TEST

TEST 13 JSR,RIS,RTI

MD-11-DOM-A

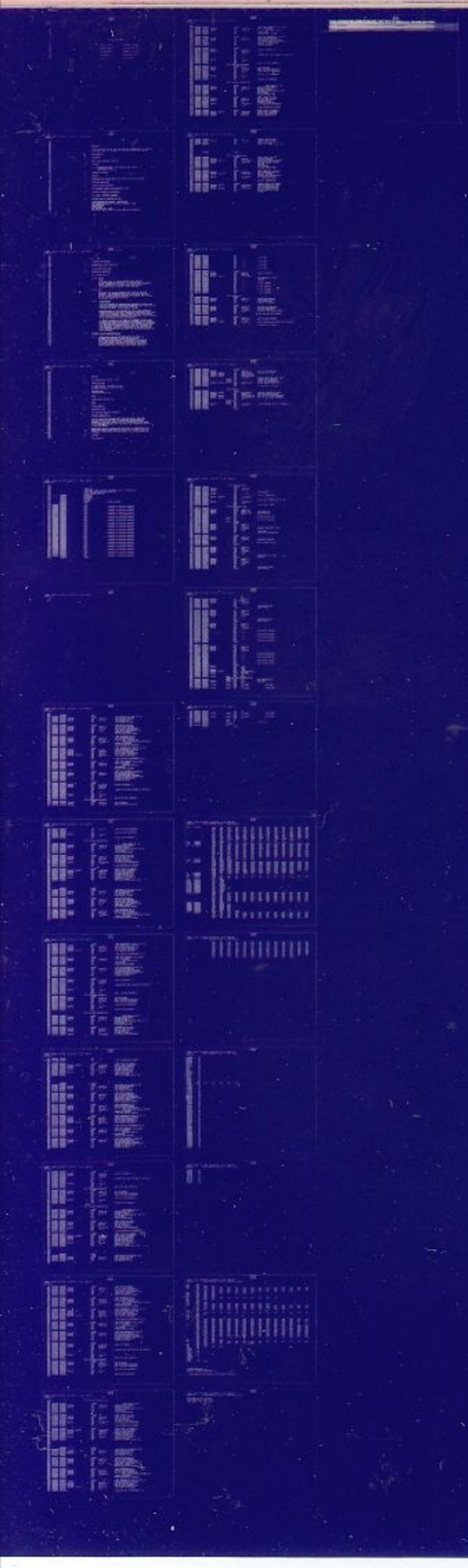
EP-DOM-A-DL-A

FICHE 1 OF 1

NOV 1976

digital

MADE IN USA



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                                        .REM    %
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IDENTIFICATION

PRODUCT CODE:	MAINDEC-11-DOMA-D
PRODUCT NAME:	T13-JSR/RTS/RTI
DATE CREATED:	FEBRUARY 16, 1970
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	JOHN HITTELL

1. ABSTRACT

THIS IS A TEST OF THE JSR, RTS AND RTI INSTRUCTION, IT IS ALSO THE FIRST TIME THE REGISTER 6 HAS BEEN "PUSHED AND POPPED".

2. REQUIREMENTS

2.1 EQUIPMENT

PDP-11/20 STANDARD COMPUTER

2.2 STORAGE

2.2.1 PROGRAM STORAGE - THE ROUTINE USES MEMORY FROM 0000 TO 5000.

3. LOADING PROCEDURE

3.1 METHOD

PROCEDURE FOR NORMAL ABSOLUTE TAPES SHOULD BE FOLLOWED.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTING

THE PROGRAM STARTS AND RESTARTS AT 200

4.2 STARTING ADDRESS OR ADDRESSES

(A) 200 = STARTING ADDRESS

4.3 PROGRAM AND/OR OPERATOR ACTION

LOAD PROGRAM INTO MEMORY. (BOTTOM 4K)
SET SWITCH REGISTER TO STARTING ADDRESS. (200)
LOAD ADDRESS.
PRESS START.
THE PROGRAM WILL LOOP.
AND RING A BELL AFTER A FIXED NUMBER OR ITERATIONS

5. OPERATION PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

NO SWITCHES ARE USED

5.2 SUBROUTINE ABSTRACTS

5.2.1 BEGIN SA 200

5.2.2 SCOPE

IS A "NOP THAT IS PLACED BETWEEN EACH SUBTEST IN THE INSTRUCTION SECTION. IF A SCOPE LOOP IS NEEDED. INSERT A BRANCH TO THE PREVIOUS SCOPE LOCATION AT THE CURRENT SCOPE LOCATION. (NOTE NOP=240)

5.2.3 HLT

INDICATES THE UNIQUE ADDRESS THAT TAGS THE FAILING SUBTEST. THE INCORRECT DATA AT THE TIME OF THE FAILURE MAY OR MAY NOT BE DISPLAYED IN REGISTER ZERO, WHICH IS THE DATA REGISTER ON A HALT.

5.2.4 TRAPCATCHER

THIS IS A SERIES OF INSTRUCTIONS DESIGNED TO DETECT AND ISOLATE UNEXPECTED TRAPS AND INTERRUPTS, THAT OCCUR IN THE TRAP AND INTERRUPT VECTOR AREA OF MEMORY.

THE PRINCIPAL OF THIS ROUTINE IS: THE VECTOR ENTRANCE ADDRESS POINTS TO THE NEXT SEQUENTIAL WORD WHICH WILL CONTAIN A HALT (000000) (THIS LOCATION IS ALSO THE STATUS WORD FOR THAT VECTOR ENTRANCE. BUT THIS WILL HAVE NO EFFECT ON IT ALSO BEING THE NEXT INSTRUCTION).

IF A HALT OCCURES IN THE TRAP OR INTERRUPT VECTOR AREA, REGISTER SIX SHOULD BE EXAMINED TO DETERMINE ITS CONTENTS, THEN USE REGISTER SIX CONTENTS AS AN ADDRESS TO DETERMINE THE LOCATION THE PROGRAM WAS AT. WHEN THE INTERRUPT OR TRAP OCCURRED. (MEMORY AS SPECIFIED BY R6 CONTAINS THE PC OF THE INSTRUCTION FOLLOWING THE INSTRUCTION WHERE THE TRAP OCCURED)

5.3 PROGRAM AND/OR OPERATOR ACTION

5.3.1 LOADING AND STARTING AT 200 STARTS THE TEST. IF AN ERROR IS DETECTED. THERE WILL BE A HALT. WHEN A HALT OCCURS AND IT IS NECESSARY TO SCOPE ON IT, PLACE INSERT A BRANCH INSTRUCION IN THE SCOPE LOCATION FOLLOWING THE HALT. THE BRANCH INSTRUCTION SHOULD BRANCH YOU TO THE PREVIOUS SCOPE LOCATION.

6. ERRORS

6.1 ALL ERRORS WILL CAUSE A HALT.

6.2 ERROR RECOVERY

ON TRAP ERRORS - RESTART AT 200.
DEPRESS CONTINUE TO CONTINUE TEST

7. RESTRICTIONS
7.1 STARTING RESTRICTION

NONE

7.2 OPERATIONAL RESTRICTION

NONE

8. MISCELLANEOUS

8.1 EXECUTION TIME

FOR THE TEST ABOUT 2 MINUTES

9. PROGRAM DESCRIPTION

THIS IS THE FIRST PROGRAM THAT USES THE STACK. REGISTER
SIX IS TESTED TO SEE THAT IT INCREMENTS AND DECREMENTS
CORRECTLY, THAT THE CORRECT DATA IS TRANSFERED TO THE STACK
FROM THE REGISTERS AND THAT THE STACK ALSO TRANSFERS CORRECTLY
TO THE REGISTERS.

WHEN USING THE RTI INSTRUCTION THE STACK IS INCREMENTED TWO
WORDS THE RESULTS ARE TESTED TO SEE IF THE STATUS IS SET UP
CORRECTLY. THE JSR AND RTS ARE TESTED TO A LEVEL SEVEN DEEP.

10. LISTING

11. FLOW CHART(S)

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                                        %

                                        ;TEST 13
                                        ;COPYRIGHT 1970, DIGITAL EQUIPMENT CORP., MAYNARD MASS.
                                        ;TEST JSR, RTS AND RTI INSTRUCTION
                                        ;PDP11 SUBROUTINE TEST
                    000000              HLT=HALT
                    000240              SCOPE=240
                    000240              OPR=240
                    000240              NOP=240
                    000006              LP=%6                   ;STACK POINTER
                    000000              .=0
000000  000002      .+2
000002  000000      HALT                ;TRAPPED TO PREVIOUS ADDRESS
000004  000006      .+2
000006  000000      HALT                ;TRAPPED TO PREVIOUS ADDRESS
000010  000012      .+2
000012  000000      HALT                ;TRAPPED TO PREVIOUS ADDRESS
000014  000016      .+2
000016  000000      HALT                ;TRAPPED TO PREVIOUS ADDRESS
000020  000022      .+2
000022  000000      HALT                ;TRAPPED TO PREVIOUS ADDRESS
000024  000026      .+2
000026  000000      HALT                ;TRAPPED TO PREVIOUS ADDRESS
000030  000032      .+2
000032  000000      HALT                ;TRAPPED TO PREVIOUS ADDRESS
000034  000036      .+2
000036  000000      HALT                ;TRAPPED TO PREVIOUS ADDRESS
000040  000042      .+2
000042  000000      HALT                ;TRAPPED TO PREVIOUS ADDRESS
000044  000046      .+2
000046  000000      HALT                ;TRAPPED TO PREVIOUS ADDRESS
000050  000052      .+2
000052  000000      HALT                ;TRAPPED TO PREVIOUS ADDRESS
000054  000056      .+2
000056  000000      HALT                ;TRAPPED TO PREVIOUS ADDRESS
000060  000062      .+2
000062  000000      HALT                ;TRAPPED TO PREVIOUS ADDRESS
000064  000066      .+2
000066  000000      HALT                ;TRAPPED TO PREVIOUS ADDRESS
000070  000072      .+2
000072  000000      HALT                ;TRAPPED TO PREVIOUS ADDRESS
000074  000076      .+2
000076  000000      HALT                ;TRAPPED TO PREVIOUS ADDRESS
000200              .=200
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        000000                          N=0
000200  000240                          SCOPE                   ;TEST ABILITY OF JSR TO JUMP
000202  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
000206  004067  000002                  JSR     %0,.+6          ;JSR AROUND HALT
000212  000000                          HLT                     ;JSR FAILED TO JUMP

000214  000240                          SCOPE                   ;TEST PC+2 TO REC 0
000216  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
000222  004067  000000                  JSR     %0,.+4          ;JSR TO NEXT INSTRUCTION
000226  022700  000226                  CMP     #.,%0           ;TEST REG 0 FOR CORRECT MOVE
000232  001401                          BEQ     .+4             ;BRANCH IF CORRECT
000234  000000                          HLT                     ;REG 0 VALUE NOT CORRECT

000236  000240                          SCOPE                   ;TEST DECREMENT OF LP
000240  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
000244  004067  000000                  JSR     %0,.+4          ;JSR TO NEXT INSTRUCTION
000250  020627  003430                  CMP     LP,#BUFF-2              ;TEST (LP) FOR INITIAL MINUS 2
000254  001401                          BEQ     .+4             ;BRANCH IF CORRECT
000256  000000                          HLT                     ;LINK POINTER NOT CORRECT

000260  000240                          SCOPE                   ;TEST TRANSFER OF (REG 0) TO (LP)
000262  012700  177777                  MOV     #-1,%0          ;INITIALIZE REG 0 TO ONES
000266  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
000272  004067  000000                  JSR     %0,.+4          ;JMP TO NEXT INSTRUCTION
000276  026727  003126  177777          CMP     BUFF-2,#-1      ;TEST BUFF-2 FOR ONES
000304  001401                          BEQ     .+4
000306  000000                          HLT                     ;(REG) WAS NOT TRANSFERED TO LP

000310  000240                          SCOPE                   ;TEST JMP INDIRECT THE LITERAL
000312  012706  003432                  MOV     #BUFF,LP        ;SET UP POINTER
000316  004037  000324                  JSR     %0,@#.+6                ;JMP OVER THE HLT
000322  000000                          HLT                     ;JSR FAILED
000324  000240                          OPR                     ;SHOULD JUMP TO HERE

000326  000240                          SCOPE                   ;TEST JSR INDIRECT A LOCATION
000330  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
000334  004077  000000                  JSR     %0,@.+4         ;JSR DEFERED NEXT LOCATION
000340  000344                          .+4                     ;POINTS TO OPERATE INSTRUCTION
000342  000000                          HLT                     ;FAILED TO JSR TO OPR
000344  000240                          OPR                     ;SHOULD JSR HERE

000346  000240                          SCOPE
000350  012700  000364                  MOV     #.+14,%0        ;POINT TO BRANCH .+4
000354  012706  003432                  MOV     #BUFF,LP
000360  004010                          JSR     %0,@%0
000362  000000                          HLT                     ;CURRENT REG USED INSTEAD OF PREVIOUS
000364  000401                          BR      .+4
000366  000000                          HLT
000370  020027  000362                  CMP     %0,#.-6
000374  001401                          BEQ     .+4
000376  000000                          HLT                     ;REG 0 NOT SET CORRECTLY
                                ;TEST JSR AUTO DECREMENT
000400  000240                          SCOPE
000402  012706  003432                  MOV     #BUFF,LP        ;SET UP STACK
000406  012700  000416                  MOV     #.+10,%0        ;REG 0 POINTS TO THE HLT
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                                        JSR     %7,-(0)         ;TEST THE AUTO DECREMENT
                                        BR      .+4
                                        HLT                     ;DID NOT AUTO DECREMENT
                                        CMP     %0,#.-4
                                        BEQ     .+4
                                        HLT                     ;FALSE AUTO DECREMENT

                                ;TEST THE RTS INSTRUCTION

                                        SCOPE                           ;TEST (REG) TO (PC)
                                        MOV     #BUFF,LP        ;SET UP LINK POINTER
                                        MOV     #.+10,%0        ;RETURN TO REG 0
                                        RTS     %0              ;RETURN AS SPECIFIED BY (REG 0)
                                        HLT                     ;RTS FAILED
                                        OPR                     ;SHOULD RETURN HERE

                                        SCOPE                   ;TEST (LP+2) TO (LP)
                                        MOV     #BUFF,LP        ;SET UP LINK POINTER
                                        MOV     #.+6,%0         ;SET UP (REG 0)
                                        RTS     %0              ;RETURN TO (REG 0)
                                        CMP     LP,#BUFF+2      ;LP SHOULD BE INCREMENTED
                                        BEQ     .+4
                                        HLT                     ;LINK POINTER NOT CORRECT

                                        SCOPE                   ;TEST ((LP)) TO (REG 0)
                                        MOV     #"AB,BUFF       ;ASCII (AB) TO BUFFER
                                        MOV     #BUFF,LP        ;SET UP LINK POINTER
                                        MOV     #.+6,%0         ;RETURN POINTER TO 0
                                        RTS     %0              ;RETURN INSTRUCTION
                                        CMP     %0,#"AB         ;TEST ((LP)) TO REG 0)
                                        BEQ     .+4             ;BRANCH IF EQUAL
                                        HLT                     ;REG 0 NOT EQUAL ASCII "AB"


                                N=N+1
                                        SCOPE                   ;TEST ABILITY OF JSR TO JUMP
                                        MOV     #BUFF,LP        ;SET UP LINK POINTER
                                        JSR     %1,.+6          ;JSR AROUND HALT
                                        HLT                     ;JSR FAILED TO JUMP

                                        SCOPE                   ;TEST PC+2 TO REC 1
                                        MOV     #BUFF,LP        ;SET UP LINK POINTER
                                        JSR     %1,.+4          ;JSR TO NEXT INSTRUCTION
                                        CMP     #.,%1           ;TEST REG 1 FOR CORRECT MOVE
                                        BEQ     .+4             ;BRANCH IF CORRECT
                                        HLT                     ;REG 1 VALUE NOT CORRECT

                                        SCOPE                   ;TEST DECREMENT OF LP
                                        MOV     #BUFF,LP        ;SET UP LINK POINTER
                                        JSR     %1,.+4          ;JSR TO NEXT INSTRUCTION
                                        CMP     LP,#BUFF-2              ;TEST (LP) FOR INITIAL MINUS 2
                                        BEQ     .+4             ;BRANCH IF CORRECT
                                        HLT                     ;LINK POINTER NOT CORRECT
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                                SCOPE                   ;TEST TRANSFER OF (REG 1) TO (LP)
                                MOV     #-1,%1          ;INITIALIZE REG 1 TO ONES
                                MOV     #BUFF,LP        ;SET UP LINK POINTER
                                JSR     %1,.+4          ;JMP TO NEXT INSTRUCTION
                                CMP     BUFF-2,#-1      ;TEST BUFF-2 FOR ONES
                                BEQ     .+4
                                HLT                     ;(REG) WAS NOT TRANSFERED TO LP

                                SCOPE                   ;TEST JMP INDIRECT THE LITERAL
                                MOV     #BUFF,LP        ;SET UP POINTER
                                JSR     %1,@#.+6                ;JMP OVER THE HLT
                                HLT                     ;JSR FAILED
                                OPR                     ;SHOULD JUMP TO HERE

                                SCOPE                   ;TEST JSR INDIRECT A LOCATION
                                MOV     #BUFF,LP        ;SET UP LINK POINTER
                                JSR     %1,@.+4         ;JSR DEFERED NEXT LOCATION
                                .+4                     ;POINTS TO OPERATE INSTRUCTION
                                HLT                     ;FAILED TO JSR TO OPR
                                OPR                     ;SHOULD JSR HERE

                                SCOPE
                                MOV     #.+14,%1        ;POINT TO BRANCH .+4
                                MOV     #BUFF,LP
                                JSR     %1,@%1
                                HLT                     ;CURRENT REG USED INSTEAD OF PREVIOUS
                                BR      .+4
                                HLT
                                CMP     %1,#.-6
                                BEQ     .+4
                                HLT                     ;REG 1 NOT SET CORRECTLY
                        ;TEST JSR AUTO DECREMENT
                                SCOPE
                                MOV     #BUFF,LP        ;SET UP STACK
                                MOV     #.+10,%1        ;REG 1 POINTS TO THE HLT
                                JSR     %7,-(1)         ;TEST THE AUTO DECREMENT
                                BR      .+4
                                HLT                     ;DID NOT AUTO DECREMENT
                                CMP     %1,#.-4
                                BEQ     .+4
                                HLT                     ;FALSE AUTO DECREMENT

                        ;TEST THE RTS INSTRUCTION

                                SCOPE                           ;TEST (REG) TO (PC)
                                MOV     #BUFF,LP        ;SET UP LINK POINTER
                                MOV     #.+10,%1        ;RETURN TO REG 1
                                RTS     %1              ;RETURN AS SPECIFIED BY (REG 1)
                                HLT                     ;RTS FAILED
                                OPR                     ;SHOULD RETURN HERE

                                SCOPE                   ;TEST (LP+2) TO (LP)
                                MOV     #BUFF,LP        ;SET UP LINK POINTER
                                MOV     #.+6,%1         ;SET UP (REG 1)
                                RTS     %1              ;RETURN TO (REG 1)
                                CMP     LP,#BUFF+2      ;LP SHOULD BE INCREMENTED
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  375  001016  001401                          BEQ     .+4
  376  001020  000000                          HLT                     ;LINK POINTER NOT CORRECT
  377
  378  001022  000240                          SCOPE                   ;TEST ((LP)) TO (REG 1)
  379  001024  012767  041101  002400          MOV     #"AB,BUFF       ;ASCII (AB) TO BUFFER
  380  001032  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
  381  001036  012701  001044                  MOV     #.+6,%1         ;RETURN POINTER TO 1
  382  001042  000201                          RTS     %1              ;RETURN INSTRUCTION
  383  001044  020127  041101                  CMP     %1,#"AB         ;TEST ((LP)) TO REG 1)
  384  001050  001401                          BEQ     .+4             ;BRANCH IF EQUAL
  385  001052  000000                          HLT                     ;REG 1 NOT EQUAL ASCII "AB"
  386
  387
  388
  389
  390           000002                         N=N+1
  391  001054  000240                          SCOPE                   ;TEST ABILITY OF JSR TO JUMP
  392  001056  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
  393  001062  004267  000002                  JSR     %2,.+6          ;JSR AROUND HALT
  394  001066  000000                          HLT                     ;JSR FAILED TO JUMP
  395
  396  001070  000240                          SCOPE                   ;TEST PC+2 TO REC 2
  397  001072  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
  398  001076  004267  000000                  JSR     %2,.+4          ;JSR TO NEXT INSTRUCTION
  399  001102  022702  001102                  CMP     #.,%2           ;TEST REG 2 FOR CORRECT MOVE
  400  001106  001401                          BEQ     .+4             ;BRANCH IF CORRECT
  401  001110  000000                          HLT                     ;REG 2 VALUE NOT CORRECT
  402
  403  001112  000240                          SCOPE                   ;TEST DECREMENT OF LP
  404  001114  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
  405  001120  004267  000000                  JSR     %2,.+4          ;JSR TO NEXT INSTRUCTION
  406  001124  020627  003430                  CMP     LP,#BUFF-2              ;TEST (LP) FOR INITIAL MINUS 2
  407  001130  001401                          BEQ     .+4             ;BRANCH IF CORRECT
  408  001132  000000                          HLT                     ;LINK POINTER NOT CORRECT
  409
  410  001134  000240                          SCOPE                   ;TEST TRANSFER OF (REG 2) TO (LP)
  411  001136  012702  177777                  MOV     #-1,%2          ;INITIALIZE REG 2 TO ONES
  412  001142  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
  413  001146  004267  000000                  JSR     %2,.+4          ;JMP TO NEXT INSTRUCTION
  414  001152  026727  002252  177777          CMP     BUFF-2,#-1      ;TEST BUFF-2 FOR ONES
  415  001160  001401                          BEQ     .+4
  416  001162  000000                          HLT                     ;(REG) WAS NOT TRANSFERED TO LP
  417
  418  001164  000240                          SCOPE                   ;TEST JMP INDIRECT THE LITERAL
  419  001166  012706  003432                  MOV     #BUFF,LP        ;SET UP POINTER
  420  001172  004237  001200                  JSR     %2,@#.+6                ;JMP OVER THE HLT
  421  001176  000000                          HLT                     ;JSR FAILED
  422  001200  000240                          OPR                     ;SHOULD JUMP TO HERE
  423
  424  001202  000240                          SCOPE                   ;TEST JSR INDIRECT @ LOCATION
  425  001204  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
  426  001210  004277  000000                  JSR     %2,@.+4         ;JSR DEFERED NEXT LOCATION
  427  001214  001220                          .+4                     ;POINTS TO OPERATE INSTRUCTION
  428  001216  000000                          HLT                     ;FAILED TO JSR TO OPR
  429  001220  000240                          OPR                     ;SHOULD JSR HERE
  430
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                                        SCOPE
001222  000240
001224  012702  001240                  MOV     #.+14,%2        ;POINT TO BRANCH .+4
001230  012706  003432                  MOV     #BUFF,LP
001234  004212                          JSR     %2,@%2
001236  000000                          HLT                     ;CURRENT REG USED INSTEAD OF PREVIOUS
001240  000401                          BR      .+4
001242  000000                          HLT
001244  020227  001236                  CMP     %2,#.-6
001250  001401                          BEQ     .+4
001252  000000                          HLT                     ;REG 2 NOT SET CORRECTLY
                                ;TEST JSR AUTO DECREMENT
001254  000240                          SCOPE
001256  012706  003432                  MOV     #BUFF,LP        ;SET UP STACK
001262  012702  001272                  MOV     #.+10,%2        ;REG 2 POINTS TO THE HLT
001266  004742                          JSR     %7,-(2)         ;TEST THE AUTO DECREMENT
001270  000401                          BR      .+4
001272  000000                          HLT                     ;DID NOT AUTO DECREMENT
001274  020227  001270                  CMP     %2,#.-4
001300  001401                          BEQ     .+4
001302  000000                          HLT                     ;FALSE AUTO DECREMENT

                                ;TEST THE RTS INSTRUCTION

001304  000240                          SCOPE                           ;TEST (REG) TO (PC)
001306  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
001312  012702  001322                  MOV     #.+10,%2        ;RETURN TO REG 2
001316  000202                          RTS     %2              ;RETURN AS SPECIFIED BY (REG 2)
001320  000000                          HLT                     ;RTS FAILED
001322  000240                          OPR                     ;SHOULD RETURN HERE

001324  000240                          SCOPE                   ;TEST (LP+2) TO (LP)
001326  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
001332  012702  001340                  MOV     #.+6,%2         ;SET UP (REG 2)
001336  000202                          RTS     %2              ;RETURN TO (REG 2)
001340  020627  003434                  CMP     LP,#BUFF+2      ;LP SHOULD BE INCREMENTED
001344  001401                          BEQ     .+4
001346  000000                          HLT                     ;LINK POINTER NOT CORRECT

001350  000240                          SCOPE                   ;TEST ((LP)) TO (REG 2)
001352  012767  041101  002052          MOV     #"AB,BUFF       ;ASCII (AB) TO BUFFER
001360  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
001364  012702  001372                  MOV     #.+6,%2         ;RETURN POINTER TO 2
001370  000202                          RTS     %2              ;RETURN INSTRUCTION
001372  020227  041101                  CMP     %2,#"AB         ;TEST ((LP)) TO REG 2)
001376  001401                          BEQ     .+4             ;BRANCH IF EQUAL
001400  000000                          HLT                     ;REG 2 NOT EQUAL ASCII "AB"


        000003                          N=N+1
001402  000240                          SCOPE                   ;TEST ABILITY OF JSR TO JUMP
001404  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
001410  004367  000002                  JSR     %3,.+6          ;JSR AROUND HALT
001414  000000                          HLT                     ;JSR FAILED TO JUMP
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001416 000240                  SCOPE                    ;TEST PC+2 TO REC 3
001420 012706 003432           MOV     #BUFF,LP         ;SET UP LINK POINTER
001424 004367 000000           JSR     %3,.+4           ;JSR TO NEXT INSTRUCTION
001430 022703 001430           CMP     #.,%3            ;TEST REG 3 FOR CORRECT MOVE
001434 001401                  BEQ     .+4              ;BRANCH IF CORRECT
001436 000000                  HLT                      ;REG 3 VALUE NOT CORRECT

001440 000240                  SCOPE                    ;TEST DECREMENT OF LP
001442 012706 003432           MOV     #BUFF,LP         ;SET UP LINK POINTER
001446 004367 000000           JSR     %3,.+4           ;JSR TO NEXT INSTRUCTION
001452 020627 003430           CMP     LP,#BUFF-2               ;TEST (LP) FOR INITIAL MINUS 2
001456 001401                  BEQ     .+4              ;BRANCH IF CORRECT
001460 000000                  HLT                      ;LINK POINTER NOT CORRECT

001462 000240                  SCOPE                    ;TEST TRANSFER OF (REG 3) TO (LP)
001464 012703 177777           MOV     #-1,%3           ;INITIALIZE REG 3 TO ONES
001470 012706 003432           MOV     #BUFF,LP         ;SET UP LINK POINTER
001474 004367 000000           JSR     %3,.+4           ;JMP TO NEXT INSTRUCTION
001500 026727 001724 177777    CMP     BUFF-2,#-1       ;TEST BUFF-2 FOR ONES
001506 001401                  BEQ     .+4
001510 000000                  HLT                      ;(REG) WAS NOT TRANSFERED TO LP

001512 000240                  SCOPE                    ;TEST JMP INDIRECT THE LITERAL
001514 012706 003432           MOV     #BUFF,LP         ;SET UP POINTER
001520 004337 001526           JSR     %3,@#.+6                 ;JMP OVER THE HLT
001524 000000                  HLT                      ;JSR FAILED
001526 000240                  OPR                      ;SHOULD JUMP TO HERE

001530 000240                  SCOPE                    ;TEST JSR INDIRECT A LOCATION
001532 012706 003432           MOV     #BUFF,LP         ;SET UP LINK POINTER
001536 004377 000000           JSR     %3,@.+4          ;JSR DEFERED NEXT LOCATION
001542 001546                  .+4                      ;POINTS TO OPERATE INSTRUCTION
001544 000000                  HLT                      ;FAILED TO JSR TO OPR
001546 000240                  OPR                      ;SHOULD JSR HERE

001550 000240                  SCOPE
001552 012703 001566           MOV     #.+14,%3         ;POINT TO BRANCH .+4
001556 012706 003432           MOV     #BUFF,LP
001562 004313                  JSR     %3,@%3
001564 000000                  HLT                      ;CURRENT REG USED INSTEAD OF PREVIOUS
001566 000401                  BR      .+4
001570 000000                  HLT
001572 020327 001564           CMP     %3,#.-6
001576 001401                  BEQ     .+4
001600 000000                  HLT                      ;REG 3 NOT SET CORRECTLY
                       ;TEST JSR AUTO DECREMENT
001602 000240                  SCOPE
001604 012706 003432           MOV     #BUFF,LP         ;SET UP STACK
001610 012703 001620           MOV     #.+10,%3         ;REG 3 POINTS TO THE HLT
001614 004743                  JSR     %7,-(3)          ;TEST THE AUTO DECREMENT
001616 000401                  BR      .+4
001620 000000                  HLT                      ;DID NOT AUTO DECREMENT
001622 020327 001616           CMP     %3,#.-4
001626 001401                  BEQ     .+4
001630 000000                  HLT                      ;FALSE AUTO DECREMENT
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                                        ;TEST THE RTS INSTRUCTION

001632  000240                          SCOPE                           ;TEST (REG) TO (PC)
001634  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
001640  012703  001650                  MOV     #.+10,%3        ;RETURN TO REG 3
001644  000203                          RTS     %3              ;RETURN AS SPECIFIED BY (REG 3)
001646  000000                          HLT                     ;RTS FAILED
001650  000240                          OPR                     ;SHOULD RETURN HERE

001652  000240                          SCOPE                           ;TEST (LP+2) TO (LP)
001654  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
001660  012703  001666                  MOV     #.+6,%3         ;SET UP (REG 3)
001664  000203                          RTS     %3              ;RETURN TO (REG 3)
001666  020627  003434                  CMP     LP,#BUFF+2      ;LP SHOULD BE INCREMENTED
001672  001401                          BEQ     .+4
001674  000000                          HLT                     ;LINK POINTER NOT CORRECT

001676  000240                          SCOPE                           ;TEST ((LP)) TO (REG 3)
001700  012767  041101  001524          MOV     #"AB,BUFF       ;ASCII (AB) TO BUFFER
001706  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
001712  012703  001720                  MOV     #.+6,%3         ;RETURN POINTER TO 3
001716  000203                          RTS     %3              ;RETURN INSTRUCTION
001720  020327  041101                  CMP     %3,#"AB         ;TEST ((LP)) TO REG 3)
001724  001401                          BEQ     .+4             ;BRANCH IF EQUAL
001726  000000                          HLT                     ;REG 3 NOT EQUAL ASCII "AB"


000004                          N=N+1
001730  000240                          SCOPE                           ;TEST ABILITY OF JSR TO JUMP
001732  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
001736  004467  000002                  JSR     %4,.+6          ;JSR AROUND HALT
001742  000000                          HLT                     ;JSR FAILED TO JUMP

001744  000240                          SCOPE                           ;TEST PC+2 TO REC 4
001746  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
001752  004467  000000                  JSR     %4,.+4          ;JSR TO NEXT INSTRUCTION
001756  022704  001756                  CMP     #.,%4           ;TEST REG 4 FOR CORRECT MOVE
001762  001401                          BEQ     .+4             ;BRANCH IF CORRECT
001764  000000                          HLT                     ;REG 4 VALUE NOT CORRECT

001766  000240                          SCOPE                           ;TEST DECREMENT OF LP
001770  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
001774  004467  000000                  JSR     %4,.+4          ;JSR TO NEXT INSTRUCTION
002000  020627  003430                  CMP     LP,#BUFF-2              ;TEST (LP) FOR INITIAL MINUS 2
002004  001401                          BEQ     .+4             ;BRANCH IF CORRECT
002006  000000                          HLT                     ;LINK POINTER NOT CORRECT

002010  000240                          SCOPE                           ;TEST TRANSFER OF (REG 4) TO (LP)
002012  012704  177777                  MOV     #-1,%4          ;INITIALIZE REG 4 TO ONES
002016  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
002022  004467  000000                  JSR     %4,.+4          ;JMP TO NEXT INSTRUCTION
002026  026727  001376  177777          CMP     BUFF-2,#-1      ;TEST BUFF-2 FOR ONES
002034  001401                          BEQ     .+4
002036  000000                          HLT                     ;(REG) WAS NOT TRANSFERED TO LP
```

```
599
600  002040  000240                          SCOPE                   ;TEST JMP INDIRECT THE LITERAL
601  002042  012706  003432                  MOV     #BUFF,LP        ;SET UP POINTER
602  002046  004437  002054                  JSR     %4,@#.+6                ;JMP OVER THE HLT
603  002052  000000                          HLT                     ;JSR FAILED
604  002054  000240                          OPR                     ;SHOULD JUMP TO HERE
605
606  002056  000240                          SCOPE                   ;TEST JSR INDIRECT A LOCATION
607  002060  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
608  002064  004477  000000                  JSR     %4,@.+4         ;JSR DEFERED NEXT LOCATION
609  002070  002074                          .+4                     ;POINTS TO OPERATE INSTRUCTION
610  002072  000000                          HLT                     ;FAILED TO JSR TO OPR
611  002074  000240                          OPR                     ;SHOULD JSR HERE
612
613  002076  000240                          SCOPE
614  002100  012704  002114                  MOV     #.+14,%4        ;POINT TO BRANCH .+4
615  002104  012706  003432                  MOV     #BUFF,LP
616  002110  004414                          JSR     %4,@%4
617  002112  000000                          HLT                     ;CURRENT REG USED INSTEAD OF PREVIOUS
618  002114  000401                          BR      .+4
619  002116  000000                          HLT
620  002120  020427  002112                  CMP     %4,#.-6
621  002124  001401                          BEQ     .+4
622  002126  000000                          HLT                     ;REG 4 NOT SET CORRECTLY
623                              ;TEST JSR AUTO DECREMENT
624  002130  000240                          SCOPE
625  002132  012706  003432                  MOV     #BUFF,LP        ;SET UP STACK
626  002136  012704  002146                  MOV     #.+10,%4        ;REG 4 POINTS TO THE HLT
627  002142  004744                          JSR     %7,-(4)         ;TEST THE AUTO DECREMENT
628  002144  000401                          BR      .+4
629  002146  000000                          HLT                     ;DID NOT AUTO DECREMENT
630  002150  020427  002144                  CMP     %4,#.-4
631  002154  001401                          BEQ     .+4
632  002156  000000                          HLT                     ;FALSE AUTO DECREMENT
633
634                              ;TEST THE RTS INSTRUCTION
635
636  002160  000240                          SCOPE                           ;TEST (REG) TO (PC)
637  002162  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
638  002166  012704  002176                  MOV     #.+10,%4        ;RETURN TO REG 4
639  002172  000204                          RTS     %4              ;RETURN AS SPECIFIED BY (REG 4)
640  002174  000000                          HLT                     ;RTS FAILED
641  002176  000240                          OPR                     ;SHOULD RETURN HERE
642
643  002200  000240                          SCOPE                   ;TEST (LP+2) TO (LP)
644  002202  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
645  002206  012704  002214                  MOV     #.+6,%4         ;SET UP (REG 4)
646  002212  000204                          RTS     %4              ;RETURN TO (REG 4)
647  002214  020627  003434                  CMP     LP,#BUFF+2      ;LP SHOULD BE INCREMENTED
648  002220  001401                          BEQ     .+4
649  002222  000000                          HLT                     ;LINK POINTER NOT CORRECT
650
651  002224  000240                          SCOPE                   ;TEST ((LP)) TO (REG 4)
652  002226  012767  041101  001176          MOV     #"AB,BUFF       ;ASCII (AB) TO BUFFER
653  002234  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
654  002240  012704  002246                  MOV     #.+6,%4         ;RETURN POINTER TO 4
```

```
   655  002244  000204                          RTS     %4              ;RETURN INSTRUCTION
   656  002246  020427  041101                  CMP     %4,#"AB         ;TEST ((LP)) TO REG 4)
   657  002252  001401                          BEQ     .+4             ;BRANCH IF EQUAL
   658  002254  000000                          HLT                     ;REG 4 NOT EQUAL ASCII "AB"
   659
   660
   661
   662
   663          000005                          N=N+1
   664
   665                                  ;TEST RTI INSTRUCTION
   666  002256  000240                          SCOPE                   ;TEST ((LP)) TO (PC)
   667  002260  005067  001150                  CLR     BUFF+2          ;CLR RTI STATUS
   668  002264  012767  002302  001140          MOV     #.+16,BUFF      ;RETURN POINTER TO BUFFER
   669  002272  012706  003432                  MOV     #BUFF,LP        ;SET UP BUFFER POINTER
   670  002276  000002                          RTI                     ;RETURN
   671  002300  000000                          HLT                     ;RTI FAILED
   672  002302  000240                          OPR                     ;SHOULD RETURN HERE
   673
   674  002304  000240                          SCOPE                   ;TEST THAT (LP) +4 TO LP
   675  002306  012706  003432                  MOV     #BUFF,LP        ;SET UP BUFFER POINTER
   676  002312  012767  002322  001112          MOV     #.+10,BUFF      ;SET UP. RETURN
   677  002320  000002                          RTI                     ;RETURN NEXT INSTRUCTION
   678  002322  020627  003436                  CMP     LP,#BUFF+4      ;LP SHOULD BE PLUS 4
   679  002326  001401                          BEQ     .+4
   680  002330  000000                          HLT                     ;LP NOT INCREMENTED
   681
   682  002332  000240                          SCOPE                   ;TEST ((LP+2)) TO STATUS
   683  002334  012767  000357  001072          MOV     #357,BUFF+2     ;RETURN STATUS ALL ONES
   684  002342  012706  003432                  MOV     #BUFF,LP        ;SET UP BUFFER POINTER
   685  002346  012767  002360  001056          MOV     #.+12,BUFF      ;SET UP RETURN POINTER
   686  002354  000257                          CCC                     ;CLEAR CONDITION CODES
   687  002356  000002                          RTI                     ;RETURN
```

```

002360  001401                          BEQ     .+4
002362  000000                          HLT                     ;Z NOT SET
002364  102401                          BVS     .+4
002366  000000                          HLT                     ;V NOT SET
002370  100401                          BMI     .+4
002372  000000                          HLT                     ;N NOT SET
002374  103401                          BCS     .+4
002376  000000                          HLT                     ;C NOT SET

002400  000240                          SCOPE
002402  005067  001026                  CLR     BUFF+2          ;ZERO TO STATUS
002406  012706  003432                  MOV     #BUFF,LP
002412  012767  002424  001012          MOV     #.+12,BUFF
002420  000277                          SCC                     ;SET CONDITION CODES
002422  000002                          RTI                     ;RETURN
002424  001001                          BNE     .+4
002426  000000                          HLT                     ;Z NOT CLEARED
002430  102001                          BVC     .+4
002432  000000                          HLT                     ;V NOT CLEARED
002434  100001                          BPL     .+4
002436  000000                          HLT                     ;N NOT CLEARED
002440  103001                          BCC     .+4
002442  000000                          HLT                     ;C NOT CLEARED

                                ;TEST JSR %7, X
002444  000240                          SCOPE
002446  012706  003432                  MOV     #BUFF,LP        ;SETUP LINK POINTER
002452  004767  000002                  JSR     %7,.+6          ;JSR AROUND HALT
002456  000000                          HLT                     ;JSR %7,.+6 FAILED

002460  000240                          SCOPE
002462  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
002466  004767  000000                  JSR     %7,.+4          ;TO NEXT LOCATION
002472  020627  003430                  CMP     LP,#BUFF-2      ;TEST(LP) FOR INITAL MINUS 2
002476  001401                          BEQ     .+4
002500  000000                          HLT                     ;LINK POINTER NOT CORRECT

002502  000240                          SCOPE
002504  012706  003432                  MOV     #BUFF,LP        ;SET UP LINK POINTER
002510  004767  000000                  JSR     %7,.+4
002514  022767  002514  000706          CMP     #.,BUFF-2       ;TEST CONTENTS FOR STACK FOR RETURN PC
002522  001401                          BEQ     .+4
002524  000000                          HLT                     ;CONTENTS NOT CORRECT
```

```
   732  002526  000240                              SCOPE
   733  002530  012706  003432                      MOV     #BUFF,LP        ;SET UP LINK POINTER
   734  002534  012767  002564  000670              MOV     #RTS7F,BUFF     ;CONTENT OF STACK
   735  002542  012767  002562  000664              MOV     #RTS7E,BUFF+2
   736  002550  012767  002560  000652              MOV     #RTS7D,BUFF-2
   737  002556  004736                              JSR     %7,@(6)+        ;SHOULD SWAP (PC) AND (BUFF)
   738  002560  000000                      RTS7D:  HLT                     ;STACK NOT INCREMENT
   739  002562  000000                      RTS7E:  HLT                     ;STACK NOT DECREMENTED
   740  002564  022767  002560  000640      RTS7F:  CMP     #RTS7D,BUFF     ;STACK SHOULD STAND STILL
   741  002572  001401                              BEQ     .+4
   742  002574  000000                              HLT                     ;PC DID NOT GO TO BUFF
   743
   744                                      ;TEST RTS %7
   745  002576  000240                              SCOPE
   746  002600  012767  002634  000624              MOV     #RTS7A,BUFF     ;RETURN LOCATION TO STACK
   747  002606  012706  003432                      MOV     #BUFF,LP        ;SET UP STACK POINTER
   748  002612  012767  002630  000610              MOV     #RTS7B,BUFF-2   ;SET UP FOR FALSE DECREMENT
   749  002620  012767  002632  000606              MOV     #RTS7C,BUFF+2   ;SET UP FOR FALSE INCREMENT
   750  002626  000207                              RTS     %7
   751  002630  000000                      RTS7B:  HLT
   752  002632  000000                      RTS7C:  HLT
   753  002634  020627  003434              RTS7A:  CMP     LP,#BUFF+2      ;STACK POINTER DID NOT INCREMENT
   754  002640  001401                              BEQ     .+4
   755  002642  000000                              HLT
   756  002644  000240                              SCOPE
```

```
                                        ;TEST A JSR TO A JSR
002646  000240                                SCOPE
002650  012706  003432                        MOV     #BUFF,LP
002654  004767  000002                        JSR     %7,.+6
002660  000000                                HLT                     ;JSR FAILED
002662  004767  000002                        JSR     %7,.+6
002666  000000                                HLT                     ;JSR TO JSR FAILED
002670  022767  002666  000530                CMP     #.-2,BUFF-4
002676  001401                                BEQ     .+4
002700  000000                                HLT                     ;STACK NOT PUSHED FOR TWO JSR
002702  020627  003426                        CMP     LP,#BUFF-4
002706  001401                                BEQ     .+4
002710  000000                                HLT                     ;PC ON STACK WRONG
                                        ;TEST AM RTS TO A RTS
002712  000240                                SCOPE
002714  012706  003432                        MOV     #BUFF,LP
002720  012746  002740                        MOV     #RTS1,-(6)      ;SET STACK UP
002724  012746  002734                        MOV     #RTS2,-(6)      ;SET STACK UP
002730  000207                                RTS     %7
002732  000000                                HLT                     ;STACK DID NOT POP
002734  000207                        RTS2:   RTS     %7
002736  000000                                HLT                     ;RTS TO RTS FAILED
002740  000240                        RTS1:   SCOPE
002742  000240                                SCOPE
002744  012706  003432                        MOV     #BUFF,LP
002750  005067  000352                        CLR     FLAG
002754  004767  000310                        JSR     %7,SUBR2        ;SHOULD COMPLIMENT FLAG
002760  005767  000342                        TST     FLAG
002764  100401                                BMI     .+4             ;TEST FLAG
002766  000000                                HLT                     ;FLAG NOT COMPLIMENTED

002770  000240                                SCOPE
002772  012706  003432                        MOV     #BUFF,LP
002776  004767  000264                        JSR     %7,SUBR1        ;IMMEDIATE RETURN
003002  000401                                BR      .+4
003004  000000                                HLT                     ;RTS AT SUB1 FAILED
003006  000240                                SCOPE

003010  012706  003432                        MOV     #BUFF,LP
003014  005067  000306                        CLR     FLAG
003020  004767  000252                        JSR     %7,SUBR3
003024  005767  000276                        TST     FLAG
003030  100401                                BMI     .+4
003032  000000                                HLT                     ;JSR OR RTS TWO DEEP
003034  000240                                SCOPE                   ;FAILED
003036  012706  003432                        MOV     #BUFF,LP
003042  005067  000260                        CLR     FLAG
003046  004767  000232                        JSR     %7,SUBR4
003052  005767  000250                        TST     FLAG
003056  100401                                BMI     .+4
003060  000000                                HLT                     ;JSR OR RTS THREE
003062  000240                                SCOPE                   ;DEEP FAILED
```

```
                                                MOV     #BUFF,LP
003064  012706  003432                          CLR     FLAG
003070  005067  000232                          JSR     %7,SUBR5
003074  004767  000212                          BMI     .+4
003100  100401                                  HLT                     ;JSR OR RTS FOUR
003102  000000                                  SCOPE                   ;DEEP FAILED
003104  000240
                                                MOV     #BUFF,LP
003106  012706  003432                          CLR     FLAG
003112  005067  000210                          JSR     %7,SUBR6
003116  004767  000176                          TST     FLAG
003122  005767  000200                          BMI     .+4
003126  100401                                  HLT                     ;JSR OR RTS FIVE
003130  000000                                  SCOPE                   ;DEEP FAILED
003132  000240                                  CCC
003134  000257
003136  012706  003432                          MOV     #BUFF,LP
003142  005067  000160                          CLR     FLAG
003146  004767  000146                          JSR     %7,SUBR6
003152  100401                                  BMI     .+4
003154  000000                                  HLT                     ;JSR OR RTS FAILED
003156  001001                                  BNE     .+4
003160  000000                                  HLT                     ;JSR OR RTS FAILED
003162  102001                                  BVC     .+4
003164  000000                                  HLT                     ;JSR OR RTS FAILED
003166  103401                                  BCS     .+4
003170  000000                                  HLT                     ;JSR OR RTS FAILED
003172  000240                                  SCOPE

003174  000277                                  SCC
003176  012706  003432                          MOV     #BUFF,LP
003202  005067  000120                          CLR     FLAG
003206  004767  000106                          JSR     %7,SUBR6
003212  100401                                  BMI     .+4
003214  000000                                  HLT                     ;JSR OR RTS FAILED
003216  001001                                  BNE     .+4
003220  000000                                  HLT                     ;JSR OR RTS FAILED
003222  102001                                  BVC     .+4
003224  000000                                  HLT                     ;JSR OR RTS FAILED
003226  103401                                  BCS     .+4
003230  000000                                  HLT                     ;JSR OR RTS FAILED
003232  000240                                  SCOPE
003234  005267  000070                          INC     LOOP
003240  100010                                  BPL     FIN
003242  005067  000062                          CLR     LOOP
003246  012737  000207  177566                  MOV     #207,@#177566
003254  105737  177564                          TSTB    @#177564
003260  100375                                  BPL     .-4
003262  000167  174712          FIN:            JMP     200
                                ;GROUP OF NESTED SUBROUTINES
003266  000207                  SUBR1:          RTS     %7              ;ONE INSTRUCTION
003270  005167  000032          SUBR2:          COM     FLAG            ;ONE DEEP
003274  000207                                  RTS     %7
003276  004767  177766          SUBR3:          JSR     %7,SUBR2                ;TWO DEEP
003302  000207                                  RTS     %7
003304  004767  177766          SUBR4:          JSR     %7,SUBR3                ;THREE DEEP
```

```
   866  003310  000207                          RTS     %7
   867  003312  004767  177766          SUBR5:  JSR     %7,SUBR4                ;FOUR DEEP
   868  003316  000207                          RTS     %7
   869  003320  004767  177766          SUBR6:  JSR     %7,SUBR5                ;FIVE DEEP
   870  003324  000207                          RTS     %7
   871  003326  000000                  FLAG:   0
   872  003330  000000                  LOOP:   0                       ;LOOP COUNT
   873          003432                  .=.+100
   874  003432  000000                  BUFF:   0
   875          000001                          .END
```

I02


```
BUFF    003432  210   215   222   224   230   232   237   243   251   261   273   280   283
                288*  289   301   306   313   315   321   323   328   334   342   352   364
                371   374   379*  380   392   397   404   406   412   414   419   425   433
                443   455   462   465   470*  471   483   488   495   497   503   505   510
                516   524   534   546   553   556   561*  562   574   579   586   588   594
                596   601   607   615   625   637   644   647   652*  653   667*  668*  669
                675   676*  678   683*  684   685*  699*  700   701*  715   720   722   727
                729   733   734*  735*  736*  740   746*  747   748*  749*  753   760   765
                768   773   782   790   796   803   811   818   826   840   874#
FIN     003262  853   858#
FLAG    003326  783*  785   797*  799   804*  806   812*  819*  821   827*  841*  861*  871#
HLT   = 000000  167#  212   219   226   234   239   246   253   255   258   265   268   276
                285   294   303   310   317   325   330   337   344   346   349   356   359
                367   376   385   394   401   408   416   421   428   435   437   440   447
                450   458   467   476   485   492   499   507   512   519   526   528   531
                538   541   549   558   567   576   583   590   598   603   610   617   619
                622   629   632   640   649   658   671   680   690   692   694   696   705
                707   709   711   717   724   731   738   739   742   751   752   755   762
                764   767   770   777   779   787   793   801   808   815   823   830   832
                834   836   844   846   848   850
LOOP    003330  852*  854*  872#
LP    =%000006  171#  210*  215*  222*  224   230*  237*  243*  251*  261*  273*  280*  283
                289*  301*  306*  313*  315   321*  328*  334*  342*  352*  364*  371*  374
                380*  392*  397*  404*  406   412*  419*  425*  433*  443*  455*  462*  465
                471*  483*  488*  495*  497   503*  510*  516*  524*  534*  546*  553*  556
                562*  574*  579*  586*  588   594*  601*  607*  615*  625*  637*  644*  647
                653*  669*  675*  678   684*  700*  715*  720*  722   727*  733*  747*  753
                760*  768   773*  782*  790*  796*  803*  811*  818*  826*  840*
N     = 000005  208#  209   299#  300   390#  391   481#  482   572#  573   663#
NOP   = 000240  170#
OPR   = 000240  169#  240   247   277   331   338   368   422   429   459   513   520   550
                604   611   641   672
RTS1    002740  774   780#
RTS2    002734  775   778#
RTS7A   002634  746   753#
RTS7B   002630  748   751#
RTS7C   002632  749   752#
RTS7D   002560  736   738#  740
RTS7E   002562  735   739#
RTS7F   002564  734   740#
SCOPE = 000240  168#  209   214   221   228   236   242   249   260   272   279   287   300
                305   312   319   327   333   340   351   363   370   378   391   396   403
                410   418   424   431   442   454   461   469   482   487   494   501   509
                515   522   533   545   552   560   573   578   585   592   600   606   613
                624   636   643   651   666   674   682   698   714   719   726   732   745
                756   759   772   780   781   789   794   802   809   816   824   837   851
SUBR1   003266  791   860#
SUBR2   003270  784   861#  863
SUBR3   003276  798   863#  865
SUBR4   003304  805   865#  867
SUBR5   003312  813   867#  869
SUBR6   003320  820   828   842   869#
.     = 003434  172#  173   175   177   179   181   183   185   187   189   191   193   195
                197   199   201   203   205#  211   216   217   218   223   225   231   233
                238   244   245   250   254   256   257   262   264   266   267   274   281
                284   290   293   302   307   308   309   314   316   322   324   329   335
```

DOMA.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

```
COMMEN      1#
ENDCOM      1#
ESCAPE      1#
GETPRI      1#
GETSWR      1#
MULT        1#
NEWTST      1#
POP         1#
PUSH        1#
REPORT      1#
SETPRI      1#
SETUP       1#
SKIP        1#
SLASH       1#
STARS       1#
SWRSU       1#
TJSRA     207#    209     300     391     482     573
TYPBIN      1#
TYPDEC      1#
TYPNAM      1#
TYPNUM      1#
TYPOCS      1#
TYPOCT      1#
TYPTXT      1#
$$ESCA      1#
$$NEWT      1#
$$SKIP      1#
.EQUAT      1#
.HEADE      1#
.KT11       1#
.SETUP      1#
.SWRHI      1#
.$ACTI      1#
.$APTB      1#
.$APTH      1#
.$APTY      1#
.$ASTA      1#
.$CATC      1#
.$CMTA      1#
.$DB2C      1#
.$DB2O      1#
.$DIV       1#
.$EOP       1#
.$ERRO      1#
.$ERRT      1#
.$MULT      1#
.$POWE      1#
.$RAND      1#
.$RDDE      1#
.$RDOC      1#
.$READ      1#
.$T2AZ      1#
.$SAVE      1#
.$SB2D      1#
.$SB2O      1#
.$SCOP      1#
```

```
.$SIZE      1#
.$SUPR      1#
.$TRAP      1#
.$TYPB      1#
.$TYPD      1#
.$TYPE      1#
.$TYPO      1#
.$40CA      1#
.1170       1#
```

M02

DOMA.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

```
BCC      710
BCS      695  835  849
BEQ      218  225  233  257  267  284  293  309  316  324  348  358  375  384  400
         407  415  439  449  466  475  491  498  506  530  540  557  566  582  589
         597  621  631  648  657  679  689  723  730  741  754  766  769
BMI      693  786  800  807  814  822  829  843
BNE      704  831  845
BPL      708  853  857
BR       254  264  345  355  436  446  527  537  618  628  792
BVC      706  833  847
BVS      691
CCC      686  825
CLR      667  699  783  797  804  812  819  827  841  854
CMP      217  224  232  256  266  283  292  308  315  323  347  357  374  383  399
         406  414  438  448  465  474  490  497  505  529  539  556  565  581  588
         596  620  630  647  656  678  722  729  740  753  765  768
COM      861
HALT     167  174  176  178  180  182  184  186  188  190  192  194  196  198  200
         202  204
INC      852
JMP      858
JSR      211  216  223  231  238  244  252  263  302  307  314  322  329  335  343
         354  393  398  405  413  420  426  434  445  484  489  496  504  511  517
         525  536  575  580  587  595  602  608  616  627  716  721  728  737  761
         763  784  791  798  805  813  820  828  842  863  865  867  869
MOV      210  215  222  229  230  237  243  250  251  261  262  273  274  280  281
         288  289  290  301  306  313  320  321  328  334  341  342  352  353  364
         365  371  372  379  380  381  392  397  404  411  412  419  425  432  433
         443  444  455  456  462  463  470  471  472  483  488  495  502  503  510
         516  523  524  534  535  546  547  553  554  561  562  563  574  579  586
         593  594  601  607  614  615  625  626  637  638  644  645  652  653  654
         668  669  675  676  683  684  685  700  701  715  720  727  733  734  735
         736  746  747  748  749  760  773  774  775  782  790  796  803  811  818
         826  840  855
RTI      670  677  687  703
RTS      275  282  291  366  373  382  457  464  473  548  555  564  639  646  655
         750  776  778  860  862  864  866  868  870
SCC      702  839
TST      785  799  806  821
TSTB     856
.ENABL     1
.END     875
.LIST      1
.MACR    207
.MACRO     1
.NLIST     1
.REM       1
.REPT    173  209
```

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

*,DOMA.SEQ/SOL/CRF/PAGNUM/NL:TOC=SYSMAC.CO,DOMA.P11

CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

RUN-TIME: 21 23 1 SECONDS
RUN-TIME RATIO: 304/47=6.4
CORE USED: 33K (65 PAGES)

Spooler runtime 3 Seconds, 19 KCS, 80 disk reads, 4 disk writes, 26 pages