLE LENGTH TO R1
        MOV    #STATBL,R2     ;MOVE SUMMARY TABLE ADDRESS TO R2
5$:     CLR    (R2)+          ;CLEAR FIRST WORD
        DEC   R1              ;SEE IF FINISHED
        BNE  5$              ; IF NO, DO MORE
        PRINTF #TABCLR,#SUMM  ; ELSE, PRINT 'TABLE CLEARED' MESSAGE
                                MOV    #SUMM,-(SP)
                                MOV    #TABCLR,-(SP)
                                MOV    #2,-(SP)
                                MOV    SP,R0
                                TRAP   C$PNTF
                                ADD    #6,SP
        P$POP  R2           ; AND RESTORE R2
        RTS   PC

;ACTION ROUTINE TO CHECK FOR PASS DEFAULT VALUE
:
ACTDFT:
1$:     CMPB   (R4),#40       ;SEE IF SPACES
        BNE   2$             ; IF NO, CONT.
        INC   R4              ; ELSE, POINT TO NEXT CHAR
        BR    1$             ; AND CHECK AGAIN
2$:     CMPB   (R4),#0       ;SEE IF DEFAULT VALUE

```

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```

7944 111120 001007          BNE      10$          : IF NO, BR
7945 111122 012763 000030 000002      MOV      #30,2(R3)   : IF YES, POINT R3 TO SKIP CHECK PASS COUNT
7946 111130 012737 000001 003154      MOV      #1,PSNUM    : SET DEFAULT TO 1
7947 111136 000403          BR       15$         : RETURN
7948 111140 012763 000004 000002 10$:  MOV      #4,2(R3)   : POINT R3 TO CHECK FOR PASS COUNT
7949 111146 000207          RTS       PC
7950
7951
7952          : ACTION ROUTINE TO READ A FILE FROM EXTERNAL MEDIA ONTO THE NODE TABLE
7953          :
7954
7955          ACTUSF:
7956          P$PUSH R2          : SAVE R2
7957          CLR      R2          : INITIALIZE R2 TO NODE TYPE 'TARGET'
7958          OPEN    CBOADR      : OPEN FILE, NAME=ASCIZ STRING
7959          013700 002366      MOV      CBOADR,R0
7960          104434          TRAP    C$OPEN
7961          BCOMPLETE 1$      : RETURN IF SUCCESSFUL
7962          103413          BCS     1$
7963          PRINTF #OPNERR,CBOADR : ELSE PRINT 'OPEN ERROR'
7964          013746 002366      MOV      CBOADR,-(SP)
7965          012746 112110      MOV      #OPNERR,-(SP)
7966          012746 000002      MOV      #2,-(SP)
7967          010600          MOV      SP,R0
7968          104417          TRAP    C$PNTF
7969          062706 000006      ADD     #6,SP
7970          CLOSE          : CLOSE FILE
7971          104435          TRAP    C$CLOS
7972          11212          1$:  CALL     RDLIN      : READ A LINE AT A TIME
7973          005737 112104      TST     BAD        : SEE IF AN ERROR DURING READ
7974          001064          BNE     25$         : BR ON ERROR TO LEAVE
7975          005737 112106      TST     EOFF       : SEE IF EOF BEFORE PROCESS
7976          001411          BEQ    10$         : IF VALID, PROCESS
7977          112234          PRINTF #EOFFND      : ELSE SAY 'END OF FILE' AND LEAVE
7978          012746 112223      MOV      #EOFFND,-(SP)
7979          012746 000001      MOV      #1,-(SP)
7980          010600          MOV      SP,R0
7981          104417          TRAP    C$PNTF
7982          062706 000004      ADD     #4,SP
7983          112254          10$: BR       25$
7984          112256          PRINTF #PLINE,#FILLIN : PRINT LINE READ FROM FILE
7985          012746 111560      MOV      #FILLIN,-(SP)
7986          012746 112172      MOV      #PLINE,-(SP)
7987          012746 000002      MOV      #2,-(SP)
7988          010600          MOV      SP,R0
7989          104417          TRAP    C$PNTF
7990          062706 000006      ADD     #6,SP
7991          111302          CALL    EDPACK #FILLIN,#ADRBUF,#6 : PUT ADDRESS INTO BINARY
7992          111324          P$POP  R1          : CHECK RESULTS
7993          001411          BEQ    12$         : IF OK, BR
7994          111330          PRINTF #CADERR      : ELSE PRINT ERROR MESSAGE
7995          012746 053306      MOV      #CADERR,-(SP)
7996          012746 000001      MOV      #1,-(SP)
7997          010600          MOV      SP,R0
7998          104417          TRAP    C$PNTF
7999          062706 000004      ADD     #4,SP

```


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READ LINE OF OPENED FILE

```

8056 111460 012746 000001
8057 111464 010600
8058 111466 104417
8059 111470 062706 000004
8060 111474 012737 177777 112104
8061 111502 000416
8062
8063 111504 122712 000015 2$:
8064 111510 001756
8065 111512 122712 000012
8066 111516 001410
8067 111520 122712 000040
8068
8069 111524 101002
8070 111526 005202
8071 111530 000746
8072
8073 111532 012737 177777 112106 6$:
8074
8075 111540 105012 5$:
8076 111542
8077
8078 111544 000014
8079 111560 000204
8080 111764 000120
8081 112104 000000
8082 112106 000000
8083
8084 112110 047045 040445 052477
8085 112116 040516 046102 020105
8086 112124 047524 047440 042520
8087 112132 020116 022442 022524
8088 112140 021101 000077
8089 112144 047045 040445 043077
8090 112152 046111 020105 042522
8091 112160 042101 042440 051122
8092 112166 051117 000077
8093 112172 047045 040445 044506
8094 112200 042514 046040 047111
8095 112206 020105 040527 035123
8096 112214 047045 052045 047045
8097 112222 000
8098 112223 045 022516 042501
8099 112230 042116 047455 026506
8100 112236 044506 042514 043040
8101 112244 052517 042116 020054
8102 112252 044506 042514 051040
8103 112260 040505 000104
8104
8105
8106
8107
8108
8109
8110
8111

```

MOV #1,-(SP)
MOV SP,R0
TRAP C\$PNTF
ADD #4,SP

MOV #-1,BAD ; SET BAD-TRY FLAG AND LEAVE
BR 5\$

2\$: CMPB #15,(R2) ; IS THE CHARACTER A <CR>
BEQ 1\$; BR IF YES (GO BACK TO GET <LF>)
CMPB #12,(R2) ; IS THE CHARACTER A <LF>
BEQ 5\$; BR IF YES (TERMINATE AND LEAVE)
CMPB #40,(R2) ; IS IT A "EOF" (END-OF-FILE(TEXT))
; (EOF=ANY NON-CHAR>37 EXCEPT CR,LF)
BHI 6\$; BR IF YES
INC R2 ; IF NO, LEAVE CHAR IN BUFFER
BR 1\$; AND GO GET MORE CHARS

6\$: MOV #-1,EOFF ; IF YES, TERMINATE INPUT BUFF
; AND SET EOF-FLAG

5\$: CLRB (R2)
RETURN

FILENM: .BLKB 12. ; BUFFER FOR FILE NAME
FILLIN: .BLKB 132. ; BUFFER FOR SINGLE LINE READ FROM FILE
MATCH: .BLKB 80. ; BUFFER FOR WORD TO MATCH FROM FILE
BAD: .WORD 0 ; ERROR/NOT-FOUND FLAG WORD
EOFF: .WORD 0 ; END-OF-FILE FLAG (<>0 = EOF)

OPNERR: .ASCIZ /%N%A?UNABLE TO OPEN "%T%A"?/

RDERR: .ASCIZ /%N%A?FILE READ ERROR?/

PLINE: .ASCIZ /%N%AFILE LINE WAS:%N%T%N/

EOFFND: .ASCIZ /%N%AEND-OF-FILE FOUND, FILE READ/

---+
SELMSG OPERATOR SELECTED MESSAGE STORAGE
THIS ROUTINE WILL TAKE THE OPERATOR SELECTED MESSAGE FROM THE COMMAND
LINE INPUT STRING BUFFER AND PUT IT INTO A BUFFER AT LOCATION OPSLBF.
INPUTS - P1 - ADDRESS OF OPERATOR SELECTED MESSAGE IN

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READ LINE OF OPENED FILE

```

8112      :
8113      :
8114      :
8115      :
8116      :
8117      :
8118      :
8119      :
8120      :
8121      :
8122      :
8123      :
8124      :
8125      :
8126      :
8127      :
8128      :
8129      :
8130      :
8131      :
8132      :
8133      :
8134      :
8135      :
8136      :
8137      :
8138      :
8139      :
8140      :
8141      :
8142      :
8143      :
8144      :
8145      :
8146      :
8147      :
8148      :
8149      :
8150      :
8151      :
8152      :
8153      :
8154      :
8155      :
8156      :
8157      :
8158      :
8159      :
8160      :
8161      :
8162      :
8163      :
8164      :
8165      :
8166      :
8167      :

```

				EXPPLICIT OUTPUTS -	NONE
				IMPLICIT OUTPUTS -	THE BUFFER AT OPSLBF WILL CONTAIN THE ASCII OPERATOR SELECTED INPUT STRING FOLLOWED BY A NULL CHARACTER
				SUBORDINATE ROUTINES -	NONE
				CALLING PROCEEDURE -	CALL SELMSG P1 ;INPUT ADDRESS OF ASCII STRING
				REGISTER USAGE -	R1 CONTAINS ADDRESS OF INPUT STRING R2 CONTAINS ADDRESS OF OUTPUT STRING

112264				SELMSG: P\$POP	R1 ;PUT ADDRESS OF OPR. SEL ASCII STRING INTO R1
112266	012702	003570		MOV #OPSLBF,R2	;PUT ADDRESS OF OUTPUT BUFFER INTO R2
112272	005003			CLR R3	;CLEAR CHARACTER COUNTER
112274	105711		5\$:	TSTB (R1)	;CHECK FOR END OF STRING
112276	001404			BEQ 10\$;GO TO 10\$ IF END
112300	112122			MOVB (R1)+,(R2)+	;ELSE, MOVE BYTE TO OUTPUT BUFFER
112302	005203			INC R3	;COUNT NUMBER OF CHARACTERS IN INPUT BUFFER
112304	000137	112274		JMP 5\$;GO DO MORE CHARACTERS
112310	112712	000000	10\$:	MOVB #0,(R2)	;PUT ZERO AT END OF OUTPUT BUFFER
112314	010337	003314		MOV R3,MSG6C	;STORE NUMBER OF CHARACTERS FOR USE IN BUF. BUILDING
112320				RETURN	

				ENTRND	ENTER NODE IN TABLE
					THIS ROUTINE ENTERS A NODE INTO THE NODE TABLE
				INPUTS	NONE
				EXPPLICIT OUTPUTS	P1 - ZERO IF SUCCESSFUL, -1 IF TABLE FULL
				IMPLICIT OUTPUTS	THE ADDRESS CONTAINED IN ADRBUF WILL BE ADDED TO THE NODE TABLE IN THE FIRST AVAILABLE SLOT WITH THE NODE TYPE CONTAINED IN NODTY (TARGET OR ASSIST)
				SUBORDINATE ROUTINES	FINDSL - FIND EMPTY SLOT IN TABLE
				CALLING PROCEEDURE	CALL ENTRND
					P\$POP P1 ;OUTPUT GOOD/BAD RESULT

112322				ENTRND: CALL FINDSL	;FIND AVAILABLE SLOT IN TABLE
112330				P\$POP R1	;CHECK IF TABLE FULL
112332	001403			BEQ 5\$;IF NOT FULL BR TO 5\$
112334				P\$PUSH #-1	;ELSE PUT FULL INDICATION ON STACK
112340	000416			BR 20\$;RETURN
112342	012703	000006	5\$:	MOV #6,R3	;SET INCR. COUNTER TO 6 (BYTES)
112346	013701	002402		MOV SLOT,R1	;MOV ADDRESS OF AVAILABLE SLOT TO R1
112352	012702	002314		MOV #ADRBUF,R2	;MOV ADDRESS OF NODE ADDRESS TO R2
112356	112221		10\$:	MOVB (R2)+,(R1)+	;MOV BYTE OF ADDRESS
112360	005303			DEC R3	;DECR. COUNTER
112362	001375			BNE 10\$;CONTINUE UNTIL 6 BYTES TRANSFERED
112364	005201			INC R1	;SET POINTER TO NODE TYPE LOCATION
112366	113711	002400		MOVB NODTY,(R1)	;MOVE NODE TYPE INTO TABLE
112372				P\$PUSH #0	;PUT ADDRESS ADDED INDICATION ON STACK
112376			20\$:	RETURN	;RETURN

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READ LINE OF OPENED FILE

```

8224 112506 001403          BEQ      15$          ;IF YES, BR 15$
8225 112510 010137 002402  MOV      R1,SLOT    ;ELSE PUT EMPTY LOC. ADDRESS INTO SLOT
8226 112514 000407          BR       30$          ;RETURN
8227 112516 012737 177777 002402 15$:  MOV     #-1,SLOT   ;PUT -1 INTO SLOT TO SHOW END OF TABLE
8228 112524 000403          BR       30$          ;RETURN
8229 112526 062701 000010 20$:  ADD     #8.,R1     ;INCR. POINTER TO NEXT LOCATION
8230 112532 000760          BR       10$          ;CHECK NEXT LOC.
8231 112534          RETURN          ;RETURN
8232
8233
8234          :---+
8235          CMPADR          COMPAIR TWO ADDRESSES
8236          THIS ROUTINE COMPAIRS TWO SIX BYTE STRINGS
8237          INPUTS          P1 - ADDRESS OF FIRST STRING
8238          OUTPUTS         P2 - ADDRESS OF SECOND STRING
8239          CALLING PROCEDURE CALL  CMPADR P1,P2
8240          P$POP          P3
8241          :---+
8242
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8247 112536          CMPADR: P$POP  R2,R3          ;PUT ADDRESS OF STRING TO BE COMPARED IN R2 AND R3
8248 112542 022223  CMP      (R2)+,(R3)+ ;DO FIRST TWO BYTES COMPARE
8249 112544 001006  BNE     10$          ; IF NO, EXIT
8250 112546 022223  CMP      (R2)+,(R3)+ ;DO SECOND TWO BYTES COMPARE
8251 112550 001004  BNE     10$          ; IF NO, EXIT
8252 112552 021213  CMP      (R2),(R3)   ;DO LAST TWO BYTES COMPARE
8253 112554 001002  BNE     10$          ; IF NO, EXIT
8254 112556 005001  CLR     R1           ;PUT COMPARISON OK INDICATOR IN R1
8255 112560 000402  BR      15$          ;PUT NO COMPARISON INDICATOR IN R1
8256 112562 012701 177777 10$:  MOV     #-1,R1
8257 112566          15$:  RETURN  R1
8258
8259          :---+
8260          PRTNOD          PRINT NODE TABLE
8261          INPUTS          NONE
8262          EXPLICIT OUTPUTS NONE
8263          IMPLICIT OUTPUTS ONE ENTRY IN THE NODE TABLE WILL BE PRINTED
8264          SUBORDINATE ROUTINES NONE
8265          CALLING SEQUENCE CALL PRTNOD
8266
8267
8268 112572          PRTNOD: PRINTF #NODADR,#STRBUF ;PRINT NODE ADDRESS
8269 112572 012746 002322          MOV     #STRBUF,-(SP)
8270 112576 012746 053430          MOV     #NODADR,-(SP)
8271 112602 012746 000002          MOV     #2,-(SP)
8272 112606 010600          MOV     SP,R0
8273 112610 104417          TRAP   C$PNTF
8274 112612 062706 000006          ADD     #6,SP
8275 112616 013702 002402          MOV     SLOT,R2          ;MOVE SLOT ADDRESS INTO R2
8276 112622 162702 002404          SUB     #NODTAB,R2      ;CALCULATE NODE LOGICAL NAME
8277 112626 006202          ASR     R2              ;USING: LOG. NO. =
8278 112630 006202          ASR     R2              ;(SLOT-#NODTAB)/8
8279 112632 006202          ASR     R2

```


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8380
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112750
112750 000015
112752

112752
112752 000031
112754 113004
112756 160000
112760 177776
112762
112762 001031
112764 113037
112766 000000
112770 000776
112772
112772 002032
112774 113073
112776 000340
113000 000000
113002 000007

113004
113004

113004 044127 052101 044440
113012 020123 044124 020105
113020 041520 051123 020117
113026 042101 051104 051505
113034 037523 000
113037 127 040510 020124

```

.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

      .WORD L10016-L$HARD/2
L$HARD::

:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:  INSERT HARDWARE PARAMETER INTERPRETIVE CODE HERE.  THIS CODE
:  IS USED BY THE SUPERVISOR TO INTERROGATE THE OPERATOR FOR
:  DEVICE INFORMATION TO PUT IN THE P-TABLE.  THIS CODE IS USED
:  IN CONJUNCTION WITH THE DEFAULT P-TABLE TEMPLATE.  THE MACROS
:  USED IN THIS SECTION ARE "GPRMD", "GPRMA" AND "GPRML".
:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

      GPRMA  ASKCSR,0,0,160000,177776,YES          ; GET CSR ADDRESS
                                                    .WORD  T$CODE
                                                    .WORD  ASKCSR
                                                    .WORD  T$LLOLIM
                                                    .WORD  T$HILIM

      GPRMA  ASKVEC,2,0,0,776,YES                ; GET VECTOR ADDRESS
                                                    .WORD  T$CODE
                                                    .WORD  ASKVEC
                                                    .WORD  T$LLOLIM
                                                    .WORD  T$HILIM

      GPRMD  ASKPRI,4,0,340,0,7,YES              ; GET PRIORITY LEVEL
                                                    .WORD  T$CODE
                                                    .WORD  ASKPRI
                                                    .WORD  340
                                                    .WORD  T$LLOLIM
                                                    .WORD  T$HILIM

      ENDHRD

                                                    .EVEN
L10016:

:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:  INSERT MESSAGES THAT ARE USED ONLY
:  DURING THE HARDWARE PARAMETER CODING SECTION.
:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

      ASKCSR: .ASCIZ  /WHAT IS THE PCSRO ADDRESS?/

      ASKVEC: .ASCIZ  /WHAT IS THE VECTOR ADDRESS?/

```

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HARDWARE PARAMETER CODING SECTION

8382	113044	051511	052040	042510
8383	113052	053040	041505	047524
8384	113060	020122	042101	051104
8385	113066	051505	037523	000
8386	113073	127	040510	020124
8387	113100	051511	052040	042510
8388	113106	050040	044522	051117
8389	113114	052111	020131	042514
8390	113122	042526	037514	000
8391		113130		
8392				

ASKPRI: .ASCIZ /WHAT IS THE PRIORITY LEVEL?/

.EVEN

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SOFTWARE PARAMETER CODING SECTION

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8400
8401
8402
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8404 113130
8405 113130 000000
8406 113132
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8417 113132
8418
8419 113132
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8421
8422
8423
8424
8425
8426
8427 113132
8428 113132 000010
8429
8430
8431
8432
8433
8434
8435 113152
8436
8437 113152 000000
8438 113154 000000
8439 113156

```
.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

                                .WORD L10017-L$SOFT/2
L$SOFT::

:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:      INSERT SOFTWARE PARAMETER INTERPRETIVE CODING HERE. THIS CODE
:      IS USED BY THE SUPERVISOR TO INTERROGATE THE OPERATOR FOR
:      SOFTWARE INFORMATION WHICH WILL BE PLACED IN THE SOFTWARE
:      TABLE. THIS SECTION IS OPTIONAL.
:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

      .EVEN

      ENDSFT

                                .EVEN
L10017:

:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:      INSERT MESSAGES THAT ARE USED ONLY
:      DURING THE SOFTWARE PARAMETER CODING SECTION.
:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

$PATCH::
      .BLKW 10

:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:      THIS IS A PATCH AREA THAT SHOULD BE INCLUDED IN ALL DIAGNOSTICS.
:      ADJUST THE SIZE TO FIT YOUR OWN PREFERENCES.
:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

      LASTAD

                                .EVEN
                                .WORD 0
                                .WORD 0

L$LAST::
```

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SOFTWARE PARAMETER CODING SECTION

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000001

```

:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:      HARDCODED P-TABLES MAY BE PLACED HERE BY USING THE SETUP MACROS.
:      THIS SECTION IS OPTIONAL AND SHOULD BE REMOVED IF IT IS NOT BEING
:      USED.  CHANGE THE POINTER MACRO ARGUMENT TO REFLECT THE REMOVAL.
:
:      THE P-TABLES ARE DELIMITED BY THE 'BGNSETUP' AND 'ENDSETUP' MACROS.
:      THE 'BGNSETUP' MACRO HAS ONE ARGUMENT WHICH IS THE NUMBER OF
:      P-TABLE ENTRIES.  EACH ENTRY IS DELIMITED BY THE 'BGNPTAB' AND
:      'ENDPTAB' MACROS.  NEITHER OF THESE MACROS REQUIRE AN ARGUMENT.
:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:
:      BGNSETUP      1
:      BGNPTAB
:      .WORD      0
:      ENDPTAB
:      ENDSETUP
:
:      .END

```


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CROSS REFERENCE TABLE -- USER SYMBOLS

CMDTY1	062444	3268#						
CMDTY2	062451	3269#						
CMDTY3	062461	3271#						
CMDTY4	062467	3273#						
CMDTY5	062474	3274#						
CMDTY6	062500	3275#	6899					
CMDTY7	062510	3277#	6512					
CMDTY8	062515	3278#						
CMDTY9	062523	3280#						
CMPADR	112536	5334	6485	6576	6743	6754	7100	8247#
CMPBUF	050570 G	2270#	4930*	5013*	5068*	7532		
CMPER1	066754	3699#	5270					
CMPER2	067051	3710#	5283					
CMPSTR	072530	4784#	4795	4799	4808	4812		
CNDADR=	000030	1267#	2425					
CNDLOG=	000037	1274#	2423					
CNODAL=	000031	1268#	2419					
CNODE =	000015	1256#	2403					
CNTR00	062703	3309#	7637					
CNTR01	062763	3318#	7644					
CNTR02	063032	3325#	7652					
CNTR03	063066	3330#	7660					
CNTR04	063133	3337#	7667					
CNTR05	063210	3345#	7674					
CNTR06	063260	3352#	7682					
CNTR07	063317	3358#	7690					
CNTR08	063367	3365#	7697					
CNTR09	063442	3373#	7704					
CNTR10	063513	3380#	7712					
CNTR11	063552	3386#	7720					
CNTR12	063622	3393#	7728					
CNTR13	063670	3400#	7736					
CNTR14	063735	3407#	7744					
CNTR15	063771	3412#	7752					
CNTR16	064033	3418#	7760					
CNTR17	064101	3425#	7767					
CNTR18	064154	3433#	7774					
CNTR19	064221	3440#	7781					
COMAND	071350 G	4214	4331	4452#	4496	4532		
COMPAR	062351	3253#	7535					
CONES =	000017	1258#	2449					
COPRSL=	000024	1263#	2460					
COUNT	050542 G	2259#	5214*	5215*	5217	5220*		
CPATRN=	000005	1248#	2481	7289	7554			
CPYCNT	050562 G	2267#	7195*	7237*	7276*	7327*	7356*	7486*
CPYLMT	053775	2659#	7080					
CRC =	004000 G	1478#						
CRNALL=	000032	1269#	2477	7154	7177			
CRUN =	000004	1247#	2486					
CSAVE =	000006	1249#	2372					
CSAVR4=	000014	1255#	2394	2417	2436	2459		
CSHCTR=	000002 G	1216#						
CSHMSG=	000034	1271#	2405					
CSIZE =	000026	1265#	2464					
CTARGT=	000000 G	1214#	5773	6505	7021	7362	7367	
CTYPE =	000025	1264#	2461					

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LOE = 040000 G	1209#			
LOGDEL 054426	2707#	7849		
LOGNAM 053440	2619#	8282		
LOPDIR 050720 G	2288#	4919		
LOT = 000010 G	1198#			
LST 072670	4844#	4847*	4849*	4863
LUPAIR 062162	3228#			
LSACP 002110 G	1040#			
LSAPT 002036 G	998#			
LSAU 100266 G	6282#			
LSAUT 002070 G	1024#			
LSAUTO 100140 G	1041	6170#		
LSCCP 002106 G	1038#			
LSCLEA 100142 G	1039	6188#		
LSCO 002032 G	994#			
LSDEPO 002011 G	976#			
LSDESC 002130 G	1031	1064#		
LSDESP 002076 G	1030#			
LSDEVP 002060 G	1016#			
LSDISP 002164 G	1001	1089#		
LSDLY 002116 G	1046#			
LSDTP 002040 G	1000#			
LSDTYP 002034 G	996#			
LSDU 100260 G	6245#			
LSDUT 002072 G	1026#			
LSDVTY 002122 G	1017	1056#		
LSEF 002052 G	1011#			
LSENVI 002044 G	1004#			
LSERRT 052426 G	2512#			
LSETP 002102 G	1034#			
L\$EXP1 002046 G	1006#			
L\$EXP4 002064 G	1020#			
L\$EXP5 002066 G	1022#			
L\$HARD 112752 G	983	8339	8340#	
L\$HIME 002120 G	1048#			
L\$HPCP 002016 G	982#			
L\$HPTP 002022 G	986#			
L\$HW 002170 G	987	1102	1103#	
L\$ICP 002104 G	1036#			
L\$INIT 076600 G	1037	5885#		
L\$LADP 002026 G	990#			
L\$LAST 113156 G	991	8439#		
L\$LOAD 002100 G	1032#			
L\$LUN 002074 G	1028#			
L\$MREV 002050 G	1008#			
L\$NAME 002000 G	965#			
L\$PRIO 002042 G	1002#			
L\$PROT 076572 G	1043	5858#		
L\$PRT 002112 G	1042#			
L\$REPP 002062 G	1018#			
L\$REV 002010 G	974#			
L\$RPT 076560 G	1019	5818#		
L\$SOFT 113132 G	8405	8406#		
L\$SPC 002056 G	1014#			
L\$SPCP 002020 G	984#			
L\$SPTP 002024 G	988#			

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L\$STA	002030	G	992#						
L\$SW	002200	G	1124	1125#					
L\$TEST	002114	G	1044#						
L\$TIML	002014	G	980#						
L\$UNIT	002012	G	978#						
L10000	002176		1102	1112#					
L10001	002200		1124	1130#					
L10002	067514		3782#						
L10003	067602		3807#						
L10004	067654		3827#						
L10005	070022		4011#						
L10006	076570		5833	5848#					
L10010	100136		6143	6158#					
L10011	100140		6178#						
L10012	100256		6220	6235#					
L10013	100264		6256	6271#					
L10014	100272		6293	6308#					
L10015	112746		6380	8305	8320#				
L10016	113004		8339	8369#					
L10017	113132		8405	8419#					
MATCH	111764		8080#						
M\$SPAT	062054		3215#						
M\$SPA1	062125		3222#	7296					
MORE =	010000	G	1443#	4550					
M\$GAD	003316	G	1652#	5213	5219				
M\$GCNT	003300	G	1643#	5217					
M\$GPRM	054641		2733#	6904	7579				
M\$GTAB	003262		1633#	3790	6902	7293	7577	7614	
M\$GTY0	062372		1633	3258#					
M\$GTY1	062400		1634	3259#					
M\$GTY2	062405		1635	3260#					
M\$GTY3	062413		1636	3262#					
M\$GTY4	062420		1637	3263#					
M\$GTY5	062425		1638	3264#					
M\$GTY6	062433		1639	3266#					
M\$GOC	003300		1644#						
M\$G00	003334	G	1644	1653	1661#				
M\$G01	003464	G	1645	1654	1677#				
M\$G02	003465	G	1646	1655	1679#				
M\$G03	003466	G	1647	1656	1681#				
M\$G04	003467	G	1648	1657	1683#				
M\$G05	003470	G	1649	1658	1685#				
M\$G1	054711		2740#	6530					
M\$G1C	003302		1645#						
M\$G11	055024		2753#	6536					
M\$G12	055137		2766#	6542					
M\$G2	055177		2772#	6516					
M\$G2C	003304		1646#						
M\$G3	055235		2778#						
M\$G3C	003306		1647#						
M\$G4	055276		2784#	6913	7588	7615			
M\$G4C	003310		1648#						
M\$G5C	003312		1649#						
M\$G6C	003314		1650#	8133*					
N\$CHN =	020000	G	1487#						
NEW	100112		5935	6134#					

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CROSS REFERENCE TABLE -- USER SYMBOLS

NOD145	052264	2476#
NOD146	052270	2477#
NOD147	052302	2478#
NOD15	051212	2369#
NOD150	052306	2479#
NOD151	052324	2480#
NOD152	052330	2481#
NOD153	052346	2482#
NOD154	052352	2483#
NOD155	052366	2484#
NOD156	052372	2485#
NOD157	052376	2486#
NOD16	051216	2370#
NOD160	052400	2490#
NOD161	052404	2491#
NOD162	052410	2492#
NOD163	052412	2496#
NOD164	052416	2497#
NOD165	052422	2498#
NOD166	052424	2499#
NOD17	051234	2371#
NOD2	051100	2358#
NOD20	051236	2372#
NOD21	051250	2373#
NOD22	051252	2374#
NOD23	051254	2375#
NOD24	051256	2376#
NOD25	051272	2377#
NOD26	051276	2378#
NOD27	051316	2379#
NOD3	051102	2359#
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NOD31	051340	2381#
NOD32	051344	2382#
NOD33	051362	2383#
NOD34	051366	2384#
NOD35	051402	2385#
NOD36	051404	2386#
NOD37	051424	2387#
NOD4	051116	2360#
NOD40	051430	2388#
NOD41	051432	2389#
NOD42	051434	2393#
NOD43	051440	2394#
NOD44	051444	2395#
NOD45	051450	2397#
NOD46	051454	2398#
NOD47	051456	2402#
NOD5	051120	2361#
NOD50	051462	2403#
NOD51	051476	2404#
NOD52	051502	2405#
NOD53	051520	2406#
NOD54	051524	2407#
NOD55	051544	2408#
NOD56	051550	2409#

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NOD57	051554	2410#							
NOD6	051134	2362#							
NOD60	051556	2414#							
NOD61	051562	2415#							
NOD62	051576	2416#							
NOD63	051602	2417#							
NOD64	051606	2418#							
NOD65	051612	2419#							
NOD66	051624	2420#							
NOD67	051630	2421#							
NOD7	051140	2363#							
NOD70	051634	2422#							
NOD71	051640	2423#							
NOD72	051644	2424#							
NOD73	051650	2425#							
NOD74	051654	2426#							
NOD75	051672	2427#							
NOD76	051676	2428#							
NOD77	051714	2429#							
NRRESP	062302	3245#	7544						
NOTNUF=	000012	1253#	2361	2365	2367	2376	2378	2380	2386
NO.NTR=	000006	1495#	2018	2023	4240	4247			
NTBHDR	053462	2623#	7808						
NULL =	000000	1243#							
NULSTR	053362	2610#	5798						
N10\$	051074	2356#							
N100\$	051456	2369	2401#						
N101\$	051462	2402#							
N102\$	051502	2403	2404#						
N104\$	051524	2405	2406#						
N106\$	051550	2407	2408#						
N110\$	051554	2404	2406	2408	2409#				
N12\$	051102	2357	2358#						
N120\$	051556	2377	2413#						
N121\$	051562	2414#							
N122\$	051602	2416#							
N123\$	051630	2418	2420#						
N124\$	051644	2419	2421	2423#					
N126\$	051650	2424#							
N130\$	051654	2415	2425#						
N132\$	051676	2426	2427#						
N134\$	051720	2428	2429#						
N135\$	051722	2420	2423	2425	2427	2429	2430#		
N14\$	051120	2359	2360#						
N140\$	051724	2379	2434#						
N141\$	051730	2435#							
N142\$	051734	2436#							
N143\$	051744	2438#							
N16\$	051140	2361	2362#						
N160\$	051746	2381	2442#	2461	2465	2469			
N161\$	051752	2443#							
N162\$	052016	2447	2448#						
N163\$	052036	2449	2450#						
N164\$	052056	2451	2452#						
N165\$	052076	2453	2454#						
N166\$	052116	2455	2456#						

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CROSS REFERENCE TABLE -- USER SYMBOLS

SUMMS2 067236
SUMMS3 067322
SUMMS4 067351
SUMMS5 067434
SUMMS6 067452
SVCGBL= 000000

SVCINS= 000001

3731#	6662													
3740#	6674													
3744#	6680													
3753#	6691													
3756#	6700													
628#	965	974	976	978	980	982	984	986	988	990	992	994		
996	998	1000	1002	1004	1006	1008	1011	1014	1016	1018	1020	1022		
1024	1026	1028	1030	1032	1034	1036	1038	1040	1042	1044	1046	1048		
1056	1064	1089	1103	1104	1125	1126	2512	3770	3786	3811	3986	5818		
5858	5885	6170	6188	6245	6282	8340	8406	8439#	8440					
628#	966	967	968	969	970	971	972	973	975	977	979	981		
983	985	987	989	991	993	995	997	999	1001	1003	1005	1007		
1009	1010	1012	1013	1015	1017	1019	1021	1023	1025	1027	1029	1031		
1033	1035	1037	1039	1041	1043	1045	1047	1049	1057	1058	1065	1070		
1088	1090	1102	1124	3773	3774	3775	3776	3777	3778	3780	3783	3792		
3793	3794	3795	3796	3797	3799	3800	3801	3802	3803	3804	3808	3813		
3814	3815	3816	3817	3818	3820	3821	3822	3823	3824	3825	3828	4012		
4127	4128	4129	4130	4133	4134	4135	4136	4140	4141	4142	4143	4147		
4148	4149	4150	4191	4192	4193	4194	4217	4218	4219	4220	4325	4326		
4327	4328	4334	4335	4336	4337	4343	4344	4345	4346	4568	4569	4570		
4571	4574	4575	4576	4577	4580	4581	4582	4583	4587	4588	4589	4590		
4639	4640	4641	4642	4643	4651	4652	4653	4654	4935	4936	4937	4938		
4941	4942	4943	4944	5018	5019	5020	5021	5024	5025	5026	5027	5073		
5074	5075	5076	5079	5080	5081	5082	5132	5133	5134	5135	5267	5268		
5269	5270	5271	5272	5273	5274	5282	5283	5284	5285	5286	5287	5359		
5360	5361	5362	5363	5364	5596	5597	5598	5599	5600	5640	5641	5642		
5643	5644	5798	5799	5800	5801	5802	5832	5833	5849	5914	5915	5917		
5919	5920	5922	5925	5926	5928	5931	5932	5934	5939	5940	5945	5946		
5947	5949	5954	5955	5956	5958	5966	5967	5968	5969	5970	5973	5974		
5975	5977	5983	5984	5985	5986	5987	5988	6016	6017	6018	6019	6020		
6021	6024	6025	6033	6034	6035	6036	6037	6038	6045	6046	6047	6048		
6049	6050	6052	6053	6054	6055	6056	6071	6072	6073	6074	6075	6080		
6081	6082	6083	6084	6087	6088	6089	6090	6091	6094	6095	6096	6097		
6098	6102	6103	6104	6105	6106	6109	6110	6111	6112	6113	6119	6120		
6121	6122	6128	6129	6130	6131	6132	6133	6136	6137	6140	6142	6143		
6159	6179	6203	6204	6205	6206	6216	6217	6219	6220	6236	6255	6256		
6272	6292	6293	6309	6344	6345	6346	6347	6348	6349	6350	6351	6361		
6362	6363	6364	6365	6370	6371	6372	6373	6374	6379	6380	6454	6455		
6456	6457	6458	6478	6479	6480	6481	6482	6488	6489	6490	6491	6492		
6494	6495	6496	6497	6498	6514	6515	6516	6517	6518	6519	6520	6530		
6531	6532	6533	6534	6536	6537	6538	6539	6540	6542	6543	6544	6545		
6546	6552	6553	6554	6555	6564	6595	6596	6597	6598	6599	6600	6608		
6609	6610	6611	6612	6613	6614	6622	6623	6624	6625	6642	6643	6644		
6645	6646	6647	6655	6656	6657	6658	6659	6660	6662	6663	6664	6665		
6666	6671	6672	6673	6674	6675	6676	6677	6678	6680	6681	6682	6683		
6684	6689	6690	6691	6692	6693	6694	6695	6699	6700	6701	6702	6703		
6704	6746	6747	6748	6749	6750	6771	6772	6773	6774	6775	6780	6795		
6796	6797	6798	6799	6813	6814	6815	6816	6817	6818	6821	6822	6823		
6824	6825	6826	6829	6830	6831	6832	6833	6834	6837	6838	6839	6840		
6841	6842	6845	6846	6847	6848	6849	6850	6853	6854	6855	6856	6857		
6858	6861	6862	6863	6864	6865	6866	6870	6871	6872	6873	6877	6878		
6879	6880	6904	6905	6906	6907	6908	6910	6911	6912	6913	6914	6915		
6916	6917	6940	6941	6942	6943	6944	7024	7025	7026	7027	7028	7058		
7059	7060	7061	7062	7080	7081	7082	7083	7084	7106	7107	7108	7109		
7110	7117	7118	7119	7120	7121	7137	7138	7139	7140	7141	7142	7186		
7187	7188	7189	7190	7206	7207	7208	7209	7213	7214	7215	7216	7217		

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TIMER2	003716	1715#	4001	4003*	4534										
TIMMIN	003706	1710#	3995*	6012*	6124*										
TIMOUT	050532	G 2255#	4585*												
TIMSEC	003710	1711#	3992*	3993	3996*	6013*	6125*								
TIMTCK	003712	1712#	3989*	3991*	4006	6014*	6126*								
TMRF =	000012	G 1320#													
TMRO =	000011	G 1319#													
TRAST	062223	3236#													
TRVACT	075344	5504	5514#	5531	5537	5543	5547	5568	5636	5660	5681	5707			
TRVADR	076330	5755#	6471	7011											
TRVALN	076144	5492	5664#												
TRVALP	076100	5491	5650#												
TRVBIF	075450	5488	5547#												
TRVBR	075440	5487	5543#												
TRVBRC	075364	5501	5521#	5544	5550	5570	5647	5662	5683	5712					
TRVDEC	075544	5494	5573#												
TRVERR	075402	5485	5531#												
TRVEXI	075422	5486	5537#												
TRVNMA	075564	5574	5577#												
TRVNOB	075374	5526#	5551	5569	5637	5661	5682								
TRVNUM	075556	5490	5576#												
TRVOCT	075556	5493	5575#												
TRVSPA	075472	5489	5554#												
TRVSTR	076232	5495	5687#												
TSTMS1	061551	3180#													
TSTMS2	061571	3183#	7284												
TSTMS3	061611	3186#													
TSTMS4	061624	3188#	7217	7403	7434	7466									
TXI =	010000	G 1299#	4405	4417											
TSARGC=	000002	966#	967#	968#	969#	970#	971#	3773#	3778	3792#	3797	3799#	3804	3813#	
		3818	3820#	3825	4639#	4643	5267#	5274	5282#	5287	5359#	5364	5596#	5600	
		5640#	5644	5798#	5802	5966#	5970	6033#	6038	6045#	6050	6052#	6056	6071#	
		6075	6080#	6084	6087#	6091	6094#	6098	6102#	6106	6109#	6113	6361#	6365	
		6370#	6374	6454#	6458	6478#	6482	6488#	6492	6494#	6498	6514#	6520	6530#	
		6534	6536#	6540	6542#	6546	6595#	6600	6608#	6614	6642#	6647	6655#	6660	
		6662#	6666	6671#	6678	6680#	6684	6689#	6695	6699#	6704	6746#	6750	6771#	
		6775	6795#	6799	6813#	6818	6821#	6826	6829#	6834	6837#	6842	6845#	6850	
		6853#	6858	6861#	6866	6904#	6908	6910#	6917	6940#	6944	7024#	7028	7058#	
		7062	7080#	7084	7106#	7110	7117#	7121	7137#	7142	7186#	7190	7213#	7221	
		7232#	7236	7267#	7272	7282#	7288	7295#	7300	7322#	7326	7348#	7353	7370#	
		7374	7376#	7380	7399#	7407	7418#	7422	7430#	7438	7449#	7453	7462#	7470	
		7481#	7485	7519#	7525	7579#	7583	7585#	7592	7606#	7610	7612#	7619	7636#	
		7641	7643#	7648	7651#	7656	7659#	7664	7666#	7671	7673#	7678	7681#	7686	
		7689#	7694	7696#	7701	7703#	7708	7711#	7716	7719#	7724	7727#	7732	7735#	
		7740	7743#	7748	7751#	7756	7759#	7764	7766#	7771	7773#	7778	7780#	7785	
		7808#	7812	7821#	7826	7848#	7853	7879#	7884	7899#	7904	7925#	7930	7964#	
		7969	7978#	7982	7985#	7990	7995#	7999	8010#	8015	8055#	8059	8191#	8196	
		8269#	8274	8281#	8286	8296#	8301								
TS	CODE=	002032	6347#	8351#	8356#	8361#									
TS	ERRN=	000036	628#	4128#	4134#	4141#	4148#	4192#	4218#	4326#	4335#	4344#	4569#	4575#	4581#
			4588#	4652#	4936#	4942#	5019#	5025#	5074#	5080#	5133#	6120#	6204#	6553#	6623#
			6871#	6878#	7207#	7227#	7307#	7316#	7392#	7413#	7444#	7476#	7790#	7866#	
TS	EXCP=	000000	6347#	6352	8351#	8355	8356#	8360	8361#	8366					
TS	FLAG=	000040	5832#	5834	6142#	6219#	6255#	6257	6292#	6294	6379#	8304#			
TS	GMAN=	000000	628#	6344#	6347	6353#									
TS	HILI=	000007	6347#	6351	8351#	8354	8356#	8359	8361#	8365					

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ENDAUT	1#	628#	6177															
ENDCLN	1#	628#	6234															
ENDCOM	1#	628#																
ENDDU	1#	628#	6270															
ENDHRD	1#	628#	8367															
ENDHW	1#	628#	1111															
ENDINI	1#	628#	6157															
ENDMOD	1#	628#																
ENDMSG	1#	628#	3781	3806	3826													
ENDPRO	1#	628#	5964															
ENDPTA	1#	628#																
ENDRPT	1#	628#	5847															
ENDSEG	1#	628#																
ENDSET	1#	628#																
ENDSFT	1#	628#	8417															
ENDSRV	1#	628#	4010															
ENDSUB	1#	628#																
ENDSW	1#	628#	1129															
ENDTST	1#	628#	8319															
EQUALS	1#	628#	1142															
ERRDF	1#	628#	4126	4132	4139	4146	4190	4216	4324	4333	4342	4567	4573	4579	4650			
ERRHRD	1#	628#	5017	5023	5072	5078	5131	6118	6869	6876								
	4934	4940	4586	6202	6551	6621	7205	7225	7305	7314	7390	7411	7442	7474	7788			
	7864																	
ERROR	1#	628#																
ERRSF	1#	628#																
ERRSOF	1#	628#																
ERRTBL	1#	628#	2511															
ESCAPE	1#	628#																
EXIT	1#	628#	5831	6141	6218	6254	6291	6378	8303									
FEQUAL	1#	628#																
GETBYT	1#	628#	8049															
GETPRI	1#	628#																
GETWOR	1#	628#																
GMANIA	1#	628#																
GMANID	1#	628#	6343															
GMANIL	1#	628#																
GPHARD	1#	628#	5972															
GPRMA	1#	628#	8350	8355														
GPRMD	1#	628#	6344#	6347	8360													
GPRML	1#	628#																
HEADER	1#	628#	964															
INLOOP	1#	628#																
IOSETU	1#	628#																
IOSTAR	1#	628#																
I\$STAC	648#	5937																
KT11	1#	628#																
LASTAD	1#	628#	8435															
MANUAL	1#	628#																
MEMORY	1#	628#	5938															
M\$BYTE	1#	628#	965#	971	972	973												
M\$CHEC	1#	628#	5832#	6142#	6219#	6255#	6292#	6379#	8304#									
M\$CNT0	1#	628#	6347#	8351#	8356#	8361#												
M\$COUN	1#	628#	3773#	3792#	3799#	3813#	3820#	4639#	5267#	5282#	5359#	5596#	5640#	5798#	5966#			
	6033#	6045#	6052#	6071#	6080#	6087#	6094#	6102#	6109#	6361#	6370#	6454#	6478#	6488#	6494#			
	6514#	6530#	6536#	6542#	6595#	6608#	6642#	6655#	6662#	6671#	6680#	6689#	6699#	6746#	6771#			

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	6795#	6813#	6821#	6829#	6837#	6845#	6853#	6861#	6904#	6910#	6940#	7024#	7058#	7080#	7106#
	7117#	7137#	7186#	7213#	7232#	7267#	7282#	7295#	7322#	7348#	7370#	7376#	7399#	7418#	7430#
	7449#	7462#	7481#	7519#	7579#	7585#	7606#	7612#	7636#	7643#	7651#	7659#	7666#	7673#	7681#
	7689#	7696#	7703#	7711#	7719#	7727#	7735#	7743#	7751#	7759#	7766#	7773#	7780#	7808#	7821#
	7848#	7879#	7899#	7925#	7964#	7978#	7985#	7995#	8010#	8055#	8191#	8269#	8281#	8296#	
MSDATA	1#	628#	965#	974	976	978	980	982	984	986	988	990	992	994	996
	993	1000	1002	1004#	1006	1008	1011	1014	1016	1018	1020	1022	1024	1026	1028
	1030	1032	1034	1036	1038	1040	1042	1044	1046	1048	1056#	1064#			
MSDECR	1#	628#	1112#	1130#	3782#	3807#	3827#	4011#	5848#	5865#	6158#	6178#	6235#	6271#	6308#
	8320#	8368#	8418#												
MSDEFA	1#	628#	6347#	8351#	8356#	8361#									
MSENDE	1#	628#	1112#	1130#	3782#	3807#	3827#	4011#	5848#	6158#	6178#	6235#	6271#	6308#	8320#
	8368#	8418#													
MSERRI	1#	628#	4127#	4133#	4140#	4147#	4191#	4217#	4325#	4334#	4343#	4568#	4574#	4580#	4587#
	4651#	4935#	4941#	5018#	5024#	5073#	5079#	5132#	6119#	6203#	6552#	6622#	6870#	6877#	7206#
	7226#	7306#	7315#	7391#	7412#	7443#	7475#	7789#	7865#						
MSESCA	1#	628#													
MSESCS	1#	628#													
MSEXCP	1#	628#	6347#	8351#	8356#	8361#									
MSEXIT	1#	628#	5832#	6142#	6143	6219#	6220	6255#	6292#	6379#	6380	8304#	8305		
MSEXSE	1#	628#	5832#	6142#	6219#	6255#	6292#	6379#	8304#						
MSEXTJ	1#	628#	5832#	5833	6142#	6219#	6255#	6256	6292#	6293	6379#	8304#			
MSGEN	1#	628#	965#	974#	976#	978#	980#	982#	984#	986#	988#	990#	992#	994#	996#
	998#	1000#	1002#	1004#	1006#	1008#	1011#	1014#	1016#	1018#	1020#	1022#	1024#	1026#	1028#
	1030#	1032#	1034#	1036#	1038#	1040#	1042#	1044#	1046#	1048#	1056#	1064#	1089#	1103#	1104#
	1112#	1125#	1126#	1130#	2512#	3770#	3782#	3786#	3807#	3811#	3827#	3986#	4011#	5818#	5848#
	5858#	5885#	6158#	6170#	6178#	6188#	6235#	6245#	6271#	6282#	6308#	6334#	6352#	8320#	8340#
	8369#	8406#	8419#	8439#											
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	8320#	8368#	8418#												
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	1030#	1032#	1034#	1036#	1038#	1040#	1042#	1044#	1046#	1048#	1056#	1064#	1088#	1089	1102#
	1103	1104	1124#	1125	1126	2512#	3770#	3786#	3811#	3986#	5818#	5858#	5885#	6170#	6188#
	6245#	6282#	8339#	8340	8405#	8406	8436#	8439							
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	978#	979	980#	981	982#	983	984#	985	986#	987	988#	989	990#	991	992#
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	1008#	1009	1010	1011#	1012	1013#	1014#	1015	1016#	1017	1018#	1019	1020#	1021	1022#
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	1064#	1065	1070	1088#	1090#	1102#	1124#	3773#	3774#	3775#	3776	3777#	3778	3780#	3783#
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	4129#	4130#	4133#	4134#	4135#	4136#	4140#	4141#	4142#	4143#	4147#	4148#	4149#	4150#	4191#
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	7267#	7268	7269	7282#	7283	7284	7285	7295#	7296	7297	7322#	7323	7348#	7349	7350
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	7433	7434	7435	7449#	7450	7462#	7463	7464	7465	7466	7467	7481#	7482	7519#	7520
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	7616	7636#	7637	7638	7643#	7644	7645	7651#	7652	7653	7659#	7660	7661	7666#	7667
	7668	7673#	7674	7675	7681#	7682	7683	7689#	7690	7691	7696#	7697	7698	7703#	7704
	7705	7711#	7712	7713	7719#	7720	7721	7727#	7728	7729	7735#	7736	7737	7743#	7744
	7745	7751#	7752	7753	7759#	7760	7761	7766#	7767	7768	7773#	7774	7775	7780#	7781
	7782	7808#	7809	7821#	7822	7823	7848#	7849	7850	7879#	7880	7881	7899#	7900	7901
	7925#	7926	7927	7964#	7965	7966	7978#	7979	7985#	7986	7987	7995#	7996	8010#	8011
	8012	8055#	8056	8191#	8192	8193	8269#	8270	8271	8281#	8282	8283	8296#	8297	8298
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MSRBRO	1#	628#	8050#	8051											
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	6087#	6090	6094#	6097	6102#	6105	6109#	6112	6119	6128#	6132	6136#	6137	6140#	6142#
	6158#	6159	6178#	6179	6203	6216#	6217	6219#	6235#	6236	6255#	6271#	6272	6292#	6308#
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	7747	7751#	7755	7759#	7763	7766#	7770	7773#	7777	7780#	7784	7789	7808#	7811	7821#
	7825	7848#	7852	7865	7879#	7883	7899#	7903	7925#	7929	7959#	7960	7964#	7968	7971#
	7978#	7981	7985#	7989	7995#	7998	8010#	8014	8050#	8055#	8058	8191#	8195	8269#	8273
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	4191#	4217#	4325#	4334#	4343#	4568#	4574#	4580#	4587#	4642#	4651#	4935#	4941#	5018#	5024#
	5073#	5079#	5132#	5273#	5286#	5363#	5599#	5643#	5801#	5849#	5915#	5920#	5926#	5932#	5939#
	5946#	5955#	5969#	5974#	5987#	6020#	6025#	6037#	6049#	6055#	6074#	6083#	6090#	6097#	6105#
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	7406#	7412#	7421#	7437#	7443#	7452#	7469#	7475#	7484#	7500#	7524#	7582#	7591#	7609#	7618#
	7640#	7647#	7655#	7663#	7670#	7677#	7685#	7693#	7700#	7707#	7715#	7723#	7731#	7739#	7747#
	7755#	7763#	7770#	7777#	7784#	7789#	7811#	7825#	7852#	7865#	7883#	7903#	7929#	7960#	7968#
	7971#	7981#	7989#	7998#	8014#	8050#	8058#	8195#	8273#	8285#	8300#	8304#	8321#		
MS STL	1#	628#	3777#	3780#	3783#	3796#	3803#	3808#	3817#	3824#	3828#	4127#	4133#	4140#	4147#
	4191#	4217#	4325#	4334#	4343#	4568#	4574#	4580#	4587#	4642#	4651#	4935#	4941#	5018#	5024#
	5073#	5079#	5132#	5273#	5286#	5363#	5599#	5643#	5801#	5849#	5915#	5920#	5926#	5932#	5939#

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CROSS REFERENCE TABLE -- MACRO NAMES

RETURN	788#	4098	4152	4354	4457	4496	4592	4655	4702	4761	4820	4866	4945	5028	5083
	5136	5177	5223	5288	5371	5423	7246	7259	7332	7492	7547	7569	8016	8076	8134
	8167	8201	8231	8257	8302										
RFLAGS	1#	628#													
RNGFRM	934#	1764	1770	1776	1782	1788	1794	1807	1813	1819	1825	1831	1837		
SETPRI	1#	628#	6023	6135	6215										
SETVEC	1#	628#	5982	6015	6127										
SLASH	1#	628#													
STARS	1#	628#													
SVC	1#	628#													
XFER	1#	628#	5832#	6142#	6219#	6255#	6292#	6379#	8304#						
XFERF	1#	628#													
XFERT	1#	628#													

. ABS. 113156 000

ERRORS DETECTED: 0

CZUACA.BIN,CZUACA.SEQ/CRF/SOL/NL:TOC=SVC34R.MLB,CZUACA.P11
 RUN-TIME: 35 42 4 SECONDS
 RUN-TIME RATIO: 132/82=1.5
 CORE USED: 21K (41 PAGES)