

DEUNA

NI EXERCISER DIAG
CZUACAO

AH-T228A-MC
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OCT 1983
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701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800
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901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000

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

*ERROR MESSAGES ARE DESCRIBED IN SECTION 3.1

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

/FLAGS:LOE:IER:BOE

2.4 HARDWARE QUESTIONS

WHEN A DIAGNOSTIC IS STARTED, THE RUNTIME SERVICES WILL PROMPT THE USER FOR HARDWARE INFORMATION BY TYPING 'CHANGE HW (L) ?' YOU MUST ANSWER 'Y' AFTER A START COMMAND UNLESS THE HARDWARE INFORMATION HAS BEEN 'PRELOADED' USING THE SETUP UTILITY (SEE CHAPTER 6 OF THE XXDP+ USER'S MANUAL). WHEN YOU ANSWER THIS QUESTION WITH A 'Y', THE RUNTIME SERVICES WILL ASK FOR THE NUMBER OF UNITS (IN DECIMAL). 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 (00000000....)
 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)

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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

```
.SBTTL PROGRAM HEADER
      .ENABL ABS,AMA
      .      =      2000
.SBTTL PROGRAM MACROS
```

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PROGRAM MACROS

```

635
636      ;ISSTACK MACRO
637      ;-----
638
639      ;+++
640      ;THE ISSTACK MACRO FACILITATES INITIALIZING THE R6 (HARDWARE) STACK
641      ;AND THE R5 (PARAMETER) STACK.  R5 IS SET TO THE STACK LOW LIMIT
642      ;(STAKLO) AND THE PARAMETER STACK GROWS UPWARD.  R6 IS SET TO THE
643      ;STACK HIGH LIMIT (STAKHI) AND THE HARDWARE STACK GROWS DOWNWARD.
644      ;IF THERE IS A STACK OVER-RUN, IT WILL BE DETECTED BY THE PREG14
645      ;ROUTINE.
646      ;---
647
648      .MACRO  ISSTACK STAKLO,STAKHI
649
650      MOV     STAKLO,R5      ;INITIALIZE THE PARAMETER STACK POINTER.
651      MOV     STAKHI,SP     ;INITIALIZE THE HARDWARE STACK POINTER.
652
653      .ENDM   ISSTACK
654
655      ;PUSH MACRO
656      ;-----
657
658      ;+++
659      ;THE 'PUSH' MACRO FACILITATES PUSHING ITEMS ON THE HARDWARE STACK.
660      ;UP TO SEVEN ITEMS MAY BE PLACED ON THE STACK WITH ONE MACRO.
661      ;---
662      .MACRO  PUSH      A,B,C,D,E,F,G
663
664      .IF NB G
665      MOV     G,-(SP)
666      .ENDC
667
668      .IF NB F
669      MOV     F,-(SP)
670      .ENDC
671
672      .IF NB E
673      MOV     E,-(SP)
674      .ENDC
675
676      .IF NB D
677      MOV     D,-(SP)
678      .ENDC
679
680      .IF NB C
681      MOV     C,-(SP)
682      .ENDC
683
684      .IF NB B
685      MOV     B,-(SP)
686      .ENDC
687
688      .IF NB A
689      MOV     A,-(SP)
690      .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      ;P$PUSH MACRO
823      ;-----
824
825      ;+++
826      ;THE P$PUSH MACRO FACILITATES PUSHING PARAMETERS ON THE PARAMETER
827      ;STACK. UP TO SEVEN ITEMS MAY BE PUSHED WITH ONE MACRO.
828      ;---
829
830      .MACRO P$PUSH 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 .NLIST
947 .ENDM
948
949 .MACRO NEXT A,B
950 .LIST
951 .WORD A'B ; SEGMENT BUFFER ADDRESS
952 .NLIST
953 .ENDM
954
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
967 002001 132
968 002002 125
969 002003 101
970 002004 103

```

LSNAME::
 .ASCII /C/
 .ASCII /Z/
 .ASCII /U/
 .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
LSENVI::		
	.WORD	0
LSEXP1::		
	.WORD	0
LSMREV::		
	.BYTE	CSREVISION
	.BYTE	CSEDIT
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

L\$UN::	.WORD	0
L\$DESP::	.WORD	0
L\$LOAD::	.WORD	L\$DESC
	EMT	ESLOAD
L\$ETP::		
L\$ICP::	.WORD	0
L\$CCP::	.WORD	L\$INIT
L\$ACP::	.WORD	L\$CLEAN
L\$PRT::	.WORD	L\$AUTO
L\$TEST::	.WORD	L\$PROT
L\$DLY::	.WORD	0
L\$HME::	.WORD	0
	.WORD	0

```

; NAMES OF DEVICES SUPPORTED BY PROGRAM
DEV TYP <DEUNA>

; TEST DESCRIPTION
DESCR I PT <CZUAC DEUNA NI EXERCISER>

.EVEN

; FORMAT STATEMENTS USED IN PRINT CALLS

```

```

LSDVTYP::
      .ASCIZ  /DEUNA/
      .EVEN

L$DESC::
      .ASCIZ  /CZUAC DEUNA NI

      .EVEN

```


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DISPATCH TABLE

.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

1080
1081
1082
1083
1084
1085
1086
1087 002162
1088 002162 000001
1089 002164
1090 002164 100274
1091

.WORD 1
L\$DISPATCH::
.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
1134
1135
1136
1137
1138
1139
1140
1141
1142
1143
1144
1145
1146
1147
1148
1149
1150
1151
1152
1153
1154
1155
1156
1157
1158
1159
1160
1161
1162
1163
1164
1165
1166
1167
1168

002176
002176 000000
002200
002200

002200
002200

002200

EQUALS

BIT DEFINITIONS

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-L\$SW/2
L\$SW::
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	BIT3==	BIT03	
1170	000004	BIT2==	BIT02	
1171	000002	BIT1==	BIT01	
1172	000001	BIT0==	BIT00	
1173		:		
1174		:	EVENT FLAG DEFINITIONS	
1175		:	EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION	
1176		:		
1177	000040	EF.START==	32.	: START COMMAND WAS ISSUED
1178	000037	EF.RESTART==	31.	: RESTART COMMAND WAS ISSUED
1179	000036	EF.CONTINUE==	30.	: CONTINUE COMMAND WAS ISSUED
1180	000035	EF.NEW==	29.	: A NEW PASS HAS BEEN STARTED
1181	000034	EF.PWR==	28.	: A POWER-FAIL/POWER-UP OCCURRED
1182		:		
1183		:		
1184		:	PRIORITY LEVEL DEFINITIONS	
1185		:		
1186	000340	PRI07==	340	
1187	000300	PRI06==	300	
1188	000240	PRI05==	240	
1189	000200	PRI04==	200	
1190	000140	PRI03==	140	
1191	000100	PRI02==	100	
1192	000040	PRI01==	40	
1193	000000	PRI00==	0	
1194		:		
1195		:	OPERATOR FLAG BITS	
1196		:		
1197	000004	EVL==	4	
1198	000010	LOT==	10	
1199	000020	ADR==	20	
1200	000040	IDU==	40	
1201	000100	ISR==	100	
1202	000200	UAM==	200	
1203	000400	BOE==	400	
1204	001000	PNT==	1000	
1205	002000	PRI==	2000	
1206	004000	IXE==	4000	
1207	010000	IBE==	10000	
1208	020000	IER==	20000	
1209	040000	LOE==	40000	
1210	100000	HOE==	100000	

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GLOBAL EQUATES SECTION

```

1211
1212
1213
1214      000000      CTARGET==0
1215      000001      CASIST==1
1216      000002      CSHCTR==2      ;ARG TYPE FOR 'SHOW COUNTERS' CMD
1217      000004      CCLNAD==4      ;ARG TYPE FOR 'CLEAR NODE/ADR' CMD
1218      000010      CCLNAL==8.      ;ARG TYPE FOR 'CLEAR NODE/ALL' CMD
1219      000020      CEXIT==16.
1220
1221      ;;;CLOCK ENABLE VALUES TO BE LOADED IN CLK'S CSR;;;
1222
1223      000100      LCLKEN==100      ; L-CLOCK CSR VALUE TO ENABLE THE CLOCK
1224      000111      PCLKEN==111      ; P-CLOCK CSR VALUE TO ENABLE THE CLOCK
1225      001600      PCLKCT==1600      ; P-CLOCK COUNT SET REGISTER FOR COUNTER
1226
1227      ; SPECIAL CLI CODES FOR 'CHAR' ARGUMENT IN CLI CALLS
1228      ; (COMMAND LINE INTERPRETER DEFINITIONS)
1229      000000      CLIERR= 0
1230      000001      CLIEXI= 1
1231      000002      CLIBR = 2
1232      000003      CLIBIF= 3
1233      000004      CLISPA= 4
1234      000005      CLINUM= 5
1235      000006      CLIALP= 6
1236      000007      CLIALN= 7
1237      000010      CLIOCT= 8.
1238      000011      CLIDEC= 9.
1239      000012      CLISTR= 10.
1240
1241      ;DEFS FOR COMMAND LINE INTERPRETATION ACTION VALUES
1242
1243      000000      NULL=0
1244      000001      HELP=1
1245      000002      NODE=2
1246      000003      BUILD=3
1247      000004      CRUN=4
1248      000005      CPATRN=5
1249      000006      CSAVE=6
1250      000007      SUMMRY=7
1251      000010      IDENT=10
1252      000011      EXIT=11
1253      000012      NOTNUF=12
1254      000013      CEXADR=13
1255      000014      CSAVR4=14
1256      000015      CNODE=15
1257      000016      CALPHA=16
1258      000017      CONES=17
1259      000020      CZEROS=20
1260      000021      C1ALT=21
1261      000022      COALT=22
1262      000023      CCCITT=23
1263      000024      COPRSL=24
1264      000025      CTYPE=25
1265      000026      CSIZE=26
1266      000027      CCPYS=27

```

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```

1267      000030      CNDADR=30
1268      000031      CNODAL=31
1269      000032      CRNALL=32
1270      000033      CLUPPR=33
1271      000034      CSHMSG=34
1272      000035      CCLMSG=35
1273      000036      CCNTR=36
1274      000037      CNDLOG=37
1275      000040      CFUNCT=40
1276      000041      CUNSAV=41
1277      000042      CCLSUM=42
1278      000043      CDIR=43
1279      000044      CDEFLT=44
1280      000045      CUNSVF=45
1281
1282      000000      ALPHA==0
1283      000001      ONES==1
1284      000002      ZEROS==2
1285      000003      ONEALT==3
1286      000004      ZROALT==4
1287      000005      CCITT==5
1288      000006      OPRSEL==6
1289
1290      :
1291      : GLOBAL EQUATES FOR THE DEUNA DRIVER
1292      :
1293      : PORT CONTROL AND STATUS REGISTER 0
1294
1295
1296      100000      SERI == BIT15      ; STATUS ERROR INTERRUPT
1297      040000      PCEI == BIT14      ; PORT COMMAND ERROR INTERRUPT
1298      020000      RXI  == BIT13      ; RECEIVE RING INTERRUPT
1299      010000      TXI  == BIT12      ; TRANSMIT RING INTERRUPT
1300      004000      DNI  == BIT11      ; DONE INTERRUPT
1301      002000      RCBI == BIT10      ; RECEIVE BUFFER UNAVAILABLE
1302      :
1303      000400      FATI == BIT08      ; FATAL ERROR INTERERUPT
1304      000200      INTR == BIT07      ; INTERRUPT SUMMARY <15:08>
1305      000100      INTE == BIT06      ; INTERRUPT ENABLE
1306      000040      RSET == BIT05      ; UNA RESET
1307
1308      : PORT COMMANDS IN BIT 3 TO BIT 0
1309      : -----
1310
1311      000001      GETPCB == BIT00      ; GET ADDRESS OF PORT CONTROL BLOCK
1312      000002      GETFNT == BIT01      ; GET COMMAND IN PORT CONTROL BLOCK
1313      000003      PNOP == BIT00!BIT01 ; NO OPERATION PERFORMED
1314      000004      STRT == BIT02      ; ENABLE XMIT AND RCVR
1315      000005      BOOT == BIT02!BIT00 ; BOOT , -> PRIM LOAD STATE,
1316      : INITATE DOWNLINE LOAD
1317
1318      000010      PDMD == BIT03      ; POLLING DEMAND/WAKE UP BIT
1319      000011      TMRO == BIT03!BIT00 ; SANITY TIMER ENABLE ( =1 ITS ON)
1320      000012      TMRF == BIT03!BIT01 ; SANITY TIMER OFF
1321      000015      RSTT == BIT03!BIT02!BIT00 ; RESET SANITY TIMER
1322      000017      STOP == BIT03!BIT02!BIT01!BIT00 ; SUSPEND UNA OPERATION

```


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GLOBAL EQUATES SECTION

```

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      RMTCL == 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

```

```

:
:      ETHERNET PACKET OFFSETS
:

```

```

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      :      -----
1406      :      (6 BYTES)
1407      :      -----
1408      :
1409      :
1410      :      +6      ! SOURCE ADDRESS !
1411      :      -----
1412      :      (6 BYTES)
1413      :      -----
1414      :
1415      :
1416      :      +12.    ! PROTOCOL TYPE !
1417      :      -----
1418      :      +14.    ! DATA !
1419      :      -----
1420      :      MORE DATA
1421      :

```

```

: +
:      XMIT RING DESCRIPTOR DEFINITIONS
: -

```

```

1426      : TDRB+0
1427      :
1428      :      NOTHING NEEDED
1429      :
1430      :
1431      : TDRB+2
1432      :
1433      :      NOTHING NEEDED
1434

```

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GLOBAL EQUATES SECTION

```

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      ; RDPB+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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GLOBAL EQUATES SECTION

```

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          ;
1537          000002      C.SECS == 2
1538          000004      C.PREC == 4
1539          000010      C.MREC == 10
1540          000014      C.RERB == 14
1541          000016      C.RERR == 16
1542          000020      C.RDAT == 20
1543          000024      C.RMDB == 24
1544          000030      C.RLIN == 30
1545          000032      C.RLEX == 32
1546          000034      C.PXMT == 34
1547          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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GLOBAL DATA SECTION

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

;MESSAGE TYPE ASCII ADDRESS TABLE

; THIS SECTION DEFINES THE DATA PATTERNS USED BY THE EXERCISER

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

; 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
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 \[ ]^~ABCDEFGHIJKLMNOPQRSTUVWXYZ ; ALPHANUMERIC
1672 003434 042103 043105 044107
1673 003442 045111 046113 047115
1674 003450 050117 051121 052123
1675 003456 053125 054127 055131
1676 003464
1677 003464 377 MSG01:: .BYTE 377 ; MESSAGE OF ALL ONES
1678 003465 MSG1::
1679 003465 000 MSG02:: .BYTE 0 ; MESSAGE OF ALL ZEROS
1680 003466 MSG2::
1681 003466 252 MSG03:: .BYTE 252 ; MESSAGE OF ALTERNATING ONES
1682 003467 MSG3::
1683 003467 125 MSG04:: .BYTE 125 ; MESSAGE OF ALTERNATING ZEROS
1684 003470 MSG4::
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
1688 003504 143325 142304 040041 .WORD 143325,142304,040041,104116,052606,172334
1689 003512 104116 052606 172334
1690 003520 105025 123754 111337 .WORD 105025,123754,111337,111523,030030,145064
1691 003526 111523 030030 145064
1692 003534 137642 143531 063617 .WORD 137642,143531,063617,135075,066730,026575
1693 003542 135075 066730 026575
1694 003550 052012 053627 070071 .WORD 052012,053627,070071,151172,165044,031605
1695 003556 151172 165044 031605
1696 003564 166632 016147 .WORD 166632,016147
1697 003570
1698 003570 000102 MSG5::
1699 OPSLBF: .BLKB 66. ;BUFFER FOR OPERATOR SELECTED MESSAGE TYPE
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

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

;
: TABLE OF START ADDRESS OF RECIEVE RING BUFFERS
;

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

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

;
: TABLE OF START ADDRESS OF TRANSMIT RING BUFFERS
;

1737 003736
1738
1739 003736 004162
1740 003740 007140
1741 003742 012116
1742 003744 015074
1743 003746 020052
1744 003750 023030
1745
1746
1747

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

;
: POINTERS TO DESCRIPTOR RING ENTRIES

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

XRGSRT::.WORD XRING ; FIRST ENTRY IN TRANSMIT RING
RRGSRT::.WORD RRING ; FIRST ENTRY IN RECIEVE RING
XRGCUR::.WORD XRING ; CURRENT ENTRY IN TRANSMIT RING
PRGCUR::.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.

1759 003772 000006
1760
1761
1762
1763

XRING:: .REPT 6
.NLIST
RNGFRM XRG00,B,0
.LIST

1764 003772 002756
1765 003774 004162
1766 003776 000000
1767 004000 000000
1768 004002 000000
1769
1770 004004 002756

.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

1868 047632 000000

1869 047634 000000

1870 047636 000000

1871 047640 000000

1872

1873 047642 000000

1874 047644 000000

1875 047646 000000

1876 047650 000000

1877

1878

1879 047652 000000

1880 047654 000000

1881 047656 000000

1882

*****8

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

PCSR0:::WORD	: PCSRS OF CURRENT SLOT	
PCSR1:::WORD	: ADDRESS OF PCSR0	(PORT COMMAND FIELD
PCSR2:::WORD	: 1	(STATE & SELF TEST FIELDS
PCSR3:::WORD	: 2	(PCB ADDRESS LO 15 BITS
	: 3	(PCB ADDRESS HI 2 BITS

PCSR0C:::WORD	0	: PCSR0 CONTENTS
PCSR1C:::WORD	0	: PCSR1 CONTENTS
PCSR2C:::WORD	0	: PCSR2 CONTENTS
PCSR3C:::WORD	0	: PCSR3 CONTENTS

UNACSR:::WORD	0	: CSR
UNAVEC:::WORD	0	: VECTOR
UNAPRI:::WORD	0	: PRIORITY

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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 $RDCN ; 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
1958      .EVEN
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
1970      .EVEN
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
1985      .EVEN
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 UCBB11   : 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 UCBB12   : 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      $CLRC::      .WORD 13      : FUNCTION
2085      050262 050160      .WORD UC13      : UCBB ADDRESS
2086      :
2087      050264 000000      .WORD 0      : DEFAULT COUNT OF COUNTER LIST
2088      050266 000040      .WORD 40      : NULL
2089      :
2090      :      (# OF WORDS IN LIST = UPPER BYTE)
2091      :      MAX NUMBER VALUE = 32 (DECIMAL) =
2092      :      40 (OCTAL)
2093
2094      : ( FOR UC13:: SEE UCB 12 ABOVE)
2095
2096      ;+
2097      :
2098      :-
2099
2100      .EVEN
2101      $RDMO::      .WORD 14      : FUNCTION CODE
2102      050272 000000      .WORD 0      : A 16 BIT COPY OF THE
2103      :
2104      :      BITS TO READ THE UNA INTERNAL
2105      :      MODE REGISTER
2106      050274 000000      .WORD 0      : NULL
2107      050276 000000      .WORD 0      : NULL

```

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```

2107
2108
2109      ;+      WDMODE == BIT03!BIT02!BIT00 ; WRITE INTERNAL LINK MODE REGISTER
2110      ;:-
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      ;+      RDSTA == BIT03!BIT02!BIT01 ; READ PORT STATUS
2122      ;:-
2123
2124      .EVEN
2125
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      ; DUMP INTERNAL MEMORY
2155      ;:-
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      ; LD MEM == 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 ; SUMMARY DATA COUNTERS
2234 ;
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 BUFLN:: .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

.SBTTL COMMAND LINE ACTION TREE

;SAMPLE CLI TREE NODE (ALWAYS AT LEAST 1 WORD)

2341	:	-----	
2342	:	! ACTION ! CHAR CODE !	
2343	:	-----	
2344	:	! MISS DISPLACEMENT !	ONLY IF 'MISS' ARGUMENT DEFINED
2345	:	-----	
2346	:	! NEXT MODE DISPLMNT !	ONLY IF 'ASCII' ARGUMENT DEFINED
2347	:	-----	
2348	:	! ASCII MATCH STRING !	ONLY IF 'ASCII' ARGUMENT DEFINED
2349	:	(.EVEN)	
2350	:	-----	

CLITRE:

;FIRST KEYWORD

2352	051070	CLITRE:		
2353				
2354		;FIRST KEYWORD		
2355	051070	CLI	CLISPA,0,N10\$	:SKIP ANY LEADING SPACES
2356	051074	N10\$: CLI	<'?'>,HELP,N12\$	:IS THE FIRST NON-SP CHAR. A '?'
2357	051100	CLI	CLIEXI,0	: IF YES DO 'HLP' AND EXIT
2358	051102	N12\$: CLI	CLISTR,HELP,N14\$,<'HELP'>	:ELSE IS FIRST WORD A 'HELP'
2359	051116	CLI	CLIEXI,0	: IF YES DO 'HLP' AND EXIT
2360	051120	N14\$: CLI	CLISTR,NOTNUF,N16\$,<'NODE'>	:ELSE IS FIRST WORD A 'NODE'
2361	051134	CLI	CLIBR,0,N80\$	: IF YES, BR N80\$
2362	051140	N16\$: CLI	CLISTR,BUILD,N18\$,<'BUILD'>	:ELSE IS FIRST WORD A 'BUILD'
2363	051154	CLI	CLIEXI,0	: IF YES DO 'BUILD' AND EXIT
2364	051156	N18\$: CLI	CLISTR,NOTNUF,N20\$,<'RUN'>	:ELSE IS FIRST WORD A 'RUN'
2365	051170	CLI	CLIBR,0,N180\$	: IF YES, BR N180\$
2366	051174	N20\$: CLI	<'S'>,NOTNUF,N25\$	:ELSE IS FIRST CHAR. A 'S'
2367	051200	CLI	CLISTR,0,N22\$,<'HOW'>	: IF YES IS REST OF WORD 'HOW'
2368	051212	CLI	CLIBR,0,N100\$	: IF YES, BR N100\$
2369	051216	N22\$: CLI	CLISTR,SUMMARY,N23\$,<'SUMMARY'>	: ELSE IS REST OF WORD 'SUMMARY'
2370	051234	CLI	CLIEXI,0	: IF YES, DO 'SUM' AND EXIT
2371	051236	N23\$: CLI	CLISTR,CSAVE,N24\$,<'AVE'>	: ELSE IS REST OF WORD 'AVE'
2372	051250	CLI	CLIEXI,0	: IF YES, DO 'SAVE' AND EXIT
2373	051252	N24\$: CLI	CLIEXR,0	: ELSE 'ILL COMMAND'
2374	051254	CLI	CLIEXI,0	: EXIT
2375	051256	N25\$: CLI	CLISTR,NOTNUF,N26\$,<'CLEAR'>	:ELSE IS FIRST WORD A 'CLEAR'
2376	051272	CLI	CLIBR,0,N120\$	: IF YES, BR N120\$
2377	051276	N26\$: CLI	CLISTR,NOTNUF,N28\$,<'IDENTIFY'>	:ELSE IS FIRST WORD 'IDENTIFY'
2378	051316	CLI	CLIBR,0,N140\$	: IF YES, GET ADDR, BR N140\$
2379	051322	N28\$: CLI	CLISTR,NOTNUF,N29\$,<'MESSAGE'>	:ELSE IS FIRST WORD 'MESSAGE'
2380	051340	CLI	CLIBR,0,N160\$	: IF YES, BR N160\$
2381	051344	N29\$: CLI	CLISTR,CUNSAV,N30\$,<'UNSAVE'>	:ELSE IS FIRST WORD 'UNSAVE'
2382	051362	CLI	CLIBR,0,N210\$	: IF YES, BR TO N210\$
2383	051366	N30\$: CLI	CLISTR,EXIT,N31\$,<'EXIT'>	:ELSE IS FIRST WORD 'EXIT'
2384	051402	CLI	CLIEXI,0	: IF YES EXIT
2385	051404	N31\$: CLI	CLISTR,NOTNUF,N32\$,<'FUNCTION'>	:ELSE IS FIRST WORD 'FUNCTION'
2386	051424	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$: CLI CLISTR,CCCITT,N167$,<'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 STING
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$: CLI CLISTR,CNALL,N183$,<'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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COMMAND LINE ACTION TREE

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

```
;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:
: 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.
;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

ERRTBL

LSERRTBL::

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

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GLOBAL TEXT SECTION

.SBTTL GLOBAL TEXT SECTION

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

CLISPM: .ASCIIZ <12><15>/NIE>/ ;NIE PROMPT

CLIERM: .ASCIIZ /%N%A?ILL CMD-BAD SYNTAX?/

CLINUF: .ASCIIZ /%N%A?INCOMPLETE COMMAND?/

CLINBG: .ASCIIZ /%N%A?NUMBER TOO BIG?/

CLIBRX: .ASCIIZ /%N%A?BAD RADIX?/

LDRESP: .ASCIIZ /%N%ANODE %T%A HAS RESPONDED./

RECERR: .ASCIIZ /%N%APACKET RECEIVED WITH UNA ERROR./

RTRYER: .ASCIIZ /%N%ATRANSMISSION ABORTED -- EXCESSIVE COLLISIONS./

BLDMSG: .ASCIIZ /%N%D2%A NODE ADDRESSES ADDED, ELAPSED TIME: %D2%A MINUTE./

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

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2573	053044	052125	027105	000
2574	053051	045	022516	041501
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
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
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
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
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
2618	053436	000124		
2619	053440	051445	032061	040445
2620	053446	022516	031104	000
2621	053455	045	030523	022464
2622	053460	000124		
2623	053462	047045	040445	047516
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

ILADMS: .ASCII /%N%ACANNOT USE BROADCAST ADDRESS (FF-FF-FF-FF-FF-FF)/

ILADM1: .ASCII2 /%N%AFOR LOOP TESTING. ADDRESS WAS NOT ADDED TO NODE TABLE.%N/

CADRER: .ASCII2 /%N%PLEASE ENTER TWELVE HEXADECIMAL DIGITS./

CADERR: .ASCII2 /%N%ATWELVE HEX-DIGITS REQUIRED FOR ADDRESS./

NULSTR: .ASCII2 /%N%AA ZERO LENGTH STRING WAS ENTERED./

NODADR: .ASCII2 /%N%S2%T/

LOGNAM: .ASCII2 /%S14%AN%D2/

NODTYP: .ASCII2 /%S14%T/

NTBHDR: .ASCII2 \%N%ANODE PHYSICAL ADDRESS NODE LOGICAL NAME TYPE(A/T)\

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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
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
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
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
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
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
2730 054626 000
2731 054627 122 051505 047524
2732 054634 042522 027104 000
2733 054641 045 022516 052101
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

UNBOND: .ASCIIZ /%N%AA UNBOUNDED 'OPERATOR INPUT' STRING WAS ENTERED./

ADRDEL: .ASCIIZ /%N%ATHE ADDRESS HAS BEEN DELETED FROM THE NODE TABLE./

LOGDEL: .ASCIIZ /%N%ANODE N%D1% HAS BEEN DELETED FROM THE NODE TABLE./

TABCLR: .ASCIIZ /%N%ATHE %T% TABLE HAS BEEN CLEARED./

UNSMMSG: .ASCIIZ /%N%ATHE NODE TABLE HAS BEEN %T/

SAVED: .ASCIIZ /SAVED./

RESTOR: .ASCIIZ /RESTORED./

MSGPRM: .ASCIIZ /%N%ATHE CURRENT MESSAGE PARAMETERS ARE:/

MSG1: .ASCIIZ /%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	047045	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%AHOWEVER, 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/

.EVEN
HMSG1: .ASCIZ /%N%A ETHERNET DEFAULT ADDRESS (HEX): %T/

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2797	055406	020040	052045	000	
2798	055413	045	031116	040445	HDMSG2: .ASCIIZ /%N2%A 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: .ASCIIZ /%N2%A 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: .ASCIIZ /%N%A 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: .ASCIIZ /%N%A 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: .ASCIIZ /%N%A 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: .ASCIIZ /%N%A 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: .ASCIIZ /%N%A 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: .ASCIIZ /%N%A 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 .ASCIIZ \%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: .ASCII2 \N%A(IT IS ONLY NECESSARY TO TYPE THE LETTERS IN BRACKETS)\

HELP3: .ASCII2 \N2%A[H]ELP OR ? - TYPES THIS HELP TEXT.\

HELP4: .ASCII2 \N2%A[E]XIT - RETURN TO THE SUPERVISOR.\

HELP5: .ASCII2 \N2%A[SH]OW [N]ODES - PRINTS INFORMATION IN CURRENT NODE TABLE.\

HELP6: .ASCII2 \N2%A[SH]OW [M]ESSAGE - PRINTS THE SELECTED MESSAGE TYPE, SIZE AND COP

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2909	056606	027123	000
2910	056611	045	031116 040445
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
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
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
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
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

HELP7: .ASCIIZ \N2%A[SH]OW [C]OUNTERS - PRINTS THE LOW LEVEL COUNTERS OF THE HOST NODE

HELP8: .ASCIIZ \N2%A[R]UN [L]OOPPAIR/PASS=NN - RUNS THE LOOPPAIR TEST.\

HELP9: .ASCIIZ \N2%A[R]UN [A]LL/PASS=NN - RUNS THE NODE-TO-NODE TEST.\

HELP10: .ASCIIZ \N2%A[R]UN [D]IRECT/PASS=NN - RUNS THE LOOP DIRECT TEST.\

HELP11: .ASCIIZ \N2%A[R]UN [P]ATTERN/PASS=NN - RUNS THE MESSAGE PATTERN TEST.\

HELP12: .ASCIIZ \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: .ASCIIZ \N%AMODIFY THE DEFAULT MESSAGE TYPE, SIZE AND COPY PARAMETERS.\

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

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

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

HELP17: .ASCIIZ \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: .ASCIIZ \N%ALISTENING TO ID MESSAGES ON THE NI.\

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

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

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

HELP22: .ASCIIZ \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: .ASCII2 \N2%A[C]LEAR [S]UMMARY - CLEARS THE TABLE OF SUMMARY TEST DATA.\

HELP24: .ASCII2 \N2%A[I]DENTIFY ADR - USES THE REQUEST ID FUNCTION TO IDENTIFY A REMOTE

HELP25: .ASCII2 \N2%A[SA]VE - SAVES THE CONTENTS OF THE NODE TABLE.\

HELP26: .ASCII2 \N2%A[U]NSAVE - REPLACES THE CURRENT NODE TABLE WITH THE SAVED ONE.\

HELP27: .ASCII2 \N%\$8%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
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
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
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				
3173				
3174				
3175				
3176	061526	047045	040445	050040
3177	061534	051501	020123	041101
3178	061542	051117	042524	020504
3179	061550	000		
3180	061551	045	022516	022524
3181	061556	020101	042524	052123
3182	061564	026440	020055	000
3183	061571	045	022516	022524
3184	061576	020101	047516	042504
3185	061604	020072	052045	000
3186	061611	045	022524	020101
3187	061616	051105	047522	000122
3188	061624	047045	052045	040445

HELP28: .ASCIZ \N%S8%

2) PASS COUNT IS A DECIMAL NUMBER BETWEEN 1 AND 65534. A

HELP29: .ASCIZ \N%S8%

VALUE OF 1 IS ASSUMED.\

HELP30: .ASCIZ \N%S8%

SPECIFYING -1 CAUSES THE TEST TO BE RUN INDEFINATELY.\

.EVEN

TEST MESSAGES AND ARGUMENTS

PASABT: .ASCIZ /N% PASS ABORTED! /

TSTMS1: .ASCIZ /N%T% TEST -- /

TSTMS2: .ASCIZ /N%T% NODE: %T /

TSTMS3: .ASCIZ /%T% ERROR /

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	PATRN: .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	/0ALT/	
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	/XN%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

UNA COUNTER INFORMATION MESSAGES

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

CNTR00: .ASCIZ /%N%5%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%AMULT, LAST 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%AMULTICAST DA'' 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%ARECEIVED 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%ARECEIVED 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%AMULTICAST 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
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
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
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
3441 064226 044515 020124 047503
3442 064234 046114 051511 047511
3443 064242 020116 044103 041105
3444 064250 020113 040506 046111
3445 064256 051125 035105 051445
3446 064264 031061 055045 000065
3447
3448
3449
3450
3451
3452 064272 047125 020101 047520
3453 064300 052122 041440 046517
3454 064306 040515 042116 042440
3455 064314 051122 051117 000
3456 064321 125 040516 043040
3457 064326 052101 046101 042440
3458 064334 051122 051117 000
3459 064341 125 042516 050130
3460 064346 040514 047111 042105
3461 064354 052440 040516 044440
3462 064362 052116 051105 052522
3463 064370 052120 000
3464 064373 125 045516 047516
3465 064400 047127 052440 040516
3466 064406 042440 051122 051117
3467 064414 000
3468 064415 125 040516 053440

CNTR16: .ASCIIZ /%N%AMULTICAST BYTES TRANSMITTED:%S8%T/

CNTR17: .ASCIIZ /%N%ATRANSMIT PACKETS ABORTED-BITMAP:%S8%B6/

CNTR18: .ASCIIZ /%N%ATRANSMIT PACKETS ABORTED:%S16%Z5/

CNTR19: .ASCIIZ /%N%AXMIT COLLISION CHECK FAILURE:%S12%Z5/

ERROR MESSAGES FOR DEUNA DRIVER

EMSG01: .ASCIIZ /UNA PORT COMMAND ERROR/

EMSG02: .ASCIIZ /UNA FATAL ERROR/

EMSG03: .ASCIIZ /UNEXPLAINED UNA INTERRUPT/

EMSG04: .ASCIIZ /UNKNOWN UNA ERROR/

EMSG05: .ASCIIZ /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 /%X%AND 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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GLOBAL TEXT SECTION

3581	065574	000116			
3582	065576	047125	041101	042514	EMSG31: .ASCIIZ /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: .ASCIIZ \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: .ASCIIZ /TIMEOUT ERROR/
3597	065722	020124	051105	047522	
3598	065730	000122			
3599	065732	005015	044524	042515	EMSG34: .ASCIIZ <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: .ASCIIZ /%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: .ASCIIZ /%ADATA PATTERN: %T%N/
3612	066044	020101	040520	052124	
3613	066052	051105	035116	022440	
3614	066060	022524	000116		
3615	066064	040445	040506	046111	EMSG37: .ASCIIZ /%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: .ASCIIZ /%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: .ASCIIZ <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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GLOBAL TEXT SECTION

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: %22/
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%AECCO: %22/
3676	066600	040445	041505	035117	
3677	066606	022440	031132	000	
3678	066613	045	022516	030523	SIMSG5: .ASCIZ /%N%S14%AUSER ECO: %22/
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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GLOBAL TEXT SECTION

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: .ASCIIZ /%N%ABYTE NUMBER:%D4%A(D) EXPECTED=%06%A(0) RECIEVED=%06%A(0)/

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

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

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

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

SUMMS3: .ASCIIZ /%N%56%Z5%S12%Z5%S10%Z5/

SUMMS4: .ASCIIZ /%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	SUMMS5: .ASCIZ /%N%56%Z5%S8%T/
3754	067442	032532	051445	022470	
3755	067450	000124			
3756	067452	051445	022465	000124	SUMMS6: .ASCIZ /%S5%T/
3757					.EVEN
3758					
3759					

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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.
:--

3760									
3761									
3762									
3763									
3764									
3765									
3766									
3767									
3768									
3769	067460				BGNMSG	ERR1			
3770	067460							ERR1::	
3771	067460	012737	000020	003672		MOV	#CEXIT,CFLAG		
3772	067466					PRINTX	#PCMSG,PCCALL		
3773	067466	013746	050564					MOV	PCCALL,-(SP)
3774	067472	012746	066714					MOV	#PCMSG,-(SP)
3775	067476	012746	000002					MOV	#2,-(SP)
3776	067502	010600						MOV	SP,R0
3777	067504	104415						TRAP	C\$PNTX
3778	067506	062706	000006					ADD	#6,SP
3779	067512					DOCLN			
3780	067512	104444						TRAP	C\$DCLN
3781	067514				ENDMSG				
3782	067514							L10002:	
3783	067514	104423						TRAP	C\$MSG
3784									
3785	067516				BGNMSG	ERR2			
3786	067516							ERR2::	
3787	067516	010146				MOV	R1,-(SP)		
3788	067520	013701	002370			MOV	P\$TYPE,R1		
3789	067524	006301				ASL	R1		
3790	067526	062701	003262			ADD	#MSGTAB,R1		
3791	067532					PRINTX	#EMSG35,#STRBUF		
3792	067532	012746	002322					MOV	#STRBUF,-(SP)
3793	067536	012746	066002					MOV	#EMSG35,-(SP)
3794	067542	012746	000002					MOV	#2,-(SP)
3795	067546	010600						MOV	SP,R0
3796	067550	104415						TRAP	C\$PNTX
3797	067552	062706	000006					ADD	#6,SP
3798	067556					PRINTX	#EMSG36,(R1)		
3799	067556	011146						MOV	(R1),-(SP)
3800	067560	012746	066037					MOV	#EMSG36,-(SP)
3801	067564	012746	000002					MOV	#2,-(SP)
3802	067570	010600						MOV	SP,R0
3803	067572	104415						TRAP	C\$PNTX
3804	067574	062706	000006					ADD	#6,SP
3805	067600	012601				MOV	(SP)+,R1		
3806	067602				ENDMSG				
3807	067602							L10003:	
3808	067602	104423						TRAP	C\$MSG
3809									
3810	067604				BGNMSG	ERR3			
3811	067604							ERR3::	
3812	067604					PRINTX	#EMSG37,#STRBUF		
3813	067604	012746	002322					MOV	#STRBUF,-(SP)
3814	067610	012746	066064					MOV	#EMSG37,-(SP)
3815	067614	012746	000002					MOV	#2,-(SP)

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GLOBAL ERROR REPORT SECTION

3816 067620 010600
3817 067622 104415
3818 067624 062706 000006
3819 067630
3820 067630 012746 002344
3821 067634 012746 066130
3822 067640 012746 000002
3823 067644 010600
3824 067646 104415
3825 067650 062706 000006
3826 067654
3827 067654
3828 067654 104423
3829

PRINTX #MSG38,#STRBU1

ENDMSG

MOV SP,R0
TRAP C\$PNTX
ADD #6,SP

MOV #STRBU1,-(SP)
MOV #MSG38,-(SP)
MOV #2,-(SP)
MOV SP,R0
TRAP C\$PNTX
ADD #6,SP

L10004:

TRAP C\$MSG

```

:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:  THESE MESSAGE AREAS ARE USED TO OUTPUT SUPPLEMENTARY INFORMATION
:  AFTER AN ERROR CALL.  THEY ARE INVOKED BY APPENDING THE NAME
:  OF THE AREA TO AN ERROR CALL:  ERRXXX 1,ERRORMESSAGE,AREANAME.
:  THE CORRESPONDING MESSAGE AREA IS SET UP IN THIS SECTION:
:      BGNMSG  AREANAME
:      [CODE]
:      ENDMSG
:
:  THE AREAS IN THIS SECTION ARE FOR MESSAGES USED IN MORE THAN ONE
:  TEST.  USE THE PRINTB (PRINT BASIC) AND PRINTX (PRINT EXTENDED)
:  MACROS.
:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

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GLOBAL SUBROUTINES SECTION

.SBTTL GLOBAL SUBROUTINES SECTION

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

++
: FUNCTIONAL DESCRIPTION:
: SUBROUTINE TO....

:XXX
: COMPLETE THE "SUBROUTINE TO...." STATEMENT WITH A FUNCTIONAL
: DESCRIPTION OF THIS SUBROUTINE.
:XXX

: INPUTS:

:XXX
: LIST THE INPUT DATA THAT ARE EXPLICITLY PASSED TO THIS SUBROUTINE.
:XXX

: IMPLICIT INPUTS:

:XXX
: LIST THE INPUT DATA THAT ARE IMPLICITLY USED BY THIS SUBROUTINE;
: FOR EXAMPLE, DATA READ FROM COMMON AREAS.
:XXX

: OUTPUTS:

:XXX
: LIST THE OUTPUT DATA THAT ARE EXPLICITLY GIVEN BY THIS SUBROUTINE
:XXX

: IMPLICIT OUTPUTS:

:XXX
: LIST THE OUTPUT DATA THAT ARE IMPLICITLY GIVEN BY THIS SUBROUTINE;
: FOR EXAMPLE, DATA STORED IN COMMON AREAS.
:XXX

: SUBORDINATE ROUTINES USED:

:XXX
: LIST THE SUBROUTINES CALLED BY THIS SUBROUTINE.
:XXX

: FUNCTIONAL SIDE EFFECTS:

:XXX
: DESCRIBE ANY EFFECTS THIS SUBROUTINE MAY HAVE UPON OTHER
: MODULES OF THE DIAGNOSTIC PROGRAM. AN EXAMPLE OF THIS IS
: THE SUBROUTINE INHIBITS ALL INTERRUPTS WITH PRIORITY 7.
:XXX

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GLOBAL SUBROUTINES SECTION

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

: CALLING SEQUENCE:

```

:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:      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
:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:--

```

```

:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:      INSERT THE CODE FOR THIS SUBROUTINE.  THE NAME OF THE SUBROUTINE SHOULD
:      BE DEFINED WITH A DOUBLE-COLON (::); THIS WILL MAKE THE SUBROUTINE GLOBAL.
:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:      BEGIN EACH SUBROUTINE AT THE TOP OF A NEW PAGE.
:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

```

.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)

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

```

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:--+
: 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)+
:      MOV      (R1)+,(R2)+      ; LOAD CLOCK'S INTR. VECTOR INTO 'CLKVEC'
:      MOV      (R1)+,(R2)+      ; LOAD CLOCK'S FREQ. INTO 'CLKHZ'
:      RTS      PC

```

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CLKSET CLOCK SETUP SUBROUTINE

.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 CLOCK INTERRUPTS THRU 'CLKVEC'. THE ADDRESS OF THIS ROUTINE WAS LOADED INTO THE CLOCK'S INTERRUPT VECTOR WITH A 'SETVEC' CALL

---+

3985	067702			BGNSRV	CLKINT		
3986	067702					CLKINT::	
3988	067702	005077	113766	CLR	@CLKCSR	:	DISABLE THE CLOCK FROM INTERRUPTING
3989	067706	005337	003712	DEC	TIMTCK	:	DECREMENT THE NO. OF TICKS/SEC
3990	067712	001015		BNE	1\$	:	GO CHECK TIMERS
3991	067714	013737	003702 003712	MOV	CLKHZ,TIMTCK	:	RESET THE NO. OF TICKS/SEC.
3992	067722	005237	003710	INC	TIMSEC	:	INC. NO OF SECS-SINCE-START
3993	067726	022737	000074 003710	CMP	#60.,TIMSEC	:	SEE IF WE'VE COUNTED 60 SEC.S YET
3994	067734	001004		BNE	1\$	:	IF NOT, GO CHECK TIMERS
3995	067736	005237	003706	INC	TIMMIN	:	ELSE, INC. MINUTES-SINCE-START
3996	067742	005037	003710	CLR	TIMSEC	:	AND RESTART SECOND COUNTER
3998	067746	005737	003714	1\$: TST	TIMER1	:	SEE IF TIMER1 TIMING ANYTHING
3999	067752	001402		BEQ	2\$	:	IF=0, NO, CHECK NEXT TIMER
4000	067754	005337	003714	DEC	TIMER1	:	ELSE DECREMENT THE TIMER VALUE (BY 1 TICK)
4001	067760	005737	003716	2\$: TST	TIMER2	:	SEE IF TIMER2 TIMING ANYTHING
4002	067764	001402		BEQ	3\$	:	IF=0, NO, CHECK NEXT TIMER
4003	067766	005337	003716	DEC	TIMER2	:	ELSE DECREMENT TIMER VALUE (BY 1 TICK)
4004	067772	005737	003720	3\$: TST	TIMERS	:	SEE IF TIMERS TIMING ANYTHING
4005	067776	001406		BEQ	4\$	:	IF=0, NOTHING BE TIMED, LEAVE
4006	070000	023737	003702 003712	CMP	CLKHZ,TIMTCK	:	SEE IF A SECOND HAS BEEN COUNTED OFF
4007	070006	001002		BNE	4\$	:	BR IF NO
4008	070010	005337	003720	DEC	TIMERS	:	ELSE, DECREMENT TIMER VALUE (BY 1 SEC.)

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CLKINT CLOCK INTERRUPT SERVICE ROUTINE

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4009 070014 013777 003704 113652 4$: MOV CLKEN,@CLKCSR ; REENABLE THE CLOCK TO INTERRUPT
4010 070022 ENDSRV
4011 070022 L10005:
4012 070022 000002 RTI
4013
4014
4015 .SBTTL PREG14 PRESERVE REGISTERS 1 THROUGH 4 ACROSS SUBROUTINE CALLS
4016 *****
4017 :INPUTS: THE RELATIVE ADDRESS OF THE CALLED ROUTINE MUST FOLLOW THE
4018 : CALL TO THIS ROUTINE (SEE CALLING SEQUENCE).
4019
4020 :OUTPUTS: -REGISTERS 1 THROUGH 4 ARE PRESERVED ACROSS THE CALLED ROUTINE.
4021 : -A CHECK IS MADE TO ENSURE THE HARDWARE STACK HASN'T OVER-RUN
4022 : THE PARAMETER STACK.
4023
4024 :CALLING SEQUENCE: THIS IS BEST HANDLED BY THE 'CALL' MACRO. THE ACTUAL
4025 : CALL IS:
4026 JSR R4,PREG14
4027 .WORD [SJBROUTINE NAME]-ANCHOR
4028
4029 :COMMENTS: THIS ROUTINE IS RE-ENTRANT AND RELOCATABLE.
4030 : THIS ROUTINE IS DRS COMPATIBLE.
4031
4032 :SUBORDINATE ROUTINES CALLED: THE ROUTINE SPECIFIED IN THE CALL.
4033 *****
4034
4035 ;R4 IS ALREADY ON THE R6 STACK.
4036 PREG14: MOV R3,-(SP) ;PUSH R3, R2, R1
4037 MOV R2,-(SP)
4038 MOV R1,-(SP)
4039
4040 MOV R4,PCCALI
4041 MOV (R4)+,R1 ;GET THE RELATIVE ADDRESS OF THE CALLED
4042 ;ROUTINE.
4043 ADD PC,R1 ;MAKE IT AN ABSOLUTE ADDRESS.
4044
4045 ANCHOR: MOV R4,-(SP) ;SAVE THE RETURN TO THE CALLING ROUTINE.
4046
4047 CMP R5,SP ;CHECK FOR STACK OVER-RUN.
4048 BLO 1$
4049 HALT ;HANDLE STACK OVER-RUN CONDITION.
4050
4051 1$: JSR PC,(R1) ;CALL THE SPECIFIED ROUTINE.
4052
4053 MOV (SP)+,R4 ;RESTORE THE RETURN TO THE CALLING ROUTINE.
4054
4055 MOV (SP)+,R1 ;RESTORE THE REGISTERS.
4056 MOV (SP)+,R2
4057 MOV (SP)+,R3
4058 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

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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
4153
4154
4155      .SBTTL  UNAINI  INITIALIZE THE UNA
4156
4157
4158      :*****
4159      :
4160      : SUBROUTINE TO
4161      :
4162      :      1) SETS UNA IN THE READY STATE
4163      :      2) INITIALIZES ALL UNA GLOBAL DATA LOCATIONS
4164      :          TO DEFAULT VALUES.
4165      :
4166      : CALLED BY:
4167      :
4168      :      CALL UNAINI
4169      :
4170      : INPUTS:      NONE
4171      :
4172      : OUTPUTS:     NONE
4173      :
4174      : SIDEFFECTS:  ALL GLOBAL LOCATIONS ARE ZEROED
4175      :

```


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UNAINI INITIALIZE THE UNA

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4173 ;*****;
4174 ;*****;
4175 ;*****;
4176 ;*****;
4177 ;*****;
4178 ;*****;
4179 ;*****;
4180 ;*****;
4181 UNAINI::MOV PCSRO, R3 ; MOVE ADDRESS OF PCSRO TO R3
4182 070262 013703 047632 MOV #RSET, (R3) ; HARDWARE RESET UNA
4183 070266 012713 000040
4184 070272 005002 ;*****;
4185 070274 011301 ;*****;
4186 070276 032701 004000 7$: CLR R2 ; LOOP COUNTER INIT
4187 070302 001006 MOV (R3), R1 ; READ PCSRO
4188 070304 005302 BIT #DNI, R1 ; WAIT FOR COMMAND TO FINISH
4189 070306 001372 BNE 9$ ; BACK TIL DNI =1
4190 070310 DEC R2 ; COUNT DOWN DELAY
4191 070310 104455 BNE 7$ ; BACK UNTIL TIMEOUT
4192 070312 000017 ERRDF 15,MSG15,ERR1 ; PRINT " DNI DID NOT SET FROM"
4193 070314 065031 ; TRAP C$ERDF
4194 070316 067460 ; .WORD 15
4195 ; .WORD MSG15
4196 ; .WORD ERR1
4197 070320 012713 004000 9$: MOV #DNI, (R3) ; " A RESET"
4198 ; WRITE ONE TO CLEAR DNI
4199 ;*****;
4200 ; NOW ENABLE INTERRUPTS FOR THE ALL
4201 ; PORT COMMANDS ET AL
4202 ;*****;
4203 MOV #INTE, (R3) ; ENABLE INTERRUPTS
4204 070324 112713 000100
4205 ;*****;
4206 ; LOAD ADDRESS OF PCBB
4207 ;*****;
4208
4209
4210 070330 012763 047666 000004 MOV #PCBB0,4(R3) ; LOWER 16 BITS OF ADRS
4211 070336 005063 000006 CLR 6(R3) ; UPPER 2
4212
4213 070342 CALL COMAND #GETPCB ; LOAD ADDRESS
4214 070354 P$POP R2 ; GET SUCCESS/FAILURE REPORT
4215 070356 001404 BEQ 10$ ; CONTINUE IF OK
4216 070360 ERRDF 5,MSG05,ERR1 ; ELSE REPORT ERROR
4217 070360 104455 ; TRAP C$ERDF
4218 070362 000005 ; .WORD 5
4219 070364 064415 ; .WORD MSG05
4220 070366 067460 ; .WORD ERR1
4221
4222
4223 070370 10$: ;*****;
4224 ; INIT GLOBAL DATA
4225 ;*****;
4226 070370 005037 047642 CLR PCSROC ; INIT CONTENTS OF CUR PCSRO
4227 070374 005037 047644 CLR PCSR1C ; PCSR1
4228 070400 005037 047646 CLR PCSR2C ; PCSR2
4229 070404 005037 047650 CLR PCSR3C ; PCSR3

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UNAINI INITIALIZE THE UNA

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4229
4230
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                000006      .REPT 6
4281                .REPT 6      CLR    (R1)+
4282                .ENDR        ; INIT TO 0
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	#\$RDCN, 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		CLR	(R1)+	
4294	070702	005302		DEC	R2	
4295	070704	001375		BNE	14\$	
4296						
4297	070706	012701	050260	MOV	#\$CLRC, R1	; CLEAR COUNTERS
4298	070712	005061	000004	CLR	4(R1)	
4299						
4300	070716	012701	050270	MOV	#\$RDMO, 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	#\$WDMO, 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	#\$RDST, 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	#\$CLRS, 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,MSG16,ERR1	; ELSE REPORT ERROR
4325	071040	104455				TRAP C\$ERDF
4326	071042	000020				.WORD 16
4327	071044	065064				.WORD MSG16
4328	071046	067460				.WORD ERR1
4329						
4330	071050			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,MSG07,ERR1	; ELSE REPORT ERROR
4334	071066	104455				TRAP C\$ERDF
4335	071070	000007				.WORD 7
4336	071072	064510				.WORD MSG07
4337	071074	067460				.WORD ERR1
4338						
4339	071076			CALL	FUNCT #RDPHYA	; READ UNA PHYSICAL ADDRESS
4340	071110			P\$POP	R2	; CHECK FOR ERROR

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UNAINI INITIALIZE THE UNA

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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)+, PCSRO0    ;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    MOV     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
4427
4428
4429
4430
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4451
4452

```

.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::

071350

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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.

```

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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```

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$:  MOVB      (R2)+,(R3)+      ; COPY DATA
4564 071706 005304      DEC      R4

```

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XMIT TRANSMIT UNA PACKETS

```

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$          ; EXIT
4573 071726          40$:  ERRDF 10,MSG10,ERR1    ; TRANSMIT RING BOOKKEEPING ERROR
4574 071726 104455                                TRAP      C$ERDF
4575 071730 000012                                .WORD      10
4576 071732 064656                                .WORD      MSG10
4577 071734 067460                                .WORD      ERR1
4578 071736 000413          BR       50$          ; BOOKKEEPING ERROR, XRGNEXT SHOULD = XRGCUR
4579 071740          42$:  ERRDF 12,MSG10,ERR1    ;
4580 071740 104455                                TRAP      C$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  45$:  INC      TIMEOUT
4586 071756          ERRHRD 8,MSG08,ERR1          ; REPORT ERROR
4587 071756 104456                                TRAP      C$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$POP P1
4607          :
4608          : SIDE EFFECTS - THE POINTERS RRGCUR AND RRGNEXT ARE UPDATED.
4609          :
4610          : REGISTER USAGE - R1 IS USED TO HOLD CURRENT PACKET STATUS INFORMATION
4611          : R2 COUNTS THE NUMBER OF PACKETS HANDLED
4612          : R4 POINTS TO THE RING DESCRIPTOR ENTRY
4613          :
4614          :--+
4615
4616          RECEVE::
4617 071776 005002          CLR      R2              ; CLEAR PACKETS HANDLED COUNTER
4618 072000 005737 050516  1$:  TST      NIRCNT          ; SEE IF ANY PACKETS TO RECEIVE
4619 072004 001476          BEQ      60$              ; IF NO, EXIT
4620 072006 013704 003760  MOV      RRGCUR,R4          ; MOVE CURRENT RECEIVE RING POINTER TO R4

```


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RECEVE RECEIVE UNA RING BUFFERS

4621	072012	016401	000004		MOV	4(R4),R1	:	MOVE STATUS OF PACKET TO R1
4622	072016	012764	100000	000004	MOV	?100000,4(R4)	:	RESET RING DESCRIPTOR
4623	072024	032701	100000		BIT	#OWN,R1	:	SEE WHO OWNS THIS BUFFER
4624	072030	001060			BNE	45\$	:	IF STILL OWNED BY UNA, ERROR
4625	072032	016403	000002		MOV	2(R4),R3	:	MOVE BUFFER ADDRESS INTO R3
4626	072036	016303	000014		MOV	PROTOT(R3),R3	:	MOVE PROTOTYPE INTO R3
4627	072042	020337	050544		CMP	R3,PROT00	:	SEE IF IT IS AN ACCEPTABLE PROTOCOL TYPE
4628	072046	001420			BEQ	10\$	:	IF YES, CONT.
4629	072050	020337	050546		CMP	R3,PROT02	:	ELSE CHECK OTHER GOOD TYPE
4630	072054	001415			BEQ	10\$	:	IF OK, CONT.
4631	072056			5\$:	CALL	GETRNX #RRGCR	:	ELSE, THROW OUT AND UPDATE
4632	072070				CALL	GETRNX #RRGNXT	:	CURRENT AND NEXT POINTERS
4633	072102	005337	050516		DEC	NIRCNT	:	DECREMENT RECEIVE COUNTER
4634	072106	000435			BR	60\$	:	EXIT
4635	072110	032701	040000	10\$:	BIT	#ERRS,R1	:	SEE IF ANY ERRORS
4636	072114	001413			BEQ	20\$	:	FOR NO ERRORS BR TO 20\$
4637	072116	005237	050536		INC	RCVERR	:	ELSE, INCREMENT RECEIVE ERROR COUNTER
4638	072122				PRINTF	#RECERR	:	PRINT ERROR MESSAGE
4639	072122	012746	052631			MOV	#RECERR,-(SP)	
4640	072126	012746	000001			MOV	#1,-(SP)	
4641	072132	010600				MOV	SP,R0	
4642	072134	104417				TRAP	C\$PNTF	
4643	072136	062706	000004			ADD	#4,SP	
4644	072142	000745			BR	5\$	:	UPDATE POINTERS AND RETURN
4645	072144	005237	050540	20\$:	INC	RCVBUF	:	INCREMENT GOOD BUFFERS RECEIVED COUNTER
4646	072150	005202		25\$:	INC	R2	:	KEEP COUNT OF HOW MANY BUFFERS RECEIVED
4647	072152	005337	050516		DEC	NIRCNT	:	KEEP BOOKKEEPING IN ORDER
4648	072156				CALL	GETRNX #RRGCR	:	UPDATE 'RECEIVE RING CURRENT' POINTER
4649	072170	000404			BR	60\$	:	
4650	072172			45\$:	ERRDF	11,MSG11,ERR1	:	RECEIVE RING BOOKKEEPING ERROR
4651	072172	104455				TRAP	C\$ERDF	
4652	072174	000013				.WORD	11	
4653	072176	064716				.WORD	MSG11	
4654	072200	067460				.WORD	ERR1	
4655	072202			60\$:	RETURN	R2	:	RETURN WITH NUMBER OF ENTRIES HANDLED

EDPACK

ETHERNET DATA PACK

THIS ROUTINE WILL CONVERT A STRING OF HEX CHARACTERS INTO A RIGHT JUSTIFIED BINARY STREAM (WITH LEADING ZEROS), COMPATIBLE WITH ETHERNET CONVENTIONS. THE SOURCE STRING MUST BE FORMATTED USING EITHER A WORD BY WORD HEX DESCRIPTION OR A BYTE BY BYTE HEX DESCRIPTION. THE RETURNED STRING WILL BE BYTE ORIENTED AS REQUIRED BY THE ETHERNET:
LO-BYTE-WORD0 HI-BYTE-WORD0 LO-BYTE-WORD1 HI-BYTE-WORD1, ETC.

INPUT ARGUMENTS

P1 - ADDRESS OF THE SOURCE (HEX) STRING TO BE CONVERTED TO A BINARY STREAM.
P2 - ADDRESS OF THE DESIRED DESTINATION BUFFER WHICH WILL ACCEPT BINARY DATA
P3 - LENGTH (IN BYTES) OF THE DESTINATION BUFFER

EXPLICIT OUTPUTS

P4 - ZERO IF SUCCESSFUL, -1 IF BUFFER TOO LONG OR ODD NUMBER OF HEX CHARACTERS

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EDPACK ETHERNET DATA PACKING ROUTINE

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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 REQD
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							
4766							
4767							
4768							
4769							
4770							
4771							
4772							
4773							
4774							
4775							
4776							
4777							
4778							
4779							
4780							
4781							
4782							
4783	072526	000000					
4784	072530	030460	031462	032464	HN:	.WORD	
4785	072536	033466	034470	041101	CMPSR:	.ASCIIZ /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 (DELIMITED 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

NO EXPLICIT OUTPUTS

IMPLIED OUTPUTS

THE BUFFER AT P2 WILL CONTAIN THE BINARY STREAM, CONVERTED DIRECTLY FROM THE BUFFER AT P1.

SUBORDINATE PROCEDURES

NONE

CALLING PROCEDURE

CALL HEXBIN P1,P2,P3

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HEXBIN HEX TO BINARY CONVERSION

```

4789 072552          HEXBIN: P$POP  R1,R2,HN      ;R1=SOURCE STRING ADDRESS
4790                                     ;R2=DESTINATION STRING ADDRESS
4791                                     ;HN=NUMBER OF BYTES REQUIRED
4792
4793 072562 060237 072526          ADD  R2 HN      ;HN NOW POINTS TO THE LAST_BYTE_POSITION+1
4794
4795 072566 012704 072530          1$: MOV  #CMPSTR,R4      ;POINTER IN THE COMPARE STRING
4796 072572 121124                2$: CMPB (R1),(R4)+      ;COMPARE CURRENT CHAR WITH A CHAR IN CMPSTR
4797 072574 001376                BNE  2$              ;REPEAT UNTIL CHARACTER FOUND IN LIST
4798 072576 005201                INC  R1              ;POINT TO THE NEXT ASCII BYTE
4799 072600 162704 072531          SUB  #CMPSTR+1,R4      ;R4 NOW CONTAINS THE ACTUAL BINARY VALUE FOR
4800                                     ;THE NIBBLE DESCRIBED BY THE CURRENT BYTE.
4801                                     ;NOTE: NIBBLE IS THE HI PORTION OF THE BYTE
4802 072604 006304                ASL  R4              ;MOVE NIBBLE TO THE HI END OF THE BYTE
4803 072606 006304                ASL  R4
4804 072610 006304                ASL  R4
4805 072612 006304                ASL  R4
4806 072614 010403                MOV  R4,R3            ;SAVE THE HI NIBBLE
4807
4808 072616 012704 072530          3$: MOV  #CMPSTR,R4      ;POINTER INTO COMPARE STRING
4809 072622 121124                CMPB (R1),(R4)+      ;COMPARE CURRENT CHAR WITH A CHAR IN CMPSTR
4810 072624 001376                BNE  3$              ;REPEAT UNTIL MATCH FOUND IN CMPSTR LIST
4811 072626 005201                INC  R1              ;POINT TO THE NEXT ASCII BYTE
4812 072630 162704 072531          SUB  #CMPSTR+1,R4      ;R4 NOW CONTAINS THE ACTUAL BINARY VALUE FOR
4813                                     ;THE NIBBLE DESCRIBED BY THE CURRENT BYTE.
4814                                     ;NOTE: NIBBLE IS THE HI PORTION OF THE BYTE
4815 072634 050403                BIS  R4,R3            ;NOW THE TWO CHARACTERS HAVE MADE A SINGLE BYTE
4816                                     ;NOW PLACE THE COMPLETE BYTE IN THE DESTINATION
4817 072636 110322                MOVB R3,(R2)+        ;AND POINT TO THE NEXT DESTINATION BYTE
4818 072640 020237 072526          CMP  R2,HN          ;IF THE DESTINATION POINTER [R2] REACHES THE
4819 072644 100750                BMI  1$              ;LAST CHARACTER POSITION+1 [HN] THEN DONL.
4820 072646                RETURN                     ;RETURN TO CALLER
4821
4822
4823
4824
4825
4826
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4829
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4834
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4840

```

BINHEX

BINARY TO HEX CONVERSION PROCEDURE

THIS PROCEDURE WILL CONVERT A BINARY DATA STREAM INTO A HEX STRING.

INPUTS - P1- BINARY DATA BUFFER ADDRESS
P2- NUMBER OF BYTES IN THE BUFFER
P3- ADDRESS OF OUTPUT BUFFER FOR HEX STRING.
HEX CHARACTER PAIRS SEPERATED BY '-'S
(NOTE: THIS BUFFER MUST BE AT LEAST 3*P2 BYTES LONG)

OUTPUTS - NONE
IMPLICIT OUTPUTS THE BUFFER AT P3 WILL CONTAIN THE HEX STRING
FOLLOWED BY A NULL CHARACTER.

SUBORDINATE ROUTINES NONE
CALLING PROCEDURE CALL BINHEX P1,P2,P3

```

4841 072650 030460 031462 032464 4841 072650 030460 031462 032464
4842 072656 033466 034470 041101 4842 072656 033466 034470 041101
4843 072664 042103 043105          4843 072664 042103 043105
4844 072670 000000          4844 072670 000000

```

HEXC: .ASCII /0123456789ABCDEF/

LST: .WORD

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BINHEX BINARY TO HEX CONVERSION PROCEDURE

4845						
4846	072672			BINHEX: P\$POP	R1,LST,R2	;R1 HAS THE INPUT BUFFER ADDRESS
4847						;LST: HAS THE NUMBER OF BYTES IN INPUT BUFFER
4848						;R2 HAS THE OUTPUT BUFFER ADDRESS
4849	072702	060137	072670			;LST IS NOW ADDRESS OF LAST SOURCE BYTE + 1
4850	072706	112103		1\$: ADD	R1,LST	;GET THE CURRENT BYTE AND POINT TO NEXT BYTE
4851	072710	110304		MOV	(R1)+,R3	;SEPARATE NIBBLES AND GET CHARACTERS SEPARATELY
4852	072712	042703	177760	MOV	R3,R4	;ONLY RIGHT BINARY NIBBLE REMAINS IN R3
4853	072716	006204		BIC	#177760,R3	;SHIFT OVER FOR LEFT BINARY NIBBLE IN R4
4854	072720	006204		ASR	R4	
4855	072722	006204		ASR	R4	
4856	072724	006204		ASR	R4	
4857	072726	042704	177760	BIC	#177760,R4	;ONLY LEFT BINARY NIBBLE REMAINS IN R4
4858						;R4 IS THE MOST SIGNIFICANT NIBBLE (FIRST)
4859						;R3 IS THE LEAST SIGNIFICANT NIBBLE (SECOND)
4860	072732	116422	072650	MOV	HEXC(R4),(R2)+	;PUT THE ASCII BYTE INTO THE BUFFER HI POSITION
4861	072736	116322	072650	MOV	HEXC(R3),(R2)+	;PUT THE ASCII BYTE INTO THE BUFFER LO POSITION
4862	072742	112722	000055	MOV	#'-,(R2)+	;PUT - BETWEEN HEX PAIRS
4863	072746	020137	072670	CMP	R1,LST	;RESULT IS NEGATIVE UNTIL R1=LST
4864	072752	103755		BLO	1\$	;UNTIL R1=LST. (TRANSFER ALL SOURCE BYTES)
4865	072754	105042		CLRB	-(R2)	;TERMINATE OUTPUT BUFFER WITH A NULL
4866	072756			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
:                XRGNTX 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 XRGNTX WHEN THE ROUTINE WAS ENTERED.
:                  XRGNTX 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

4899 072760
4900 072760

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BLDLD BUILD LOOP DIRECT DATA BUFFERS FOR TRANSMIT.

4901	072762	013704	003762		MOV	XRG NXT,R4	:	MOVE NEXT PACKET ADDRESS TO R4
4902	072766	032764	100000	000004	BIT	#OWN,4(R4)	:	CHECK OWNERSHIP BIT
4903	072774	001110			BNE	40\$	:	IF DON'T OWN, BOOKKEEPING ERROR,
4904	072775	016404	000002		MOV	2(R4),R4	:	POINT R4 TO DATA BLOCK
4905	073002	013703	002372		MOV	P\$SIZE,R3	:	PUT MESSAGE SIZE INTO R3
4906	073006	062703	000040		ADD	#40,R3	:	ADD HEADER AND LOOP DIRECT INFO TO LENGTH
4907	073012	010337	050560		MOV	R3,XFER	:	PUT BYTES TRANSFERED INTO WORD
4908	073016	162737	000016	050560	SUB	#16,XFER	:	AND CORRECT FOR HEADER
4909	073024	022703	002756		CMP	#XPKLEN,R3	:	SEE IF LONGER THAN ONE PACKET
4910	073030	002477			BLT	45\$	:	IF YES, ERROR
4911	073032	010337	050566		MOV	R3,BUFLEN	:	PUT PACKET LENGTH IN BUFLEN
4912	073036	012164	000000		MOV	(R1)+,DESTIN(R4)	:	MOVE FIRST TWO BYTES OF ADDRESS
4913	073042	012164	000002		MOV	(R1)+,DESTIN+2(R4)	:	MOVE BYTES THREE AND FOUR
4914	073046	011164	000004		MOV	(R1),DESTIN+4(R4)	:	MOVE BYTES FIVE AND SIX
4915	073052	005064	000006		CLR	SOURCC(R4)	:	LEAVE BLANK SPACE FOR SOURCE ADDRESS
4916	073056	005064	000010		CLR	SOURCC+2(R4)	:	SIX BYTES WORTH
4917	073062	005064	000012		CLR	SOURCC+4(R4)	:	
4918	073066	013764	050544	000014	MOV	PROTO,PROTOT(R4)	:	MOVE PROTOCOL TYPE INTO HEADER
4919	073074	012702	050720		MOV	#LOPDIR,R2	:	MOVE LOOPDIRECT FORMAT HEADER LOC. TO R2
4920	073100	012264	000016		MOV	(R2)+,LDSKIP(R4)	:	SKIP COUNT
4921	073104	011264	000020		MOV	(R2),LDFCT1(R4)	:	FUNCTION CODE (FORWARD)
4922	073110	013764	047762	000022	MOV	PHYADR,LDADR1(R4)	:	LOCAL NODE ADDRESS
4923	073116	013764	047764	000024	MOV	PHYADR+2,LDADR1+2(R4)	:	SIX BYTES
4924	073124	013764	047766	000026	MOV	PHYADR+4,LDADR1+4(R4)	:	
4925	073132	016264	000010	000030	MOV	10(R2),LDFCT2(R4)	:	FUNCTION CODE (REPLY)
4926	073140	013764	047762	000032	MOV	PHYADR,LDADR2(R4)	:	LOCAL NODE ADDRESS
4927	073146	013764	047764	000034	MOV	PHYADR+2,LDADR2+2(R4)	:	SIX BYTES
4928	073154	013764	047766	000036	MOV	PHYADR+4,LDADR2+4(R4)	:	
4929	073162	062704	000040		ADD	#LDADR2+6,R4	:	POINT R4 TO FIRST DATA BYTE
4930	073166	010437	050570		MOV	R4,CMPBUF	:	STORE BUFFER LOCATION FOR DATA COMPARE
4931	073172				CALL	BLDBUF R4	:	BUILD DATA BUFFER
4932	073202				CALL	GETXNX #XRG NXT	:	UPDATE POINTER TO NEXT RING ENTRY
4933	073214	000411			BR	60\$	:	EXIT
4934	073216			40\$:	ERRDF	13,MSG10,ERR1	:	TRANSMIT RING BOOKKEEPING ERROR
4935	073216	104455					TRAP	C\$ERDF
4936	073220	000015					.WORD	13
4937	073222	064656					.WORD	MSG10
4938	073224	067460					.WORD	ERR1
4939	073226	000404						
4940	073230			45\$:	BR	60\$	:	EXIT
4941	073230	104455			ERRDF	14,MSG14,ERR1	:	MESSAGE SIZE TOO SIG
4942	073232	000016					TRAP	C\$ERDF
4943	073234	064755					.WORD	14
4944	073236	067460					.WORD	MSG14
4945	073240			60\$:			.WORD	ERR1
4946					RETURN			

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BLDFAS BUILD PACKET FOR FULL ASSIST TRANSMISSION.

.SBTTL BLDFAS BUILD PACKET FOR FULL ASSIST TRANSMISSION.

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:--+
: 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
:
:--+
```

4974	073242				BLDFAS::				
4975	073242				P\$POP	R1,R2			: PUT ADDRESS OF TARGET ADDRESS INTO R1
4976									: AND ADDRESS OF ASSIST ADDRESS INTO R2
4977	073246	013704	003762		MOV	XRGXNT,R4			: MOVE NEXT PACKET ADDRESS TO R4
4978	073252	032764	100000	000004	BIT	#OWN,4(R4)			: CHECK OWNERSHIP BIT
4979	073260	001140			BNE	40\$			: IF DON'T OWN, BOOKKEEPING ERROR,
4980	073262	016404	000002		MOV	2(R4),R4			: POINT R4 TO DATA BLOCK
4981	073266	013703	002372		MOV	P\$SIZE,R3			: PUT MESSAGE SIZE INTO R3
4982	073272	062703	000060		ADD	#60,R3			: ADD HEADER INFO TO LENGTH
4983	073276	010337	050560		MOV	R3,XFER			: PUT 'BYTES TRANSFERED' INTO WORD
4984	073302	162737	000016	050560	SUB	#16,XFER			: AND CORRECT FOR HEADER
4985	073310	022703	002756		CMP	#XPKLEN,R3			: SEE IF LONGER THAN ONE PACKET
4986	073314	002527			BLT	45\$			: IF YES, ERROR
4987	073316	010337	050566		MOV	R3,BUFLEN			: PUT PACKET LENGTH IN BUFLN
4988	073322	011264	000000		MOV	(R2),DESTIN(R4)			: MOVE FIRST TWO BYTES OF ADDRESS
4989	073326	016264	000002	000002	MOV	2(R2),DESTIN+2(R4)			: MOVE BYTES THREE AND FOUR
4990	073334	016264	000004	000004	MOV	4(R2),DESTIN+4(R4)			: MOVE BYTES FIVE AND SIX
4991	073342	005064	000006		CLR	SOURCC(R4)			: LEAVE BLANK SPACE FOR SOURCE ADDRESS
4992	073346	005064	000010		CLR	SOURCC+2(R4)			: SIX BYTES WORTH
4993	073352	005064	000012		CLR	SOURCC+4(R4)			
4994	073356	013764	050544	000014	MOV	PROT0,PROT0(R4)			: MOVE PROTOCOL TYPE INTO HEADER
4995	073364	012764	000000	000016	MOV	#0,FASKIP(R4)			: SKIP COUNT
4996	073372	012764	000002	000020	MOV	#2,FAFCT1(R4)			: FUNCTION CODE (FORWARD)
4997	073400	011164	000022		MOV	(R1),FAADR1(R4)			: TARGET NODE ADDRESS
4998	073404	016164	000002	000024	MOV	2(R1),FAADR1+2(R4)			: SIX BYTES
4999	073412	016164	000004	000026	MOV	4(R1),FAADR1+4(R4)			
5000	073420	012764	000002	000030	MOV	#2,FAFCT2(R4)			: FUNCTION CODE (FORWARD)
5001	073426	011264	000032		MOV	(R2),FAADR2(R4)			: ASSIST NODE ADDRESS
5002	073432	016264	000002	000034	MOV	2(R2),FAADR2+2(R4)			: SIX BYTES

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BLDFAS BUILD PACKET FOR FU ASSIST TRANSMISSION.

5003	073440	016264	000004	000036	MOV	4(R2),FAADR4(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 #XRGXNT	:	UPDATE POINTER TO NEXT RING ENTRY	
5016	073560	000411			BR	50\$	:	EXIT	
5017	073562				ERRDF	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	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

.SBTTL BLDAST BUILD TRANSMIT AND RECEIVE ASSIST PACKETS

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5030
5031
5032
5033 073606      BLDAST::
5034 073606      P$POP    R1,R2      ; PUT DESTINATION ADDRESS INTO R1
5035                                     ; ASSIST ADDRESS INTO R2
5036 073612 013704 003762      MOV    XRGNXT,R4      ; MOVE NEXT PACKET ADDRESS TO R4
5037 073616 032764 100000 000004  BIT    #OWN,4(R4)    ; CHECK OWNERSHIP BIT
5038 073624 001125      BNE    40$      ; IF DON'T OWN, BOOKKEEPING ERROR
5039 073626 016404 000002      MOV    2(R4),R4      ; POINT R4 TO DATA BLOCK
5040 073632 013703 002372      MOV    P$SIZE,R3      ; PUT MESSAGE SIZE INTO R3
5041 073636 062703 000050      ADD    #50,R3      ; ADD HEADER INFO INTO LENGTH
5042 073642 010337 050560      MOV    R3,XFER      ; PUT 'BYTES TRANSFERED' INTO WORD
5043 073646 162737 000016 050560  SUB    #16,XFER      ; AND CORRECT FOR HEADER
5044 073654 022703 002756      CMP    #XPKLEN,R3      ; SEE IF LONGER THAN ONE PACKET
5045 073660 002514      BLT    45$      ; IF YES, ERROR
5046 073662 010337 050566      MOV    R3,BUFLEN      ; PUT PACKET LENGTH INTO BUFLEN
5047 073666 011164 000000      MOV    (R1),DESTIN(R4)  ; MOVE DESTINATION ADDRESS INTO HEADER
5048 073672 016164 000002 000002  MOV    2(R1),DESTIN+2(R4) ; SIX BYTES WORTH
5049 073700 016164 000004 000004  MOV    4(R1),DESTIN+4(R4)
5050 073706 005064 000006      CLR    SOURCC(R4)      ; LEAVE BLANK SPACE FOR SOURCE ADDRESS
5051 073712 005064 000010      CLR    SOURCC+2(R4)    ; SIX BYTES WORTH
5052 073716 005064 000012      CLR    SOURCC+4(R4)
5053 073722 013764 050544 000014  MOV    PROT00,PROTOT(R4)  ; MOVE PROTOCOL TYPE INTO HEADER
5054 073730 012764 000000 000016  MOV    #0,FASKIP(R4)    ; SKIP COUNT
5055 073736 012764 000002 000020  MOV    #2,FAFCT1(R4)    ; FUNCTION CODE (FORWARD)
5056 073744 011264 000022      MOV    (R2),FAADR1(R4)  ; TARGET NODE ADDRESS
5057 073750 016264 000002 000024  MOV    2(R2),FAADR1+2(R4) ; SIX BYTES
5058 073756 016264 000004 000026  MOV    4(R2),FAADR1+4(R4)
5059 073764 012764 000002 000030  MOV    #2,FAFCT2(R4)    ; FUNCTION CODE (FORWARD)
5060 073772 013764 047762 000032  MOV    PHYADR,FAADR2(R4)  ; LOCAL NODE ADDRESS
5061 074000 013764 047764 000034  MOV    PHYADR+2,FAADR2+2(R4) ; SIX BYTES WORTH
5062 074006 013764 047766 000036  MOV    PHYADR+4,FAADR2+4(R4)
5063 074014 012764 000001 000040  MOV    #1,FAFCT3(R4)    ; FUNCTION CODE (REPLY)
5064 074022 013764 047762 000042  MOV    PHYADR,FAADR3(R4)  ; LOCAL NODE ADDRESS
5065 074030 013764 047764 000044  MOV    PHYADR+2,FAADR3+2(R4)
5066 074036 013764 047766 000046  MOV    PHYADR+4,FAADR3+4(R4)
5067 074044 062704 000050      ADD    #FAADR3+6,R4      ; POINT R4 TO FIRST DATA BYTE
5068 074050 010437 C>0570      MOV    R4,CMPBUF      ; STORE BUFFER LOCATION FOR DATA COMPARE
5069 074054      CALL    BLDBUF R4      ; BUILD DATA BUFFER
5070 074064      CALL    GETXNX #XRGNXT  ; UPDATE RING POINTER
5071 074076 000411      BR      50$
5072 074100      40$:  ERRDF    35,MSG10,ERR1      ; TRANSMIT RING BOOKKEEPING ERROR
5073 074100 104455      TRAP    C$ERDF
5074 074102 000043      .WORD    35
5075 074104 064656      .WORD    MSG10
5076 074106 067460      .WORD    ERR1
5077 074110 000404      BR      50$
5078 074112      45$:  ERRDF    36,MSG14,ERR1      ; MESSAGE SIZE TOO BIG ERROR
5079 074112 104455      TRAP    C$ERDF
5080 074114 000044      .WORD    36
5081 074116 064755      .WORD    MSG14
5082 074120 067460      .WORD    ERR1
5083 074122      50$:  RETURN
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```

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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.

---+

BLDREQ::

5111	074124				MOV	XRGXNT,R4	:	MOVE NEXT PACKET ADDRESS TO R4
5112	074124	013704	000000		BIT	#OWN,4(R4)	:	CHECK OWNERSHIP BIT
5113	074130	032764	100000	000004	BNE	40\$	:	IF DON'T OWN, BOOKKEEPING ERROR
5114	074136	001044			MOV	2(R4),R4	:	POINT R4 TO DATA BLOCK
5115	074140	016404	000002		MOV	#100,BUFLEN	:	MOVE BUFFER SIZE TO BUFLEN
5116	074144	012737	000100	050566	MOV	#ADRBUF,R1	:	MOVE ADDRESS OF DEST. ADDR. TO R1
5117	074152	012701	002314		MOV	(R1)+,DESTIN(R4)	:	MOVE FIRST TWO BYTE OF DEST. ADDR.
5118	074156	012164	000000		MOV	(R1)+,DESTIN+2(R4)	:	AND BYTES THREE AND FOUR
5119	074162	012164	000002		MOV	(R1),DESTIN+4(R4)	:	AND LAST TWO BYTES
5120	074166	011164	000004		CLR	SOURCE(R4)	:	LEAVE BLANK SPACE FOR SOURCE ADDR.
5121	074172	005064	000006		CLR	SOURCE+2(R4)	:	SIX BYTES WORTH
5122	074176	005064	000010		CLR	SOURCE+4(R4)	:	
5123	074202	005064	000012		MOV	PROT02,PROT0(R4)	:	MOVE PROTOCOL TYPE INTO HEADER
5124	074206	013764	050546	000014	MOV	#REQID,R2	:	MOVE REQUEST ID HEADER LOC. TO R2
5125	074214	012702	050712		MOV	(R2)+,HEADER(R4)	:	BYTE COUNT
5126	074220	012264	000016		MOV	(R2)+,HEADER+2(R4)	:	FUNCTION CODE (REQUEST ID)
5127	074224	012264	000020		MOV	(R2),HEADER+4(R4)	:	RECEIPT NO.
5128	074230	011264	000022		CALL	GETXNX #XRGXNT	:	UPDATE POINTER TO NEXT RING ENTRY
5129	074234				BR	50\$	:	EXIT
5130	074246	000404			ERRDF	21,MSG10,ERR1	:	TRANSMIT RING BOOKKEEPING ERROR
5131	074250						:	TRAP C\$ERDF
5132	074250	104455					:	.WORD 21
5133	074252	000025					:	.WORD MSG10
5134	074254	064656					:	.WORD ERR1
5135	074256	067460					:	
5136	074260				50\$:	RETURN	:	
5137							:	
5138							:	
5139					.SBTTL	GET?NX GET NEXT TRANSMIT OR RECIEVE RING ENTRY	:	
5140							:	
5141					---		:	

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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 GETRNX #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
:
:-->
GETRNX::
      MOV      RRGSR, R1      ; MOVE FIRST RING ENTRY TO R1
      MOV      RRGSL, R2      ; MOVE LAST RING ENTRY TO R2
      BR       GETCOM         ; GO TO COMMON CODE

GETXNX::
      MOV      XRGSR, R1      ; MOVE FIRST RING ENTRY TO R1
      MOV      XRGSL, 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
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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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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 FRRORS IS ALSO PRINTED.

INPUTS -    P1 - THE SIZE (IN BYTES) OF    BUFFER TO BE COMPARED.
            P2 - THE ADDRESS OF BUFFER    COMPARE OTHER BUFFER AGAINST.
            P3 - THE ADDRESS OF THE SEC    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
    CMPB (R2),(R3)
    BEQ 20$
    INC TEMP
    CMP #5,TEMP
    BLT 20$
    PRINTX #CMPE1,R4,(R2),(R3)

```

```

: INCREMENT OFFSET COUNTER
: COMPARE BUFFERS
: IF SAME, BRANCH
: INCREMENT ERROR COUNTER
: IF MORE THAN 5 ERRORS,
: DON'T PRINT MESSAGE
: PRINT ERROR MESSAGE

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```

    MOV (R3),-(SP)
    MOV (R2),-(SP)
    MOV R4, -(SP)
    MOV #CMPE1, -(SP)
    MOV #4, -(SP)
    MOV SP,R0
    TRAP C$PNTX
    ADD #12,SP

```

20\$:

```

    INC R2
    INC R3
    DEC R1
    BNE 10$
    CMP #0,TEMP
    BEQ 30$

```

```

: INCREMENT BUFFER 1 POINTER
: INCREMENT BUFFER 2 POINTER
: DECREMENT COMPARE SIZE
: IF NOT FINISHED, GO BACK FOR MORE
: WERE THERE ANY ERRORS?
: IF NO, EXIT

```

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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

.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 EXIST. 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.

5321
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			15\$: MOV	(R2),(R1)	: ADD NEW ADDRESS TO TABLE	
5339	074634	016261	000002	000002	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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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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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	DECSTR:: .BLKB 12.	: 12 BYTES FOR ASCII OUTPUT STRING
5447	075214	000000	PART:: .WORD 0	: PARTIAL COUNTER
5448				

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075216
075216 013704 003144
075222 013703 003146
075226 121327 000003
075232 003405
075234 105714
075236 001441
075240 121327 000013
075244 003023
075246 111301
075250 006301
075252 016101 075266
075256 062701 075266
075262 004711
075264 000760

075266 000114
075270 000134
075272 000152
075274 000162
075276 000204
075300 000270
075302 000612
075304 000656
075306 000270
075310 000256
075312 000744

075314 121314
075316 001403
075320 004737 075364
075324 000740
075326 005204
075330 004737 075344

.SBTTL COMMAND LINE TRAVERSE ROUTINES

..++

P\$TRV SUBROUTINE

..PARSE THE COMMAND LINE SUBROUTINE
..TAKE ACTIONS (VIA ACTION TREE) AS PARSING LINE
..PARSING DIRECTIONS FROM 'CLI PARSING NODES'
..REGS USED:

..R1,R5=SCRATCH
..R2=ACTION CODE PARAMETER FROM TREE
..R3=PARSE TREE POINTER
..R4=INPUT STRING POINTER

..CALLING SEQUENCE:

..JSR PC,P\$TRV

..--

P\$TRV:

MOV P\$BUFA,R4
MOV P\$TREE,R3
P\$TR5: CMPB (R3),#3
BLE 5\$
TSTB (R4)
BEQ P\$EXIT
CMPB (R3),#11.
BGT 20\$
5\$: MOVB (R3),R1
ASL R1
MOV 10\$(R1),R1
ADD #10\$,R1
JSR PC,(R1)
BR P\$TR5

..SEE IF ONE OF FIRST THREE SPECIAL CODES
..IF YES, DON'T CHECK INPUT STRING
..SEE IF ANY CHARS LEFT IN INPUT STRING
..BR IF NO
..SEE IF SPECIAL CLI CHAR CODE OR ASCII
..BR IF REGULAR ASCII CHAR.
..GET SPECIAL CHAR CODE INTO R5
..BUILD TRAVERSE ROUTINE ADDRESS
..JSR TO SPECIAL CLI TRAVERSE ROUTINE
..GO SEE IF MORE OF STRING LEFT

10\$:

.WORD TRVERR-10\$
.WORD TRVEXI-10\$
.WORD TRVBR-10\$
.WORD TRVBIF-10\$
.WORD TRVSPA-10\$
.WORD TRVNUM-10\$
.WORD TRVALP-10\$
.WORD TRVALN-10\$
.WORD TRVOCT-10\$
.WORD TRVDEC-10\$
.WORD TRVSTR-10\$

..TRAVERSE TABLE FOR 'CLI FUNCTIONS'
:1
:2
:3
:4
:5
:6
:7
:8
:9
:10

..NOT A SPECIAL CODE

20\$:

CMPB (R3),(R4)
BEQ 22\$
JSR PC,TRVBRC
BR P\$TR5
22\$: INC R4
JSR PC,TRVACT

..SEE IF FIRST CHAR OF STRING IS A MATCH
..BR IF A MATCH
..IF NOT A MATCH, GO TAKE MISS BRANCH
..THEN GO BACK PT'G TO MISS NODE
..IF A MATCH, INCR. CHAR POINTER
..GO DO ACTION DEFINED BY

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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
5513          ;GOTO USER ACTION ROUTINE
5514 075344 116302 000001      TRVACT: MOV    1(R3),R2          ;GET ACTION CODE FROM CLI NODE
5515 075350 042702 177400          BIC    #177400,R2          ;CLEAR ANY SIGN EXTENSION
5516 075354 013701 003150          MOV    P$ACT,R1          ;GET ADDRESS OF CLI ACTION ROUTINE
5517 075360 004711          JSR    PC,(R1)          ;DO ACTION DEFINED BY CODE
5518 075362 000207          RTS    PC          ;RETURN TO CALLING CODE
5519
5520          ;TAKE BRANCH IN TREE
5521 075364 016301 000002      TRVBRC: MOV    2(R3),R1          ;GET BRANCH DISPLACEMENT FROM TREE
5522 075370 060103          ADD    R1,R3          ; AND POINT R3 TO THE 'MISS' NODE
5523 075372 000207          RTS    PC          ; RETURN TO P$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$TRV ROUTINE
5541
5542          ;BRANCH ACTION CODE
5543 075440 004737 075344      TRVBR: JSR    PC,TRVACT          ;GO TAKE BRANCH ACTION
5544 075444 000137 075364          JMP    TRVBRC
5545
5546          ;BRANCH-IF ACTION CODE
5547 075450 004737 075344      TRVBIF: JSR    PC,TRVACT
5548 075454 105737 003161          TST    P$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	MOV	#-1,P\$RADX+1	:SET 'MINUS FLAG' (HI BYTE OF P\$RADX)
5585	075614	005204		11\$:	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	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	MOV	#-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\$:	MOV	(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, PSCNT		;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	PSCNT, 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				MOV	#CLINBG, -(SP)
5641	076050	012746	000001				MOV	#1, -(SP)
5642	076054	010600					MOV	SP, R0
5643	076056	104417					TRAP	C\$PNTF
5644	076060	062706	000004				ADD	#4, SP
5645	076064	112737	177777	003161	5\$: MOVB	#-1, P\$GDBD		;SET ERROR RETURN FLAG
5646	076072				POP	R5		;RESTORE R5
5647	076074	000137	075364		JMP	TRVBRC		;TAKE 'MISS' BRANCH
5648								
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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5673 076174 002406          BLT      2$          ;BR IF YES (NOT ALPHA)
5674 076176 121427 000132  CMPB    (R4),#132      ;SEE IF CHAR. GREATER THAN A 'Z'
5675 076202 003003          BGT      2$          ;BR IF YES (NOT ALPHA)
5676 076204 005204          INC      R4          ;UPDATE CMD LINE PTR TO NEXT CHAR
5677 076206 005201          INC      R1          ;INDICATE AN ALPHA FOUND
5678 076210 000756          BR       10$         ;GO LOOK AT NEXT CHAR.
5679 076212 005701          2$:  TST      R1          ;SEE IF ANY ALPHANUM'S WERE FOUND
5680 076214 001404          BEQ      3$          ;BR IF NO
5681 076216 004737 075344  JSR      PC,TRVACT    ;IF ANY FOUND TAKE ACTION
5682 076222 000137 075374  JMP      TRVNOB    ;THEN UPDATE R3 TO NEXT NODE -NO BRANCH
5683 076226 000137 075364  3$:  JMP      TRVBRC    ;NONE FOUND, TAKE MISS BRANCH
5684
5685
5686
5687 076232          TRVSTR: PUSH    R5          ;SAVE R5
5688 076234 010401          MOV      R4,R1        ;POINT R1 TO CMD STRING
5689 076236 010305          MOV      R3,R5
5690 076240 062705 000006  ADD      #6,R5        ;POINT R5 TO MATCH STRING FROM CLI NODE
5691 076244 005037 003152  CLR      P$CNT        ;CLEAR CHAR MATCH COUNT
5692 076250 105715          2$:  TSTB    (R5)        ;SEE IF END OF MATCH STRING YET
5693 076252 001411          BEQ      10$         ;BR IF YES
5694 076254 105711          TSTB    (R1)        ;SEE IF END OF CMD LINE YET
5695 076256 001407          BEQ      10$         ;BR IF YES
5696 076260 121115          CMPB    (R1),(R5)      ;SEE IF CHARACTERS MATCH
5697 076262 001005          BNE      10$         ;BR IF NO
5698 076264 005237 003152  INC      P$CNT        ;MATCH -INCREMENT MATCH COUNT
5699 076270 005201          INC      R1          ;UPDATE STRING POINTERS
5700 076272 005205          INC      R5
5701 076274 000765          BR       2$          ;BR TO CONTINUE CHECKING CHARS.
5702
5703 076276 005737 003152  10$:  TST      P$CNT        ;WHEN DONE SEE IF ANY MATCHES FOUND
5704 076302 001407          BEQ      15$         ;BR IF NO, GO TAKE THE MISS BRANCH
5705 076304 010104          MOV      R1,R4        ;POINT CMD POINTER TO END OF STRING &
5706 076306          POP      R5          ;RESTORE R5
5707 076310 004737 075344  JSR      PC,TRVACT    ;IF A MATCH FOUND, GO DO MATCH ACTION
5708 076314 066303 000004  ADD      4(R3),R3      ;UPDATE R3 TO NEXT NODE (NO BRANCH)
5709 076320 000207          RTS      PC          ; (NO RETURN THRU TRVNOB SINCE DIFFERENT
5710                                     ; DISPLACEMENT DUE TO MATCH STRING)
5711 076322          15$:  POP      R5          ;RESTORE R5
5712 076324 000137 075364  JMP      TRVBRC    ; GO TAKE BRANCH
5713                                     ; (PARSED OK), -1 IF ILL CMD.....
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---+ TRVADR TRAVERSE COMMAND LINE INPUT ADDRESS

THIS ROUTINE IS CALLED BY TWO DIFFERENT ACTION ROUTINES. THE
NODE ACTION ROUTINE CALLS IT TO PARSE THROUGH THE NODE
ADDRESS INPUT BY THE OPERATOR. THE OPRSEL ACTION ROUTINE
CALLS TRVADR TO PARSE THROUGH THE 'OPERATOR SELECTED' MESSAGE
WHICH HAS BEEN INPUT IN THE COMMAND LINE. FOR A NODE ADDRESS,
THE ROUTINE LOOKS FOR A '/' AS A DELIMITER FOR THE ADDRESS,
AND REPLACES THE / WITH A NULL BYTE FOR USE BY THE ADDRESS
PACKING ROUTINE. WHEN CALLED BY THE OPRSEL ROUTINE, A ''
IS EXPECTED AS THE DELIMITER FOR THE OPERATOR SELECTED MESSAGE.
IF A NULL STRING IS ENTERED, AN ERROR MESSAGE IS PRINTED.

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COMMAND LINE TRAVERSE ROUTINES

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076330 005001
076332 121427 000000
076336 001423
076340 121427 000040
076344 002414
076346 121427 000042
076352 001454
076354 121427 000057
076360 001420
076362 121427 000132
076366 003003
076370 005204
076372 005201
076374 000756
076376 112737 177777 003161 10\$:
076404 000464
076406 005701 20\$:
076410 001772
076412 012737 000000 003672 25\$:
076420 000456
076422 005701 30\$:
076424 001764
076426 112714 000000
076432 005204
076434 121427 000000
076440 001764
076442 121427 000101
076446 001412
076450 121427 000124
076454 001756

TRVADR: CLR R1
1\$: CMPB (R4),#0
BEQ 20\$
CMPB (R4),#40
BLT 10\$
CMPB (R4),#42
BEQ 40\$
CMPB (R4),#57
BEQ 30\$
CMPB (R4),#132
BGT 10\$
INC R4
INC R1
BR 1\$
MOV B -1,P\$GDBD
BR 50\$
20\$: TST R1
BEQ 10\$
25\$: MOV #CTARGET,CFLAG
BR 50\$
30\$: TST R1
BEQ 10\$
MOV B #0,(R4)
INC R4
CMPB (R4),#0
BEQ 25\$
CMPB (R4),#A
BEQ 35\$
CMPB (R4),#T
BEQ 25\$

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

COMMAND LINE INPUT CONDITION	P\$GDBD	OUTPUTS 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 ''		-1
	0	CHAR. AFTER ''	OPRSEL	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

:CLEAR HEX DIGIT FOUND FLAG
:SEE IF NUL CHAR.
: IF YES, RETURN
:SEE IF ILLEGAL CHARACTER
:IF YES; BRANCH TO ERROR ROUTINE
:SEE IF CHAR. IS A ''
:IF YES, BRANCH TO 40\$
:SEE IF CHAR. IS A '/'
:BRANCH IF YES
:SEE IF CHAR. GREATER THAN 'F'
: IF YES, ILLEGAL CHAR.
:UPDATE CMD LINE POINTER TO NEXT CHAR.
:INCIDATE A VALID CHAR. FOUND
:LOOK AT NEXT CHAR.
:SET ERROR FLAG
:RETURN
:SEE IF VALID CHARACTERS FOUND
: IF NO, ILLEGAL CHAR.
:SET TARGET FLAG
:RETURN
:SEE IF VALID CHARACTERS FOUND
: IF NO, ILLEGAL CHAR.
: IF YES, REPLACE '/' WITH NULL CHAR.
:UPDATE CMD. LINE POINTER TO NEXT CHAR.
:IS NEXT CHAR. NULL
: IF YES, TAKE DEFAULT OF TARGET
:IS NEXT CHAR. 'A'
: IF YES, BR 35\$
:IS NEXT CHAR. 'T'
: IF YES, SET TARGET FLAG

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COMMAND LINE TRAVERSE ROUTINES

Address	Hex	Dec	Offset	Label	Instruction	Comment
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,P\$MERR	: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

```

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

```

LSRPT::

[illegible]

```
JSR      PC,ACTSUM
EXIT     RPT
```

```
.WORD JSJMP
.WORD L10006-2-.
```

[illegible]

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REPORT CODING SECTION

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5847 076570

5848 076570

5849 076570 104425

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

:XXX

.EVEN

ENDRPT

L10006:

TRAP

CSRPT

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PROTECTION TABLE

.SBTTL PROTECTION TABLE

..**
: THIS TABLE IS USED BY THE RUNTIME SERVICES
: TO PROTECT THE LOAD MEDIA.
:--

BGNPROT

L\$PROT::

-1 ;OFFSET INTO P-TABLE FOR CSR ADDRESS
-1 ;OFFSET INTO P-TABLE FOR MASSBUS ADDRESS
-1 ;OFFSET INTO P-TABLE FOR DRIVE NUMBER

ENDPROT

..XX
: INSERT BYTE OFFSET FOR DATA NOTED IN COMMENTS ABOVE. (OFFSET
: REFERS TO THE NUMBER OF BYTES FROM THE BEGINNING OF A PTABLE
: ENTRY TO THE ITEM IN QUESTION.) IF THE PARTICULAR
: ITEM DOES NOT APPLY, LEAVE ENTRY AS -1. WHEN THE RUNTIME
: SERVICES EXECUTES A GPARD, IT USES THESE OFFSETS (IF NOT
: SET TO -1) TO GET THE ITEMS AND COMPARE WITH THOSE SAVED
: IN THE XXDP+ MONITOR. IF THE UNIT BEING REQUESTED MATCHES THE
: LOAD DEVICE, THE RUNTIME SERVICES RETURN AN INCOMPLETE FLAG ON
: THE GPARD.
:XX

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5857 076572
5858 076572
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5860 076572 177777
5861 076574 177777
5862 076576 177777
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5864 076600
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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::

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'.

5909	076600	022737	000020	003672	INIT:	CMP	#CEXIT,CFLAG	:SEE IF EXIT COMMAND TYPED
5910	076606	001004				BNE	INIT1	: IF NO, DO INIT CODE
5911	076610	005037	003672			CLR	CFLAG	: ELSE, CLEAR EXIT FLAG
5912	076614	000137	100130			JMP	INICLN	: AND DO CLEANUP
5913	076620				INIT1:	READEF	#EF.START	:IF HERE BECAUSE OF 'START'. DO INIT
5914	076620	012700	000040					MOV #EF.START,R0
5915	076624	104447						TRAP CSREFG
5916	076626					BCOMplete	START	
5917	076626	103424						BCS START
5918	076630					READEF	#EF.RESTART	:IF HERE BECAUSE OF 'RESTART', DO SOME INIT
5919	076630	012700	000037					MOV #EF.RESTART,R0
5920	076634	104447						TRAP CSREFG
5921	076636					BNCOMplete	5\$	
5922	076636	103002						BCC 5\$
5923	076640	000137	100046		5\$:	JMP	RESTR	
5924	076644					READEF	#EF.CONTINUE	:IF HERE BECAUSE OF 'CONTINUE', EXIT
5925	076644	012700	000036					MOV #EF.CONTINUE,R0
5926	076650	104447						TRAP CSREFG
5927	076652					BNCOMplete	10\$	
5928	076652	103002						BCC 10\$
5929	076654	000137	100046		10\$:	JMP	RESTR	
5930	076660					READEF	#EF.NEW	:IF HERE ON NEW PASS, SKIP SOME INIT
5931	076660	012700	000035					MOV #EF.NEW,R0
5932	076664	104447						TRAP CSREFG

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5933	076666				BNCOMPLETE	15\$		
5934	076666	103002					BCC	15\$
5935	076670	000137	100112		JMP	NEW		
5936	076674	000137	100132		JMP	INIEXI		
5937	076700				15\$: I\$STACK #1000,SP			:IF DON'T KNOW WHY WE'RE HERE, EXIT
5938	076706				START: MEMORY FRESIZ			:SET PARAMETER STACK POINTER
5939	076706	104431						:GET FREE MEMORY INFO
5940	076710	010037	047660				TRAP	C\$MEM
5941	076714	013737	047660	047662	MOV	FRESIZ,FREMEM		MOV RO,FRESIZ
5942	076722	062737	000002	047662	ADD	#2,FREMEM		:SIZE OF FREE MEMORY IN FRESIZ
5943	076730	012702	003674		MOV	#CLKCSR,R2		:START OF FREE MEMORY IN FREMEM
5944	076734				CLOCK L,R1			:SETUP R2 AS A PRT. TO CLOCK INFO. BLOCK
5945	076734	012700	000114					:GET LINE CLOCK INFO
5946	076740	104462					MOV	#L,RO
5947	076742	010001					TRAP	C\$CLK
5948	076744						MOV	RO,R1
5949	076744	103006			BNCOMPLETE	1\$		:IF NONE, SEE IF P CLOCK PRESENT
5950	076746	004737	067656		JSR	PC,CLKSET		BCC 1\$
5951	076752	012737	000100	003704	MOV	#LCLKEN,CLKEN		:SET UP CLOCK INFO TABLE AND VECTOR
5952	076760	000436			BR	3\$		:SET UP THE ENABLE LINE CLOCK DATA
5953	076762				1\$: CLOCK P,R1			:GET P CLOCK INFO
5954	076762	012700	000120					
5955	076766	104462					MOV	#P,RO
5956	076770	010001					TRAP	C\$CLK
5957	076772						MOV	RO,R1
5958	076772	103017			BNCOMPLETE	2\$		:IF NO CLOCK, ERROR
5959	076774	004737	067656		JSR	PC,CLKSET		BCC 2\$
5960	077000	062737	000002	003674	ADD	#2,CLKCSR		: ELSE SET UP CLOCK INFO AND VECTOR
5961	077006	012777	001600	104660	MOV	#PCLKCT,@CLKCSR		: POINT CLKCSR TO P-CLK COUNT SET REG.
5962	077014	162737	000002	003674	SUB	#2,CLKCSR		:LOAD CLK SET REG. WITH COUNT VALUE
5963	077022	012737	000111	003704	MOV	#PCLKEN,CLKEN		:POINT CLKCSR BACK TO P-CLK CSR
5964	077030	000412			BR	3\$		:SETUP TO ENABLE P-CLK DATA
5965	077032				2\$: PRINTF #NOCLK			:ERROR MESSAGE
5966	077032	012746	062622				MOV	#NOCLK,-(SP)
5967	077036	012746	000001				MOV	#1,-(SP)
5968	077042	010600					MOV	SP,RO
5969	077044	104417					TRAP	C\$PNTF
5970	077046	062706	000004				ADD	#4,SP
5971	077052	000137	100130		JMP	INICLN		:CANNOT CONTINUE, DO CLEANUP
5972	077056				3\$: GPHARD #0,R1			:GET P-TAB POINTER FOR THIS UNIT
5973	077056	012700	000000				MOV	#0,RO
5974	077062	104442					TRAP	C\$GPHRD
5975	077064	010001					MOV	RO,R1
5976	077066				BCOMPLETE	4\$		:THIS ONE IS NOT AVAILABLE
5977	077066	103402					BCS	4\$
5978	077070	000137	100130		JMP	INICLN		
5979	077074	012137	047652		MOV	(R1)+,UNACSR		:SAVE CSR
5980	077100	012137	047654		MOV	(R1)+,UNAVEC		:SAVE VECTOR
5981	077104	012137	047656		MOV	(R1)+,UNAPRI		:SAVE PRIORITY
5982	077110				SETVEC UNAVEC,#UNAI\$R,UNAPRI			:SETUP UNA INTERRUPT VECTOR
5983	077110	013746	047656				MOV	UNAPRI,-(SP)
5984	077114	012746	071144				MOV	#UNAI\$R,-(SP)
5985	077120	013746	047654				MOV	UNAVEC,-(SP)
5986	077124	012746	000003				MOV	#3,-(SP)
5987	077130	104437					TRAP	C\$SVEC
5988	077132	062706	000010				ADD	#10,SP

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```

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$SVEC
6021 077334 062706 000010              ADD      #10,SP
6022 077340 013777 003704 104326      MOV      CLKEN,@CLKCSR ;SET ENABLE BITS IN THE CLOCK TO START
6023 077346              SETPRI      #PRI00 ;SET PRIORITY=0 SO CLOCK CAN INTERRUPT
6024 077346 012700 000000              MOV      #PRI00,R0
6025 077352 104441              TRAP      C$SPRI
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$: CALL      BINHEX #PCBB2,#6,#STRBUF ;PUT ADDRESS INTO HEX FORMAT
6032 077426              PRINTS      #HDMMSG1,#STRBUF ;PRINT ADDRESS
6033 077426 012746 002322              MOV      #STRBUF,-(SP)
6034 077432 012746 055342              MOV      #HDMMSG1,-(SP)
6035 077436 012746 000002              MOV      #2,-(SP)
6036 077442 010600              MOV      SP,R0
6037 077444 104416              TRAP      C$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      #HDMMSG2,R2 ;PRINT ROM VERSION

```

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INITIALIZE SECTION

[illegible]

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INITIALIZE SECTION

6157 100136
6158 100136
6159 100136 104411

ENDINIT

L10010: TRAP CSINIT

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AUTODROP SECTION

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.SBTTL AUTODROP SECTION

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

BGNAUTO

L\$AUTO::

:XXX
: INSERT CODE HERE TO CHECK DEVICE(S) TO SEE IF THEY RESPOND.
: ISSUE A 'DODU' FOR THOSE THAT DON'T.
:XXX

ENDAUTO

L10011: TRAP C\$AUTO

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CLEANUP CODING SECTION

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6187 100142
6188 100142
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6197 100142 012737 000000 050044
6198 100150
6199 100162 012737 000400 050044
6200 100170
6201 100172 001404
6202 100174
6203 100174 104456
6204 100176 000046
6205 100200 065442
6206 100202 000000
6207 100204 005737 050516
6208 100210 001413
6209 100212
6210 100220
6211 100222 001770
6212 100224
6213 100236 000762
6214 100240 005077 103430
6215 100244
6216 100244 012700 000340
6217 100250 104441
6218 100252
6219 100252 104432
6220 100254 000002
6221
6222
6223
6224
6225
6226
6227
6228
6229
6230
6231
6232
6233
6234 100256
6235 100256

.SBTTL CLEANUP CODING SECTION

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

BGNCLN

L\$CLEAN::

;XX
; INSERT YOUR CLEANUP CODING. THIS CODING SHOULD
; RESTORE YOUR TEST-DEVICE TO A NEUTRAL STATE.
; THIS CODE WILL BE EXECUTED AFTER EACH PASS AND AFTER THE
; PROGRAM IS INTERRUPTED BY '^C'.
;XX

```

MOV      #0,$WDMC+4      ;CLEAR MULTICAST ADDRESS LIST
CALL     FUNCT  #WDMULA   ; WRITE 0 INTO LIST LENGTH
MOV      #400,$WDMC+4    ; RESET FOR 1 ENTRY
P$POP    R2              ;CHECK FOR ERROR
BEQ      25$             ; IF OK CONTINUE
ERRHRD   38,MSG25        ; ELSE, REPORT ERROR
                                TRAP      C$ERHRD
                                .WORD     38
                                .WORD     MSG25
                                .WORD     0

25$:     TST      NIRCNT   ;SEE IF RECEVE COUNT ZERO
BEQ      30$             ; IF YES, EXIT
CALL     RECEVE          ; ELSE, CLEAR OUT UNWANTED ENTRIES
P$POP    R2
BEQ      25$             ; IF ANY WERE FOUND, UPDATE NEXT POINTER
CALL     GETRNX  #RRGNXT
BR       25$             ;SEE IF ANY MORE ENTRIES
30$:     CLR      @CLKCSR  ;DISABLE CLOCK
SETPRI   #PRI07          ;SET PROCESSOR PRIORITY BACK TO 7
                                MOV      #PRI07,R0
                                TRAP     C$SPRI

EXIT     CLN
                                TRAP     C$EXIT
                                .WORD    L10012-.
```

;XX
; INSERT LOCAL STORAGE THAT IS USED ONLY
; DURING THE CLEANUP SECTION.
;XX

;XX
; INSERT MESSAGES THAT ARE USED ONLY
; DURING THE CLEANUP SECTION.
;XX

.EVEN

ENDCLN

L10012:

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CLEANUP CODING SECTION

6236 100256 104412

TRAP C\$CLEAN

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DROP UNIT SECTION

.SBTTL DROP UNIT SECTION

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

BGNDU

L\$DU::

:XXX
: 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.
:XXX

EXIT DU

.WORD JSJMP
.WORD L10013-2-.

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

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

.EVEN

ENDDU

L10013: TRAP C\$DU

6237
6238
6239
6240
6241
6242
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

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ADD UNIT SECTION

100266	
100266	
100266	
100266	000167
100270	000000
100272	
100272	
100272	104452

```

:++
: THE ADD-UNIT SECTION CONTAINS ANY CODE THE PROGRAMMER WISHES
:   TO BE EXECUTED IN CONJUNCTION WITH THE ADDING OF A UNIT BACK
:   TO THE TEST CYCLE.
:--

```

LSAU::

[illegible]

```
.WORD JSJMP
.WORD L10014-2-.
```

[illegible][illegible]

ENDAU

L10014: TRAP CSAU

[illegible]

```

; **
; TEST TO ...
; --

```

[illegible]

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TEST 1:

```

6329 ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
6330 ;      INSERT PROGRAM EQUATES THAT ARE USED ONLY IN THIS TEST.
6331 ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
6332
6333     100274      BGNTST
6334     100274
6335
6336 ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
6337 ;      INSERT THE CODING FOR THIS HARDWARE TEST.
6338 ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
6339 .SBTTL GETCL  COMMAND LINE FETCH & INTERPRETATION SECTION
6340
6341     100274     105037     003161      GETCL:  CLRB      PSGBDB      ;CLEAR CMD LINE PARSING ERROR FLAG
6342     100300     105037     003160      CLRB      PSNNUF
6343     100304      GMANID     CLISPM,CMDBUF,A,0,1,72.,NO      ;GET CMD LINE FROM OPERATOR
6344     100304     104443
6345     100306     000406      TRAP      C$GMAN
6346     100310     002200      BR        10000$
6347     100312     000142      .WORD    CMDBUF
6348     100314     052436      .WORD    T$CODE
6349     100316     000000      .WORD    CLISPM
6350     100320     000001      .WORD    0
6351     100322     000110      .WORD    T$LOLIM
6352     100324      10000$:      .WORD    T$HILIM
6353     100324     012737     002200     003144      MOV      #CMDBUF,PSBUFA
6354     100332     012737     051070     003146      MOV      #CLITRE,P$TREE
6355     100340     012737     100456     003150      MOV      #CLIACT,P$ACT
6356     100346     005037     003672      CLR      CFLAG      ;CLEAR QUALIFIER FLAG
6357     100352     004737     075216      JSR      PC,P$TRV      ;GO PARSE COMMAND TREE
6358     100356     105737     003161      TSTB     PSGBDB      ;SEE IF PARSED OK, OR AN ERROR
6359     100362     001412      BEQ      1$
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,R0
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     PSNNUF      ;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,R0
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      #C$EXIT,CFLAG      ;WAS EXIT COMMAND TYPED?
6377     100450     001311      BNE      GETCL      ; IF NOT GET NEW COMMAND LINE
6378     100452      EXIT      TST      ; ELSE EXIT
6379     100452     104432      TRAP     C$EXIT
6380     100454     012272      .WORD    L10015-.
6381
6382 .SBTTL CLI ACTION TABLE AND ROUTINES
6383 ;      USER MUST CLEAR/SET PSGBDB 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

6385	100456				
6386	100456	006302			
6387	100460	016202	100474		
6388	100464	062702	100474		
6389	100470	004712			
6390	100472	000207			
6391					
6392					
6393	100474	000122			
6394	100476	000124			
6395	100500	000162			
6396	100502	000472			
6397	100504	003542			
6398	100506	006326			
6399	100510	010164			
6400	100512	001214			
6401	100514	001570			
6402	100516	002654			
6403	100520	000114			
6404	100522	002664			
6405	100524	002746			
6406	100526	007670			
6407	100530	002754			
6408	100532	002764			
6409	100534	002774			
6410	100536	003004			
6411	100540	003014			
6412	100542	003024			
6413	100544	003034			
6414	100546	003162			
6415	100550	003170			
6416	100552	003246			
6417	100554	003324			
6418	100556	003462			
6419	100560	003662			
6420	100562	004724			
6421	100564	006410			
6422	100566	006502			
6423	100570	006606			
6424	100572	010044			
6425	100574	010130			
6426	100576	010230			
6427	100600	010332			
6428	100602	004276			
6429	100604	010406			
6430	100606	010454			
6431					

CLI ACT:				
	ASL	R2		;MULTIPLY ACTION CODE BY 2
	MOV	10\$(R2),R2		;OFFSET VALUE
	ADD	#10\$,R2		;ADD BASE VALUE
	JSR	PC,(R2)		;GO DO ACTION
	RTS	PC		;RETURN TO TRVACT

10\$:				
	.WORD	ACTNUL-10\$		;BRIEF DESCRIPTION OF ACTION TAKEN
	.WORD	ACTHLP-10\$		;0-NULL
	.WORD	ACTNOD-10\$		;1-HELP
	.WORD	ACTBLD-10\$		;2-NODE
	.WORD	ACTRUN-10\$		;3-BUILD
	.WORD	ACTPAT-10\$		;4-RUN SPECIFIED TEST
	.WORD	ACTSAV-10\$		;5-SET 'MESSAGE PATTERN' TEST FLAG
	.WORD	ACTSUM-10\$		;6-SAVE NODE TABLE
	.WORD	ACTIDT-10\$		;7-PRINT SUMMARY TABLE
	.WORD	ACTEXT-10\$		;10-REQUEST ID
	.WORD	ACTNUF-10\$		;11-EXIT
	.WORD	ACTXAD-10\$		;12-NOT ENOUGH INFO
	.WORD	ACTSR4-10\$		;13-EXTRACT NI NODE ADDRESS FROM INPUT LINE
	.WORD	ACTSND-10\$		;14-SAVE POINTER TO BEGINING OF ADDRESS STRING
	.WORD	ACTALP-10\$		;15-SET 'NODE' FLAG FOR SHOW COMMAND
	.WORD	ACTONE-10\$		;16-SET 'ALPHA' FLAG
	.WORD	ACTZRO-10\$		;17-SET 'ONES' FLAG
	.WORD	ACT1AL-10\$		;20-SET 'ZEROS' FLAG
	.WORD	ACTOAL-10\$		;21-SET '1ALT' FLAG
	.WORD	ACTCTT-10\$		;22-SET 'OALT' FLAG
	.WORD	ACTOPR-10\$		;23-SET 'CCITT' FLAG
	.WORD	ACTTYP-10\$		;24-SET 'OPER SEL' FLAG
	.WORD	ACTSZE-10\$		;25-DETERMINE MESSAGE TYPE
	.WORD	ACTCPY-10\$		;26-DETERMINE MESSAGE SIZE
	.WORD	ACTNAD-10\$		;27-DETERMINE MESSAGE COPIES
	.WORD	ACTNAL-10\$		;30-SET 'NODE/ADDRESS' FLAG
	.WORD	ACTRNA-10\$		;31-SET 'NODE/ALL' FLAG
	.WORD	ACTRNL-10\$		;32-SET 'ALL' FLAG FOR RUN COMMAND
	.WORD	ACTSMS-10\$		;33-SET 'LOOPPAIR' FLAG FOR RUN CMD
	.WORD	ACTCMS-10\$		;34-SHOW CURRENT MESSAGE PARAMETERS
	.WORD	ACTCNT-10\$		;35-RESET MESSAGE PARAMETERS TO DEFAULT
	.WORD	ACTCNL-10\$		;36-SET 'COUNTER' FLAG FOR SHOW COMMAND
	.WORD	ACTFCT-10\$		;37-CLEAR LOGICAL NODE NAMED FROM TABLE
	.WORD	ACTUNS-10\$		;40-INITIATE UNA PORT COMMAND FUNCTION
	.WORD	ACTCSU-10\$		;41-UNSAVE NODE TABLE
	.WORD	ACTDIR-10\$		;42-CLEAR SUMMARY TABLE
	.WORD	ACTDFT-10\$		;43-SET 'LOOP DIRECT' FLAG FOR RUN COMMAND
	.WORD	ACTUSF-10\$		;44-LOOK FOR PASS COUNT DEFAULT
	.WORD			;45-UNSAVE NODE TABLE FROM A FILE

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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$NNUF          ;SET FLAG TO SAY NEED MORE OF COMMAND
6439
6440
6441      ;ACTION ROUTINE TO DO NOTHING
6442
6443
6444 100616 000207 ACTNUL: RTS      PC          ;RETURN TO PARSER
6445
6446
6447
6448      ;ACTION ROUTINE TO PRINT OUT HELP FILE
6449
6450
6451 100620 ACTHLP: P$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$POP   R2          ;ELSE, RESTORE R2 AND RETURN
6462 100654 000207      RTS    PC
6463
6464
6465
6466      ;ACTION ROUTINE TO READ IN NODE PHY. ADDRESS, STORE IT IN ADRBUF
6467      ;AND ENTER IT INTO THE NODE TABLE
6468
6469
6470 100656 105037 003160 ACTNOD: CLR    P$NNUF          ;CLEAR NOTNUF FLAG
6471 100662 004737 076330      JSR    PC,TRVADR      ;TRAVERSE ADDRESS, CHECK IF TARGET OR ASSIST
6472 100666 105737 003161      TST    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$PNTF
6482 100736 062706 000004      ADD    #4,SP
6483 100742 000510      BR     50$          ;AND RETURN
6484 100744      15$: CALL    CMPADR #ADRBUF,#ILLADR      ;SEE IF ILLEGAL ADDRESS
6485 100762      P$POP   R1
6486 100764 001021      BNE    17$      ;IF YES, PRINT ERROR MESSAGE
6487 100766      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		;CONVERT BINARY ADDRESS
6502	101052	022737	000001	003672				;INTO ASCII STRING
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	#CTARGET,NODTY		;MOVE TARGET INTO NODE TYPE
6507	101100	012737	062603	002312	BR	25\$		
6508	101106	012737	000001	002400	20\$:	MOV	#ARGTY6,KEYWD2	;MOVE 'ASSIST' INTO KEYWD2
6509	101114				MOV	#CASIST,NODTY		
6510	101122				25\$:	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
6522								#10,SP
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                                ; IF YES, EXIT
6613 101616 104416                                ; ELSE, PRINT 'STILL WORKING' MESSAGE
6614 101620 062706 000010                                MOV    TEMP2,-(SP)
6615 101624 005037 050550                                MOV    TEMP,-(SP)
6616 101630 000642                                MOV    #BLDMSG,-(SP)
6617 101632 012737 000000 050044 50$:  BEQ    #3,-(SP)
6618 101640                                MOV    SP,R0
6619 101652                                TRAP   C$PNTS
6620 101654 001404                                ADD    #10,SP
6621 101656                                CLR    TEMP
6622 101656 104456                                BR    19$
6623 101660 C70042                                MOV    #0,$WDMC+4
6624 101662 065442                                CALL   FUNCT #WDMULA
6625 101664 000000                                P$POP  R2
6626 101666 004737 110364                                BEQ    54$
6627 101672 012737 000400 050044 54$:  ERRHRD 34,EMSG25
6628 101700                                ; CLEAR MULTICAST ADDRESS LIST
6629 101706 000207                                ; WRITE 0 INTO LIST LENGTH
6630                                ; CHECK FOR ERROR
6631                                ; IF OK CONTINUE
6632                                ; ELSE, REPORT ERROR
6633                                TRAP   C$ERHRD
6634                                .WORD  34
6635                                .WORD  EMSG25
6636                                .WORD  0
6637                                JSR    PC,ACTSND
6638                                MOV    #400,$WDMC+4
6639                                P$POP  R2,R3,R4
6640                                RTS    PC
6641                                ; PRINT NODE TABLE
6642                                ; RESET MULTICAST LIST FOR 1 ENTRY
6643                                ; RESTORE REGISTERS
6644                                ; ACTION ROUTINE TO PRINT OUT THE SUMMARY DATA
6645                                ;
6646                                ACTSUM: CLR    P$NNUF
6647                                P$PUSH R2,R3,R4
6648                                MOV    #STATBL,R1
6649                                TST    (R1)
6650                                BNE    5$
6651                                PRINTF #TABEMT,#SUMM
6652                                ; CLEAR NOTNUF FLAG
6653                                ; MOVE ADDRESS OF TABLE TO R1
6654                                ; SEE IF TABLE EMPTY
6655                                ; IF NOT, CONT.
6656                                ; ELSE PRINT 'TABLE EMPTY' MESSAGE
6657                                MOV    #SUMM,-(SP)
6658                                MOV    #TABEMT,-(SP)
6659                                MOV    #2,-(SP)
6660                                MOV    SP,R0
6661                                TRAP   C$PNTF
6662                                ADD    #6,SP
6663                                BR    30$
6664                                5$:  CMP    (R1),#-1
6665                                BEQ    30$
6666                                TST    (R1)
6667                                BEQ    30$
6668                                CALL   BINHEX R1,#6,#STRBUF
6669                                PRINTF #SUMMS1,#STRBUF
6670                                ; EXIT
6671                                ; SEE IF AT END OF TABLE
6672                                ; IF YES, EXIT
6673                                ; SEE IF REST OF TABLE EMPTY
6674                                ; IF YES, EXIT
6675                                ; PRINT SUMMARY DATA
6676                                ; NODE ADDRESS
6677                                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							

30\$:

;

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```

3$:      JMP      40$
        CALL    BLDREQ
        CALL    XMIT
        PSPOP   R2
        BEQ     4$
        JMP     45$
; BUILD REQUEST ID MESSAGE PACKET
; TRANSMIT REQUEST
; GET RESULTS, R2 = SUCCESS/FAILURE
; IF OK BRANCH
; ELSE JUMP TO 45$

```

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6768	102470	005737	050534	4\$:	TST	RETRY5	:	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 TIMEOUT	
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 RECEIVED, 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 RECEIVED 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		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		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				CALL	BINHEX R2,#6,#STRBUF	:	PUT ADDRESS INTO STRBUF	
6812	102714			27\$:	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 FUNCTION 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				ADD	#6,SP
6868				BR	51\$		; EXIT
6869	103146						
6870	103146	104455		40\$:	ERRDF	23,MSG23,ERR1	; ERROR -- CAN'T WRITE MODE
6871	103150	000027				TRAP	C\$ERDF
6872	103152	065321				.WORD	23
6873	103154	067460				.WORD	MSG23
6874	103156	000424				.WORD	ERR1
6875							
6876	103160			45\$:	ERRDF	24,MSG24,ERR1	; ERROR -- CAN'T TRANSMIT PACKETS
6877	103160	104455				TRAP	C\$ERDF
6878	103162	000030				.WORD	24
6879	103164	065366				.WORD	MSG24

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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
6919 103346 000207      50$:  CLRB   P$NNUF          ;CLEAR NOTNUF FLAG
6920                                RTS    PC
6921
6922
6923      ;ACTION ROUTINE TO RETURN CONTROL TO THE SUPERVISOR
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          PSPOP  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              MOV #CADRER,-(SP)
6940 103414 012746 053232          MOV #1,-(SP)
6941 103420 012746 000001          MOV SP,R0
6942 103424 010600          MOV TRAP C$PNTF
6943 103426 104417          ADD #4,SP
6944 103430 062706 000004          ; AND CLEAR 'NOT ENOUGH' FLAG
6945 103434 105037 003160 10$: CLRB  PS$NUF
6946 103440 000207          RTS   PC
6947
6948
6949      ;ACTION ROUTINE TO STORE POINTER TO BEGINING OF OPERATOR INPUT ADDRESS
6950      ;IN COMMAND INPUT BUFFER
6951
6952
6953 103442 010437 002366  ACTSR4: MOV   R4,CBOADR          ;SAVE STRING POINTER
6954 103446 000207          10$: 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$TYPE ;SFT MESSAGE TYPE
6995 103516 000207 RTS PC
6996
6997
6998
6999
7000
7001
7002 103520 012737 000005 002370 ACTCTT: MOV #CCITT,P$TYPE ;SET MESSAGE TYPE
7003 103526 000207 RTS PC
7004
7005
7006
7007
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 CTARGET 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$: CMP #CTARGET,CFLAG ;SEE IF CTARGET FLAG SET, IF YES ERROR
7022 103614 001011 BNE 30$ ;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
7036
7037
7038
7039
7040
7041 103656 004737 103242 ACTTYP: JSR PC,ACTMSG ;CHECK FOR ADDITIONAL COMMANDS
7042 103662 000207 RTS PC
7043
7044
7045
7046
7047

```

;ACTION ROUTINE TO INPUT MESSAGE SIZE PARAMETER, CHECK TO SEE IF
;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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CLI ACTION TABLE AND ROUTINES

```

7104 104074 001364          BNE      21$
7105 104076          PRINTF  #NOCMPR
7106 104076 012746 054160          :IF NOT, COMPARE NEXT ENTRY
7107 104102 012746 000001          :ELSE, PRINT ADDRESS DOESN'T COMPARE MSG.
7108 104106 010600          MOV      #NOCMPR,-(SP)
7109 104110 104417          MOV      #1,-(SP)
7110 104112 062706 000004          MOV      SP,R0
7111 104116 000414          TRAP     C$PNTF
7112 104120 005023          ADD      #4,SP
7113 104122 005023          :RETURN
7114 104124 005023          :ELSE, CLEAR NODE FROM TABLE
7115 104126 005013          BR       30$
7116 104130          CLR      (R3)+
7117 104130 012746 054340          CLR      (R3)+
7118 104134 012746 000001          CLR      (R3)+
7119 104140 010600          CLR      (R3)
7120 104142 104417          PRINTF  #ADRDEL
7121 104144 062706 000004          :PRINT NODE DELETED FROM TABLE MESSAGE
7122 104150          MOV      #ADRDEL,-(SP)
7123 104154 000207          MOV      #1,-(SP)
7124          MOV      SP,R0
7125          TRAP     C$PNTF
7126          ADD      #4,SP
7127          :RESTORE R2 AND R3
7128          :RETURN
7129          :
7130          :ACTION ROUTINE TO CLEAR NODE TABLE
7131          :
7132          ACTNAL: P$PUSH  R2,R3
7133          MOV      #TBLLN,R3
7134          MOV      #NODTBL,R2
7135          10$: CLR      (R2)+
7136          DEC      R3
7137          BNE      10$
7138          PRINTF  #TABCLR,#NOD
7139          :SAVE R2,R3
7140          :SET INCR. COUNTER TO 40
7141          :MOVE NODE TABLE ADDRESS INTO R2
7142          :CLEAR BYTE IN NODE TABEL
7143          :DECRIMENT COUNTER
7144          :CONTINUE UNTIL DONE
7145          :PRINT NODE TABLE CLEARED MESSAGE
7146          MOV      #NOD,-(SP)
7147          MOV      #TABCLR,-(SP)
7148          MOV      #2,-(SP)
7149          MOV      SP,R0
7150          TRAP     C$PNTF
7151          ADD      #6,SP
7152          :CLEAR NOTNUF FLAG
7153          :RESTORE R2 AND R3
7154          CLRB      P$NNUF
7155          P$POP     R2,R3
7156          RTS      PC
7157          :
7158          :ACTION ROUTINE TO RUN SPECIFIED TEST
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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 20$:    CMP    P$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          ; ACTION ROUTINE TO SET 'RUN ALL' FLAG
7174          ;
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$:    CALL    BLDFAS R1,SLOT      ; BUILD FULL ASSIST MESSAGE
7202 104524          CALL    XMIT          ; TRANSMIT MESSAGE
7203 104532          P$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$ERHRD
7207 104540 000045          .WORD    37
7208 104542 065366          .WORD    MSG24
7209 104544 000000          .WORD    0
7210 104546          17$:    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,R0
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,R0
7235	104704	104414					TRAP	C\$PNTB
7236	104706	062706	000004				ADD	#4,SP
7237	104712	005337	050562			101\$:	DEC	CPYCNT
7238	104716	001274					BNE	15\$
7239	104720					CALL	WRITES #2,R1,SLOT	; DECREMENT 'COPIES' COUNTER
7240	104740	000644				BR	10\$	; IF MORE TO DO, LOOP
7241	104742	062701	000010			25\$:	ADD	#10,R1
7242	104746	010137	002402				MOV	R1,SLOT
7243	104752					CALL	FULSLT	; ELSE, UPDATE SUMMARY TABLE
7244	104760	022737	177777	002402			CMP	#-1,SLOT
7245	104766	001231					BNE	10\$
7246	104770					32\$:	RETURN	; POINT R1 TO NEXT TARGET NODE
7247								; UPDATE SLOT
7248								; GET ADDRESS FROM TABLE
7249								; SEE IF END OF TABLE
7250								; IF NO, CONTINUE ELSE, FINISHED
7251								
7252	104772	012737	000043	002310		ACTDIR:	MOV	#CDIR,KEYWD1
7253	105000	000207					RTS	PC
7254								; SET FLAG
7255	105002					RUNDIR:	CALL	DIRCOM
7256	105010						P\$POP	R1
7257	105012	022701	000001				CMP	#1,R1
7258	105016	001400					BEQ	10\$
7259	105020					10\$:	RETURN	; CALL COMMON CODE
7260								; WAS TABLE EMPTY?
7261	105022	005001				DIRCOM:	CLR	R1
7262	105024	012737	002404	002402			MOV	#NODTBL,SLOT
7263	105032						CALL	FULSLT
7264	105040	022737	177777	002402			CMP	#-1,SLOT
7265	105046	001015					BNE	9\$
7266	105050						PRINTF	#TABEMT,#NOD
7267	105050	012746	053701					; CLEAR RESULTS REGISTER
7268	105054	012746	053632					; MOVE NODE TABLE ADDRESS TO SLOT
7269	105060	012746	000002					; SEE IF TABLE EMPTY
7270	105064	010600						; IF NO CONTINUE
7271	105066	104417						; ELSE, PRINT 'TABLE EMPTY' MESSAGE
							MOV	#NOD,-(SP)
							MOV	#TABEMT,-(SP)
							MOV	#2,-(SP)
							MOV	SP,R0
							TRAP	C\$PNTF

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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$:  RETURN  R1
7333
7334
7335          ; ACTION ROUTINE TO SET 'RUN LOOPPAIR' FLAG
7336          ;
7337
7338
7339 105420 012737 000033 002310 ACTRNL: MOV     #CLUPPR,KEYWD1      ; SET FLAG
7340 105426 000207          RTS      PC
7341
7342 105430 005037 050552          RUNLUP: CLR     TEMP1          ; CLEAR 'HEADER PRINTED' FLAG
7343 105434 012737 002404 002402      MOV     #NODTBL,SLOT      ; MOVE NODE TABLE ADDRESS TO SLOT
7344 105442          CALL     FULSLT          ; SEE IF TABLE EMPTY
7345 105450 022737 177777 002402      CMP     #-1,SLOT
7346 105456 001014          BNE     9$
7347 105460          PRINTF  #TABEMT,#NOD      ; IF NO, CONTINUE
7348 105460 012746 053701          ; ELSE, PRINT 'TABLE EMPTY' MESSAGE
7349 105464 012746 053632          MOV     #NOD,-(SP)
7350 105470 012746 000002          MOV     #TABEMT,-(SP)
7351 105474 010600          MOV     #2,-(SP)
7352 105476 104417          MOV     SP,R0
7353 105500 062706 000006          TRAP    C$PNTF
7354 105504 000137 106514          ADD     #6,SP
7355 105510 012737 002404 002402 9$:  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$
7360 105542 000137 106514          JMP     30$
7361 105546 013701 002402          11$:  MOV     SLOT,R1          ; MOVE SLOT TO R1
7362 105552 126127 000007 000000      CMPB    7(R1),#CTARLT      ; SEE IF TARGET NODE
7363 105560 001431          BEQ     18$
7364 105562 010102          MOV     R1,R2          ; IF YES, BRANCH
7365 105564 062701 000010          ADD     #10,R1      ; ELSE, POINT R1 TO TARGET NODE
7366          BR      19$
7367 105570 126127 000007 000000 15$:  CMPB    7(R1),#CTARGET      ; AND R2 TO ASSIST NODE
7368 105576 001425          BEQ     19$
7369 105600          17$:  PRINTF  #MSG32
7370 105600 012746 065637          MOV     #MSG32,-(SP)
7371 105604 012746 000001          MOV     #1,-(SP)
7372 105610 010600          MOV     SP,R0
7373 105612 104417          TRAP    C$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$PNTF
7380 105634 062706 000004          ADD     #4,SP
7381 105640 000137 106514          JMP     30$
7382 105644 010102          18$:  MOV     R1,R2          ; EXIT
7383 105646 062702 000010          ADD     #10,R2      ; POINT R1 TO TARGET NODE
; 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 TIMEOUT
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	RECEVE		; CHECK FOR ANSWER
7504	106552				P\$POP	R1		; R2 HOLDS NO. OF BUFFERS RECEIVED
7505	106554	001770			BEQ	35\$		; IF NO BUFFERS RECEIVED, 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	GETRX #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 B'S
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	#COMPARE,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 RESPONSE' 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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7552      ;
7553      ;
7554 107022 012737 000005 002310 ACTPAT: MOV    #CPATRN,KEYWD1      ;SET FLAG
7555 107030 000207                RTS      PC
7556      ;
7557      ;
7558 107032                RUNPAT: P$PUSH  P$TYPE                ; SAVE TYPE PARAMETER
7559 107036 005037 002370                CLR    P$TYPE                ; SET TYPE TO FIRST TYPE
7560 107042                5$:      CALL    DIRCOM                ; SEND MESSAGES
7561 107050                P$POP    R1                ; GET RESULTS TO KEEP STACK IN ORDER
7562 107052 001403                BEQ     10$                ; IF OK, CONT
7563 107054 022701 000001                CMP     #1,R1                ; ELSE, WAS TABLE EMPTY
7564 107060 001406                BEQ     15$                ; IF YES, RETURN
7565 107062 005237 002370 10$:      INC     P$TYPE                ; SET TO NEXT TYPE
7566 107066 022737 000005 002370        CMP     #5,P$TYPE                ; SEE IF DONE ALL OF THEM
7567 107074 002362                BGE     5$                ; IF NOT, DO MORE
7568 107076                15$:      P$POP    P$TYPE                ; RESTORE MESSAGE TYPE
7569 107102                RETURN
7570      ;
7571      ;
7572      ;ACTION ROUTINE TO SHOW THE CURRENT MESSAGE PARAMETERS
7573      ;
7574      ;
7575 107104 013701 002370 ACTSMS: MOV     P$TYPE,R1                ;GET MESSAGE TYPE INTO R1
7576 107110 006301                ASL      R1                ;MULTIPLY BY 2
7577 107112 062701 003262                ADD     #MSGTAB,R1                ;ADD MESSAGE TABLE OFFSET
7578 107116                PRINTF    #MSGPRM                ;PRINT MESSAGE PARAMETER MESSAGE
7579 107116 012746 054641                MOV     #MSGPRM,-(SP)
7580 107122 012746 000001                MOV     #1,-(SP)
7581 107126 010600                MOV     SP,R0
7582 107130 104417                TRAP    C$PNTF
7583 107132 062706 000004                ADD     #4,SP
7584 107136                PRINTF    #MSG4,(R1),P$SIZE,P$CPYS        ;PRINT PARAMETERS
7585 107136 013746 002374                MOV     P$CPYS,-(SP)
7586 107142 013746 002372                MOV     P$SIZE,-(SP)
7587 107146 011146                MOV     (R1),-(SP)
7588 107150 012746 055276                MOV     #MSG4,-(SP)
7589 107154 012746 000004                MOV     #4,-(SP)
7590 107160 010600                MOV     SP,R0
7591 107162 104417                TRAP    C$PNTF
7592 107164 062706 000012                ADD     #12,SP
7593 107170 105037 003160                CLRB    P$NNUF
7594 107174 000207                RTS      PC
7595      ;
7596      ;
7597      ;
7598      ;ACTION ROUTINE TO CLEAR THE CURRENT MESSAGE PARAMETERS AND
7599      ;RESET THEM TO THE DEFAULT VALUE
7600      ;
7601      ;
7602 107176 012737 000000 002370 ACTCMS: MOV     #ALPHA,P$TYPE                ;RESET TYPE
7603 107204 012737 001000 002372        MOV     #512,P$SIZE                ;RESET SIZE
7604 107212 012737 000001 002374        MOV     #1,P$CPYS                ;RESET COPIES
7605 107220                PRINTF    #CLRMSG                ;PRINT MESSAGE PARAMETERS RESET MESSAGE
7606 107220 012746 053716                MOV     #CLRMSG,-(SP)
7607 107224 012746 000001                MOV     #1,-(SP)

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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				:	ACTION ROUTINE TO SET SHOW COUNTERS FLAG		
7626				:			
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,R0
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,R0
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,R0
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,R0
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,R0
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,R0
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,R0
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,R0
7723	110014	104417			TRAP	C\$PNTF
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	000C02		MOV	#2,-(SP)
7730	110050	010600			MOV	SP,R0
7731	110052	104417			TRAP	C\$PNTF
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,R0
7739	110110	104417			TRAP	C\$PNTF
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,R0
7747	110146	104417			TRAP	C\$PNTF
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,R0
7755	110204	104417			TRAP	C\$PNTF
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,R0
7763	110242	104417			TRAP	C\$PNTF
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,R0
7770	110266	104417			TRAP	C\$PNTF
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				MOV	SP,R0
7777	110312	104417				TRAP	C\$PNTF
7778	110314	062706	000006			ADD	#6,SP
7779	110320			PRINTF	#CNTR19,UCB12+74		
7780	110320	013746	050254			MOV	UCB12+74,-(SP)
7781	110324	012746	064221			MOV	#CNTR19,-(SP)
7782	110330	012746	000002			MOV	#2,-(SP)
7783	110334	010600				MOV	SP,R0
7784	110336	104417				TRAP	C\$PNTF
7785	110340	062706	000006			ADD	#6,SP
7786	110344	000404		BR	50\$		
7787							
7788	110346			40\$:	ERRHRD 31,MSG31		
7789	110346	104456				TRAP	C\$ERHRD
7790	110350	000037				.WORD	31
7791	110352	065576				.WORD	MSG31
7792	110354	000000				.WORD	0
7793							
7794	110356	105037	003160	50\$:	CLRB PS\$NUF		
7795	110362	000207			RTS PC		
7796							
7797							
7798							
7799							
7800							
7801							
7802	110364	105037	003160	ACTSND:	CLRB PS\$NUF		
7803	110370	012737	002404 002402		MOV #NODTBL,SLOT		:MOVE NODE TABLE ADDRESS INTO SLOT
7804	110376				CALL FULSLT		:SEE IF TABLE EMPTY
7805	110404	022737	177777 002402		CMP #-1,SLOT		:IF YES, DON'T PRINT HEADER
7806	110412	001437			BEQ 15\$		
7807	110414				PRINTF #NTBHDR		:PRINT NODE TABLE HEADER
7808	110414	012746	053462			MOV	#NTBHDR,-(SP)
7809	110420	012746	000001			MOV	#1,-(SP)
7810	110424	010600				MOV	SP,R0
7811	110426	104417				TRAP	C\$PNTF
7812	110430	062706	000004			ADD	#4,SP
7813	110434			10\$:	CALL FULSLT		:FIND LOCATION IN TABLE WITH AN ADDRESS
7814	110442	022737	177777 002402		CMP #-1,SLOT		:CHECK IF AT END OF TABLE
7815	110450	001432			BEQ 20\$		:IF YES, RETURN
7816	110452				CALL BINHEX SLOT,#6,#STRBUF		:ELSE, PUT ASCII ADDRESS INTO BUFFER
7817	110474				CALL PRTNOD		:PRINT NODE TABLE ENTRY
7818	110502	062737	000010 002402		ADD #8.,SLOT		:INCR. SLOT TO POINT TO NEXT TABLE ENTRY
7819	110510	000751			BR 10\$		:CONTINUE UNTIL ALL ENTRIES PRINTED
7820	110512			15\$:	PRINTF #TABEMT,#NOD		
7821	110512	012746	053701			MOV	#NOD,-(SP)
7822	110516	012746	053632			MOV	#TABEMT,-(SP)
7823	110522	012746	000002			MOV	#2,-(SP)
7824	110526	010600				MOV	SP,R0
7825	110530	104417				TRAP	C\$PNTF
7826	110532	062706	000006			ADD	#6,SP
7827	110536	000207		20\$:	RTS PC		:RETURN
7828							
7829							
7830							
7831							

:ACTION ROUTINE TO CLEAR A NODE SPECIFIED BY NODE LOGICAL NAME

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7832      ;FROM THE NODE TABLE
7833      ;
7834
7835      ACTCNL: P$PUSH R2      ;SAVE R2
7836      MOV      P$NUM,R2    ;PUT NODE LOGICAL NUMBER INTO R2
7837      ASL      R2          ;MULTIPLY BY 8
7838      ASL      R2          ;NODE TABLE ADDRESS =
7839      ASL      R2          ; (LOG. NO. X 8) + #NODTBL
7840      ADD      #NODTBL,R2   ;ADD OFFSET
7841      CLR      (R2)+       ;CLEAR ENTRY (8 BYTES)
7842      CLR      (R2)+
7843      CLR      (R2)+
7844      CLR      (R2)
7845      P$POP      R2          ;RESTORE R2
7846      CLRB     P$NNUF       ;CLEAR NOTNUF FLAG
7847      PRINTF   #LOGDEL,P$NUM ;PRINT MESSAGE INDICATING DELETION
7848      MOV      P$NUM,-(SP)
7849      MOV      #LOGDEL,-(SP)
7850      MOV      #2,-(SP)
7851      MOV      SP,R0
7852      TRAP     C$PNTF
7853      ADD      #6,SP
7854      RTS      PC          ;RETURN
7855
7856      ;
7857      ;ACTION ROUTINE TO INITIATE A UNA PORT COMMAND
7858      ;
7859
7860      ACTFCT: CLRB     P$NNUF ;CLEAR NOTNUF FLAG
7861      CALL     FUNCT P$NUM    ;CALL FUNCTION ROUTINE WITH FUNCTION CODE
7862      P$POP     R1            ;CHECK RESULTS
7863      BEQ      1$            ; IF OK EXIT
7864      ERRHRD   30,EMSG30      ; ELSE REPORT ERROR
7865      TRAP     C$ERHRD
7866      .WORD    30
7867      .WORD    EMSG30
7868      .WORD    0
7869      1$:      RTS      PC
7870
7871      ;
7872      ;ACTION ROUTINE TO SAVE NODE TABLE
7873      ;
7874
7875      ACTSAV: P$PUSH R2,R3    ;SAVE R2 AND R3
7876      MOV      #NODTBL,R2    ;SET REGISTERS FOR COPYING
7877      MOV      #SAVTBL,R3     ;R2 = FROM, R3 = TO
7878      PRINTF   #UNSMMSG,#SAVED ;PRINT 'TABLE SAVED' MESSAGE
7879      MOV      #SAVED,-(SP)
7880      MOV      #UNSMMSG,-(SP)
7881      MOV      #2,-(SP)
7882      MOV      SP,R0
7883      TRAP     C$PNTF
7884      ADD      #6,SP
7885      JMP      SAVCOM
7886
7887      ;

```

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CLI ACTION TABLE AND ROUTINES

```

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    PSNNUF                ;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    PS: 'F               ; CLEAR 'NOT ENOUGH' FLAG
        RTS     PC

;ACTION ROUTINE TO CLEAR SUMMARY TABLE
;
ACTCSU: CLRB    PSNNUF                ;CLEAR 'NOT ENOUGH' COUNTER
        P$PUSH  R2                    ;SAVE R2
        MOV     #STBL,R1              ;MOVE TABLE LENGTH TO R1
        MOV     #STATBL,R2            ;MOVE SUMMARY TABLE ADDRESS TO R2
5$:      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$: MOV      #4,2(R3)      ; POINT R3 TO CHECK FOR PASS COUNT
7949 111146 000207      15$: RTS      PC
7950
7951      ;
7952      ; ACTION ROUTINE TO READ A FILE FROM EXTERNAL MEDIA ONTO THE NODE TABLE
7953      ;
7954
7955 111150      ACTUSF:
7956 111150      P$PUSH R2      ; SAVE R2
7957 111152 005002      CLR      R2      ; INITIALIZE R2 TO NODE TYPE 'TARGET'
7958 111154      OPEN      CBOADR      ; OPEN FILE, NAME=ASCIZ STRING
7959 111154 013700 002366      MOV      CBOADR,R0
7960 111160 104434      TRAP      C$OPEN
7961 111162      BCOMPLETE      1$      ; RETURN IF SUCCESSFUL
7962 111162 103413      BCS      1$
7963 111164      PRINTF      #OPNERR,CBOADR      ; ELSE PRINT 'OPEN ERROR'
7964 111164 013746 002366      MOV      CBOADR,-(SP)
7965 111170 012746 112110      MOV      #OPNERR,-(SP)
7966 111174 012746 000002      MOV      #2,-(SP)
7967 111200 010600      MOV      SP,R0
7968 111202 104417      TRAP      C$PNTF
7969 111204 062706 000006      ADD      #6,SP
7970 111210      CLOSE
7971 111210 104435      ; CLOSE FILE
7972 111212      1$: CALL      RDLIN      ; READ A LINE AT A TIME
7973 111220 005737 112104      TST      BAD      ; SEE IF AN ERROR DURING READ
7974 111224 001064      BNE      25$      ; BR ON ERROR TO LEAVE
7975 111226 005737 112106      TST      EOFF      ; SEE IF EOF BEFORE PROCESS
7976 111232 001411      BLQ      10$      ; IF VALID, PROCESS
7977 111234      PRINTF      #EOFFND      ; ELSE SAY 'END OF FILE' AND LEAVE
7978 111234 012746 112223      MOV      #EOFFND,-(SP)
7979 111240 012746 000001      MOV      #1,-(SP)
7980 111244 010600      MOV      SP,R0
7981 111246 104417      TRAP      C$PNTF
7982 111250 062706 000004      ADD      #4,SP
7983 111254 000450      BR       25$
7984 111256      10$: PRINTF      #PLINE,#FILLIN      ; PRINT LINE READ FROM FILE
7985 111256 012746 111560      MOV      #FILLIN,-(SP)
7986 111262 012746 112172      MOV      #PLINE,-(SP)
7987 111266 012746 000002      MOV      #2,-(SP)
7988 111272 010600      MOV      SP,R0
7989 111274 104417      TRAP      C$PNTF
7990 111276 062706 000006      ADD      #6,SP
7991 111302      CALL      EDPACK #FILLIN,#ADRBUF,#6      ; PUT ADDRESS INTO BINARY
7992 111324      P$POP      R1      ; CHECK RESULTS
7993 111326 001411      BEQ      12$      ; IF OK, BR
7994 111330      PRINTF      #CADERR      ; ELSE PRINT ERROR MESSAGE
7995 111330 012746 053306      MOV      #CADERR,-(SP)
7996 111334 012746 000001      MOV      #1,-(SP)
7997 111340 010600      MOV      SP,R0
7998 111342 104417      TRAP      C$PNTF
7999 111344 062706 000004      ADD      #4,SP

```


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[illegible]

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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      :
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8160      :
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8162      :
8163      :
8164      :
8165      :
8166      :
8167      :

```

112264	012702	003570	SELMSG: P\$POP	R1	:PUT ADDRESS OF OPR. SEL ASCII STRING INTO R1
112266			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		

```

8136      :
8137      :
8138      :
8139      :
8140      :
8141      :
8142      :
8143      :
8144      :
8145      :
8146      :
8147      :
8148      :
8149      :
8150      :
8151      :
8152      :
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8162      :
8163      :
8164      :
8165      :
8166      :
8167      :

```

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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8184 112400 012702 002404
8185 112404 022712 000000
8186 112410 001422
8187 112412 062702 000010
8188 112416 022712 177777
8189 112422 001370
8190 112424
8191 112424 012746 053701
8192 112430 012746 053560
8193 112434 012746 000002
8194 112440 010600
8195 112442 104417
8196 112444 062706 000006
8197 112450
8198 112454 000404
8199 112456 010237 002402
8200 112462
8201 112466
8202
8203
8204
8205
8206
8207
8208
8209
8210
8211
8212
8213
8214
8215
8216
8217
8218
8219
8220 112470 013701 002402
8221 112474 022711 000000
8222 112500 001412
8223 112502 022711 177777

```

FINDSL FIND EMPTY SLOT IN NODE TABLE
 INPUTS NONE
 EXPLICIT OUTPUTS NONE
 IMPLICIT OUTPUTS THE ADDRESS OF THE FIRST AVAILABLE SLOT IN THE
 NODE TABLE WILL BE LOCATED IN SLOT. THE
 PARAMETER STACK WILL CONTAIN -1 IF THE NODE
 TABLE IS FULL AND 0 IF AN EMPTY SLOT WAS FOUND
 SUBORDINATE ROUTINES NONE
 CALLING PROCEDURE CALL FINDSL
 PSPOP P1 ; -1 IF FULL/ 0 IF SLOT AVAILABLE

```

FINDSL: MOV #NODTBL,R2 ;MOVE ADDRESS OF NODE TABLE TO R2
10$: CMP #0,(R2) ;SEE IF SLOT EMPTY
      BEQ 20$ ;IF YES, BR 20$
      ADD #8,R2 ;ELSE MOVE POINTER TO NEXT ENTRY LOC.
      CMP #-1,(R2) ;SEE IF AT END OF TABLE
      BNE 10$ ;IF NOT, CONTINUE LOOKING
      PRINTF #TABFUL,#NOD ;ELSE, PRINT TABLE FULL MESSAGE
                        MOV #NOD,-(SP)
                        MOV #TABFUL,-(SP)
                        MOV #2,-(SP)
                        MOV SP,R0
                        TRAP C$PNTF
                        ADD #6,SP
                        ;PUT TABLE FULL INDICATION ON STACK
20$: BR 30$ ;RETURN
      MOV R2,SLOT ;MOVE ADDRESS OF EMPTY LOC. INTO SLOT
      PSPUSH #0 ;PUT LOC. FOUND INDICATION ON STACK
30$: RETURN ;RETURN

```

FULLSLT FULL SLOT ROUTINE
 THIS ROUTINE FINDS A LOCATION IN THE TABLE WHERE A NODE PHYSICAL
 ADDRESS EXISTS. IT IS USED WHEN PRINTING OUT THE NODE TABLE.
 INPUTS NONE
 EXPLICIT OUTPUTS NONE
 IMPLICIT OUTPUTS THE LOCATION SLOT WILL CONTAIN THE PHYSICAL
 ADDRESS OF A NODE TABLE ENTRY. SLOT WILL
 CONTAIN -1 WHEN POINTING TO THE END OF THE
 NODE TABLE
 SUBORDINATE ROUTINES NONE
 CALLING PROCEDURE CALL FULLSLT

```

FULLSLT: MOV SLOT,R1 ;MOVE SLOT LOCATION TO R1
10$: CMP #0,(R1) ;CHECK IF EMPTY
      BEQ 20$ ;IF YES, BR 20$
      CMP #-1,(R1) ;SEE IF END OF NODE TABLE

```

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```

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      30$: RETURN      ;RETURN
8232
8233      :---+
8234      :      CMPADR      COMPARE TWO ADDRESSES
8235      :
8236      :      THIS ROUTINE COMPAIRS TWO SIX BYTE STRINGS
8237      :
8238      :      INPUTS      P1 - ADDRESS OF FIRST STRING
8239      :      P2 - ADDRESS OF SECOND STRING
8240      :      OUTPUTS    P3 - 0 = COMPARISON/-1 = NO COMPARISON
8241      :
8242      :      CALLING PROCEDURE      CALL      CMPADR P1,P2
8243      :      P$POP      P3
8244      :
8245      :---+
8246
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      :
8262      :      INPUTS      NONE
8263      :      EXPLICIT OUTPUTS      NONE
8264      :      IMPLICIT OUTPUTS      ONE ENTRY IN THE NODE TABLE WILL BE PRINTED
8265      :      SUBORDINATE ROUTINES      NONE
8266      :      CALLING SEQUENCE      CALL PRTNOD
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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8280	112634					PRINTF #LOGNAM,R2		;PRINT LOGICAL NAME		
8281	112634	010246							MCV R2,-(SP)	
8282	112636	012746	053440						MOV #LOGNAM,-(SP)	
8283	112642	012746	000002						MOV #2,-(SP)	
8284	112646	010600							MOV SP,R0	
8285	112650	104417							TRAP C\$PNTF	
8286	112652	062706	000006						ADD #6,SP	
8287	112656	013702	002402			MOV SLOT,R2		;SEE IF TARGET OR ASSIST NODE		
8288	112662	062702	000007			ADD #7,R2		; INFO CONTAINED IN 7TH BYTE OF ENTRY		
8289	112666	111203				MOVB (R2),R3		;MOVE INTO R3		
8290	112670	020327	000001			CMP R3,#CASIST		;SEE IF ASSIST NODE		
8291	112674	001404				BEQ 10\$		; IF YES, BR 10\$		
8292	112676	012737	062613	002312		MOV #ARGTY7,KEYWD2		; ELSE MOVE 'TARGET' INTO KEYWD2		
8293	112704	000403				BR 20\$		; CONTINUE		
8294	112706	012737	062603	002312	10\$:	MOV #ARGTY6,KEYWD2		; MOVE 'ASSIST' INTO KEYWD2		
8295	112714				20\$:	PRINTF #NODTYP,KEYWD2		;PRINT NODE TYPE		
8296	112714	013746	002312						MOV KEYWD2,-(SP)	
8297	112720	012746	053453						MOV #NODTYP,-(SP)	
8298	112724	012746	000002						MOV #2,-(SP)	
8299	112730	010600							MOV SP,R0	
8300	112732	104417							TRAP C\$PNTF	
8301	112734	062706	000006						ADD #6,SP	
8302	112740					RETURN		;RETURN		
8303	112742					EXIT TST				
8304	112742	104432							TRAP C\$EXIT	
8305	112744	000002							.WORD L10015-	
8306										
8307						:XXX				
8308						: INSERT LOCAL STORAGE THAT IS USED ONLY				
8309						: DURING THIS TEST.				
8310						:XXX				
8311										
8312						:XXX				
8313						: INSERT MESSAGES THAT ARE USED ONLY				
8314						: DURING THIS TEST.				
8315						:XXX				
8316										
8317						.EVEN				
8318										
8319	112746					ENDTST				
8320	112746							L10015:		
8321	112746	104401						TRAP C\$ETST		
8322										
8323						:XXX				
8324						: BEGIN THE REMAINING TESTS ON NEW PAGES.				
8325						:XXX				

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8364
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8376
8377
8378
8379
8380
8381

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

044127 052101 044440
020123 044124 020105
041520 051123 020117
042101 051104 051505
037523 000
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::

XX
: 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'.
XX

GPRMA ASKCSR,0,0,160000,177776,YES

; GET CSR ADDRESS

.WORD T\$CODE
.WORD ASKCSR
.WORD T\$LOLIM
.WORD T\$HILIM

GPRMA ASKVEC,2,0,0,776,YES

; GET VECTOR ADDRESS

.WORD T\$CODE
.WORD ASKVEC
.WORD T\$LOLIM
.WORD T\$HILIM

GPRMD ASKPRI,4,0,340,0,7,YES

; GET PRIORITY LEVEL

.WORD T\$CODE
.WORD ASKPRI
.WORD 340
.WORD T\$LOLIM
.WORD T\$HILIM

ENDHRD

.EVEN
L10016:

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

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

ASKVEC: .ASCIIZ /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

8393
8394
8395
8396
8397
8398
8399
8400
8401
8402
8403
8404 113130
8405 113130 000000
8406 113132
8407
8408
8409
8410
8411
8412
8413
8414
8415
8416
8417 113132
8418
8419 113132
8420
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::

:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:      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.
:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

      .EVEN

      ENDSFT

                                .EVEN
                                L10017:

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

$PATCH::
      .BLKW 10

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

      LASTAD

                                .EVEN
                                .WORD 0
                                .WORD 0

L$LAST::
```

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SOFTWARE PARAMETER CODING SECTION

8440
8441
8442
8443
8444
8445
8446
8447
8448
8449
8450
8451
8452
8453
8454
8455
8456
8457
8458
8459

000001

```

:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:      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.
:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:
:      BGNSETUP          1
:      BGNPTAB
:      .WORD      0
:      ENDPTAB
:      ENDSETUP
:
:      .END
```

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CROSS REFERENCE TABLE -- USER SYMBOLS

[illegible]

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CROSS REFERENCE TABLE -- USER SYMBOLS

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BUFLEN =	050566 G	2269#	4527	4562	4911*	4987*	5046*	5116*	7513	7520
BUILD =	000003	1246#	2363							
CADERR	053306	2602#	7995							
CADRER	053232	2594#	6478	6940						
CALPHA=	000016	1257#	2447							
CASIST=	000001 G	1215#	5789	6502	6503	7384	8290			
CBOADR	002366	1572#	6475	6936	6953*	7020	7959	7964		
CCCITT=	000023	1262#	2457							
CCITT =	000005 G	1287#	7002							
CCLP:SG=	000035	1272#	2426							
CCLNAD=	000004 G	1217#								
CCLNAL=	000010 G	1218#								
CCLSUM=	000042	1277#	2428							
CCNTR =	000036	1273#	2407							
CCPYS =	000027	1266#	2468							
CDEFLT=	000044	1279#	2482							
CDIR =	000043	1278#	2479	7162	7252					
CEXADR=	000013	1254#	2424	2438						
CEXIT =	000020 G	1219#	3771	5909	6376	6926				
CFLAG	003672	1701#	3771*	5773*	5789*	5794*	5909	5911*	6356*	6376
CFUNCT=	000040	1275#	2491							
CLIACT	100456	6355	6385#							
CLIALN=	000007	1236#	2437							
CLIALP=	000006	1235#								
CLIBIF=	000003	1232#	2397							
CLIBR =	000002	1231#	2362	2366	2369	2377	2379	2381	2383	2387
		2408	2409	2420	2423	2424	2425	2427	2429	2436
		2454	2456	2458	2460	2461	2465	2469	2470	2476
CLIBRX	052554	2540#	5596							
CLIDEC=	000011	1238#	2422	2464	2468	2485				
CLIERM	052445	2526#	6361							
CLIERR=	000000	1229#	2374	2388	2430					
CLIEXI=	000001	1230#	2358	2360	2364	2371	2373	2375	2385	2389
		2486	2492	2498	2499					
CLINBG	052527	2536#	5640							
CLINUF	052476	2531#	6370							
CLINUM=	000005	1234#								
CLIOCT=	000010	1237#	2491							
CLISPA=	000004	1233#	2356	2393	2402	2411	2416	2435	2443	2474
CLISTR=	000012	1239#	2359	2361	2363	2365	2368	2370	2372	2376
		2386	2403	2405	2407	2415	2419	2426	2428	2445
		2455	2457	2462	2466	2475	2477	2479	2481	2483
CLITRE	051070	2352#	6354							
CLISPM	052436	2524#	6348							
CLKBR	003676	1705#	6016	6128						
CLKCSR	003674	1704#	3988*	4009*	5943	5960*	5961*	5962*	6022*	6134*
CLKEN	003704	1708#	4009	5951*	5963*	6022	6134			
CLKHZ	003702	1707#	3991	4006	6014	6126				
CLKINT	067702 G	3986#	6017	6129						
CLKSET	067656	3941#	5950	5959						
CLKVEC	003700	1706#	6018	6130						
CLRcnt=	000013 G	1377#								

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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#						
COMPADR	112536	5334	6485	6576	6743	6754	7100	8247#
COMPBUF	050570 G	2270#	4930*	5013*	5068*	7532		
CMPEP1	066754	3699#	5270					
CMPEP2	067051	3710#	5283					
COMPSTR	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					
CTARGET=	000000 G	1214#	5773	6505	7021	7362	7367	
CTYPE =	000025	1264#	2461					

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[illegible]

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[illegible]

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[illegible]

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CROSS REFERENCE TABLE -- USER SYMBOLS

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#			
LSEXP1 002046 G	1006#			
LSEXP4 002064 G	1020#			
LSEXP5 002066 G	1022#			
LSHARD 112752 G	983	8339	8340#	
LSHIME 002120 G	1048#			
LSHPCP 002016 G	982#			
LSHPTP 002022 G	986#			
LSHW 002170 G	987	1102	1103#	
LSICP 002104 G	1036#			
LSINIT 076600 G	1037	5885#		
LSLADP 002026 G	990#			
LSLAST 113156 G	991	8439#		
LSLOAD 002100 G	1032#			
LSLUN 002074 G	1028#			
LSMREV 002050 G	1008#			
LSNAME 002000 G	965#			
LSPRIO 002042 G	1002#			
LSPROT 076572 G	1043	5858#		
LSPRT 002112 G	1042#			
LSREPP 002062 G	1018#			
LSREV 002010 G	974#			
LSRPT 076560 G	1019	5818#		
LSOFT 113132 G	8405	8406#		
LSGPC 002056 G	1014#			
LSGPCP 002020 G	984#			
LSPTP 002024 G	988#			

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CROSS REFERENCE TABLE -- USER SYMBOLS

LSSTA	002030	G	992#						
LSSW	002200	G	1124	1125#					
LSTEST	002114	G	1044#						
LSTIML	002014	G	980#						
LSUNIT	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#						
MESPAT	062054		3215#						
MESPA1	062125		3222#	7296					
MORE =	010000	G	1443#	4550					
MSGAD	003316	G	1652#	5213	5219				
MSGCNT	003300	G	1643#	5217					
MSGPRM	054641		2733#	6904	7579				
MSGTAB	003202		1633#	3790	6902	7293	7577	7614	
MSGTY0	062372		1633	3258#					
MSGTY1	062400		1634	3259#					
MSGTY2	062405		1635	3260#					
MSGTY3	062413		1636	3262#					
MSGTY4	062420		1637	3263#					
MSGTY5	062425		1638	3264#					
MSGTY6	062433		1639	3266#					
MSG0C	003300		1644#						
MSG00	003334	G	1644	1653	1661#				
MSG01	003464	G	1645	1654	1677#				
MSG02	003465	G	1646	1655	1679#				
MSG03	003466	G	1647	1656	1681#				
MSG04	003467	G	1648	1657	1683#				
MSG05	003470	G	1649	1658	1685#				
MSG1	054711		2740#	6530					
MSG1C	003302		1645#						
MSG11	055024		2753#	6536					
MSG12	055137		2766#	5542					
MSG2	055177		2772#	6516					
MSG2C	003304		1646#						
MSG3	055235		2778#						
MSG3C	003306		1647#						
MSG4	055276		2784#	6913	7588	7615			
MSG4C	003310		1648#						
MSG5C	003312		1649#						
MSG6C	003314		1650#	8133*					
NCHN =	020000	G	1487#						
NEW	100112		5935	6134#					

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CROSS REFERENCE TABLE -- USER SYMBOLS

[illegible]

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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#
NOD30	051322	2380#
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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CROSS REFERENCE TABLE -- USER SYMBOLS

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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[illegible]

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[illegible]

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[illegible]

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RRG004	036720 G	1729	1826	1855#												
RRG005	041676 G	1730	1832	1856#												
RRG006	044654 G	1731	1838	1857#												
RRING	004066 G	1749	1751	1753	1755	1802#	1996	2020	4237	4238						
RRNGTB	003722 G	1724#														
RSET =	000040 G	1306#	4182													
RSTT =	000015 G	1321#														
RTRY =	002000 G	1450#	4552													
RTRYER	052675	2555#	6771													
RUN =	000003 G	1342#														
RUNALL	104366	7157	7180#													
RUNCOM	106516	7223	7312	7409	7440	7472	7494#									
RUNDIR	105002	7165	7255#													
RUNLUP	105430	7161	7342#													
RUNPAT	107032	7167	7558#													
RXI =	020000 G	1298#	4401	4417												
SAVCOM	111002	7885	7905#													
SAVED	054620	2729#	7879													
SAVTBL	002530	1582#	7877	7897												
SELMSG	112264	7020	8124#													
SERI =	100000 G	1296#	4390	4419												
SFPTBL	002200 G	1126#														
SIADDR=	000042 G	1509#	6810													
SIDEV =	000053 G	1510#	6859													
SIECO =	000030 G	1506#	6835													
SIFNCT=	000035 G	1508#	6851													
SIMSG1	066440	3658#	6814													
SIMSG2	066477	3664#	6822													
SIMSG3	066532	3669#	6830													
SIMSG4	066572	3675#	6838													
SIMSG5	066613	3678#	6846													
SIMSG6	066641	3682#	6854													
SIMSG7	066667	3686#	6862													
SIRCPT=	000022 G	1504#	6789	6819												
SIUECO=	000031 G	1507#	6843													
SIVERS=	000027 G	1505#	6827													
SIZLMT	054061	2668#	7058													
SLOT	002402 G	1578#	6560*	6584	7192*	7194	7196*	7197	7199	7202	7240	7242*	7244	7262*		
		7264	7275*	7278	7281	7302	7330*	7343*	7345	7355*	7358	7361	7490*	7803*		
		7805	7814	7817	7818*	8159	8199*	8220	8225*	8227*	8275	8287				
SOURCC=	000006 G	1400#	4915*	4916*	4917*	4991*	4992*	4993*	5050*	5051*	5052*	5121*				

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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										
T\$ARGC=	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							
		6347#	8351#	8356#	8361#									
T\$CODE=	002032	628#	4128#	4134#	4141#	4148#	4192#	4218#	4326#	4335#	4344#	4569#	4575#	4581#
T\$ERRN=	000036	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#	
T\$EXCP=	000000	6347#	6352	8351#	8355	8356#	8360	8361#	8366					
T\$FLAG=	000040	5832#	5834	6142#	6219#	6255#	6257	6292#	6294	6379#	8304#			
T\$GMAN=	000000	628#	6344#	6347	6353#									
T\$HILI=	000007	6347#	6351	8351#	8354	8356#	8359	8361#	8365					

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T\$LAST= 000001	628#	8437#											
T\$LOLI= 000000	6347#	6350	8351#	8353	8356#	8358	8361#	8364					
T\$LSYM= 010000	628#	1113	1131	3783	3808	3828	4012	5849	6159	6179	6236	6272	6309
	8321	8370	8420										
T\$LTNO= 000001	8440#												
T\$NEST= 177777	628#	1102#	1112#	1124#	1130#	3770#	3782#	3786#	3807#	3811#	3827#	3986#	4011#
	5818#	5848#	5858#	5865#	5885#	6158#	6170#	6178#	6188#	6235#	6245#	6271#	6282#
	6308#	6335#	8320#	8339#	8368#	8405#	8418#						
T\$NSO = 000005	1102#	1112	1124#	1130	3770#	3782	3786#	3807	3811#	3827	3986#	4011	5818#
	5848	5858#	5865	5885#	6158	6170#	6178	6188#	6235	6245#	6271	6282#	6308
	6335#	6320	8339#	8368	8405#	8418							
T\$PTNU= 000000	628#												
T\$SAVL= 177777	628#												
T\$SEGL= 177777	628#												
T\$SUBN= 000000	628#	6334#											
T\$TAGL= 177777	628#												
T\$TAGN= 010020	628#	1102#	1124#	3770#	3786#	3811#	3986#	5818#	5858#	5885#	6170#	6188#	6245#
	6282#	6335#	8339#	8405#									
T\$TEMP= 000005	1090#	1091#	1112#	1130#	3782#	3807#	3827#	4011#	5832#	5833	5848#	5865#	6142#
	6143	6158#	6178#	6219#	6220	6235#	6255#	6256	6271#	6292#	6293	6308#	6347#
	6379#	6380	8304#	8305	8320#	8351#	8356#	8361#	8368#	8418#			
T\$TEST= 000001	628#	6334#	8440										
T\$TSTM= 177777	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	5946	5955	5969	5974	5987	6020	6025	6037
	6049	6055	6074	6083	6090	6097	6105	6112	6119	6132	6137	6140	6142
	6159	6179	6203	6217	6219	6236	6272	6309	6344	6364	6373	6379	6457
	6481	6491	6497	6519	6533	6539	6545	6552	6564	6599	6613	6622	6646
	6659	6665	6677	6683	6694	6703	6749	6774	6780	6798	6817	6825	6833
	6841	6849	6857	6865	6870	6877	6907	6916	6943	7027	7061	7083	7109
	7120	7141	7189	7206	7220	7226	7235	7271	7287	7299	7306	7315	7325
	7352	7373	7379	7391	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											

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UCB11	050134	G	2008	2014#											
UCB12	050160	G	2033	2045#	4291	7643	7650	7658	7666	7673	7680	7688	7696	7703	7710
			7718	7726	7734	7742	7750	7758	7766	7773	7780				
UCB13	050160	G	2044#	2085											
UCB20	050340	G	2159	2163#	6057										
UCB21	050340	G	2164#	2175											
UCB22	050400		2185	2198#	6803	6804									
UCB23	050400		2194	2199#											
UCB6	050010	G	1960	1964#											
UCB7	050050	G	1972	1976#											
UDBB	050466	G	2227#												
UNACSR	047652	G	1879#	5979*	5989										
UNAINI	070262	G	4181#	6027											
UNAI SR	071144	G	4368#	5984											
UNAPRI	047656	G	1881#	5981*	5983										
UNAVEC	047654	G	1880#	5980*	5985										
UNBOND	054252		2689#	7024											
UNIHLT=	000005	G	1344#												
UNIT	047664	G	1886#												
UNMSG	054561		2723#	7880	7900	8011									
WAIT	070066	G	4083#	4457											
WDMODE=	000015	G	1380#	6760	6885										
WDMULA=	000007	G	1371#	6199	6549	6619									
WDPHYA=	000005	G	1368#												
WDRNGS=	000011	G	1374#	4322											
WDSYS =	000023	G	1390#												
WRITES	074544		5322#	6883	7240	7330	7490								
XFER	050560	G	2266#	4907*	4908*	4983*	4984*	5012*	5043*	7506					
XFLAG	050520	G	2250#	4407*	4530*	4536									
XMIT	071434	G	4523#	6765	7203	7303	7388	7425	7456						
XP KLEN=	002756	G	1493#	1845	1846	1847	1848	1849	1850	4909	4985	5044			
XPWR =	100000	G	1329#												
XRG CUR	003756	G	1750#	4235*	4241	4244	4524	4516	4547	4558	4560				
XRGLST	003766	G	1754#	5170											
XRG NXT	003762	G	1752#	4236*	4547	4559	4901	4933	4977	5016	5036	5071	5112	5130	
XRG SRT	003752	G	1748#	5169											
XRG001	004162	G	1739	1765	1845#										
XRG002	007140	G	1740	1771	1846#										
XRG003	012116	G	1741	1777	1847#										
XRG004	015074	G	1742	1783	1848#										
XRG005	020052	G	1743	1789	1849#										
XRG006	023030	G	1744	1795	1850#										
XRING	003772	G	1748	1750	1752	1754	1759#	1993	2015	4235	4236				
XRNGTB	003736	G	1737#												
X\$ =	000167		908#	2356#	2357#	2358#	2359#	2360#	2361#	2362#	2363#	2364#	2365#	2366#	2367#
			2368#	2369#	2370#	2371#	2372#	2373#	2374#	2375#	2376#	2377#	2378#	2379#	2380#
			2381#	2382#	2383#	2384#	2385#	2386#	2387#	2388#	2389#	2393#	2394#	2395#	2397#
			2398#	2402#	2403#	2404#	2405#	2406#	2407#	2408#	2409#	2410#	2414#	2415#	2416#
			2417#	2418#	2419#	2420#	2421#	2422#	2423#	2424#	2425#	2426#	2427#	2428#	2429#
			2430#	2431#	2435#	2436#	2437#	2438#	2439#	2443#	2444#	2445#	2446#	2447#	2448#
			2449#	2450#	2451#	2452#	2453#	2454#	2455#	2456#	2457#	2458#	2459#	2460#	2461#
			2462#	2463#	2464#	2465#	2466#	2467#	2468#	2469#	2470#	2474#	2475#	2476#	2477#
			2478#	2479#	2480#	2481#	2482#	2483#	2484#	2485#	2486#	2490#	2491#	2492#	2496#
			2497#	2498#	2499#										
X\$ALWA=	000000		628#												
X\$FALS=	000040		628#												

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CROSS REFERENCE TABLE -- USER SYMBOLS

[illegible]

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CROSS REFERENCE TABLE -- MACRO NAMES

[illegible]

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CROSS REFERENCE TABLE -- MACRO NAMES

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			
	4934	4940	5017	5023	5072	5078	5131	6118	6869	6876								
ERRHRD	1#	628#	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#																
ISSTAC	648#	5937																
KT11	1#	628#																
LASTAD	1#	628#	8435															
MANUAL	1#	628#																
MEMORY	1#	628#	5938															
MSBYTE	1#	628#	965#	971	972	973												
MSCHEC	1#	628#	5832#	6142#	6219#	6255#	6292#	6379#	8304#									
MSCNTO	1#	628#	6347#	8351#	8356#	8361#												
MSCOUN	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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CROSS REFERENCE TABLE -- MACRO NAMES

MSDATA	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#	
	1#	628#	965#	974	976	978	980	982	984	986	988	990	992	994	996
	953	1000	1002	1004#	1006	1008	1011	1014	1016	1018	1020	1022	1024	1026	1028
MSDECR	1030	1032	1034	1036	1038	1040	1042	1044	1046	1048	1056#	1064#			
	1#	628#	1112#	1130#	3782#	3807#	3827#	4011#	5848#	5865#	6158#	6178#	6235#	6271#	6308#
MSDEFA	8320#	8368#	8418#												
MSENDE	1#	628#	6347#	8351#	8356#	8361#									
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	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#			
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	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#											
MSGENB	1#	628#	6344#	6345											
MSGETS	1#	628#	1112#	1130#	3782#	3807#	3827#	4011#	5848#	5865#	6158#	6178#	6235#	6271#	6308#
	8320#	8368#	8418#												
MSGETT	1#	628#	5832#	6142#	6219#	6255#	6292#	6379#	8304#						
MSGNGB	1#	628#	965#	974#	976#	978#	980#	982#	984#	986#	988#	990#	992#	994#	996#
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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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	1023	1024#	1025	1026#	1027	1028#	1029	1030#	1031	1032#	1033	1034#	1035	1036#	1037
	1038#	1039	1040#	1041	1042#	1043	1044#	1045	1046#	1047	1048#	1049	1056#	1057	1058
	1064#	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#
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	4583#	4587#	4588#	4589#	4590#	4639#	4640#	46.1	4642#	4643	4651#	4652#	4653#	4654#	4935#
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	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

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5969#	5970	5973#	5974#	5975#	5977#	5983#	5984#	5985#	5986#	5987#	5988	6016#	6017#	6018#
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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#
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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#
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6871#	6872#	6873#	6877#	6878#	6879#	6880#	6904#	6905#	6906	6907#	6908	6910#	6911#	6912#
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7283#	7284#	7285#	7286	7287#	7288	7295#	7296#	7297#	7298	7299#	7300	7306#	7307#	7308#
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7475#	7476#	7477#	7478#	7481#	7482#	7483	7484#	7485	7500#	7519#	7520#	7521#	7522#	7523
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7656	7659#	7660#	7661#	7662	7663#	7664	7666#	7667#	7668#	7669	7670#	7671	7673#	7674#
7675#	7676	7677#	7678	7681#	7682#	7683#	7684	7685#	7686	7689#	7690#	7691#	7692	7693#
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7753#	7754	7755#	7756	7759#	7760#	7761#	7762	7763#	7764	7766#	7767#	7768#	7769	7770#
7771	7773#	7774#	7775#	7776	7777#	7778	7780#	7781#	7782#	7783	7784#	7785	7789#	7790#
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7850#	7851	7852#	7853	7865#	7866#	7867#	7868#	7879#	7880#	7881#	7882#	7883#	7884	7899#
7900#	7901#	7902	7903#	7904	7925#	7926#	7927#	7928	7929#	7930	7954#	7960#	7962#	7964#
7965#	7966#	7967	7968#	7969	7971#	7978#	7979#	7980	7981#	7982	7985#	7986#	7987#	7988
7989#	7990	7995#	7996#	7997	7998#	7999	8010#	8011#	8012#	8013	8014#	8015	8050#	8051#
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8272	8273#	8274	8281#	8282#	8283#	8284	8285#	8286	8296#	8297#	8298#	8299	8300#	8301
8304#	8305#	8321#	8339#	8351#	8352	8353	8354	8356#	8357	8358	8359	8361#	8362	8363
8364	8365	8368#	8405#	8418#	8436#	8437#	8438#							
M\$GNLS	1#	628#												
M\$GNSU	1#	628#												
M\$GNTA	1#	628#	1112#	1130#	3782#	3807#	3827#	4011#	5848#	6158#	6178#	6235#	6271#	6308#
	8368#	8369	8418#	8419										8320#
M\$GNTE	1#	628#	6334#											

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MSHAPT MSHNAP MSINCR	1#	628#	965#												
	1#	628#	965#	1004											
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	4642#	4651#	4935#	4941#	5018#	5024#	5073#	5079#	5132#	5273#	5286#	5599#	5599#	5643#	5801#
	5818#	5849#	5858#	5885#	5915#	5930#	5926#	5932#	5939#	5946#	5955#	5969#	5974#	5987#	6020#
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	6159#	6170#	6179#	615#	6203#	6217#	6219#	6236#	6245#	6272#	6282#	6309#	6334#	6335#	6344#
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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
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	8167	8201	8231	8257	8302										
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SETVEC	1#	628#	5982	6015	6127										
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STARS	1#	628#													
SVC	1#	628#													
XFER	1#	628#	5832#	6142#	6219#	6255#	6292#	6379#	8304#						
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. ABS. 113156 000

ERRORS DETECTED: 0

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RUN-TIME: 35 42 4 SECONDS
RUN-TIME RATIO: 132/82=1.5
CORE USED: 21K (41 PAGES)