

11/03

LSI-11 EIS INST TEST
CVKABBO

AH-S366B-MC
FICHE 1 OF 1

MAR 1982
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MADE IN USA



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.REPT 0

IDENTIFICATION

PRODUCT CODE: AC-8190B-MC
PRODUCT NAME: CVKABBO LSI-11 EIS INST TEST
DATE CREATED: JULY, 1981
MAINTAINER: DIAGNOSTIC GROUP

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CONTENTS

50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101

- 1. ABSTRACT
- 2. REQUIREMENTS
 - 2.1 EQUIPMENT
 - 2.2 STORAGE
 - 2.3 PRELIMINARY PROGRAMS
- 3. LOADING PROCEDURE
- 4. STARTING PROCEDURE
 - 4.1 CONTROL SWITCH SETTINGS
 - 4.2 STARTING ADDRESS
 - 4.3 PROGRAM AND/OR OPERATOR ACTION
- 5. OPERATING PROCEDURE
 - 5.1 SWITCH SETTINGS
 - 5.2 SUBROUTINE ABSTRACTS
- 6. ERRORS
 - 6.1 ERROR PRINTOUT
 - 6.2 ERROR RECOVERY
- 7. RESTRICTIONS
- 8. MISCELLANEOUS
 - 8.1 EXECUTION TIME
 - 8.2 STACK POINTER
 - 8.3 PASS COUNTER
 - 8.4 TEST NUMBER
 - 8.5 POWER FAIL
- 9. PROGRAM DESCRIPTION

103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
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1. ABSTRACT

THIS PROGRAM TESTS THE LSI-11 EXTENDED INSTRUCTION SET <ASH, ASHC, MUL, AND DIV> OPTION USING REGISTERS 0-5 AT-LEAST ONCE WITH EACH INSTRUCTION. IT IS ALSO CHECKED THAT EXTENDED INSTRUCTIONS CAN BE INTERRUPTED (BY THE CONSOLE TELETYPE) [HOWEVER THIS TEST WILL NOT BE EXECUTED WHEN BIT 5 OF \$ENVM BYTE IS HIGH]. THE PROGRAM SHOULD BE RUN FOR AT LEAST 2 PASSES WITH ALL SWITCHES LOW. THE PROGRAM IS DESIGNED TO RUN UNDER APT. AND ACT. SYSTEMS. WHEN RUNNING UNDER APT WITH BIT 5 OF \$ENVM LOW IT WILL BE REQUIRED TO HAVE A SLU WITH TTY REGISTERS HAVING ADDRESSES OF 176560-66 AND INTERRUPT VECTORS OF 70 FOR RECEIVER AND 74 FOR TRANSMITTER

2. REQUIREMENTS

2.1 EQUIPMENT

LSI-11 STANDARD COMPUTER WITH EIS OPTION AND 4K OF MEMORY

2.2 STORAGE

PROGRAM STORAGE - THE ROUTINES USE MEMORY 0 - 17500

2.3 PRELIMINARY PROGRAMS

NONE

3. LOADING PROCEDURE

USE STANDARD PROCEDURE FOR ABS TAPES.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

SEE 5.1 (ALL LOW FOR WORST CASE TESTING)

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4.2 STARTING ADDRESS

AFTER LOADING THE PROGRAM IT SHOULD ALWAYS BE STARTED AT 200. IF IT IS DESIRED TO SAVE THE PASS COUNTER THEN THE PROGRAM SHOULD BE RESTARTED AT LOCATION RESTRT [I.E. 222] OTHERWISE THE PROGRAM CAN BE RESTARTED AT 200

4.3 PROGRAM AND/OR OPERATOR ACTION

4.3.1 STAND ALONE

- 1) PLACE LTC SWITCH IN OFF POSITION (IF APPLICABLE).
- 2) LOAD PROGRAM INTO MEMORY USING ABS LOADER OR XXDP+ (.R VKAB??).
- 3) SET SWITCHES (SEE SEC 5.1) ALL LOW FOR WORST CASE.
- 4) TYPE 200G IF USING ABS LOADER.
- 5) THE PROGRAM WILL LOOP AND "END PASS" WILL BE TYPED AFTER COMPLETION OF FIRST PASS AND EVERY 4TH PASS. HOWEVER TYPE OUT WILL BE SUPPRESSED IF BIT 5 OF LOCATION \$ENVM IS HIGH
- 6) A MINIMUM OF TWO PASSES SHOULD ALWAYS BE RUN.

4.3.2 UNDER APT

LOAD THE PROGRAM AND START AFTER SETTING THE DESIRED SWITCHES (SEE SEC. 5.1). HOWEVER IF THE DIAGNOSTIC IS RUN UNDER APT. WITH BIT 5 OF \$ENVM LOW THEN IT WILL BE REQUIRED THAT A SLU WITH TTY REGISTERS HAVING ADDRESSES OF 176560-66, AND INTERRUPT VECTORS OF 70 FOR RECEIVER AND 74 FOR TRANSMITTER BE PRESENT, IT WILL ALSO BE REQUIRED TO CHANGE THE PASS TIME FROM 5 SEC. TO 15 SECONDS AND THE TEST TIME FROM 3 TO 10 SECONDS

5. OPERATING PROCEDURE

5.1 SWITCH SETTINGS

A 16 BIT LOCATION CALLED \$SWREG (I.E. LOCATION 422) HAS BEEN USED TO GIVE THE FOLLOWING OPTIONS BY INSERTING A 1 IN THEIR RESPECTIVE POSITIONS

BIT #	OCTAL VALUE	FUNCTION
15	100000.....	HALT ON ERROR
13	020000.....	INHIBIT PRINTOUT

AN 8 BIT BYTE \$ENVM [I.E. LOCATION 421] HAS BEEN USED TO DEFINE THE OPERATING MODE. ALL TYPEOUTS CAN BE SUPPRESSED BY MAKING BIT 5 OF BYTE \$ENVM HIGH, IN OTHER WORDS BY PLACING A 20000 IN LOCATION 420

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5.2 SUBROUTINE ABSTRACTS

5.2.1 HALT ROUTINE

THIS ROUTINE CALLED VIA JSR INSTRUCTION IS USED EACH TIME AN ERROR IS SEEN AND AN ERROR MESSAGE OF THE FORMAT GIVEN IN SEC. 6.1 IS TYPED OUT UNLESS SUPRESSED BY THE SWITCHES DEFINED IN SEC. 5.1

5.2.2 TRAP CATCHER

A ".+2" - "HALT" SEQUENCE IS REPEATED FROM 0-776 TO CATCH ANY UNEXPECTED TRAPS. THUS ANY UNEXPECTED TRAPS OR INTERRUPTS WILL HALT AT THE VECTOR +2.

6. ERRORS

6.1 ERROR PRINTOUT

THE FORMAT IS AS FOLLOWS:

ADR ERRNM

WHERE:

ADR = ADDRESS OF ERROR

ERRNM = ERROR NUMBER

IN MOST CASES THE COMMENT BESIDE THE CALL FOR HALT SUBROUTINE TELLS WHAT WAS BEING CHECKED AND WHAT WAS EXPECTED. ALL PRINTOUTS WILL BE SUPPRESSED WHEN BIT 5 OF LOCATION \$ENVM IS HIGH. WHILE RUNNING UNDER APT THE DIAGNOSTIC WILL NOT SUPPORT SPOOLING OF CONSOLE OUTPUTS.

6.2 ERROR RECOVERY

RESTART AT 200 OR 222 (SEE SEC 4.2)

7. RESTRICTIONS

NONE

8. MISCELLANEOUS

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8.1 EXECUTION TIME

DUE TO THE RANDOM CHARACTERISTIC OF THE INTERRUPT TESTS, THE EXECUTION TIME CAN BE 5 SECONDS OR MORE PER PASS. HOWEVER, NORMALLY FIRST "END PASS" WILL BE TYPED WITHIN 5 SECONDS AND WITHIN 50 SECONDS FOR EVERY CONSECUTIVE 10 PASSES

8.2 STACK POINTER

STACK IS INITIALLY SET TO 600

8.3 PASS COUNT

A 16 BIT LOCATION "\$PASS" (I.E. LOCATION 406) IS USED TO KEEP PASS COUNT. IT CAN BE CLEARED BY RESTARTING THE PROGRAM AT 200

8.4 TEST NUMBER

A 16 BIT LOCATION "\$TESTN" (I.E. LOCATION 404) IS USED TO KEEP TRACK OF THE TEST NUMBER, UPPER BYTE OF THIS LOCATION GIVES THE ITERATION NUMBER AND THE LOWER BYTE THE TEST THAT WAS BEING EXECUTED

8.5 POWER FAIL

THE DIAGNOSTIC CAN BE POWER FAILED WITH NO ERRORS. TO USE, START THE TEST AS USUAL AND POWER DOWN THEN UP AT ANY TIME, THE PROGRAM SHOULD RESTART FROM TEST 0 AFTER TYPING "POWER" WITH NO ERRORS. HOWEVER IF THE PROGRAM IS STORED IN A MOS MEMORY THAT CAN NOT HOLD DATA WITH POWER DOWN THEN THE PROGRAM WILL NOT RECOVER FROM A POWER FAIL

9. PROGRAM DESCRIPTION

THIS PROGRAM TESTS ALL THE EIS INSTRUCTIONS OF THE LSI-11 FOR ASH AND ASHC INSTRUCTIONS EVERY EVEN PASS IS EXECUTED WITH DESTINATION MODE 0 FOR ALL REGISTERS AND EVERY ODD PASS WITH DESTINATION MODE OF 67. THE DIAGNOSTIC DOES NOT MAKE A PASS WITH T BIT SET.

.ENDR

319
320
321
322
325
(1)
(1)
(1)
(1)
(1)
(1)
(1)
(1)
(1)
(1)
(1)
(1)
326
327

000001
160000

```
.ABS  
.NLIST MD,MC,CND  
.LIST ME  
.TITLE DVKABA  
:*COPYRIGHT (C) AUGUST 1975  
:*DIGITAL EQUIPMENT CORP.  
:*MAYNARD, MASS. 01754  
:*  
:*PROGRAM BY PERVEZ ZAKI  
:*  
:*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC  
:*PACKAGE (MAINDEC-11-DZQAC-C5), JAN, 1981.  
:*  
$TN=1  
$SWR=160000      ;:HALT ON ERROR, LOOP ON TEST, INHIBIT ERROR TYPOU1
```



```
329  
330 ;:*****  
331  
332 000000 ;=0 ;TRAP CATCHER 0 - 776  
333  
334 ;:*****  
341  
342 .SBTTL ACT11 HOOKS  
(1)  
(2) ;:*****  
(1) ;HOOKS REQUIRED BY ACT11  
(1) 001000 $SVPC=. ;SAVE PC  
(1) 000046 000046 .=46  
(1) 000046 017032 $ENDAD ;:1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP  
(1) 000052 000052 .=52  
(1) 000052 000000 .WORD 0 ;:2)SET LOC.52 TO ZERO  
(1) 000052 001000 .= $SVPC ;: RESTORE PC  
343  
344 000000 DUMMY= 0  
345 000001 ERRNM= 1  
346 000051 F= 51  
347 000176 N= 176  
348 000007 PC= %7  
349 000006 SP= %6  
350 010701 SCOPE= 10701  
351 010701 SCOPE1= 10701  
352 010703 SCOPE3= 10703  
353 001000 SW09= 1000  
354 002000 SW10= 2000  
355 004000 SW11= 4000  
356 010000 SW12= 10000  
357 000004 TYPE= 10T  
358  
359  
360 000020 000020 ;=20  
361 000020 017300 $TYPE
```

363 000400
364
(1)
(2)
(1)
(1) 000400
(1) 000400 000000
(1) 000402 000000
(1) 000404 000000
(1) 000406 000000
(1) 000410 000000
(1) 000412 000000
(1) 000414 000000
(1) 000416 000000
(1) 000420
(1) 000420 000
(1) 000421 000
(1) 000422 000000
(1) 000424 000000
(1) 000426 000000
(1)
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(1) 000430
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366
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(1) 000430
(1) 000024 000024
(1) 000024 000200
(1) 000044 000044
(1) 000044 000430
(1) 000430
(2)
(1)
(1)
(1)
(1) 000430
(1) 000430 000000
(1) 000432 000400
(1) 000434 000003
(1) 000436 000005
(1) 000440 000000
(1) 000442 000014
367
368 000430 000430
369 000430
370 000432
371 000432

```
.=400
.SBTTL APT MAILBOX-ETABLE

:*****
.EVEN
$MAIL:                ;; APT MAILBOX
$MSGTY: .WORD  AMSGTY  ;; MESSAGE TYPE CODE
$FATAL: .WORD  AFATAL  ;; FATAL ERROR NUMBER
$TESTN: .WORD  ATESTN  ;; TEST NUMBER
$PASS:  .WORD  APASS   ;; PASS COUNT
$DEVCT: .WORD  ADEVCT  ;; DEVICE COUNT
$UNIT:  .WORD  AUNIT   ;; I/O UNIT NUMBER
$MSGAD: .WORD  AMSGAD  ;; MESSAGE ADDRESS
$MSGLG: .WORD  AMSGLG  ;; MESSAGE LENGTH
$ETABLE:                ;; APT ENVIRONMENT TABLE
$ENV:   .BYTE  AENV    ;; ENVIRONMENT BYTE
$ENVM:  .BYTE  AENVM   ;; ENVIRONMENT MODE BITS
$SWREG: .WORD  ASWREG  ;; APT SWITCH REGISTER
$USWR:  .WORD  AUSWR   ;; USER SWITCHES
$CPUOP: .WORD  ACPUOP  ;; CPU TYPE, OPTIONS
: *
: *                      BITS 15-11=CPU TYPE
: *                      11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
: *                      11/70=06,PDQ=07,Q=10
: *                      BIT 10=REAL TIME CLOCK
: *                      BIT  9=FLOATING POINT PROCESSOR
: *                      BIT  8=MEMORY MANAGEMENT
$ETEND:
.MEXIT

.SBTTL APT PARAMETER BLOCK

:*****
:SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
:*****
.$X=                ;;SAVE CURRENT LOCATION
.=24                ;;SET POWER FAIL TO POINT TO START OF PROGRAM
200                 ;;FOR APT START UP
.=44                ;;POINT TO APT INDIRECT ADDRESS PNTR.
$APTHDR             ;;POINT TO APT HEADER BLOCK
.=.$X               ;;RESET LOCATION COUNTER
:*****
:SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
:INTERFACE SPEC.

$APTHD:
$HIBTS: .WORD  0      ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
$MBADR: .WORD  $MAIL  ;;ADDRESS OF APT MAILBOX (BITS 0-15)
$STMT:  .WORD  3      ;;RUN TIM OF LONGEST TEST
$PASTM: .WORD  5      ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
$UNITM: .WORD      ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
        .WORD  $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)

COUNT:            .= $APTHD
PSWORD:            .= COUNT+2
```



```

716          000200      012737      017064      000024      .=200
717 000200 012737 017064 000024      MOV      #SPWRDN,@#24      ;PREPARE TO SERVICE POWER DOWN ROUTINE
718 000206 012700 000410      MOV      #$DEVCT,R0      ;PREPARE TO INITIALIZE THE STACK
719 000212 005040      2$:      CLR      -(R0)
720 000214 022700 000400      CMP      #SMAIL,R0
721 000220 001374      BNE     2$
722 000222 000167 000352      RESTRT: JMP      BEGIN
723
724          000600      .=600
725
726 000600 012705 000404      BEGIN:  MOV      #STESTN,R5      ;MAKE R5 POINT TO THE LOCATION $TESTN
727 000604 005037 000430      CLR      @#COUNT      ;CLEAR THE COUNTER
728 000610 012715 000001      MOV      #1,(R5)      ;INITIALIZE TEST NUMBER
729 000614 012706 000600      MOV      #BEGIN,SP      ;** STACK AT BEGIN **
733 000620      MTPS     #0      ;PLACE #0 IN PSW
(1) 000620 106427      .WORD   106400!...C
737 000624 132737 000001 000420      BITB    #1,@#$ENV      ;ARE WE UNDER APT ?
738 000632 001410      BEQ     2$      ;IF NOT THEN GO TO 2$
739 000634 012700 000510      MOV      #STPS+2,R0      ;OTHERWISE SET FOR OTHER SLU
740 000640 012740 176564      MOV      #176564,-(R0)
741 000644 012740 176566      MOV      #176566,-(R0)
742 000650 012740 000074      MOV      #74,-(R0)
743 000654 012737 000001 000434 2$:      MOV      #1,@#TEMP1      ;TEMP1=1
744 000662 005037 000436      CLR      @#TEMP2      ;TEMP2=0
745 000666 012737 000001 000440      MOV      #1,@#TEMP3      ;TEMP3=1
746 000674 005037 000442      CLR      @#TEMP4      ;TEMP4=0
747
748
752
753          ;*****
754          ;      ASH INSTRUCTION TESTS
755          ;*****
756
757
758
759
760
761          ;*****
762          ;      TESTS 1-36
763          ;*****
764
765 000700 010701      START:  SCOPE1
766 000702 013700 000434      MOV      @#TEMP1,%0      ;LOAD R0 WITH THE CONTENTS OF TEMP1
767 000706 032737 000001 000406      BIT      #1,@#$PASS      ;IS IT AN EVEN PASS ?
768 000714 001004      BNE     2$      ;IF NOT THEN GO TO 2$
769 000716 013701 000436      MOV      @#TEMP2,R1      ;OTHERWISE EXECUTE THE INSTRUCTION
770          ;IN MODE 0 USING R1
771 000722 072001      ASH     R1,R0
772 000724 000402      BR      4$
773 000726 C72067 177504      2$:      ASH     TEMP2,%0      ;SHIFT R0 BY THE NUMBER SPECIFIED BY TEMP2
777 000732      MFPS    @#PSWORD      ;SAVE PS
(1) 000732 106737      .WORD   106700!...C
781 000736 123737 000442 000432      CMPB    @#TEMP4,@#PSWORD;IS THE PS = TEMP4 ?
782 000744 001403      BEQ     +10
783 000746 004767 016142      JSR     PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(2)          ;THE PS IS NOT EQUAL TO 0
    
```

(2)	000752	000001		1					
784	000754	005237	000430	INC	@#COUNT				:INCREMENT THE COUNTER
785	000760	023700	000440	CMP	@#TEMP3,%0				:IS THE RESULT IN R0 EQUAL TO TEMP3?
786	000764	001403		BEQ	+.10				
787	000766			6\$:					
(2)	000766	004767	016122	JSR	PC,\$HLT				:SEEN AN ERROR, GO TO TH HALT ROUTINE :EITHER INCORRECT R0 OR INCORRECT SEQUENCE
(2)				2					
788	000772	000002		CMP	(R5),@#COUNT				:IS THE TEST NUMBER EQUAL TO THE :COUNTER?
789	000774	021537	000430						:IF NOT GO TO THE HLT ABOVE
790	001000	001372		BNE	6\$				
791	001002	005215		INC	(R5)				
792	001004	010701		SCOPE1					
793	001006	021527	000037	CMP	(R5),#37				:HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT :BY 14. AND RIGHT BY 14.?
794									
795	001012	002011		BGE	8\$				
796	001014	005237	000436	INC	@#TEMP2				
797	001020	006367	177414	ASL	TEMP3				:SHIFT TEMP3 LEFT.
798	001024	021527	000020	CMP	(R5),#20				:HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
799	001030	001004		BNE	REG1				
800	001032	000167	000764	JMP	NEGAT				:IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
801	001036	004767	001006	JSR	PC,TST37				:IF SO GO AND CONTINUE THE REST OF THE PROGRAM
802	001042	010703		8\$:					
803	001044	013701	000434	REG1:	SCOPE3				
804	001050	032737	000001 000406	MOV	@#TEMP1,%1				:LOAD R1 WITH THE CONTENTS OF TEMP1
805	001056	001004		BIT	#1,@#\$PASS				:IS IT AN EVEN PASS ?
806	001060	013702	000436	BNE	2\$:IF NOT THEN GO TO 2\$
807	001064	072102		MOV	@#TEMP2,R2				:OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
808	001066	000402		ASH	R2,R1				:USING R1
809	001070	072167	177342	BR	4\$				
813	001074			2\$:	ASH	TEMP2,%1			:SHIFT R1 BY THE NUMBER SPECIFIED BY TEMP2
(1)	001074	106737		4\$:	MFPS	@#PSWORD			:SAVE PS
817	001100	123737	000442 000432	.WORD	106700!..C				
818	001106	001403		CMPB	@#TEMP4,@#PSWORD				:IS THE PS = TEMP4 ?
819	001110	004767	016000	BEQ	+.10				
(2)				JSR	PC,\$HLT				:SEEN AN ERROR, GO TO TH HALT ROUTINE :THE PS IS NOT EQUAL TO 0
(2)	001114	000003		3					
820	001116	005237	000430	INC	@#COUNT				:INCREMENT THE COUNTER
821	001122	023701	000440	CMP	@#TEMP3,%1				:IS THE RESULT IN R1 EQUAL TO TEMP3?
822	001126	001403		BEQ	+.10				
823	001130			6\$:					
(2)	001130	004767	015760	JSR	PC,\$HLT				:SEEN AN ERROR, GO TO TH HALT ROUTINE :EITHER INCORRECT R1 OR INCORRECT SEQUENCE
(2)				4					
824	001134	000004		CMP	(R5),@#COUNT				:IS THE TEST NUMBER EQUAL TO THE COUNTER?
825	001142	001372	000430	BNE	6\$:IF NOT GO TO THE HLT ABOVE
826	001144	005215		INC	(R5)				
827	001146	010703		SCOPE3					
828	001150	021527	000037	CMP	(R5),#37				:HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT :BY 14. AND RIGHT BY 14.?
829									
830	001154	002011		BGE	8\$				
831	001156	005237	000436	INC	@#TEMP2				
832	001162	006367	177252	ASL	TEMP3				:SHIFT TEMP3 LEFT
833	001166	021527	000020	CMP	(R5),#20				:HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
834	001172	001004		BNE	REG2				
835	001174	000167	000622	JMP	NEGAT				:IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT

DVKABA MACY11 30(1046) 14-SEP-81 16:32 PAGE 4-8
 CVKABB.P11 14-SEP-81 16:31 ASH INSTRUCTION TESTS

SEQ 0013

836	001200	004767	000644	8\$:	JSR	PC,TST37	:IF SO GO AND CONTINUE THE REST OF THE PROGRAM
837	001204	010701		REG2:	SCOPE1		
838	001206	013702	000434		MOV	@#TEMP1,%2	:LOAD R2 WITH THE CONTENTS OF TEMP1
839	001212	032737	000001 000406		BIT	#1,@#\$PASS	:IS IT AN EVEN PASS ?
840	001220	001004			BNE	2\$:IF NOT THEN GO TO 2\$
841	001222	013703	000436		MOV	@#TEMP2,R3	:OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
842	001226	072203			ASH	R3,R2	:USING R2
843	001230	000402			BR	4\$	
844	001232	072267	177200	2\$:	ASH	TEMP2,%2	:SHIFT R2 BY THE NUMBER SPECIFIED BY TEMP2
848	001236			4\$:	MFPS	@#PSWORD	:SAVE PS
(1)	001236	106737			.WORD	106700!..C	
852	001242	123737	000442 000432		CMPB	@#TEMP4,@#PSWORD	:IS THE PS = TEMP4 ?
853	001250	001403			BEQ	+.10	
854	001252	004767	015636		JSR	PC,\$HLT	:SEEN AN ERROR, GO TO TH HALT ROUTINE
(2)							:THE PS IS NOT EQUAL TO 0
(2)	001256	000005			5		
855	001260	005237	000430		INC	@#COUNT	
856	001264	023702	000440		CMP	@#TEMP3,%2	:IS THE RESULT IN R2 EQUAL TO TEMP3?
857	001270	001403			BEQ	+.10	
858	001272			6\$:			
(2)	001272	004767	015616		JSR	PC,\$HLT	:SEEN AN ERROR, GO TO TH HALT ROUTINE
(2)							:EITHER INCORRECT R2 OR INCORRECT SEQUENCE
(2)	001276	000006			6		
859	001300	021537	000430		CMP	(R5),@#COUNT	:IS THE TEST NUMBER EQUAL TO THE COUNTER?
860	001304	001372			BNE	6\$:IF NOT GO TO THE HLT ABOVE
861	001306	005215			INC	(R5)	
862	001310	010701			SCOPE1		
863	001312	021527	000037		CMP	(R5),#37	:HAS THE CONTENTS OF REGISTERS BEEN SHIFTED
864							:LEFT BY 14, AND RIGHT BY 14.?
865	001316	002011			BGE	8\$	
866	001320	005237	000436		INC	@#TEMP2	
867	001324	006367	177110		ASL	TEMP3	:SHIFTED TEMP3 LEFT
868	001330	021527	000020		CMP	(R5),#20	:HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
869	001334	001004			BNE	REG3	
870	001336	000167	000460		JMP	NEGAT	:IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
871	001342	004767	000502	8\$:	JSR	PC,TST37	:IF SO GO AND CONTINUE THE REST OF THE PROGRAM
872	001346	010701		REG3:	SCOPE1		
873	001350	013703	000434		MOV	@#TEMP1,%3	:LOAD R3 WITH THE CONTENTS OF TEMP1
874	001354	032737	000001 000406		BIT	#1,@#\$PASS	:IS IT AN EVEN PASS ?
875	001362	001004			BNE	2\$:IF NOT THEN GO TO 2\$
876	001364	013704	000436		MOV	@#TEMP2,R4	:OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
877	001370	072304			ASH	R4,R3	:USING R3
878	001372	000402			BR	4\$	
879	001374	072367	177036	2\$:	ASH	TEMP2,%3	:SHIFT R3 BY THE NUMBER SPECIFIED BY TEMP2
883	001400			4\$:	MFPS	@#PSWORD	:SAVE PS
(1)	001400	106737			.WORD	106700!..C	
887	001404	123737	000442 000432		CMPB	@#TEMP4,@#PSWORD	:IS THE PS = TEMP4 ?
888	001412	001403			BEQ	+.10	
889	001414	004767	015474		JSR	PC,\$HLT	:SEEN AN ERROR, GO TO TH HALT ROUTINE
(2)							:THE PS IS NOT EQUAL TO 0.
(2)	001420	000007			7		
890	001422	005237	000430		INC	@#COUNT	
891	001426	023703	000440		CMP	@#TEMP3,%3	:IS THE RESULT IN R3 EQUAL TO TEMP3?
892	001432	001403			BEQ	+.10	
893	001434			6\$:			
(2)	001434	004767	015454		JSR	PC,\$HLT	:SEEN AN ERROR, GO TO TH HALT ROUTINE

948	001670	001004			BNE	2\$:IF NOT THEN GO TO 2\$
949	001672	013700	000436		MOV	@#TEMP2,R0		:OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
950	001676	072500			ASH	R0,R5		:USING R5
951	001700	000402			BR	4\$		
952	001702	072567	176530		ASH	TEMP2,%5		:SHIFT R5 BY THE NUMBER SPECIFIED BY TEMP2
956	001706				MFPS	@#PSWORD		:SAVE PS
(1)	001706	106737			.WORD	106700!..C		
960	001712	123737	000442	000432	CMPB	@#TEMP4,@#PSWORD		:IS PS = TEMP4 ?
961	001720	001403			BEQ	.+10		
962	001722	004767	015166		JSR	PC,\$HLT		:SEEN AN ERROR, GO TO TH HALT ROUTINE
(2)								:THE PS IS NOT EQUAL TO 0.
(2)	001726	000013			13			
963	001730	005237	000430		INC	@#COUNT		
964	001734	023705	000440		CMP	@#TEMP3,%5		:IS THE RESULT IN R5 EQUAL TO TEMP3?
965	001740	001403			BEQ	.+10		
966	001742				6\$:			
(2)	001742	004767	015146		JSR	PC,\$HLT		:SEEN AN ERROR, GO TO TH HALT ROUTINE
(2)								:EITHER INCORRECT R5 OR INCORRECT SEQUENCE
(2)	001746	000014			14			
967	001750	021137	000430		CMP	(R1),@#COUNT		:IS THE TEST NUMBER EQUAL TO THE COUNTER?
968	001754	001372			BNE	6\$:IF NOT GO TO THE HLT ABOVE
969	001756	010105			MOV	R1,R5		:RESTORE R5
970	001760	005215			INC	(R5)		
971	001762	010701			SCOPE1			
972	001764	021527	000037		CMP	(R5),#37		:HAS THE CONTENTS OF REGISTERS BEEN SHIFTED
973								:LEFT BY 14. AND RIGHT BY 14.?
974	001770	002010			BGE	8\$:IF SO GO AND CONTINUE THE REST OF THE PROGRAM
975	001772	005237	000436		INC	@#TEMP2		
976	001776	006367	176436		ASL	TEMP3		:SHIFT TEMP3 LEFT
977	002002	021527	000020		CMP	(R5),#20		:HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
978	002006	001405			BEQ	NEGAT		:IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
979	002010	000402			BR	10\$		
980	002012	004767	000032		JSR	PC,TST37		
981	002016	000167	176656		JMP	START		:GO BACK TO START
982	002022	012737	040000	000434	NEGAT:	MOV #40000,@#TEMP1		:TEMP1=40000
983	002030	012737	177762	000436		MOV #177762,@#TEMP2		:TEMP2=177762
984	002036	012737	000001	000440		MOV #1,@#TEMP3		:TEMP3=1
985	002044	000167	176630		JMP	START		
986	002050	021527	000037		TST37:	CMP (R5),#37		:IS IT TEST 37?
987	002054	001013			BNE	TST40		:IF NOT THEN TRY TEST 40
988	002056	005037	000434		CLR	@#TEMP1		:0
989	002062	012737	000020	000436	MOV	#16,@#TEMP2		:SHIFTED BY 16
990	002070	005037	000440		CLR	@#TEMP3		:IS=0
991	002074	012737	000004	000442	MOV	#4,@#TEMP4		:AND PS=4
992	002102	000207			RTS	PC		
993	002104	021527	000040		TST40:	CMP (R5),#40		:IS IT TEST 40?
994	002110	001003			BNE	TST41		:IF NOT THEN TRY TEST 41
995	002112	005037	000436		CLR	@#TEMP2		:0 SHIFTED BY 0=0 AND PS=4
996	002116	000207			RTS	PC		
997	002120	021527	000041		TST41:	CMP (R5),#41		:IS IT TEST 41?
998	002124	001004			BNE	TST42		:IF NOT THEN TRY TEST 42
999	002126	012737	177760	000436	MOV	#-16,@#TEMP2		:0 SHIFTED BY -16.=0 AND PS=4
1000	002134	000207			RTS	PC		
1001	002136	021527	000042		TST42:	CMP (R5),#42		:IS IT TEST 42?
1002	002142	001013			BNE	TST43		:IF NOT THEN TRY TEST 43
1003	002144	012737	100000	000434	MOV	#100000,@#TEMP1		:100000

1004	002152	005237	000436		INC	@#TEMP2	:SHIFTED BY -15
1005	002156	005337	000440		DEC	@#TEMP3	:IS=-1
1006	002162	012737	000010	000442	MOV	#10,@#TEMP4	:AND PS=10
1007	002170	000207			RTS	PC	
1008	002172	021527	000043		TST43: CMP	(R5),#43	:IS IT TEST 43?
1009	002176	001012			BNE	TST44	:IF NOT THEN IF NOT THEN TRY TEST 44
1010	002200	012737	125252	000434	MOV	#125252,@#TEMP1	:125252
1011	002206	012737	177777	000436	MOV	#-1,@#TEMP2	:SHIFTED BY -1
1012	002214	012737	152525	000440	MOV	#152525,@#TEMP3	:IS=152525 AND PS=10
1013	002222	000207			RTS	PC	
1014	002224	021527	000044		TST44: CMP	(R5),#44	:IS IT TEST 44?
1015	002230	001012			BNE	TST45	:IF NOT THEN TRY TEST 45
1016	002232	012737	000001	000436	MOV	#1,@#TEMP2	:125252 SHIFTED BY 1
1017	002240	012737	052524	000440	MOV	#52524,@#TEMP3	:IS=52524
1018	002246	012737	000003	000442	MOV	#3,@#TEMP4	:AND PS=3
1019	002254	000207			RTS	PC	
1020	002256	021527	000045		TST45: CMP	(R5),#45	:IS IT TEST 45?
1021	002262	001012			BNE	TST46	:IF NOT THEN TRY TEST 46
1022	002264	012737	177776	000436	MOV	#-2,@#TEMP2	:125252 SHIFTED BY -2
1023	002272	012737	165252	000440	MOV	#165252,@#TEMP3	:IS=165252
1024	002300	012737	000011	000442	MOV	#11,@#TEMP4	:AND PS=11
1025	002306	000207			RTS	PC	
1026	002310	021527	000046		TST46: CMP	(R5),#46	:IS IT TEST 46?
1027	002314	001014			BNE	TST47	:IF NOT THEN TRY TEST 47
1028	002316	012737	177777	000434	MOV	#-1,@#TEMP1	: -1
1029	002324	012737	000020	000436	MOV	#16,@#TEMP2	:SHIFTED BY 15.
1030	002332	005037	000440		CLR	@#TEMP3	:IS=0
1031	002336	012737	000007	000442	MOV	#7,@#TEMP4	:AND PS=7
1032	002344	000207			RTS	PC	
1033	002346	021527	000047		TST47: CMP	(R5),#47	:IS IT TEST 47?
1034	002352	001011			BNE	TST50	:IF NOT THEN TRY TEST 50
1035	002354	005337	000436		DEC	@#TEMP2	: -1 SHIFTED BY 15
1036	002360	012737	100000	000440	MOV	#100000,@#TEMP3	:IS=100000
1037	002366	012737	000011	000442	MOV	#11,@#TEMP4	:AND PS=11
1038	002374	000207			RTS	PC	
1039	002376	021527	000050		TST50: CMP	(R5),#50	:IS IT TEST 50
1040	002402	001007			BNE	ENT51	:IF NOT THEN TRY TEST 51
1041	002404	012737	137777	000434	MOV	#137777,@#TEMP1	:137777 SHIFTED BY 15. IS=100000
1042	002412	012737	000013	000442	MOV	#13,@#TEMP4	:AND PS=13
1043	002420	000207			RTS	PC	
1044	002422	021527	000051		ENT51: CMP	(R5),#51	:IS IT ENTERING TEST 51?
1045	002426	001403			BEQ	.+10	
1046	002430	004767	014460		JSR	PC,\$HLT	:SEEN AN ERROR, GO TO TH HALT ROUTINE :TEST NUMBER GOOFED
(2)							
(2)	002434	000015				15	
1047							
1048	002436	005726			TST	(SP)+	:RESTORE STACK POINTER
1049	002440	012704	177771		MOV	#-7,%4	
1050	002444	012702	000454		MOV	#S1,%2	
1051	002450	012703	000456		MOV	#S2,%3	

1052

(1)
 (1)
 (1)
 (1) 002454 010701
 (1) 002456 012701 125252
 (1) 002462 072127 000005
 (1) 002466
 (2) 002466 106737
 (1) 002472 122737 000003 000432
 (1) 002500 001403
 (3) 002502 004767 014406
 (3)
 (3) 002506 000016
 (1) 002510 022701 052500
 (1) 002514 001403
 (1) 002516
 (3) 002516 004767 014372
 (3)
 (3) 002522 000017
 (1) 002524 021527 000051
 (1) 002530 001372
 (1) 002532 005215

```

:*****
:TEST:51  LSI-11  ASH  125252 SHIFTED BY #5 = 52500  PS = 3
:*****
TST51:  SCOPE1
        MOV      #125252,%1      ;LOAD R1 WITH 125252
        ASH     #5,%1          ;SHIFT R1 BY #5
        MFPS    @#PSWORD       ;SAVE PS
        .WORD   106700!..C
        CMPB   #3,@#PSWORD     ;IS THE PS 3?
        BEQ    .+10
        JSR    PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                ;THE PS IS NOT EQUAL TO 3
        16
        CMP    #52500,%1       ;IS THE RESULT 52500?
        BEQ    .+10
1$:     JSR    PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                ;R1 IS NOT EQUAL TO 52500 OR INCORRECT SEQUENCE
        17
        CMP    (R5),#51        ;IS $TESTN = #51
        BNE   1$              ;IF NOT THEN GO TO HLT ABOVE
        INC   (R5)
    
```

1053

(1)
 (1)
 (1)
 (1) 002534 010701
 (1) 002536 012700 125252
 (1) 002542 072077 175710
 (1) 002546
 (2) 002546 106737
 (1) 002552 122737 000010 000432
 (1) 002560 001403
 (3) 002562 004767 014326
 (3)
 (3) 002566 000020
 (1) 002570 022700 177525
 (1) 002574 001403
 (1) 002576
 (3) 002576 004767 014312
 (3)
 (3) 002602 000021
 (1) 002604 021527 000052
 (1) 002610 001372
 (1) 002612 005215

```

:*****
:TEST:52  LSI-11  ASH  125252 SHIFTED BY @S2 = 177525  PS = 10
:*****
TST52:  SCOPE1
        MOV      #125252,%0      ;LOAD R0 WITH 125252
        ASH     @S2,%0          ;SHIFT R0 BY @S2
        MFPS    @#PSWORD       ;SAVE PS
        .WORD   106700!..C
        CMPB   #10,@#PSWORD    ;IS THE PS 10?
        BEQ    .+10
        JSR    PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                ;THE PS IS NOT EQUAL TO 10
        20
        CMP    #177525,%0       ;IS THE RESULT 177525?
        BEQ    .+10
1$:     JSR    PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
        21
        CMP    (R5),#52        ;IS $TESTN = #52
        BNE   1$              ;IF NOT THEN GO TO HLT ABOVE
        INC   (R5)
    
```


1056

(1)
(1)
(1)
(1)
(1)
(2)
(1)
(1)
(3)
(3)
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(1)
(1)
(1)

002752 010701
002754 012700 125252
002760 072022
002762
002762 106737
002766 122737 000010 000432
002774 001403
002776 004767 014112
003002 000026
003004 022700 177525
003010 001403
003012
003012 004767 014076
003016 000027
003020 021527 000055
003024 001372
003026 005215

```
*****
:TEST:55 LSI-11 ASH 125252 SHIFTED BY (2)+ = 177525 PS = 10
*****
TST55: SCOPE1
MOV #125252,%0 ;LOAD R0 WITH 125252
ASH (2)+,%0 ;SHIFT R0 BY (2)+
MFPS @#PSWORD ;SAVE PS
.WORD 106700!..C
CMPB #10,@#PSWORD ;IS THE PS 10?
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;THE PS IS NOT EQUAL TO 10
26
CMP #177525,%0 ;IS THE RESULT 177525?
BEQ .+10
1$: JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
27
CMP (R5),#55 ;IS $TESTN = #55
BNE 1$ ;IF NOT THEN GO TO HLT ABOVE
INC (R5)
```

1057

(1)
(1)
(1)
(1)
(1)
(2)
(1)
(1)
(3)
(3)
(3)
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(1)
(1)
(1)
(3)
(3)
(3)
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(1)
(1)

003030 010701
003032 012700 125252
003036 072042
003040
003040 106737
003044 122737 000010 000432
003052 001403
003054 004767 014034
003060 000030
003062 022700 177525
003066 001403
003070
003070 004767 014020
003074 000031
003076 021527 000056
003102 001372
003104 005215

```
*****
:TEST:56 LSI-11 ASH 125252 SHIFTED BY -(2) = 177525 PS = 10
*****
TST56: SCOPE1
MOV #125252,%0 ;LOAD R0 WITH 125252
ASH -(2),%0 ;SHIFT R0 BY -(2)
MFPS @#PSWORD ;SAVE PS
.WORD 106700!..C
CMPB #10,@#PSWORD ;IS THE PS 10?
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;THE PS IS NOT EQUAL TO 10
30
CMP #177525,%0 ;IS THE RESULT 177525?
BEQ .+10
1$: JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
31
CMP (R5),#56 ;IS $TESTN = #56
BNE 1$ ;IF NOT THEN GO TO HLT ABOVE
INC (R5)
```

1058

(1)
 (1)
 (1)
 (1) 003106 010701
 (1) 003110 012700 125252
 (1) 003114 072063 000002
 (1) 003120
 (2) 003120 106737
 (1) 003124 122737 000011 000432
 (1) 003132 001403
 (3) 003134 004767 013754
 (3)
 (3) 003140 000032
 (1) 003142 022700 177252
 (1) 003146 001403
 (1) 003150
 (3) 003150 004767 013740
 (3)
 (3) 003154 000033
 (1) 003156 021527 000057
 (1) 003162 001372
 (1) 003164 005215
 (1)
 (1)
 (1)

```

:*****
:TEST:57  LSI-11  ASH  125252 SHIFTED BY 2(3) = 177252  PS = 11
:*****
TST57:  SCOPE1
MOV      #125252,%0      ;LOAD R0 WITH 125252
ASH      2(3),%0         ;SHIFT R0 BY 2(3)
MFPS     @#PSWORD        ;SAVE PS
.WORD    106700!...C
CMPB     #11,@#PSWORD    ;IS THE PS 11?
BEQ      .+10
JSR      PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                          ;THE PS IS NOT EQUAL TO 11
32
CMP      #177252,%0     ;IS THE RESULT 177252?
BEQ      .+10
1$:     JSR      PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                          ;R0 IS NOT EQUAL TO 177252 OR INCORRECT SEQUENCE
33
CMP      (R5),#57       ;IS $TESTN = #57
BNE      1$             ;IF NOT THEN GO TO HLT ABOVE
INC      (R5)
    
```

1059

(1)
 (1)
 (1)
 (1) 003166 010701
 (1) 003170 012700 125252
 (1) 003174 072073 000000
 (1) 003200
 (2) 003200 106737
 (1) 003204 122737 000010 000432
 (1) 003212 001403
 (3) 003214 004767 013674
 (3)
 (3) 003220 000034
 (1) 003222 022700 177525
 (1) 003226 001403
 (1) 003230
 (3) 003230 004767 013660
 (3)
 (3) 003234 000035
 (1) 003236 021527 000060
 (1) 003242 001372
 (1) 003244 005215
 (1)
 (1)
 (1)

```

:*****
:TEST:60  LSI-11  ASH  125252 SHIFTED BY @ (3) = 177525  PS = 10
:*****
TST60:  SCOPE1
MOV      #125252,%0      ;LOAD R0 WITH 125252
ASH      @ (3),%0        ;SHIFT R0 BY @ (3)
MFPS     @#PSWORD        ;SAVE PS
.WORD    106700!...C
CMPB     #10,@#PSWORD    ;IS THE PS 10?
BEQ      .+10
JSR      PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                          ;THE PS IS NOT EQUAL TO 10
34
CMP      #177525,%0     ;IS THE RESULT 177525?
BEQ      .+10
1$:     JSR      PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                          ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
35
CMP      (R5),#60       ;IS $TESTN = #60
BNE      1$             ;IF NOT THEN GO TO HLT ABOVE
INC      (R5)
    
```

1060

(1)
(1)
(1)
(1) 003246 010701
(1) 003250 012700 125252
(1) 003254 072033
(1) 003256
(2) 003256 106737
(1) 003262 122737 000010 000432
(1) 003270 001403
(3) 003272 004767 013616
(3)
(3) 003276 000036
(1) 003300 022700 177525
(1) 003304 001403
(1) 003306
(3) 003306 004767 013602
(3)
(3) 003312 000037
(1) 003314 021527 000061
(1) 003320 001372
(1) 003322 005215
(1)
(1)
(1)

```
*****  
:TEST:61 LSI-11 ASH 125252 SHIFTED BY @ (3)+ = 177525 PS = 10  
*****  
TST61: SCOPE1  
MOV #125252,%0 ;LOAD R0 WITH 125252  
ASH @ (3)+,%0 ;SHIFT R0 BY @ (3)+  
MFPS @#PSWORD ;SAVE PS  
.WORD 106700!..C  
CMPB #10,@#PSWORD ;IS THE PS 10?  
BEQ .+10  
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE  
;THE PS IS NOT EQUAL TO 10  
36  
CMP #177525,%0 ;IS THE RESULT 177525?  
BEQ .+10  
1$: JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE  
;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE  
37  
CMP (R5),#61 ;IS $TESTN = #61  
BNE 1$ ;IF NOT THEN GO TO HLT ABOVE  
INC (R5)
```

1061

(1)
(1)
(1)
(1) 003324 010701
(1) 003326 012700 125252
(1) 003332 072053
(1) 003334
(2) 003334 106737
(1) 003340 122737 000010 000432
(1) 003346 001403
(3) 003350 004767 013540
(3)
(3) 003354 000040
(1) 003356 022700 177525
(1) 003362 001403
(1) 003364
(3) 003364 004767 013524
(3)
(3) 003370 000041
(1) 003372 021527 000062
(1) 003376 001372
(1) 003400 005215
(1)
(1)
(1)

```
*****  
:TEST:62 LSI-11 ASH 125252 SHIFTED BY @-(3) = 177525 PS = 10  
*****  
TST62: SCOPE1  
MOV #125252,%0 ;LOAD R0 WITH 125252  
ASH @-(3),%0 ;SHIFT R0 BY @-(3)  
MFPS @#PSWORD ;SAVE PS  
.WORD 106700!..C  
CMPB #10,@#PSWORD ;IS THE PS 10?  
BEQ .+10  
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE  
;THE PS IS NOT EQUAL TO 10  
40  
CMP #177525,%0 ;IS THE RESULT 177525?  
BEQ .+10  
1$: JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE  
;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE  
41  
CMP (R5),#62 ;IS $TESTN = #62  
BNE 1$ ;IF NOT THEN GO TO HLT ABOVE  
INC (R5)
```

1065
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*****  
: ASHC INSTRUCTION TESTS  
*****
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1077 003402 012737 000062 000430      MOV    #62,@#COUNT
1078 003410 005037 000434                CLR    @#TEMP1          ;TEMP1=0
1079 003414 012737 000001 000436      MOV    #1,@#TEMP2      ;TEMP2=1
1080 003422 005037 000440                CLR    @#TEMP3          ;TEMP3=0
1081 003426 005037 000442                CLR    @#TEMP4          ;TEMP4=0
1082 003432 012737 000001 000444      MOV    #1,@#TEMP5      ;TEMP5=1
1083 003440 005037 000446                CLR    @#TEMP6          ;0 1 SHIFTED BY 0=0 1, PS=0
1084
1085 003444 010703                REG01: SCOPE3
1086 003446 010502                MOV    R5,R2           ;SAVE R5
1087 003450 013700 000434                MOV    @#TEMP1,%0      ;PLACE THE CONTENTS OF TEMP1 IN REGISTER 0
1088 003454 013701 000436                MOV    @#TEMP2,%0!1    ;PLACE THE CONTENTS OF TEMP2 IN REGISTER 1
1089 003460 000241                CLC
1090 003462 032737 000001 000406      BIT    #1,@#$PASS      ;IS IT AN EVEN PASS ?
1091 003470 001004                BNE    2$              ;IF NOT THEN GO TO 2$
1092 003472 013705 000440                MOV    @#TEMP3,R5      ;OTHERWISE EXECUTE ASHC INSTRUCTION IN MODE 0
1093 003476 073005                ASHC   R5,R0           ;USING R0
1094 003500 000402                BR     4$
1095 003502 073067 174732                2$: ASHC   TEMP3,%0      ;ASHC REGISTER 0 BY THE CONTENTS OF TEMP3
1099 003506 073067 174732                4$: MFPS  @#PSWORD      ;SAVE PS
(1) 003506 106737                .WORD  106700!...C
1103 003512 123737 000446 000432      CMPB   @#TEMP6,@#PSWORD;COMPARE PS WITH THE CONTENTS OF TEMP6
1104 003520 001403                BEQ    .+10
1105 003522 004767 013366                JSR    PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(2)
(2) 003526 000042                42
1106 003530 005237 000430                INC    @#COUNT
1107 003534 023700 000442                CMP    @#TEMP4,%0      ;IS THE RESULT IN R0 SAME AS TEMP4?
1108 003540 001403                BEQ    .+10
1109 003542 004767 013346                JSR    PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(2)
(2) 003546 000043                43
1110 003550 023701 000444                CMP    @#TEMP5,%1      ;IS THE RESULT IN R1 SAME AS TEMP5?
1111 003554 001403                BEQ    .+10            ;TEMP1 TEMP2 SHIFTED BY TEMP3=TEMP4 TEMP5
1112                                ;AND PS=TEMP6
1113 003556 004767 013332                JSR    PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(2)
(2) 003562 000044                44
1114 003564 010205                MOV    R2,R5           ;RESTORE R5
1115 003566 021537 000430                CMP    (R5),@#COUNT   ;IS TEST NUMBER=COUNTER?
1116 003572 001403                BEQ    .+10
1117 003574 004767 013314                JSR    PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(2)
(2) 003600 000045                45
1118 003602 005215                INC    (R5)
1119 003604 021527 000160                CMP    (R5),#160       ;HAVE THE FIRST 159 TEST BEEN EXECUTED?
1120 003610 002014                BGE    6$              ;YES
1121 003612 005237 000440                INC    @#TEMP3

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1122	003616	000241			CLC		
1123	003620	006137	000444		ROL	@#TEMP5	:ROTATE TEMP5 LEFT BY 1 PLACE
1124	003624	006137	000442		ROL	@#TEMP4	:INTRODUCE CARRY FROM TEMP4 IN TEMP5
1125	003630	021527	000121		CMP	(R5),#121	:IS IT TEST 121?
1126	003634	001004			BNE	REG23	
1127	003636	004467	000410		JSR	R4,RITSH	:IF SO THEN GO AND INITIATE RIGHT SHIFT
1128	003642	004777	000440		JSR	%7,TST160	
1129	003646	01070			6\$: REG23:	SCOPE1	
1130	003650	013702	000434		MOV	@#TEMP1,%2	:PLACE THE CONTENTS OF TEMP1 IN REGISTER 2
1131	003654	013703	00436		MOV	@#TEMP2,%2!1	:PLACE THE CONTENTS OF TEMP2 IN REGISTER 3
1132	003660	000241			CLC		
1133	003662	032737	000001	000406	BIT	#1,@#\$PASS	:IS IT AN EVEN PASS ?
1134	003670	001004			BNE	2\$:IF NOT THEN GO TO 2\$
1135	003672	013704	000440		MOV	@#TEMP3,R4	:OTHERWISE EXECUTE ASHC INSTRUCTION IN MODE 0
1136	003676	073204			ASHC	R4,R2	:USING R2
1137	003700	000402			BR	4\$	
1138	003702	073267	174532		2\$: 4\$: ASHC	TEMP3,%2	:ASHC REGISTER 2 BY THE CONTENTS OF TEMP3
1142	003706				MFPS	@#PSWORD	:SAVE PS
(1)	003706	106737			.WORD	106700!..C	
1146	003712	123737	000446	000432	CMPB	@#TEMP6,@#PSWORD	:COMPARE PS WITH THE CONTENTS OF TEMP6
1147	003720	001403			BEQ	+.10	
1148	003722	004767	013166		JSR	PC,\$HLT	:SEEN AN ERROR, GO TO TH HALT ROUTINE
(2)							:WRONG PS
(2)	003726	000046			46		
1149	003730	005237	000430		INC	@#COUNT	
1150	003734	023702	000442		CMP	@#TEMP4,%2	:IS THE RESULT IN R2 SAME AS TEMP4?
1151	003740	001403			BEQ	+.10	
1152	003742	004767	013146		JSR	PC,\$HLT	:SEEN AN ERROR, GO TO TH HALT ROUTINE
(2)							:WRONG RESULT IN R2
(2)	003746	000047			47		
1153	003750	023703	000444		CMP	@#TEMP5,%3	:IS THE RESULT IN R3 SAME AS TEMP5?
1154	003754	001403			BEQ	+.10	:TEMP1 TEMP2 SHIFTED BY TEMP3=TEMP4 TEMP5
1155							:AND PS=TEMP6
1156	003756	004767	013132		JSR	PC,\$HLT	:SEEN AN ERROR, GO TO TH HALT ROUTINE
(2)							:WRONG RESULT IN R1
(2)	003762	000050			50		
1157	003764	021537	000430		CMP	(R5),@#COUNT	:IS TEST NUMBER=COUNTER?
1158	003770	001403			BEQ	+.10	
1159	003772	004767	013116		JSR	PC,\$HLT	:SEEN AN ERROR, GO TO TH HALT ROUTINE
(2)							:NO
(2)	003776	000051			51		
1160	004000	005215			INC	(R5)	
1161	004002	021527	000160		CMP	(R5),#160	:HAVE THE FIRST 159 TEST BEEN EXECUTED?
1162	004006	002014			BGE	6\$:YES
1163	004010	005237	000440		INC	@#TEMP3	
1164	004014	000241			CLC		
1165	004016	006137	000444		ROL	@#TEMP5	:ROTATE TEMP5 LEFT BY 1 PLACE
1166	004022	006137	000442		ROL	@#TEMP4	:INTRODUCE CARRY FROM TEMP5 IN TEMP4
1167	004026	021527	000121		CMP	(R5),#121	:IS IT TEST 121?
1168	004032	001004			BNE	REG45	
1169	004034	004467	000212		JSR	R4,RITSH	:IF SO THEN GO AND INITIATE RIGHT SHIFT
1170	004040	004767	000242		6\$: REG45:	JSR %7,TST160	
1171	004044	010701			SCOPE1		
1172	004046	010501			MOV	R5,R1	:SAVE R5
1173	004050	013704	000434		MOV	@#TEMP1,%4	:PLACE THE CONTENTS OF TEMP1 IN REGISTER 4
1174	004054	013705	000436		MOV	@#TEMP2,%4!1	:PLACE THE CONTENTS OF TEMP2 IN REGISTER 5

1175	004060	000241			CLC		
1176	004062	032737	000001	000406	BIT	#1,@#SPASS	:IS IT AN EVEN PASS ?
1177	004070	001004			BNE	2\$:IF NOT THEN GO TO 2\$
1178	004072	013700	000440		MOV	@#TEMP3,R0	:OTHERWISE EXECUTE ASHC INSTRUCTION IN MODE 0
1179	004076	073400			ASHC	R0,R4	:USING R4
1180	004100	000402			BR	4\$	
1181	004102	073467	174332		ASHC	TEMP3,%4	:ASHC REGISTER 4 BY THE CONTENTS OF TEMP3
1185	004106				MFPS	@#PSWORD	:SAVE PS
(1)	004106	106737			.WORD	106700!..C	
1189	004112	123737	000446	000432	CMPB	@#TEMP6,@#PSWORD	:COMPARE PS WITH THE CONTENTS OF TEMP6
1190	004120	001403			BEQ	.+10	
1191	004122	004767	012766		JSR	PC,\$HLT	:SEEN AN ERROR, GO TO TH HALI ROUTINE
(2)							:WRONG PS
(2)	004126	000052			52		
1192	004130	005237	000430		INC	@#COUNT	
1193	004134	023704	000442		CMP	@#TEMP4,%4	:IS THE RESULT IN R4 SAME AS TEMP4?
1194	004140	001403			BEQ	.+10	
1195	004142	004767	012746		JSR	PC,\$HLT	:SEEN AN ERROR, GO TO TH HALT ROUTINE
(2)							:WRONG RESULT IN R4
(2)	004146	000053			53		
1196	004150	023705	000444		CMP	@#TEMP5,%5	:IS THE RESULT IN R5 SAME AS TEMP5?
1197	004154	001403			BEQ	.+10	:TEMP1 TEMP2 SHIFTED BY TEMP3=TEMP4 TEMP5
1198							:AND PS=TEMP6
1199	004156	004767	012732		JSR	PC,\$HLT	:SEEN AN ERROR, GO TO TH HALT ROUTINE
(2)							:WRONG RESULT IN R5
(2)	004162	000054			54		
1200	004164	021137	000430		CMP	(R1),@#COUNT	:IS TEST NUMBER=COUNTER?
1201	004170	001403			BEQ	.+10	
1202	004172	004767	012716		JSR	PC,\$HLT	:SEEN AN ERROR, GO TO TH HALT ROUTINE
(2)							:NO
(2)	004176	000055			55		
1203	004200	010105			MOV	R1,R5	:RESTORE R5
1204	004202	005215			INC	(R5)	
1205	004204	021527	000160		CMP	(R5),#160	:HAVE THE FIRST 159 TEST BEEN EXECUTED?
1206	004210	002014			BGE	6\$:YES
1207	004212	005237	000440		INC	@#TEMP3	
1208	004216	000241			CLC		
1209	004220	006137	000444		ROL	@#TEMP5	:ROTATE TEMP5 LEFT BY 1 PLACE
1210	004224	006137	000442		ROL	@#TEMP4	:INTRODUCE CARRY FROM TEMP5 IN TEMP4
1211	004230	021527	000121		CMP	(R5),#121	:IS IT TEST 121?
1212	004234	001004			BNE	8\$	
1213	004236	004467	000010		JSR	R4,RITSH	:IF SO THEN GO AND INITIATE RIGHT SHIFT
1214	004242	004767	000040		JSR	%7,TST160	
1215	004246	000167	177172		JMP	REG01	
1216	004252	022424			RITSH: CMP	(R4)+,(R4)+	:MAKE R4 POINT TO THE NEXT REG TAG
1217	004254	012737	040000	000434	MOV	#40000,@#TEMP1	:TEMP1=4000
1218	004262	005037	000436		CLR	@#TEMP2	:TEMP2=0
1219	004266	012737	177742	000440	MOV	#-30,@#TEMP3	:TEMP3=-30
1220	004274	005037	000442		CLR	@#TEMP4	:TEMP4=0
1221	004300	005237	000444		INC	@#TEMP5	:TEMP5=1
1222	004304	000204			RTS	R4	
1223	004306	021527	000160		TST160: CMP	(R5),#160	:IS IT TEST 160
1224	004312	001010			BNE	TST161	:IF NOT THEN TRY TEST 161
1225	004314	005037	000434		CLR	@#TEMP1	:0 0 SHIFTED BY 0
1226	004320	005037	000442		CLR	@#TEMP4	:IS EQUAL TO 0 0
1227	004324	012737	000004	000446	MOV	#4,@#TEMP6	:AND PS=4

1228	004332	000207			RTS	%7	
1229	004334	021527	000161		TST161: CMP	(R5),#161	:IS IT TEST 161
1230	004340	001004			BNE	TST162	
1231	004342	012737	177746	000440	MOV	#-32,@#TEMP3	:0 0 SHIFTED BY -32=0 0, PS=4
1232	004350	000207			RTS	%7	
1233	004352	021527	000162		TST162: CMP	(R5),#162	:IS IT TEST 162
1234	004356	001004			BNE	TST163	:IF NOT THEN TRY TEST 163
1235	004360	012737	000032	000440	MOV	#32,@#TEMP3	:0 0 SHIFTED BY 32=0 0, PS=4
1236	004366	000207			RTS	%7	
1237	004370	021527	000163		TST163: CMP	(R5),#163	:IS IT TEST 163?
1238	004374	001016			BNE	TST164	:IF NOT THEN TRY TEST 164
1239	004376	012737	052525	000434	MOV	#52525,@#TEMP1	:52525 0
1240	004404	012737	177760	000440	MOV	#-16,@#TEMP3	:SHIFTED BY -16.
1241	004412	005037	000442		CLR	@#TEMP4	
1242	004416	012737	052525	000444	MOV	#52525,@#TEMP5	:IS EQUAL TO 0 52525
1243	004424	005037	000446		CLR	@#TEMP6	:AND PS = 0
1244	004430	000207			RTS	%7	
1245	004432	021527	000164		TST164: CMP	(R5),#164	:IS IT TEST 164?
1246	004436	001014			BNE	TST165	:IF NOT THEN TRY TEST 165
1247	004440	012737	125252	000434	MOV	#125252,@#TEMP1	:125252 0 SHIFTED BY -16.
1248	004446	005337	000442		DEC	@#TEMP4	
1249	004452	012737	125252	000444	MOV	#125252,@#TEMP5	:IS EQUAL TO -1 125252
1250	004460	012737	000010	000446	MOV	#10,@#TEMP6	:AND PS=10
1251	004466	000207			RTS	%7	
1252	004470	021527	000165		TST165: CMP	(R5),#165	:IS IT TEST 165?
1253	004474	001007			BNE	TST166	:IF NOT THEN TRY TEST 166
1254	004476	012737	177777	000434	MOV	#-1,@#TEMP1	:-1 0 SHIFTED BY -16
1255	004504	012737	177777	000444	MOV	#-1,@#TEMP5	:IS EQUAL TO -1 -1, AND PS=10
1256	004512	000207			RTS	%7	
1257	004514	021527	000166		TST166: CMP	(R5),#166	:IS IT TEST 166?
1258	004520	001011			BNE	TST167	:IF NOT THEN TRY TEST 167
1259	004522	012737	100000	000434	MOV	#100000,@#TEMP1	:100000 0
1260	004530	012737	177740	000440	MOV	#-32,@#TEMP3	:SHIFTED BY -32 IS EQUAL TO -1 -1
1261	004536	005237	000446		INC	@#TEMP6	:AND PS=11
1262	004542	000207			RTS	%7	
1263	004544	021527	000167		TST167: CMP	(R5),#167	:IS IT TEST 167?
1264	004550	001014			BNE	TST170	:IF NOT THEN TRY TEST 170
1265	004552	005037	000434		CLR	@#TEMP1	
1266	004556	005337	000436		DEC	@#TEMP2	:0 -1
1267	004562	012737	000020	000440	MOV	#16,@#TEMP3	:SHIFTED BY 16.
1268	004570	005037	000444		CLR	@#TEMP5	:IS EQUAL TO -1 0
1269	004574	005237	000446		INC	@#TEMP6	:AND PS=12
1270	004600	000207			RTS	%7	
1271	004602	021527	000170		TST170: CMP	(R5),#170	:IS IT TEST 170?
1272	004606	001007			BNE	TST171	:IF NOT THEN TRY TEST 171
1273	004610	012737	125252	000436	MOV	#125252,@#TEMP2	:0 125252 SHIFTED BY 16
1274	004616	012737	125252	000442	MOV	#125252,@#TEMP4	:IS EQUAL TO 125252 0, AND PS=12
1275	004624	000207			RTS	%7	
1276	004626	021527	000171		TST171: CMP	(R5),#171	:IS IT TEST 171?
1277	004632	001010			BNE	TST172	:IF NOT THEN TRY TEST 172
1278	004634	005337	000440		DEC	@#TEMP3	:0 125252 SHIFTED BY 15
1279	004640	012737	052525	000442	MOV	#52525,@#TEMP4	:IS EQUAL TO 52525 0
1280	004646	005037	000446		CLR	@#TEMP6	:AND PS=0
1281	004652	000207			RTS	%7	
1282	004654	021527	000172		TST172: CMP	(R5),#172	:IS IT TEST 172?
1283	004660	001006			BNE	TST173	:IF NOT THEN TRY TEST 173

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1284 004662 012737 052525 000436      MOV    #52525,@#TEMP2 ;0 52525
1285 004670 005237 000440      INC    @#TEMP3        ;SHIFTED BY 16. IS EQUAL TO 52525 0, AND PS=0
1286 004674 000207                RTS
1287 004676 021527 000173      TST173: CMP    (R5),#173 ;IS IT TEST 173?
1288 004702 001014      BNE    TST174        ;IF NOT THEN TRY TEST 174
1289 004704 012737 177777 000436      MOV    #-1,@#TEMP2   ;0 -1
1290 004712 005337 000440      DEC    @#TEMP3        ;SHIFTED BY 15.
1291 004716 012737 077777 000442      MOV    #77777,@#TEMP4
1292 004724 012737 100000 000444      MOV    #100000,@#TEMP5 ;IS EQUAL TO 77777 100000, AND PS=0
1293 004732 000207                RTS
1294 004734 021527 000174      TST174: CMP    (R5),#174 ;IS IT TEST 174?
1295 004740 001013      BNE    TST175        ;IF NOT THEN TRY TEST 175
1296 004742 012737 100000 000434      MOV    #100000,@#TEMP1
1297 004750 005337 000436      DEC    @#TEMP2        ;100000 -2 SHIFTED BY 15.
1298 004754 005037 000444      CLR    @#TEMP5        ;IS EQUAL TO 77777 0
1299 004760 012737 000002 000446      MOV    #2,@#TEMP6    ;AND PS=2
1300 004766 000207                RTS
1301 004770 021527 000175      TST175: CMP    (R5),#175 ;IS IT TEST 175?
1302 004774 001015      BNE    ENT176        ;IF NOT THEN TRY TEST :76
1303 004776 012737 177777 000434      MOV    #-1,@#TEMP1
1304 005004 005037 000436      CLR    @#TEMP2        ;-1 0
1305 005010 005237 000440      INC    @#TEMP3        ;SHIFTED BY 16.
1306 005014 005037 000442      CLR    @#TEMP4        ;IS EQUAL TO 0 0
1307 005020 012737 000007 000446      MOV    #7,@#TEMP6    ;AND PS=7
1308 005026 000207                RTS
1309 005030 021527 000176      ENT176: CMP    (R5),#176 ;IS THE PROGRM ENTERING TEST 176?
1310 005034 001403      BEQ
1311 005036 004767 012052      JSR    PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(2)                                     ;TEST NUMBER GOOFED
(2) 005042 000056      56
1312
1313 005044 005726      TST    (SP)+         ;RESTORE STACK POINTER
1314
    
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005046 010701
005050 012701 000000
005054 012701 000001
005060 000241
005062 073127 000010
005066 106737
005072 122737 000000 000432
005100 001403
005102 004767 012006
005106 000057
005110 022701 000400
005114 001403
005116 004767 011772
005122 000060
005124 021527 000176
005130 001403
005132 004767 011756
005136 000061
005140 005215

:TEST:176 1 SHIFTED BY 8. = 400 PS = 0

TST176: SCOPE1
MOV #DUMMY,%1 ;LOAD R1 WITH DUMMY
MOV #1,%1!1 ;LOAD R1!1 WITH 1
CLC
ASHC #8,%1 ;SHIFT R1,R1!1 BY 8.
MFPS @#PSWORD ;SAVE PS
.WORD 106700!..C
CMPB #0,@#PSWORD ;IS THE PS 0?
BEQ +10
JSR PC,\$HLT ;SEEN AN ERRGR, GO TO TH HALT ROUTINE
;THE PS IS NOT EQUAL TO 0
57
CMP #400,%1 ;IS THE RESULT 400?
BEQ +10
JSR PC,\$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;R1 IS NOT EQUAL TO 400
60
CMP (R5),#176 ;IS \$TESTN = #176?
BEQ +10 ;IF NOT THEN GO TO HLT
JSR PC,\$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;TEST IS IN WRONG SEQUENCE
61
INC (R5)

1316

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005142 010701
005144 012703 000000
005150 012703 177777
005154 000241
005156 073327 000017
005162 106737
005166 122737 000011 000432
005174 001403
005176 004767 011712
005202 000062
005204 022703 100000
005210 001403
005212 004767 011676
005216 000063
005220 021527 000177
005224 001403
005226 004767 011662
005232 000064
005234 005215

:TEST:177 -1 SHIFTED BY 15. = 100000 PS = 11

TST177: SCOPE1
MOV #DUMMY,%3 ;LOAD R3 WITH DUMMY
MOV #-1,%3!1 ;LOAD R3!1 WITH -1
CLC
ASHC #15,%3 ;SHIFT R3,R3!1 BY 15.
MFPS @#PSWORD ;SAVE PS
.WORD 106700!..C
CMPB #11,@#PSWORD ;IS THE PS 11?
BEQ +10
JSR PC,\$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;THE PS IS NOT EQUAL TO 11
62
CMP #100000,%3 ;IS THE RESULT 100000?
BEQ +10
JSR PC,\$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;R3 IS NOT EQUAL TO 100000
63
CMP (R5),#177 ;IS \$TESTN = #177?
BEQ +10 ;IF NOT THEN GO TO HLT
JSR PC,\$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;TEST IS IN WRONG SEQUENCE
64
INC (R5)

(1)
(1)

1317

```
(1)
(1)
(1)
(1) 005236 010701
(1) 005240 010501
(1) 005242 012705 000000
(1) 005246 012705 052525
(1) 005252 000241
(1) 005254 073527 000000
(1) 005260
(2) 005260 106737
(1) 005264 122737 000000 000432
(1) 005272 001403
(3) 005274 004767 011614
(3)
(3) 005300 000065
(1) 005302 022705 052525
(1) 005306 001403
(3) 005310 004767 011600
(3)
(3) 005314 000066
(1) 005316 010105
(1) 005320 021527 000200
(1) 005324 001403
(3) 005326 004767 011562
(3)
(3) 005332 000067
(1) 005334 005215
(1)
(1)
```

```
*****
:TEST:200      52525 SHIFTED BY 0 = 52525  PS = 0
*****
TST200: SCOPE1
MOV      R5,R1      ;SAVE R5
MOV      #DUMMY,%5 ;LOAD R5 WITH DUMMY
MOV      #52525,%5!1 ;LOAD R5!1 WITH 52525
CLC
ASHC     #-13,%5    ;SHIFT R5,R5!1 BY 0
MFPS     @#PSWORD   ;SAVE PS
        .WORD      106700!..C
CMPB     #0,@#PSWORD ;IS THE PS 0?
BEQ      +10
JSR      PC,$HLT    ;SEEN AN ERROR, GO TO TH HALT ROUTINE
        ;THE PS IS NOT EQUAL TO 0
        65
CMP      #52525,%5  ;IS THE RESULT 52525?
BEQ      +10
JSR      PC,$HLT    ;SEEN AN ERROR, GO TO TH HALT ROUTINE
        ;R5 IS NOT EQUAL TO 52525
        66
MOV      R1,R5      ;RESTORE R5
CMP      (R5),#200  ;IS $TESTN = #200?
BEQ      +10        ;IF NOT THEN GO TO HLT
JSR      PC,$HLT    ;SEEN AN ERROR, GO TO TH HALT ROUTINE
        ;TEST IS IN WRONG SEQUENCE
        67
INC      (R5)
```

1318

```
(1)
(1)
(1)
(1) 005336 010701
(1) 005340 012701 000000
(1) 005344 012701 020010
(1) 005350 000241
(1) 005352 073127 177763
(1) 005356
(2) 005356 106737
(1) 005362 122737 000000 000432
(1) 005370 001403
(3) 005372 004767 011516
(3)
(3) 005376 000070
(1) 005400 022701 000101
(1) 005404 001403
(3) 005406 004767 011502
(3)
(3) 005412 000071
(1) 005414 021527 000201
(1) 005420 001403
(3) 005422 004767 011466
(3)
```

```
*****
:TEST:201      20010 SHIFTED BY -13. = 101  PS = 0
*****
TST201: SCOPE1
MOV      #DUMMY,%1 ;LOAD R1 WITH DUMMY
MOV      #20010,%1!1 ;LOAD R1!1 WITH 20010
CLC
ASHC     #-13,%1    ;SHIFT R1,R1!1 BY -13.
MFPS     @#PSWORD   ;SAVE PS
        .WORD      106700!..C
CMPB     #0,@#PSWORD ;IS THE PS 0?
BEQ      +10
JSR      PC,$HLT    ;SEEN AN ERROR, GO TO TH HALT ROUTINE
        ;THE PS IS NOT EQUAL TO 0
        70
CMP      #101,%1    ;IS THE RESULT 101?
BEQ      +10
JSR      PC,$HLT    ;SEEN AN ERROR, GO TO TH HALT ROUTINE
        ;R1 IS NOT EQUAL TO 101
        71
CMP      (R5),#201  ;IS $TESTN = #201?
BEQ      +10        ;IF NOT THEN GO TO HLT
JSR      PC,$HLT    ;SEEN AN ERROR, GO TO TH HALT ROUTINE
        ;TEST IS IN WRONG SEQUENCE
```

(3) 005426 000072
(1) 005430 005215
(1)
(1)

72
INC (R5)

1319
 (1)
 (1)
 (1)
 (1) 005432 010701
 (1) 005434 012703 000000
 (1) 005440 012703 177777
 (1) 005444 000241
 (1) 005446 073327 000020
 (1) 005452
 (2) 005452 106737
 (1) 005456 122737 000011 000432
 (1) 005464 001403
 (3) 005466 004767 011422
 (3)
 (3) 005472 000073
 (1) 005474 022703 000000
 (1) 005500 001403
 (3) 005502 004767 011406
 (3)
 (3) 005506 000074
 (1) 005510 021527 000202
 (1) 005514 001403
 (3) 005516 004767 011372
 (3)
 (3) 005522 000075
 (1) 005524 005215

```

:*****
:TEST:202      -1 SHIFTED BY 16. = 0  PS = 11
:*****
TST202: SCOPE1
MOV      #DUMMY,%3      ;LOAD R3 WITH DUMMY
MOV      #-1,%3!1      ;LOAD R3!1 WITH -1
CLC
ASHC     #16.,%3        ;SHIFT R3,R3!1 BY 16.
MFPS     @#PSWORD      ;SAVE PS
.WORD    106700!..C
CMPB     #11,@#PSWORD  ;IS THE PS 11?
BEQ      .+10
JSR      PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;THE PS IS NOT EQUAL TO 11
73
CMP      #0,%3         ;IS THE RESULT 0?
BEQ      .+10
JSR      PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;R3 IS NOT EQUAL TO 0
74
CMP      (R5),#202     ;IS $TESTN = #202?
BEQ      .+10         ;IF NOT THEN GO TO HLT
JSR      PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;TEST IS IN WRONG SEQUENCE
75
INC      (R5)

```

1320
 (1)
 (1)
 (1)
 (1) 005526 010701
 (1) 005530 010501
 (1) 005532 012705 000000
 (1) 005536 012705 000001
 (1) 005542 000241
 (1) 005544 073527 177777
 (1) 005550
 (2) 005550 106737
 (1) 005554 122737 000001 000432
 (1) 005562 001403
 (3) 005564 004767 011324
 (3)
 (3) 005570 000076
 (1) 005572 022705 100000
 (1) 005576 001403
 (3) 005600 004767 011310
 (3)
 (3) 005604 000077
 (1) 005606 010105
 (1) 005610 021527 000203
 (1) 005614 001403
 (3) 005616 004767 011272
 (3)

```

:*****
:TEST:203      1 SHIFTED BY -1 = 100000  PS = 1
:*****
TST203: SCOPE1
MOV      R5,R1         ;SAVE R5
MOV      #DUMMY,%5    ;LOAD R5 WITH DUMMY
MOV      #1,%5!1     ;LOAD R5!1 WITH 1
CLC
ASHC     #-1,%5       ;SHIFT R5,R5!1 BY -1
MFPS     @#PSWORD      ;SAVE PS
.WORD    106700!..C
CMPB     #1,@#PSWORD  ;IS THE PS 1?
BEQ      .+10
JSR      PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;THE PS IS NOT EQUAL TO 1
76
CMP      #100000,%5   ;IS THE RESULT 100000?
BEQ      .+10
JSR      PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;R5 IS NOT EQUAL TO 100000
77
MOV      R1,R5         ;RESTORE R5
CMP      (R5),#203    ;IS $TESTN = #203?
BEQ      .+10         ;IF NOT THEN GO TO HLT
JSR      PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;TEST IS IN WRONG SEQUENCE

```


(3) 005622 000100
(1) 005624 005215
(1)
(1)

100
INC (R5)

1321
 (1)
 (1)
 (1)
 (1) 005626 010701
 (1) 005630 012701 000000
 (1) 005634 012701 125252
 (1) 005640 000241
 (1) 005642 073127 177760
 (1) 005646
 (2) 005646 106737
 (1) 005652 122737 000011 000432
 (1) 005660 001403
 (3) 005662 004767 011226
 (3)
 (3) 005666 000101
 (1) 005670 022701 125252
 (1) 005674 001403
 (3) 005676 004767 011212
 (3)
 (3) 005702 000102
 (1) 005704 021527 000204
 (1) 005710 001403
 (3) 005712 004767 011176
 (3)
 (3) 005716 000103
 (1) 005720 005215
 (1)
 (1)

```

:*****
:TEST:204      125252 SHIFTED BY -16. = 125252 PS = 11
:*****
TST204: SCOPE1
MOV      #DUMMY,%1      ;LOAD R1 WITH DUMMY
MOV      #125252,%1!1   ;LOAD R1!1 WITH 125252
CLC
ASHC     #-16.,%1      ;SHIFT R1,R1!1 BY -16.
MFPS     @#PSWORD      ;SAVE PS
.WORD    106700!..C
CMPB     #11,@#PSWORD   ;IS THE PS 11?
BEQ      .+10
JSR      PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                        ;THE PS IS NOT EQUAL TO 11
101
CMP      #125252,%1     ;IS THE RESULT 125252?
BEQ      .+10
JSR      PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                        ;R1 IS NOT EQUAL TO 125252
102
CMP      (R5),#204      ;IS $TESTN = #204?
BEQ      .+10          ;IF NOT THEN GO TO HLT
JSR      PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                        ;TEST IS IN WRONG SEQUENCE
103
INC      (R5)
    
```

1322
 (1)
 (1)
 (1)
 (1) 005722 010701
 (1) 005724 012702 125252
 (1) 005730 012703 125252
 (1) 005734 000241
 (1) 005736 073227 000025
 (1) 005742
 (2) 005742 106737
 (1) 005746 122737 000003 000432
 (1) 005754 001403
 (3) 005756 004767 011132
 (3)
 (3) 005762 000104
 (1) 005764 022702 052500
 (1) 005770 001403
 (3) 005772 004767 011116
 (3)
 (3) 005776 000105
 (1) 006000 022703 000000
 (1) 006004 001403
 (3) 006006 004767 011102
 (3)
 (3) 006012 000106
 (1) 006014 021527 000205

```

:*****
:TEST:205      125252 125252 SHIFTED BY 21. = 52500 000000 PS = 3
:*****
TST205: SCOPE1
MOV      #125252,%2     ;LOAD R2 WITH 125252
MOV      #125252,%2!1  ;LOAD R2!1 WITH 125252
CLC
ASHC     #21.,%2       ;SHIFT R2,R2!1 BY 21.
MFPS     @#PSWORD      ;SAVE PS
.WORD    106700!..C
CMPB     #3,@#PSWORD   ;IS THE PS 3?
BEQ      .+10
JSR      PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                        ;THE PS IS NOT EQUAL TO 3
104
CMP      #52500,%2     ;IS THE RESULT 52500?
BEQ      .+10
JSR      PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                        ;R2 IS NOT EQUAL TO 52500
105
CMP      #000000,%2!1  ;IS THE RESULT 000000?
BEQ      .+10
JSR      PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                        ;R2!1 IS NOT EQUAL TO 000000
106
CMP      (R5),#205     ;IS $TESTN = #205?
    
```

(1)	006020	001403		BEO	.+10	
(3)	006022	004767	011066	JSR	PC,\$HLT	
(3)						
(3)	006026	000107		107		
(1)	006030	005215		INC	(R5)	
(1)						
(1)						
1323						
1324	006032	012702	177771	MOV	#-7,%2	
1325	006036	012703	000454	MOV	#S1,%3	
1326	006042	012704	000456	MOV	#S2,%4	
1327						

:IF NOT THEN GO TO HLT
:SEEN AN ERROR, GO TO TH HALT ROUTINE
:TEST IS IN WRONG SEQUENCE

1328
 (1)
 (1)
 (1)
 (1) 006046 010701
 (1) 006050 012700 125252
 (1) 006054 012701 125252
 (1) 006060 000241
 (1) 006062 073067 172366
 (1) 006066
 (2) 006066 106737
 (1) 006072 122737 000010 000432
 (1) 006100 001403
 (3) 006102 004767 011006
 (3)
 (3) 006106 000110
 (1) 006110 022700 177525
 (1) 006114 001403
 (3) 006116 004767 010772
 (3)
 (3) 006122 000111
 (1) 006124 022701 052525
 (1) 006130 001403
 (1) 006132
 (3) 006132 004767 010756
 (3)
 (3) 006136 000112
 (1) 006140 021527 000206
 (1) 006144 001372
 (1) 006146 005215
 (1)
 (1)

```

:*****
:TEST:206      125252 125252 SHIFTED BY S1 = 177525 52525 PS = 10
:*****
TST206: SCOPE1
MOV      #125252,%0      ;LOAD R0 WITH 125252
MOV      #125252,%0!1   ;LOAD R0!1 WITH 125252
CLC
ASHC     S1,%0          ;SHIFT R0,R0!1 BY S1
MFPS     @#PSWORD      ;SAVE PS
.WORD    106700!..C
CMPB     #10,@#PSWORD   ;IS THE PS 10?
BEQ      .+10
JSR      PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                        ;THE PS IS NOT EQUAL TO 10
110
CMP      #177525,%0     ;IS THE RESULT 177525?
BEQ      .+10
JSR      PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                        ;R0 IS NOT EQUAL TO 177525
111
CMP      #52525,%0!1   ;IS THE RESULT 52525?
BEQ      .+10
1$:
JSR      PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                        ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
112
CMP      (R5),#206     ;IS THE $TESTN = #206?
BNE      1$           ;IF NOT THEN GO TO HLT ABOVE
INC      (R5)
  
```

1329
 (1)
 (1)
 (1)
 (1) 006150 010701
 (1) 006152 012700 125252
 (1) 006156 012701 125252
 (1) 006162 000241
 (1) 006164 073077 172266
 (1) 006170
 (2) 006170 106737
 (1) 006174 122737 000010 000432
 (1) 006202 001403
 (3) 006204 004767 010704
 (3)
 (3) 006210 000113
 (1) 006212 022700 177525
 (1) 006216 001403
 (3) 006220 004767 010670
 (3)
 (3) 006224 000114
 (1) 006226 022701 052525
 (1) 006232 001403
 (1) 006234

```

:*****
:TEST:207      125252 125252 SHIFTED BY @S2 = 177525 52525 PS = 10
:*****
TST207: SCOPE1
MOV      #125252,%0      ;LOAD R0 WITH 125252
MOV      #125252,%0!1   ;LOAD R0!1 WITH 125252
CLC
ASHC     @S2,%0         ;SHIFT R0,R0!1 BY @S2
MFPS     @#PSWORD      ;SAVE PS
.WORD    106700!..C
CMPB     #10,@#PSWORD   ;IS THE PS 10?
BEQ      .+10
JSR      PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                        ;THE PS IS NOT EQUAL TO 10
113
CMP      #177525,%0     ;IS THE RESULT 177525?
BEQ      .+10
JSR      PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                        ;R0 IS NOT EQUAL TO 177525
114
CMP      #52525,%0!1   ;IS THE RESULT 52525?
BEQ      .+10
1$:
  
```

(3)	006234	004767	010654	JSR	PC,\$HLT	:SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)						:R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
(3)	006240	000115		115		
(1)	006242	021527	000207	CMP	(R5),#207	:IS THE \$TESTN = #207?
(1)	006246	001372		BNE	1\$:IF NOT THEN GO TO HLT ABOVE
(1)	006250	005215		INC	(R5)	
(1)						
(1)						

1330

```
(1)
(1)
(1)
(1) 006252 010701
(1) 006254 012700 125252
(1) 006260 012701 125252
(1) 006264 000241
(1) 006266 073037 000454
(1) 006272
(2) 006272 106737
(1) 006276 122737 000010 000432
(1) 006304 001403
(3) 006306 004767 010602
(3)
(3) 006312 000116
(1) 006314 022700 177525
(1) 006320 001403
(3) 006322 004767 010566
(3)
(3) 006326 000117
(1) 006330 022701 052525
(1) 006334 001403
(1) 006336
(3) 006336 004767 010552
(3)
(3) 006342 000120
(1) 006344 021527 000210
(1) 006350 001372
(1) 006352 005215
(1)
(1)
```

```
*****
:TEST:210      125252 125252 SHIFTED BY @#S1 = 177525 52525 PS = 10
*****
TST210: SCOPE1
MOV      #125252,%0      ;LOAD R0 WITH 125252
MOV      #125252,%0!1    ;LOAD R0!1 WITH 125252
CLC
ASHC     @#S1,%0         ;SHIFT R0,R0!1 BY @#S1
MFPS     @#PSWORD        ;SAVE PS
        .WORD 106700!..C
CMPB     #10,@#PSWORD    ;IS THE PS 10?
BEQ      .+10
JSR      PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                        ;THE PS IS NOT EQUAL TO 10
        116
CMP      #177525,%0      ;IS THE RESULT 177525?
BEQ      .+10
JSR      PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                        ;R0 IS NOT EQUAL TO 177525
        117
CMP      #52525,%0!1     ;IS THE RESULT 52525?
BEQ      .+10
1$:      JSR      PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                        ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
        120
CMP      (R5),#210       ;IS THE $TESTN = #210?
BNE      1$              ;IF NOT THEN GO TO HLT ABOVE
INC      (R5)
```

1331

```
(1)
(1)
(1)
(1) 006354 010701
(1) 006356 012700 125252
(1) 006362 012701 125252
(1) 006366 000241
(1) 006370 073013
(1) 006372
(2) 006372 106737
(1) 006376 122737 000010 000432
(1) 006404 001403
(3) 00 06 004767 010502
(3)
(3) 006412 000121
(1) 006414 022700 177525
(1) 006420 001403
(3) 006422 004767 010466
(3)
(3) 006426 000122
(1) 006430 022701 052525
(1) 006434 001403
(1) 006436
```

```
*****
:TEST:211      125252 125252 SHIFTED BY (3) = 177525 52525 PS = 10
*****
TST211: SCOPE1
MOV      #125252,%0      ;LOAD R0 WITH 125252
MOV      #125252,%0!1    ;LOAD R0!1 WITH 125252
CLC
ASHC     (3),%0          ;SHIFT R0,R0!1 BY (3)
MFPS     @#PSWORD        ;SAVE PS
        .WORD 106700!..C
CMPB     #10,@#PSWORD    ;IS THE PS 10?
BEQ      .+10
JSR      PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                        ;THE PS IS NOT EQUAL TO 10
        121
CMP      #177525,%0      ;IS THE RESULT 177525?
BEQ      .+10
JSR      PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                        ;R0 IS NOT EQUAL TO 177525
        122
CMP      #52525,%0!1     ;IS THE RESULT 52525?
BEQ      .+10
1$:      JSR      PC,$HLT
```

(3) 006436 004767 010452
(3)
(3) 006442 000123
(1) 006444 021527 000211
(1) 006450 001372
(1) 006452 005215
(1)
(1)

JSR PC,\$HLT
123
CMP (R5),#211
BNE 1\$
INC (R5)

:SEEN AN ERROR, GO TO TH HALT ROUTINE
:R0:1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
:IS THE \$TESTN = #211?
:IF NOT THEN GO TO HLT ABOVE

```

1332
(1)
(1)
(1)
(1) 006454 010701
(1) 006456 012700 125252
(1) 006462 012701 125252
(1) 006466 000241
(1) 006470 073023
(1) 006472
(2) 006472 106737
(1) 006476 122737 000010 000432
(1) 006504 001403
(3) 006506 004767 010402
(3)
(3) 006512 000124
(1) 006514 022700 177525
(1) 006520 001403
(3) 006522 004767 010366
(3)
(3) 006526 000125
(1) 006530 022701 052525
(1) 006534 001403
(1) 006536
(3) 006536 004767 010352
(3)
(3) 006542 000126
(1) 006544 021527 000212
(1) 006550 001372
(1) 006552 005215
(1)
(1)
TST212: SCOPE1
MOV #125252,%0 ;LOAD R0 WITH 125252
MOV #125252,%0!1 ;LOAD R0!1 WITH 125252
CLC
ASHC (3)+,%0 ;SHIFT R0,R0!1 BY (3)+
MFPS @#PSWORD ;SAVE PS
.WORD 106700!..C
CMPB #10,@#PSWORD ;IS THE PS 10?
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;THE PS IS NOT EQUAL TO 10
124
CMP #177525,%0 ;IS THE RESULT 177525?
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;R0 IS NOT EQUAL TO 177525
125
CMP #52525,%0!1 ;IS THE RESULT 52525?
BEQ .+10
1$: JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
126
CMP (R5),#212 ;IS THE $TESTN = #212?
BNE 1$ ;IF NOT THEN GO TO HLT ABOVE
INC (R5)

```

```

1333
(1)
(1)
(1)
(1) 006554 010701
(1) 006556 012700 125252
(1) 006562 012701 125252
(1) 006566 000241
(1) 006570 073043
(1) 006572
(2) 006572 106737
(1) 006576 122737 000010 000432
(1) 006604 001403
(3) 006606 004767 010302
(3)
(3) 006612 000127
(1) 006614 022700 177525
(1) 006620 001403
(3) 006622 004767 010266
(3)
(3) 006626 000130
(1) 006630 022701 052525
(1) 006634 001403
(1) 006636
TST213: SCOPE1
MOV #125252,%0 ;LOAD R0 WITH 125252
MOV #125252,%0!1 ;LOAD R0!1 WITH 125252
CLC
ASHC -(3),%0 ;SHIFT R0,R0!1 BY -(3)
MFPS @#PSWORD ;SAVE PS
.WORD 106700!..C
CMPB #10,@#PSWORD ;IS THE PS 10?
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;THE PS IS NOT EQUAL TO 10
127
CMP #177525,%0 ;IS THE RESULT 177525?
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;R0 IS NOT EQUAL TO 177525
130
CMP #52525,%0!1 ;IS THE RESULT 52525?
BEQ .+10
1$:

```


(3) 006636 004767 010252
(3)
(3) 006642 000131
(1) 006644 021527 000213
(1) 006650 001372
(1) 006652 005215
(1)
(1)

JSR PC,\$HLT
131
CMP (R5),#213
BNE 1\$
INC (R5)

:SEEN AN ERROR, GO TO TH HALT ROUTINE
:R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
:IS THE \$TESTN = #213?
:IF NOT THEN GO TO HLT ABOVE

1334

```
(1)
(1)
(1)
(1) 006654 010701
(1) 006656 012700 125252
(1) 006662 012701 125252
(1) 006666 000241
(1) 006670 073064 000002
(1) 006674
(2) 006674 106737
(1) 006700 122737 000011 000432
(1) 006706 001403
(3) 006710 004767 010200
(3)
(3) 006714 000132
(1) 006716 022700 177252
(1) 006722 001403
(3) 006724 004767 010164
(3)
(3) 006730 000133
(1) 006732 022701 125252
(1) 006736 001403
(1) 006740
(3) 006740 004767 010150
(3)
(3) 006744 000134
(1) 006746 021527 000214
(1) 006752 001372
(1) 006754 005215
(1)
(1)
```

```
*****
:TEST:214 125252 125252 SHIFTED BY 2(4) = 177252 125252 PS = 11
*****
TST214: SCOPE1
MOV #125252,%0 ;LOAD R0 WITH 125252
MOV #125252,%0!1 ;LOAD R0!1 WITH 125252
CLC
ASHC 2(4),%0 ;SHIFT R0,R0!1 BY 2(4)
MFPS @#PSWORD ;SAVE PS
.WORD 106700!..C
CMPB #11,@#PSWORD ;IS THE PS 11?
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;THE PS IS NOT EQUAL TO 11
132
CMP #177252,%0 ;IS THE RESULT 177252?
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;R0 IS NOT EQUAL TO 177252
133
CMP #125252,%0!1 ;IS THE RESULT 125252?
BEQ .+10
1$: JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;R0!1 IS NOT EQUAL TO 125252 OR INCORRECT SEQUENCE
134
CMP (R5),#214 ;IS THE $TESTN = #214?
BNE 1$ ;IF NOT THEN GO TO HLT ABOVE
INC (R5)
```

1335

```
(1)
(1)
(1)
(1) 006756 010701
(1) 006760 012700 125252
(1) 006764 012701 125252
(1) 006770 000241
(1) 006772 073074 000000
(1) 006776
(2) 006776 106737
(1) 007002 122737 000010 000432
(1) 007010 001403
(3) 007012 004767 010076
(3)
(3) 007016 000135
(1) 007020 022700 177525
(1) 007024 001403
(3) 007026 004767 010062
(3)
(3) 007032 000136
(1) 007034 022701 052525
(1) 007040 001403
(1) 007042
```

```
*****
:TEST:215 125252 125252 SHIFTED BY @ (4) = 177525 52525 PS = 10
*****
TST215: SCOPE1
MOV #125252,%0 ;LOAD R0 WITH 125252
MOV #125252,%0!1 ;LOAD R0!1 WITH 125252
CLC
ASHC @(4),%0 ;SHIFT R0,R0!1 BY @(4)
MFPS @#PSWORD ;SAVE PS
.WORD 106700!..C
CMPB #10,@#PSWORD ;IS THE PS 10?
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;THE PS IS NOT EQUAL TO 10
135
CMP #177525,%0 ;IS THE RESULT 177525?
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;R0 IS NOT EQUAL TO 177525
136
CMP #52525,%0!1 ;IS THE RESULT 52525?
BEQ .+10
1$: JSR PC,$HLT
```

(3)	007042	004767	010046	JSR	PC,\$HLT	:SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)						:R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
(3)	007046	000137		137		
(1)	007050	021527	000215	CMP	(R5),#215	:IS THE \$TESTN = #215?
(1)	007054	001372		BNE	1\$:IF NOT THEN GO TO HLT ABOVE
(1)	007056	005215		INC	(R5)	
(1)						
(1)						

1336

```
(1)
(1)
(1)
(1) 007060 010701
(1) 007062 012700 125252
(1) 007066 012701 125252
(1) 007072 000241
(1) 007074 073034
(1) 007076
(2) 007076 106737
(1) 007102 122737 000010 000432
(1) 007110 001403
(3) 007112 004767 007776
(3)
(3) 007116 000140
(1) 007120 022700 177525
(1) 007124 001403
(3) 007126 004767 007762
(3)
(3) 007132 000141
(1) 007134 022701 052525
(1) 007140 001403
(1) 007142
(3) 007142 004767 007746
(3)
(3) 007146 000142
(1) 007150 021527 000216
(1) 007154 001372
(1) 007156 005215
(1)
(1)
```

```
*****
;TEST:216      125252 125252 SHIFTED BY @-(4)+ = 177525 52525 PS = 10
*****
TST216: SCOPE1
MOV      #125252,%0          ;LOAD R0 WITH 125252
MOV      #125252,%0!1       ;LOAD R0!1 WITH 125252
CLC
ASHC     @-(4),%0           ;SHIFT R0,R0!1 BY @-(4)
MFPS     @#PSWORD          ;SAVE PS
.WORD    106700!..C
CMPB     #10,@#PSWORD       ;IS THE PS 10?
BEQ      .+10
JSR      PC,$HLT           ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;THE PS IS NOT EQUAL TO 10
140
CMP      #177525,%0         ;IS THE RESULT 177525?
BEQ      .+10
JSR      PC,$HLT           ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;R0 IS NOT EQUAL TO 177525
141
CMP      #52525,%0!1       ;IS THE RESULT 52525?
BEQ      .+10
1$:      JSR      PC,$HLT   ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
142
CMP      (R5),#216         ;IS THE $TESTN = #216?
BNE      1$               ;IF NOT THEN GO TO HLT ABOVE
INC      (R5)
```

1337

```
(1)
(1)
(1)
(1) 007160 010701
(1) 007162 012700 125252
(1) 007166 012701 125252
(1) 007172 000241
(1) 007174 073054
(1) 007176
(2) 007176 106737
(1) 007202 122737 000010 000432
(1) 007210 001403
(3) 007212 004767 007676
(3)
(3) 007216 000143
(1) 007220 022700 177525
(1) 007224 001403
(3) 007226 004767 007662
(3)
(3) 007232 000144
(1) 007234 022701 052525
(1) 007240 001403
(1) 007242
```

```
*****
;TEST:217      125252 125252 SHIFTED BY @-(4) = 177525 52525 PS = 10
*****
TST217: SCOPE1
MOV      #125252,%0          ;LOAD R0 WITH 125252
MOV      #125252,%0!1       ;LOAD R0!1 WITH 125252
CLC
ASHC     @-(4),%0           ;SHIFT R0,R0!1 BY @-(4)
MFPS     @#PSWORD          ;SAVE PS
.WORD    106700!..C
CMPB     #10,@#PSWORD       ;IS THE PS 10?
BEQ      .+10
JSR      PC,$HLT           ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;THE PS IS NOT EQUAL TO 10
143
CMP      #177525,%0         ;IS THE RESULT 177525?
BEQ      .+10
JSR      PC,$HLT           ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;R0 IS NOT EQUAL TO 177525
144
CMP      #52525,%0!1       ;IS THE RESULT 52525?
BEQ      .+10
1$:      JSR      PC,$HLT
```

```
(3) 007242 004767 007646 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;RO!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
(3) 007246 000145 145
(1) 007250 021527 000217 CMP (R5),#217 ;IS THE $TESTN = #217?
(1) 007254 001372 BNE 1$ ;IF NOT THEN GO TO HLT ABOVE
(1) 007256 005215 INC (R5)
```

1338
1339
1340
1341
1342
1343
1344
1438
1439
1440
1441
1442
1443
1444
1445

: MUL INSTRUCTION TESTS

:TEST:220 MUL 1 * #0 = 0 0 PS = 4

```
(1) 007260 010701 TST220: SCOPE
(1) 007262 012700 MOV #1,%0 ;LOAD MULTIPLICAND WITH 1
(1) 007266 070027 MUL #0,%0 ;MULTIPLY 1 * #0
(1) 007272 MFPS @#PSWORD ;SAVE PS
(2) 007272 106737 .WORD 106700!..C
(1) 007276 122737 000004 000432 CMPB #4,@#PSWORD ;IS PS = 4
(1) 007304 001403 BEQ .+10
(3) 007306 004767 007602 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;PS IS WRONG
(3) 007312 000146 146
(1) 007314 022700 000000 CMP #0,%0 ;IS HIGH ORDER = 0
(1) 007320 001403 BEQ .+10
(3) 007322 004767 007566 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;HIGH ORDER IS WRONG
(3) 007326 000147 147
(1) 007330 022701 000000 CMP #0,%0!1 ;IS LOW ORDER = 0
(1) 007334 001403 BEQ .+10
(1) 007336 1$: JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3) 007342 000150 150
(1) 007344 021527 000220 CMP (R5),#220
(1) 007350 001372 BNE 1$ ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 007352 005215 INC (R5)
```

1446
(1)
(1)
(1)

:TEST:221 MUL -1 * #1 = -1 -1 PS = 10

```
(1) 007354 010701 TST221: SCOPE
(1) 007356 012700 MOV #-1,%0 ;LOAD MULTIPLICAND WITH -1
```

```

(1) 007362 070027 000001      MUL      #1,%0      ;MULTIPLY -1 * #1
(1) 007366                    MFPS     @#PSWORD   ;SAVE PS
(2) 007366 106737                    .WORD   106700!..C
(1) 007372 122737 000010 000432  CMPB    #10,@#PSWORD ;IS PS = 10
(1) 007400 001403                    BEQ     .+10
(3) 007402 004767 007506      JSR     PC,$HLT     ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;PS IS WRONG
(3) 007406 000151                    151
(1) 007410 022700 177777      CMP     #-1,%0     ;IS HIGH ORDER = -1
(1) 007414 001403                    BEQ     .+10
(3) 007416 004767 007472      JSR     PC,$HLT     ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;HIGH ORDER IS WRONG
(3) 007422 000152                    152
(1) 007424 022701 177777      CMP     #-1,%0!1   ;IS LOW ORDER = -1
(1) 007430 001403                    BEQ     .+10
(1) 007432                    1$:
(3) 007432 004767 007456      JSR     PC,$HLT     ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3) 007436 000153                    153
(1) 007440 021527 000221      CMP     (R5),#221
(1) 007444 001372                    BNE    1$           ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 007446 005215                    INC    (R5)
1447
(1)                                ;*****
(1)                                ;TEST:222      MUL      2 * #2 = 0 4      PS = 0
(1)                                ;*****
(1)                                TST222: SCOPE
(1) 007450 010701                    MOV     #2,%2      ;LOAD MULTIPLICAND WITH 2
(1) 007452 012702 000002      MUL     #2,%2      ;MULTIPLY 2 * #2
(1) 007456 070227 000002      MFPS   @#PSWORD   ;SAVE PS
(2) 007462 106737                    .WORD   106700!..C
(1) 007466 122737 000000 000432  CMPB    #0,@#PSWORD ;IS PS = 0
(1) 007474 001403                    BEQ     .+10
(3) 007476 004767 007412      JSR     PC,$HLT     ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;PS IS WRONG
(3) 007502 000154                    154
(1) 007504 022702 000000      CMP     #0,%2      ;IS HIGH ORDER = 0
(1) 007510 001403                    BEQ     .+10
(3) 007512 004767 007376      JSR     PC,$HLT     ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;HIGH ORDER IS WRONG
(3) 007516 000155                    155
(1) 007520 022703 000004      CMP     #4,%2!1   ;IS LOW ORDER = 4
(1) 007524 001403                    BEQ     .+10
(1) 007526                    1$:
(3) 007526 004767 007362      JSR     PC,$HLT     ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3) 007532 000156                    156
(1) 007534 021527 000222      CMP     (R5),#222
(1) 007540 001372                    BNE    1$           ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 007542 005215                    INC    (R5)
1448
(1)                                ;*****
(1)                                ;TEST:223      MUL      1000 * #200 = 1 0      PS = 1
(1)                                ;*****
(1)                                TST223: SCOPE
(1) 007544 010701                    MOV     R5,R1      ;SAVE R5
(1) 007546 010501

```

```
(1) 007550 012704 001000      MOV      #1000,%4      ;LOAD MULTIPLICAND WITH 1000
(1) 007554 070427 000200      MUL      #200,%4      ;MULTIPLY 1000 * #200
(1) 007560                      MFPS     @#PSWORD      ;SAVE PS
(2) 007560 106737                      .WORD   106700!..C
(1) 007564 122737 000001 000432  CMPB     #1,@#PSWORD   ;IS PS = 1
(1) 007572 001403                      BEQ     .+10
(3) 007574 004767 007314      JSR     PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;PS IS WRONG
(3) 007600 000157                      157
(1) 007602 022704 000001      CMP     #1,%4         ;IS HIGH ORDER = 1
(1) 007606 001403                      BEQ     .+10
(3) 007610 004767 007300      JSR     PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;HIGH ORDER IS WRONG
(3) 007614 000160                      160
(1) 007616 022705 000000      CMP     #0,%4!1      ;IS LOW ORDER = 0
(1) 007622 001403                      BEQ     .+10
(1) 007624                      1$:
(3) 007624 004767 007264      JSR     PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3) 007630 000161                      161
(1) 007632 021127 000223      CMP     (R1),#223     ;CHECK THE TEST NUMBER
(1) 007636 001372                      BNE     1$            ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 007640 010105                      MOV     R1,R5         ;RESTORE R5
(1) 007642 005215                      INC     (R5)
```

```
1449
(1) *****
(1) :TEST:224      MUL      2 * #77777 = 0 177776      PS = 1
(1) *****
```

```
(1) 007644 010701                      TST224: SCOPE
(1) 007646 012700 000002      MOV     #2,%0         ;LOAD MULTIPLICAND WITH 2
(1) 007652 070027 077777      MUL     #77777,%0     ;MULTIPLY 2 * #77777
(1) 007656                      MFPS     @#PSWORD      ;SAVE PS
(2) 007656 106737                      .WORD   106700!..C
(1) 007662 122737 000001 000432  CMPB     #1,@#PSWORD   ;IS PS = 1
(1) 007670 001403                      BEQ     .+10
(3) 007672 004767 007216      JSR     PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;PS IS WRONG
(3) 007676 000162                      162
(1) 007700 022700 000000      CMP     #0,%0         ;IS HIGH ORDER = 0
(1) 007704 001403                      BEQ     .+10
(3) 007706 004767 007202      JSR     PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;HIGH ORDER IS WRONG
(3) 007712 000163                      163
(1) 007714 022701 177776      CMP     #177776,%0!1  ;IS LOW ORDER = 177776
(1) 007720 001403                      BEQ     .+10
(1) 007722                      1$:
(3) 007722 004767 007166      JSR     PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3) 007726 000164                      164
(1) 007730 021527 000224      CMP     (R5),#224     ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 007734 001372                      BNE     1$
(1) 007736 005215                      INC     (R5)
```

```
1450
(1) *****
(1) :TEST:225      MUL      7777 * #10 = 0 77770      PS = 0
(1) *****
```

```

(1) 007740 010701          TST225: SCOPE
(1) 007742 012702 007777  MOV      #7777,%2      ;LOAD MULTIPLICAND WITH 7777
(1) 007746 070227 000010  MUL      #10,%2      ;MULTIPLY 7777 * #10
(1) 007752          MFPS     @#PSWORD    ;SAVE PS
(2) 007752 106737          .WORD    106700!..C
(1) 007756 122737 000000 000432  CMPB    #0,@#PSWORD ;IS PS = 0
(1) 007764 001403          BEQ     .+10
(3) 007766 004767 007122          JSR     PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;PS IS WRONG
(3) 007772 000165          165
(1) 007774 022702 000000          CMP     #0,%2      ;IS HIGH ORDER = 0
(1) 010000 001403          BEQ     .+10
(3) 010002 004767 007106          JSR     PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;HIGH ORDER IS WRONG
(3) 010006 000166          166
(1) 010010 022703 077770          CMP     #77770,%2!1 ;IS LOW ORDER = 77770
(1) 010014 001403          BEQ     .+10
(1) 010016          1$:
(3) 010016 004767 007072          JSR     PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3) 010022 000167          167
(1) 010024 021527 000225          CMP     (R5),#225
(1) 010030 001372          BNE     1$           ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 010032 005215          INC     (R5)
1451 *****
(1) ;TEST:226      MUL      77777 * #77777 = 37777 1      PS = 1
(1) *****
(1)
(1) 010034 010701          TST226: SCOPE
(1) 010036 010501          MOV     R5,R1      ;SAVE R5
(1) 010040 012704 077777          MOV     #77777,%4  ;LOAD MULTIPLICAND WITH 77777
(1) 010044 070427 077777          MUL     #77777,%4  ;MULTIPLY 77777 * #77777
(1) 010050          MFPS     @#PSWORD    ;SAVE PS
(2) 010050 106737          .WORD    106700!..C
(1) 010054 122737 000001 000432  CMPB    #1,@#PSWORD ;IS PS = 1
(1) 010062 001403          BEQ     .+10
(3) 010064 004767 007024          JSR     PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;PS IS WRONG
(3) 010070 000170          170
(1) 010072 022704 037777          CMP     #37777,%4  ;IS HIGH ORDER = 37777
(1) 010076 001403          BEQ     .+10
(3) 010100 004767 007010          JSR     PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;HIGH ORDER IS WRONG
(3) 010104 000171          171
(1) 010106 022705 000001          CMP     #1,%4!1    ;IS LOW ORDER = 1
(1) 010112 001403          BEQ     .+10
(1) 010114          1$:
(3) 010114 004767 006774          JSR     PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3) 010120 000172          172
(1) 010122 021127 000226          CMP     (R1),#226  ;CHECK THE TEST NUMBER
(1) 010126 001372          BNE     1$           ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 010130 010105          MOV     R1,R5      ;RESTORE R5
(1) 010132 005215          INC     (R5)
1452 *****
(1) ;TEST:227      MUL     -1 * #77777 = -1 10001      PS = 10
    
```



```

(1) ;*****
(1) (1) 010134 010701 TST227: SCOPE
(1) 010136 012702 177777 MOV #-1,%2 ;LOAD MULTIPLICAND WITH -1
(1) 010142 070227 077777 MUL #77777,%2 ;MULTIPLY -1 * #77777
(1) 010146 MFPS @#PSWORD ;SAVE PS
(2) 010146 106737 .WORD 106700!..C
(1) 010152 122737 000010 000432 CMPB #10,@#PSWORD ;IS PS = 10
(1) 010160 001403 BEQ .+10
(3) 010162 004767 006726 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;PS IS WRONG
(3) 010166 000173 173
(1) 010170 022702 177777 CMP #-1,%2 ;IS HIGH ORDER = -1
(1) 010174 001403 BEQ .+10
(3) 010176 004767 006712 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;HIGH ORDER IS WRONG
(3) 010202 000174 174
(1) 010204 022703 100001 CMP #100001,%2!1 ;IS LOW ORDER = 100001
(1) 010210 001403 BEQ .+10
(1) 010212 1$: JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) 010212 004767 006676 ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3) 175
(3) 010216 000175 CMP (R5),#227
(1) 010220 021527 000227 BNE 1$ ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 010224 001372 INC (R5)
(1) 010226 005215

```

```

1453 ;*****
(1) ;TEST:230 MUL -2 * #77777 = -1 2 PS = 11
(1) ;*****

```

```

(1) (1) 010230 010701 TST230: SCOPE
(1) 010232 012700 177776 MOV #-2,%0 ;LOAD MULTIPLICAND WITH -2
(1) 010236 070027 077777 MUL #77777,%0 ;MULTIPLY -2 * #77777
(1) 010242 MFPS @#PSWORD ;SAVE PS
(2) 010242 106737 .WORD 106700!..C
(1) 010246 122737 000011 000432 CMPB #11,@#PSWORD ;IS PS = 11
(1) 010254 001403 BEQ .+10
(3) 010256 004767 006632 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;PS IS WRONG
(3) 010262 000176 176
(1) 010264 022700 177777 CMP #-1,%0 ;IS HIGH ORDER = -1
(1) 010270 001403 BEQ .+10
(3) 010272 004767 006616 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;HIGH ORDER IS WRONG
(3) 010276 000177 177
(1) 010300 022701 000002 CMP #2,%0!1 ;IS LOW ORDER = 2
(1) 010304 001403 BEQ .+10
(1) 010306 1$: JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) 010306 004767 006602 ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3) 200
(3) 010312 000200 CMP (R5),#230
(1) 010314 021527 000230 BNE 1$ ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 010320 001372 INC (R5)
(1) 010322 005215

```

```

1454 ;*****
(1) ;TEST:231 MUL 125252 * #2 = -1 52524 PS = 11

```

```

(1) ;*****
(1)
(1) 010324 010701 TST231: SCOPE
(1) 010326 012702 125252 MOV #125252,%2 ;LOAD MULTIPLICAND WITH 125252
(1) 010332 070227 000002 MUL #2,%2 ;MULTIPLY 125252 * #2
(1) 010336 MFPS @#PSWORD ;SAVE PS
(2) 010336 106737 .WORD 106700!..C
(1) 010342 122737 000011 000432 CMPB #11,@#PSWORD ;IS PS = 11
(1) 010350 001403 BEQ .+10
(3) 010352 004767 006536 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;PS IS WRONG
(3) 010356 000201 201
(1) 010360 022702 177777 CMP #-1,%2 ;IS HIGH ORDER = -1
(1) 010364 001403 BEQ .+10
(3) 010366 004767 006522 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;HIGH ORDER IS WRONG
(3) 010372 000202 202
(1) 010374 022703 052524 CMP #52524,%2!1 ;IS LOW ORDER = 52524
(1) 010400 001403 BEQ .+10
(1) 010402 1$: JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) 010402 004767 006506 ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3) 010406 000203 203
(1) 010410 021527 000231 CMP (R5),#231
(1) 010414 001372 BNE 1$ ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 010416 005215 INC (R5)
1455 ;*****
(1) ;TEST:232 MUL 125252 * #40000 = 165252 100000 PS = 11
(1) ;*****
(1)
(1) 010420 010701 TST232: SCOPE
(1) 010422 010501 MOV R5,R1 ;SAVE R5
(1) 010424 012704 125252 MOV #125252,%4 ;LOAD MULTIPLICAND WITH 125252
(1) 010430 070427 040000 MUL #40000,%4 ;MULTIPLY 125252 * #40000
(1) 010434 MFPS @#PSWORD ;SAVE PS
(2) 010434 106737 .WORD 106700!..C
(1) 010440 122737 000011 000432 CMPB #11,@#PSWORD ;IS PS = 11
(1) 010446 001403 BEQ .+10
(3) 010450 004767 006440 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;PS IS WRONG
(3) 010454 000204 204
(1) 010456 022704 165252 CMP #165252,%4 ;IS HIGH ORDER = 165252
(1) 010462 001403 BEQ .+10
(3) 010464 004767 006424 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;HIGH ORDER IS WRONG
(3) 010470 000205 205
(1) 010472 022705 100000 CMP #100000,%4!1 ;IS LOW ORDER = 100000
(1) 010476 001403 BEQ .+10
(1) 010500 1$: JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) 010500 004767 006410 ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3) 010504 000206 206
(1) 010506 021127 000232 CMP (R1),#232 ;CHECK THE TEST NUMBER
(1) 010512 001372 BNE 1$ ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 010514 010105 MOV R1,R5 ;RESTORE R5
(1) 010516 005215 INC (R5)
  
```

1456

```

:*****
:TEST:233      MUL      107070 * #107070 = 31222 26100      PS = 1
:*****
TST233: SCOPE
MOV      #107070,%0      ;LOAD MULTIPLICAND WITH 107070
MUL      #107070,%0      ;MULTIPLY 107070 * #107070
MFPS     @#PSWORD        ;SAVE PS
.WORD    106700!..C
CMPB     #1,@#PSWORD     ;IS PS = 1
BEQ      .+10
JSR      PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                ;PS IS WRONG
                                207
CMP      #31222,%0      ;IS HIGH ORDER = 31222
BEQ      .+10
JSR      PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                ;HIGH ORDER IS WRONG
                                210
CMP      #26100,%0!1    ;IS LOW ORDER = 26100
BEQ      .+10
1$:      JSR      PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
                                211
CMP      (R5),#233
BNE      1$
INC      (R5)
;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE

```

1457

```

:*****
:TEST:234      MUL      -1 * #1 = -1 -1      PS = 10
:*****
TST234: SCOPE
MOV      #-1,%1         ;LOAD MULTIPLICAND WITH -1
MUL      #1,%1          ;MULTIPLY -1 * #1
MFPS     @#PSWORD        ;SAVE PS
.WORD    106700!..C
CMPB     #10,@#PSWORD    ;IS PS = 10
BEQ      .+10
JSR      PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                ;PS IS WRONG
                                212
CMP      #-1,%1         ;IS HIGH ORDER = -1
BEQ      .+10
JSR      PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                ;HIGH ORDER IS WRONG
                                213
CMP      #-1,%1!1      ;IS LOW ORDER = -1
BEQ      .+10
1$:      JSR      PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
                                214
CMP      (R5),#234
BNE      1$
INC      (R5)
;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE

```

```

(1)
(1)
(1)
(1) 010520 010701
(1) 010522 012700 107070
(1) 010526 070027 107070
(1) 010532
(2) 010532 106737
(1) 010536 122737 000001 000432
(1) 010544 001403
(3) 010546 004767 006342
(3)
(3) 010552 000207
(1) 010554 022700 031222
(1) 010560 001403
(3) 010562 004767 006326
(3)
(3) 010566 000210
(1) 010570 022701 026100
(1) 010574 001403
(1) 010576
(3) 010576 004767 006312
(3)
(3) 010602 000211
(1) 010604 021527 000233
(1) 010610 001372
(1) 010612 005215
(1)
(1)
(1)
(1) 010614 010701
(1) 010616 012701 177777
(1) 010622 070127 000001
(1) 010626
(2) 010626 106737
(1) 010632 122737 000010 000432
(1) 010640 001403
(3) 010642 004767 006246
(3)
(3) 010646 000212
(1) 010650 022701 177777
(1) 010654 001403
(3) 010656 004767 006232
(3)
(3) 010662 000213
(1) 010664 022701 177777
(1) 010670 001403
(1) 010672
(3) 010672 004767 006216
(3)
(3) 010676 000214
(1) 010700 021527 000234
(1) 010704 001372
(1) 010706 005215

```

1458

```
(1)
(1)
(1)
(1) 010710 010701
(1) 010712 012703 177777
(1) 010716 070327 000000
(1) 010722
(2) 010722 106737
(1) 010726 122737 000004 000432
(1) 010734 001403
(3) 010736 004767 006152
(3)
(3) 010742 000215
(1) 010744 022703 000000
(1) 010750 001403
(3) 010752 004767 006136
(3)
(3) 010756 000216
(1) 010760 022703 000000
(1) 010764 001403
(1) 010766
(3) 010766 004767 006122
(3)
(3) 010772 000217
(1) 010774 021527 000235
(1) 011000 001372
(1) 011002 005215
```

```
*****
:TEST:235      MUL      -1 * #0 = 0 0      PS = 4
*****
TST235: SCOPE
MOV      #-1,%3      ;LOAD MULTIPLICAND WITH -1
MUL      #0,%3      ;MULTIPLY -1 * #0
MFPS     @#PSWORD   ;SAVE PS
        .WORD      106700!...C
CMPB     #4,@#PSWORD ;IS PS = 4
BEQ      .+10
JSR      PC,$HLT    ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                    ;PS IS WRONG
        215
CMP      #0,%3      ;IS HIGH ORDER = 0
BEQ      .+10
JSR      PC,$HLT    ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                    ;HIGH ORDER IS WRONG
        216
CMP      #0,%3!1    ;IS LOW ORDER = 0
BEQ      .+10
1$:      JSR      PC,$HLT    ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                    ;LOW ORDER IS WRONG OR WRONG SEQUENCE
        217
CMP      (R5),#235
BNE      1$
INC      (R5)
                    ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
```

1459

```
(1)
(1)
(1)
(1) 011004 010701
(1) 011006 010501
(1) 011010 012705 077777
(1) 011014 070527 100000
(1) 011020
(2) 011020 106737
(1) 011024 122737 000011 000432
(1) 011032 001403
(3) 011034 004767 006054
(3)
(3) 011040 000220
(1) 011042 022705 100000
(1) 011046 001403
(3) 011050 004767 006040
(3)
(3) 011054 000221
(1) 011056 022705 100000
(1) 011062 001403
(1) 011064
(3) 011064 004767 006024
(3)
(3) 011070 000222
(1) 011072 021127 000236
(1) 011076 001372
```

```
*****
:TEST:236      MUL      77777 * #100000 = 100000 100000      PS = 11
*****
TST236: SCOPE
MOV      R5,R1      ;SAVE R5
MOV      #77777,%5  ;LOAD MULTIPLICAND WITH 77777
MUL      #100000,%5 ;MULTIPLY 77777 * #100000
MFPS     @#PSWORD   ;SAVE PS
        .WORD      106700!...C
CMPB     #11,@#PSWORD ;IS PS = 11
BEQ      .+10
JSR      PC,$HLT    ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                    ;PS IS WRONG
        220
CMP      #100000,%5 ;IS HIGH ORDER = 100000
BEQ      .+10
JSR      PC,$HLT    ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                    ;HIGH ORDER IS WRONG
        221
CMP      #100000,%5!1 ;IS LOW ORDER = 100000
BEQ      .+10
1$:      JSR      PC,$HLT    ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                    ;LOW ORDER IS WRONG OR WRONG SEQUENCE
        222
CMP      (R1),#236
BNE      1$
                    ;CHECK THE TEST NUMBER
                    ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
```

```

(1) 011100 010105
(1) 011102 005215
1460
(1)
(1)
(1) 011104 010701
(1) 011106 012701 177777
(1) 011112 070127 077777
(1) 011116
(2) 011116 106737
(1) 011122 122737 000010 000432
(1) 011130 001403
(3) 011132 004767 005756
(3)
(3) 011136 000223
(1) 011140 022701 100001
(1) 011144 001403
(3) 011146 004767 005742
(3)
(3) 011152 000224
(1) 011154 022701 100001
(1) 011160 001403
(1) 011162
(3) 011162 004767 005726
(3)
(3) 011166 000225
(1) 011170 021527 000237
(1) 011174 001372
(1) 011176 005215

```

```

MOV R1,R5 ;RESTORE R5
INC (R5)
:*****
:TEST:237 MUL -1 * #77777 = 100001 100001 PS = 10
:*****
TST237: SCOPE
MOV #-1,%1 ;LOAD MULTIPLICAND WITH -1
MUL #77777,%1 ;MULTIPLY -1 * #77777
MFPS @#PSWORD ;SAVE PS
.WORD 106700!..C
CMPB #10,@#PSWORD ;IS PS = 10
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;PS IS WRONG
223
CMP #100001,%1 ;IS HIGH ORDER = 100001
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;HIGH ORDER IS WRONG
224
CMP #100001,%1!1 ;IS LOW ORDER = 100001
BEQ .+10
1$: JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;LOW ORDER IS WRONG OR WRONG SEQUENCE
225
CMP (R5),#237
BNE 1$ ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
INC (R5)

```

```

1461
(1)
(1)
(1) 011200 010701
(1) 011202 012703 077777
(1) 011206 070327 077777
(1) 011212
(2) 011212 106737
(1) 011216 122737 000001 000432
(1) 011224 001403
(3) 011226 004767 005662
(3)
(3) 011232 000226
(1) 011234 022703 000001
(1) 011240 001403
(3) 011242 004767 005646
(3)
(3) 011246 000227
(1) 011250 022703 000001
(1) 011254 001403
(1) 011256
(3) 011256 004767 005632
(3)
(3) 011262 000230
(1) 011264 021527 000240

```

```

:*****
:TEST:240 MUL 77777 * #77777 = 1 1 PS = 1
:*****
TST240: SCOPE
MOV #77777,%3 ;LOAD MULTIPLICAND WITH 77777
MUL #77777,%3 ;MULTIPLY 77777 * #77777
MFPS @#PSWORD ;SAVE PS
.WORD 106700!..C
CMPB #1,@#PSWORD ;IS PS = 1
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;PS IS WRONG
226
CMP #1,%3 ;IS HIGH ORDER = 1
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;HIGH ORDER IS WRONG
227
CMP #1,%3!1 ;IS LOW ORDER = 1
BEQ .+10
1$: JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;LOW ORDER IS WRONG OR WRONG SEQUENCE
230
CMP (R5),#240

```

```

(1) 011270 001372          BNE 1$          ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 011272 005215          INC (R5)
1462 *****
(1) :TEST:241          MUL 2 * #2 = 4 4          PS = 0
(1) *****
(1)
(1) 011274 010701          TST241: SCOPE
(1) 011276 010501          MOV R5,R1          ;SAVE R5
(1) 011300 012705 000002   MOV #2,%5          ;LOAD MULTIPLICAND WITH 2
(1) 011304 070527 000002   MUL #2,%5          ;MULTIPLY 2 * #2
(1) 011310          MFPS @#PSWORD      ;SAVE PS
(2) 011310 106737          .WORD 106700!..C
(1) 011314 122737 000000 000432  CMPB #0,@#PSWORD   ;IS PS = 0
(1) 011322 001403          BEQ .+10
(3) 011324 004767 005564   JSR PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                               ;PS IS WRONG
(3) 011330 000231          231
(1) 011332 022705 000004   CMP #4,%5          ;IS HIGH ORDER = 4
(1) 011336 001403          BEQ .+10
(3) 011340 004767 005550   JSR PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                               ;HIGH ORDER IS WRONG
(3) 011344 000232          232
(1) 011346 022705 000004   CMP #4,%5!1        ;IS LOW ORDER = 4
(1) 011352 001403          BEQ .+10
(1) 011354          1$:
(3) 011354 004767 005534   JSR PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                               ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3) 011360 000233          233
(1) 011362 021127 000241   CMP (R1),#241      ;CHECK THE TEST NUMBER
(1) 011366 001372          BNE 1$          ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 011370 010105          MOV R1,R5          ;RESTORE R5
(1) 011372 005215          INC (R5)
1463 011374 012702 040000   MOV #40000,%2
1464 011400 012703 000464   MOV #S5,%3
1465 011404 012704 000466   MOV #S6,%4
1466 *****
1467 :TEST:242          MUL 125252 * S5 = 165252 100000          PS = 11
(1) *****
(1)
(1) 011410 010701          TST242: SCOPE
(1) 011412 012700 125252   MOV #125252,%0     ;LOAD MULTIPLICAND WITH 125252
(1) 011416 070067 167042   MUL S5,%0          ;MULTIPLY 125252 * S5
(1) 011422          MFPS @#PSWORD      ;SAVE PS
(2) 011422 106737          .WORD 106700!..C
(1) 011426 122737 000011 000432  CMPB #11,@#PSWORD  ;IS PS = 11
(1) 011434 001403          BEQ .+10
(3) 011436 004767 005452   JSR PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                               ;PS IS WRONG
(3) 011442 000234          234
(1) 011444 022700 165252   CMP #165252,%0     ;IS HIGH ORDER = 165252
(1) 011450 001403          BEQ .+10
(3) 011452 004767 005436   JSR PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                               ;HIGH ORDER IS WRONG
(3) 011456 000235          235
(1) 011460 022701 100000   CMP #100000,%0!1   ;IS LOW ORDER = 100000

```

```

(1) 011464 001403          BEQ      .+10
(1) 011466
(3) 011466 004767 005422    1$:     JSR      PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3) 011472 000236          236
(1) 011474 021527 000242    CMP      (R5),#242
(1) 011500 001372          BNE      1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 011502 005215          INC      (R5)
1468
(1)
(1)
(1)
(1) 011504 010701          TST243: SCOPE
(1) 011506 012700 125252    MOV      #125252,%0      ;LOAD MULTIPLICAND WITH 125252
(1) 011512 070077 166750    MUL      @S6,%0          ;MULTIPLY 125252 * @S6
(1) 011516          MFPS     @#PSWORD        ;SAVE PS
(2) 011516 106737          .WORD   106700!..C
(1) 011522 122737 000011 000432  CMPB     #11,@#PSWORD    ;IS PS = 11
(1) 011530 001403          BEQ      .+10
(3) 011532 004767 005356    JSR      PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;PS IS WRONG
(3) 011536 000237          237
(1) 011540 022700 165252    CMP      #165252,%0      ;IS HIGH ORDER = 165252
(1) 011544 001403          BEQ      .+10
(3) 011546 004767 005342    JSR      PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;HIGH ORDER IS WRONG
(3) 011552 000240          240
(1) 011554 022701 100000    CMP      #100000,%0!1    ;IS LOW ORDER = 100000
(1) 011560 001403          BEQ      .+10
(1) 011562
(3) 011562 004767 005326    1$:     JSR      PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3) 011566 000241          241
(1) 011570 021527 000243    CMP      (R5),#243
(1) 011574 001372          BNE      1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 011576 005215          INC      (R5)
1469
(1)
(1)
(1)
(1) 011600 010701          TST244: SCOPE
(1) 011602 012700 125252    MOV      #125252,%0      ;LOAD MULTIPLICAND WITH 125252
(1) 011606 070037 000464    MUL      @#S5,%0          ;MULTIPLY 125252 * @#S5
(1) 011612          MFPS     @#PSWORD        ;SAVE PS
(2) 011612 106737          .WORD   106700!..C
(1) 011616 122737 000011 000432  CMPB     #11,@#PSWORD    ;IS PS = 11
(1) 011624 001403          BEQ      .+10
(3) 011626 004767 005262    JSR      PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;PS IS WRONG
(3) 011632 000242          242
(1) 011634 022700 165252    CMP      #165252,%0      ;IS HIGH ORDER = 165252
(1) 011640 001403          BEQ      .+10
(3) 011642 004767 005246    JSR      PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;HIGH ORDER IS WRONG
(3) 011646 000243          243
(1) 011650 022701 100000    CMP      #100000,%0!1    ;IS LOW ORDER = 100000

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MUL INSTRUCTION TESTS

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(1) 011654 001403          BEQ      .+10
(1) 011656                1$:      JSR      PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) 011656 004767 005232          ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3) 011662 000244          244
(1) 011664 021527 000244          CMP      (R5),#244
(1) 011670 001372          BNE     1$      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 011672 005215          INC      (R5)
1470
(1)
(1)
(1) 011674 010701          TST245: SCOPE
(1) 011676 012700 125252          MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
(1) 011702 070002          MUL     %2,%0          ;MULTIPLY 125252 * %2
(1) 011704          MFPS    @#PSWORD      ;SAVE PS
(2) 011704 106737          .WORD  106700!..C
(1) 011710 122737 000011 000432          CMPB   #11,@#PSWORD    ;IS PS = 11
(1) 011716 001403          BEQ     .+10
(3) 011720 004767 005170          JSR     PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)          ;PS IS WRONG
(3) 011724 000245          245
(1) 011726 022700 165252          CMP     #165252,%0    ;IS HIGH ORDER = 165252
(1) 011732 001403          BEQ     .+10
(3) 011734 004767 005154          JSR     PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)          ;HIGH ORDER IS WRONG
(3) 011740 000246          246
(1) 011742 022701 100000          CMP     #100000,%0!1  ;IS LOW ORDER = 100000
(1) 011746 001403          BEQ     .+10
(1) 011750                1$:      JSR     PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) 011750 004767 005140          ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3)          247
(3) 011754 000247          CMP     (R5),#245
(1) 011756 021527 000245          BNE     1$      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 011762 001372          INC     (R5)
1471
(1)
(1)
(1) 011766 010701          TST246: SCOPE
(1) 011770 012700 125252          MOV     #125252,%0    ;LOAD MULTIPLICAND WITH 125252
(1) 011774 070023          MUL     (3)+,%0      ;MULTIPLY 125252 * (3)+
(1) 011776          MFPS    @#PSWORD      ;SAVE PS
(2) 011776 106737          .WORD  106700!..C
(1) 012002 122737 000011 000432          CMPB   #11,@#PSWORD    ;IS PS = 11
(1) 012010 001403          BEQ     .+10
(3) 012012 004767 005076          JSR     PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)          ;PS IS WRONG
(3) 012016 000250          250
(1) 012020 022700 165252          CMP     #165252,%0    ;IS HIGH ORDER = 165252
(1) 012024 001403          BEQ     .+10
(3) 012026 004767 005062          JSR     PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)          ;HIGH ORDER IS WRONG
(3) 012032 000251          251
(1) 012034 022701 100000          CMP     #100000,%0!1  ;IS LOW ORDER = 100000

```



```

(1) 012040 001403          BEQ      .+10
(1) 012042                1$:      JSR      PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) 012042 004767 005046                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3) 012046 000252          252
(1) 012050 021527 000246          CMP      (R5),#246
(1) 012054 001372          BNE     1$      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 012056 005215          INC     (R5)

```

```

1472
(1) *****
(1) :TEST:247      MUL      125252 * -(3) = 165252 100000      PS = 11
(1) *****

```

```

(1) 012060 010701          TST247: SCOPE
(1) 012062 012700 125252          MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
(1) 012066 070043          MUL     -(3),%0        ;MULTIPLY 125252 * -(3)
(1) 012070          MFPS    @#PSWORD      ;SAVE PS
(2) 012070 106737          .WORD  106700!..C
(1) 012074 122737 000011 000432          CMPB   #11,@#PSWORD    ;IS PS = 11
(1) 012102 001403          BEQ     .+10
(3) 012104 004767 005004          JSR     PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)          ;PS IS WRONG
(3) 012110 000253          253
(1) 012112 022700 165252          CMP     #165252,%0      ;IS HIGH ORDER = 165252
(1) 012116 001403          BEQ     .+10
(3) 012120 004767 004770          JSR     PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)          ;HIGH ORDER IS WRONG

```

```

(3) 012124 000254          254
(1) 012126 022701 100000          CMP     #100000,%0!1    ;IS LOW ORDER = 100000
(1) 012132 001403          BEQ     .+10
(1) 012134                1$:      JSR     PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) 012134 004767 004754                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3) 012140 000255          255
(1) 012142 021527 000247          CMP     (R5),#247
(1) 012146 001372          BNE     1$      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 012150 005215          INC     (R5)

```

```

1473
(1) *****
(1) :TEST:250      MUL      125252 * 2(4) = 165252 100000      PS = 11
(1) *****

```

```

(1) 012152 010701          TST250: SCOPE
(1) 012154 012700 125252          MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
(1) 012160 070064 000002          MUL     2(4),%0        ;MULTIPLY 125252 * 2(4)
(1) 012164          MFPS    @#PSWORD      ;SAVE PS
(2) 012164 106737          .WORD  106700!..C
(1) 012170 122737 000011 000432          CMPB   #11,@#PSWORD    ;IS PS = 11
(1) 012176 001403          BEQ     .+10
(3) 012200 004767 004710          JSR     PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)          ;PS IS WRONG
(3) 012204 000256          256
(1) 012206 022700 165252          CMP     #165252,%0      ;IS HIGH ORDER = 165252
(1) 012212 001403          BEQ     .+10
(3) 012214 004767 004674          JSR     PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)          ;HIGH ORDER IS WRONG
(3) 012220 000257          257
(1) 012222 022701 100000          CMP     #100000,%0!1    ;IS LOW ORDER = 100000

```

```
(1) 012226 001403
(1) 012230
(3) 012230 004767 004660
(3)
(3) 012234 000260
(1) 012236 021527 000250
(1) 012242 001372
(1) 012244 005215
1474
(1)
(1)
(1)
(1) 012246 010701
(1) 012250 012700 125252
(1) 012254 070074 000000
(1) 012260
(2) 012260 106737
(1) 012264 122737 000011 000432
(1) 012272 001403
(3) 012274 004767 004614
(3)
(3) 012300 000261
(1) 012302 022700 165252
(1) 012306 001403
(3) 012310 004767 004600
(3)
(3) 012314 000262
(1) 012316 022701 100000
(1) 012322 001403
(1) 012324
(3) 012324 004767 004564
(3)
(3) 012330 000263
(1) 012332 021527 000251
(1) 012336 001372
(1) 012340 005215
1475
(1)
(1)
(1)
(1) 012342 010701
(1) 012344 012700 125252
(1) 012350 070034
(1) 012352
(2) 012352 106737
(1) 012356 122737 000011 000432
(1) 012364 001403
(3) 012366 004767 004522
(3)
(3) 012372 000264
(1) 012374 022700 165252
(1) 012400 001403
(3) 012402 004767 004506
(3)
(3) 012406 000265
(1) 012410 022701 100000

1$: BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;LOW ORDER IS WRONG OR WRONG SEQUENCE
260
CMP (R5),#250
BNE 1$ ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
INC (R5)
:*****
;TEST:251 MUL 125252 * @ (4) = 165252 100000 PS = 11
:*****
TST251: SCOPE
MOV #125252,%0 ;LOAD MULTIPLICAND WITH 125252
MUL @ (4),%0 ;MULTIPLY 125252 * @ (4)
MFPS @#PSWORD ;SAVE PS
.WORD 106700!..C
CMPB #11,@#PSWORD ;IS PS = 11
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;PS IS WRONG
261
CMP #165252,%0 ;IS HIGH ORDER = 165252
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;HIGH ORDER IS WRONG
262
CMP #100000,%0!1 ;IS LOW ORDER = 100000
BEQ .+10
1$: JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;LOW ORDER IS WRONG OR WRONG SEQUENCE
263
CMP (R5),#251
BNE 1$ ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
INC (R5)
:*****
;TEST:252 MUL 125252 * @ (4)+ = 165252 100000 PS = 11
:*****
TST252: SCOPE
MOV #125252,%0 ;LOAD MULTIPLICAND WITH 125252
MUL @ (4)+,%0 ;MULTIPLY 125252 * @ (4)+
MFPS @#PSWORD ;SAVE PS
.WORD 106700!..C
CMPB #11,@#PSWORD ;IS PS = 11
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;PS IS WRONG
264
CMP #165252,%0 ;IS HIGH ORDER = 165252
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;HIGH ORDER IS WRONG
265
CMP #100000,%0!1 ;IS LOW ORDER = 100000
```

```

(1) 012414 001403          BEQ      .+10
(1) 012416                1$:      JSR      PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) 012416 004767 004472          ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3) 012422 000266          266
(1) 012424 021527 000252          CMP      (R5),#252
(1) 012430 001372          BNE     1$      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 012432 005215          INC     (R5)
1476
(1)
(1)
(1)
(1) 012434 010701          TST253: SCOPE
(1) 012436 012700 125252          MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
(1) 012442 070054          MUL     @-(4),%0        ;MULTIPLY 125252 * @-(4)
(1) 012444          MFPS   @#PSWORD        ;SAVE PS
(2) 012444 106737          .WORD  106700!..C
(1) 012450 122737 000011 000432          CMPB   #11,@#PSWORD    ;IS PS = 11
(1) 012456 001403          BEQ     .+10
(3) 012460 004767 004430          JSR     PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)          ;PS IS WRONG
(3) 012464 000267          267
(1) 012466 022700 165252          CMP     #165252,%0     ;IS HIGH ORDER = 165252
(1) 012472 001403          BEQ     .+10
(3) 012474 004767 004414          JSR     PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)          ;HIGH ORDER IS WRONG
(3) 012500 000270          270
(1) 012502 022701 100000          CMP     #100000,%0!1   ;IS LOW ORDER = 100000
(1) 012506 001403          BEQ     .+10
(1) 012510          1$:
(3) 012510 004767 004400          JSR     PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)          ;LOW ORDER IS WRONG OR WRONG SEQUENCE
(3) 012514 000271          271
(1) 012516 021527 000253          CMP     (R5),#253
(1) 012522 001372          BNE     1$      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
(1) 012524 005215          INC     (R5)

```

```

1480
1481
1482
1483
1484
1485
1486
:*****
:      DIV INSTRUCTION TESTS
:*****

```

```

:*****
:TEST:254      DIV      0 4 / #2 = 2      REM = 0      PS = 0
:*****

```

```

(1)
(1)
(1) 012526 010701          TST254: SCOPE
(1) 012530 012700 000000          MOV     #0,%0          ;LOAD HIGH ORDER WITH 0
(1) 012534 012701 000004          MOV     #4,%0+1       ;LOAD LOW ORDER WITH 4
(1) 012540 071027 000002          DIV     #2,%0          ;DIVIDE BY #2
(1) 012544          MFPS   @#PSWORD        ;SAVE PS
(2) 012544 106737          .WORD  106700!..C
(1)
(1) 012550 122737 000000 000432          CMPB   #0,@#PSWORD    ;IS PS = 0
(1) 012556 001403          BEQ     .+10
(3) 012560 004767 004330          JSR     PC,$HLT        ;SEEN AN ERROR, GO TO TH HALT ROUTINE

```

```

(3)                                ;PS IS WRONG
(3) 012564 000272                  272
(1)
(1) 012566 022700 000002          CMP    #2,%0          ;IS QUOTIENT = 2
(1) 012572 001403                BEQ    .+10
(3) 012574 004767 004314          JSR    PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;QUOTIENT IS WRONG
(3) 012600 000273                  273
(1)
(1) 012602 022701 000000          CMP    #0,%0+1      ;IS REMAINDER = 0
(1) 012606 001403                BEQ    .+10
(3) 012610 004767 004300          JSR    PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;WRONG REMAINDER
(3) 012614 000274                  274
(1) 012616 021527 000254          CMP    (R5),#254
(1) 012622 001403                BEQ    .+10          ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 012624 004767 004264          JSR    PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;TEST IS IN WRONG SEQUENCE
(3) 012630 000275                  275
(1) 012632 005215                INC    (R5)
(1)
1487
(1)                                ;*****
(1)                                ;TEST:255      DIV    -1 -9. / #3 = -3      REM = 0      PS = 10
(1)                                ;*****
(1)
(1) 012634 010701                TST255: SCOPE
(1) 012636 012702 177777          MOV    #-1,%2       ;LOAD HIGH ORDER WITH -1
(1) 012642 012703 177767          MOV    #-9,%2+1     ;LOAD LOW ORDER WITH -9.
(1) 012646 071227 000003          DIV    #3,%2        ;DIVIDE BY #3
(1) 012652                MFPS    @#PSWORD     ;SAVE PS
(2) 012652 106737                .WORD  106700!..C
(1)
(1) 012656 122737 000010 000432  CMPB   #10,@#PSWORD ;IS PS = 10
(1) 012664 001403                BEQ    .+10
(3) 012666 004767 004222          JSR    PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;PS IS WRONG
(3) 012672 000276                  276
(1)
(1) 012674 022702 177775          CMP    #-3,%2       ;IS QUOTIENT = -3
(1) 012700 001403                BEQ    .+10
(3) 012702 004767 004206          JSR    PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;QUOTIENT IS WRONG
(3) 012706 000277                  277
(1)
(1) 012710 022703 000000          CMP    #0,%2+1      ;IS REMAINDER = 0
(1) 012714 001403                BEQ    .+10
(3) 012716 004767 004172          JSR    PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;WRONG REMAINDER
(3) 012722 000300                  300
(1) 012724 021527 000255          CMP    (R5),#255
(1) 012730 001403                BEQ    .+10          ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 012732 004767 004156          JSR    PC,$HLT       ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;TEST IS IN WRONG SEQUENCE
(3) 012736 000301                  301
(1) 012740 005215                INC    (R5)
(1)

```

1488

```
(1)
(1)
(1)
(1) 012742 010701
(1) 012744 010501
(1) 012746 012704 000000
(1) 012752 012705 000011
(1) 012756 071427 000002
(1) 012762
(2) 012762 106737
(1)
(1) 012766 122737 000000 000432
(1) 012774 001403
(3) 012776 004767 004112
(3)
(3) 013002 000302
(1)
(1) 013004 022704 000004
(1) 013010 001403
(3) 013012 004767 004076
(3)
(3) 013016 000303
(1)
(1) 013020 022705 000001
(1) 013024 001403
(3) 013026 004767 004062
(3)
(3) 013032 000304
(1) 013034 010105
(1) 013036 021527 000256
(1) 013042 001403
(3) 013044 004767 004044
(3)
(3) 013050 000305
(1) 013052 005215
(1)
```

```
*****
:TEST:256 DIV 0 9. / #2 = 4 REM = 1 PS = 0
*****
```

```
TST256: SCOPE
MOV R5,R1 ;SAVE R5
MOV #0,%4 ;LOAD HIGH ORDER WITH 0
MOV #9,%4+1 ;LOAD LOW ORDER WITH 9.
DIV #2,%4 ;DIVIDE BY #2
MFPS @#PSWORD ;SAVE PS
.WORD 106700!..C

CMPB #0,@#PSWORD ;IS PS = 0
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;PS IS WRONG
302

CMP #4,%4 ;IS QUOTIENT = 4
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;QUOTIENT IS WRONG
303

CMP #1,%4+1 ;IS REMAINDER = 1
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;WRONG REMAINDER
304

MOV R1,R5 ;RESTORE R5
CMP (R5),#256
BEQ .+10 ;IF IN WRONG SEQUENCE GO TO THE HLT
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;TEST IS IN WRONG SEQUENCE
305
INC (R5)
```

1489

```
(1)
(1)
(1)
(1) 013054 010701
(1) 013056 012700 177777
(1) 013062 012701 177767
(1) 013066 071027 000002
(1) 013072
(2) 013072 106737
(1)
(1) 013076 122737 000010 000432
(1) 013104 001403
(3) 013106 004767 004002
(3)
(3) 013112 000306
(1)
(1) 013114 022700 177774
(1) 013120 001403
```

```
*****
:TEST:257 DIV -1 -9. / #2 = -4 REM = -1 PS = 10
*****
```

```
TST257: SCOPE
MOV #-1,%0 ;LOAD HIGH ORDER WITH -1
MOV #-9,%0+1 ;LOAD LOW ORDER WITH -9.
DIV #2,%0 ;DIVIDE BY #2
MFPS @#PSWORD ;SAVE PS
.WORD 106700!..C

CMPB #10,@#PSWORD ;IS PS = 10
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;PS IS WRONG
306

CMP #-4,%0 ;IS QUOTIENT = -4
BEQ .+10
```

```

(3) 013122 004767 003766 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;QUOTIENT IS WRONG
(3) 013126 000307 307
(1)
(1) 013130 022701 177777 CMP #-1,%0+1 ;IS REMAINDER = -1
(1) 013134 001403 BEQ .+10
(3) 013136 004767 003752 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;WRONG REMAINDER
(3) 013142 000310 310
(1) 013144 021527 000257 CMP (R5),#257
(1) 013150 001403 BEQ .+10 ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 013152 004767 003736 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;TEST IS IN WRONG SEQUENCE
(3) 013156 000311 311
(1) 013160 005215 INC (R5)
  
```

```

1490
(1) :*****
(1) :TEST:260 DIV 0 2 / #-3 = 0 REM = 2 PS = 4
(1) :*****
  
```

```

(1) 013162 010701 TST260: SCOPE
(1) 013164 012702 000000 MOV #0,%2 ;LOAD HIGH ORDER WITH 0
(1) 013170 012703 000002 MOV #2,%2+1 ;LOAD LOW ORDER WITH 2
(1) 013174 071227 177775 DIV #-3,%2 ;DIVIDE BY #-3
(1) 013200 MFPS @#PSWORD ;SAVE PS
(2) 013200 106737 .WORD 106700!..C
(1)
(1) 013204 122737 000004 000432 CMPB #4,@#PSWORD ;IS PS = 4
(1) 013212 001403 BEQ .+10
(3) 013214 004767 003674 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;PS IS WRONG
(3) 013220 000312 312
(1)
(1) 013222 022702 000000 CMP #0,%2 ;IS QUOTIENT = 0
(1) 013226 001403 BEQ .+10
(3) 013230 004767 003660 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;QUOTIENT IS WRONG
(3) 013234 000313 313
(1)
(1) 013236 022703 000002 CMP #2,%2+1 ;IS REMAINDER = 2
(1) 013242 001403 BEQ .+10
(3) 013244 004767 003644 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;WRONG REMAINDER
(3) 013250 000314 314
(1) 013252 021527 000260 CMP (R5),#260
(1) 013256 001403 BEQ .+10 ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 013260 004767 003630 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;TEST IS IN WRONG SEQUENCE
(3) 013264 000315 315
(1) 013266 005215 INC (R5)
  
```

```

1491
(1) :*****
(1) :TEST:261 DIV -1 -2 / #3 = 0 REM = -2 PS = 4
(1) :*****
  
```

```

(1) 013270 010701 TST261: SCOPE
  
```

```

(1) 013272 010501      MOV    R5,R1      ;SAVE R5
(1) 013274 012704 177777  MOV    #-1,%4    ;LOAD HIGH ORDER WITH -1
(1) 013300 012705 177776  MOV    #-2,%4+1  ;LOAD LOW ORDER WITH -2
(1) 013304 071427 000003  DIV    #3,%4     ;DIVIDE BY #3
(1) 013310      MFPS   @#PSWORD  ;SAVE PS
(2) 013310 106737      .WORD 106700!...C
(1)
(1) 013314 122737 000004 000432  CMPB   #4,@#PSWORD ;IS PS = 4
(1) 013322 001403      BEQ    .+10
(3) 013324 004767 003564  JSR    PC,$HLT   ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;PS IS WRONG
(3) 013330 000316      316
(1)
(1) 013332 022704 000000      CMP    #0,%4     ;IS QUOTIENT = 0
(1) 013336 001403      BEQ    .+10
(3) 013340 004767 003550  JSR    PC,$HLT   ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;QUOTIENT IS WRONG
(3) 013344 000317      317
(1)
(1) 013346 022705 177776      CMP    #-2,%4+1  ;IS REMAINDER = -2
(1) 013352 001403      BEQ    .+10
(3) 013354 004767 003534  JSR    PC,$HLT   ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;WRONG REMAINDER
(3) 013360 000320      320
(1) 013362 010105      MOV    R1,R5     ;RESTORE R5
(1) 013364 021527 000261  CMP    (R5),#261
(1) 013370 001403      BEQ    .+10
(3) 013372 004767 003516  JSR    PC,$HLT   ;IF IN WRONG SEQUENCE GO TO THE HLT
(3)                                     ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;TEST IS IN WRONG SEQUENCE
(3) 013376 000321      321
(1) 013400 005215      INC    (R5)

```

```

1492
(1)
(1)
(1)
:*****
:TEST:262      DIV    -1 -1 / #1 = -1      REM = 0      PS = 10
:*****

```

```

(1) 013402 010701      TST262: SCOPE
(1) 013404 012700 177777  MOV    #-1,%0    ;LOAD HIGH ORDER WITH -1
(1) 013410 012701 177777  MOV    #-1,%0+1  ;LOAD LOW ORDER WITH -1
(1) 013414 071027 000001  DIV    #1,%0     ;DIVIDE BY #1
(1) 013420      MFPS   @#PSWORD  ;SAVE PS
(2) 013420 106737      .WORD 106700!...C
(1)
(1) 013424 122737 000010 000432  CMPB   #10,@#PSWORD ;IS PS = 10
(1) 013432 001403      BEQ    .+10
(3) 013434 004767 003454  JSR    PC,$HLT   ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;PS IS WRONG
(3) 013440 000322      322
(1)
(1) 013442 022700 177777      CMP    #-1,%0    ;IS QUOTIENT = -1
(1) 013446 001403      BEQ    .+10
(3) 013450 004767 003440  JSR    PC,$HLT   ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;QUOTIENT IS WRONG
(3) 013454 000323      323
(1)
(1) 013456 022701 000000      CMP    #0,%0+1  ;IS REMAINDER = 0

```

```

(1) 013462 001403 BEQ .+10
(3) 013464 004767 003424 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;WRONG REMAINDER
(3) 013470 000324 324
(1) 013472 021527 000262 CMP (R5),#262
(1) 013476 001403 BEQ .+10 ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 013500 004767 003410 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;TEST IS IN WRONG SEQUENCE
(3) 013504 000325 325
(1) 013506 005215 INC (R5)
    
```

```

1493
(1) ;*****
(1) ;TEST:263 DIV 0 0 / #1 = 0 REM = 0 PS = 4
(1) ;*****
    
```

```

(1) 013510 010701 TST263: SCOPE
(1) 013512 012700 000000 MOV #0,%0 ;LOAD HIGH ORDER WITH 0
(1) 013516 012701 000000 MOV #0,%0+1 ;LOAD LOW ORDER WITH 0
(1) 013522 071027 000001 DIV #1,%0 ;DIVIDE BY #1
(1) 013526 MFPS @#PSWORD ;SAVE PS
(2) 013526 106737 .WORD 106700!..C
(1)
(1) 013532 122737 000004 000432 CMPB #4,@#PSWORD ;IS PS = 4
(1) 013540 001403 BEQ .+10
(3) 013542 004767 003346 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;PS IS WRONG
(3) 013546 000326 326
(1)
(1) 013550 022700 000000 CMP #0,%0 ;IS QUOTIENT = 0
(1) 013554 001403 BEQ .+10
(3) 013556 004767 003332 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;QUOTIENT IS WRONG
(3) 013562 000327 327
(1)
(1) 013564 022701 000000 CMP #0,%0+1 ;IS REMAINDER = 0
(1) 013570 001403 BEQ .+10
(3) 013572 004767 003316 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;WRONG REMAINDER
(3) 013576 000330 330
(1) 013600 021527 000263 CMP (R5),#263
(1) 013604 001403 BEQ .+10 ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 013606 004767 003302 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;TEST IS IN WRONG SEQUENCE
(3) 013612 000331 331
(1) 013614 005215 INC (R5)
    
```

```

1494
(1) ;*****
(1) ;TEST:264 DIV -1 125252 / #2 = 152525 REM = 0 PS = 10
(1) ;*****
    
```

```

(1) 013616 010701 TST264: SCOPE
(1) 013620 012702 177777 MOV #-1,%2 ;LOAD HIGH ORDER WITH -1
(1) 013624 012703 125252 MOV #125252,%2+1 ;LOAD LOW ORDER WITH 125252
(1) 013630 071227 000002 DIV #2,%2 ;DIVIDE BY #2
(1) 013634 MFPS @#PSWORD ;SAVE PS
(2) 013634 106737 .WORD 106700!..C
    
```



```

(1)
(1) 013640 122737 000010 000432      CMPB  #10,@#PSWORD      ;IS PS = 10
(1) 013646 001403                      BEQ   .+10
(3) 013650 004767 003240              JSR   PC,$HLT           ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;PS IS WRONG
(3) 013654 000332                      332
(1)
(1) 013656 022702 152525              CMP   #152525,%2       ;IS QUOTIENT = 152525
(1) 013662 001403                      BEQ   .+10
(3) 013664 004767 003224              JSR   PC,$HLT           ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;QUOTIENT IS WRONG
(3) 013670 000333                      333
(1)
(1) 013672 022703 000000              CMP   #0,%2+1         ;IS REMAINDER = 0
(1) 013676 001403                      BEQ   .+10
(3) 013700 004767 003210              JSR   PC,$HLT           ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;WRONG REMAINDER
(3) 013704 000334                      334
(1) 013706 021527 000264              CMP   (R5),#264
(1) 013712 001403                      BEQ   .+10
(3) 013714 004767 003174              JSR   PC,$HLT           ;IF IN WRONG SEQUENCE GO TO THE HLT
(3)                                     ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;TEST IS IN WRONG SEQUENCE
(3) 013720 000335                      335
(1) 013722 005215                      INC   (R5)
(1)
1495
(1)
(1)
(1)
(1) 013724 010701                      TST265: SCOPE
(1) 013726 010501                      MOV   R5,R1           ;SAVE R5
(1) 013730 012704 177777              MOV   #-1,%4          ;LOAD HIGH ORDER WITH -1
(1) 013734 012705 177777              MOV   #-1,%4+1        ;LOAD LOW ORDER WITH -1
(1) 013740 071427 177777              DIV   #-1,%4          ;DIVIDE BY #-1
(1) 013744                      MFPS  @#PSWORD        ;SAVE PS
(2) 013744 106737                      .WORD 106700!...C
(1)
(1) 013750 122737 000000 000432      CMPB  #0,@#PSWORD      ;IS PS = 0
(1) 013756 001403                      BEQ   .+10
(3) 013760 004767 003130              JSR   PC,$HLT           ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;PS IS WRONG
(3) 013764 000336                      336
(1)
(1) 013766 022704 000001              CMP   #1,%4          ;IS QUOTIENT = 1
(1) 013772 001403                      BEQ   .+10
(3) 013774 004767 003114              JSR   PC,$HLT           ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;QUOTIENT IS WRONG
(3) 014000 000337                      337
(1)
(1) 014002 022705 000000              CMP   #0,%4+1        ;IS REMAINDER = 0
(1) 014006 001403                      BEQ   .+10
(3) 014010 004767 003100              JSR   PC,$HLT           ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;WRONG REMAINDER
(3) 014014 000340                      340
(1) 014016 010105                      MOV   R1,R5           ;RESTORE R5
(1) 014020 021527 000265              CMP   (R5),#265
  
```

```

:*****
:TEST:265      DIV      -1 -1 / #-1 = 1      REM = 0      PS = 0
:*****
  
```

```

(1) 014024 001403      BEQ    .+10      ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 014026 004767 003062 JSR    PC,$HLT   ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;TEST IS IN WRONG SEQUENCE
(3) 014032 000341      341
(1) 014034 005215      INC    (R5)

```

```

1496
(1) :*****
(1) :TEST:266      DIV    25253 1 / #125252 = 100000      REM = 1      PS = 10
(1) :*****

```

```

(1) 014036 010701      TST266: SCOPE
(1) 014040 012700 025253 MOV    #25253,%0   ;LOAD HIGH ORDER WITH 25253
(1) 014044 012701 000001 MOV    #1,%0+1     ;LOAD LOW ORDER WITH 1
(1) 014050 071027 125252 DIV    #125252,%0  ;DIVIDE BY #125252
(1) 014054      MFPS   @#PSWORD   ;SAVE PS
(2) 014054 106737      .WORD  106700!..C
(1) 014060 122737 000010 000432 CMPB   #10,@#PSWORD ;IS PS = 10
(1) 014066 001403      BEQ    .+10
(3) 014070 004767 003020 JSR    PC,$HLT   ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;PS IS WRONG
(3) 014074 000342      342
(1) 014076 022700 100000 CMP    #100000,%0  ;IS QUOTIENT = 100000
(1) 014102 001403      BEQ    .+10
(3) 014104 004767 003004 JSR    PC,$HLT   ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;QUOTIENT IS WRONG
(3) 014110 000343      343
(1) 014112 022701 000001 CMP    #1,%0+1     ;IS REMAINDER = 1
(1) 014116 001403      BEQ    .+10
(3) 014120 004767 002770 JSR    PC,$HLT   ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;WRONG REMAINDER
(3) 014124 000344      344
(1) 014126 021527 000266 CMP    (R5),#266
(1) 014132 001403      BEQ    .+10      ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 014134 004767 002754 JSR    PC,$HLT   ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;TEST IS IN WRONG SEQUENCE
(3) 014140 000345      345
(1) 014142 005215      INC    (R5)

```

```

1497
(1) :*****
(1) :TEST:267      DIV    37777 77777 / #77777 = 77777      REM = 77776      PS = 0
(1) :*****

```

```

(1) 014144 010701      TST267: SCOPE
(1) 014146 012702 037777 MOV    #37777,%2   ;LOAD HIGH ORDER WITH 37777
(1) 014152 012703 077777 MOV    #77777,%2+1 ;LOAD LOW ORDER WITH 77777
(1) 014156 071227 077777 DIV    #77777,%2   ;DIVIDE BY #77777
(1) 014162      MFPS   @#PSWORD   ;SAVE PS
(2) 014162 106737      .WORD  106700!..C
(1) 014166 122737 000000 000432 CMPB   #0,@#PSWORD ;IS PS = 0
(1) 014174 001403      BEQ    .+10
(3) 014176 004767 002712 JSR    PC,$HLT   ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;PS IS WRONG

```

```

(3) 014202 000346          346
(1)
(1) 014204 022702 077777    CMP    #77777,%2    ;IS QUOTIENT = 77777
(1) 014210 001403          BEQ    .+10
(3) 014212 004767 002676    JSR    PC,$HLT     ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;QUOTIENT IS WRONG
(3) 014216 000347          347
(1)
(1) 014220 022703 077776    CMP    #77776,%2+1 ;IS REMAINDER = 77776
(1) 014224 001403          BEQ    .+10
(3) 014226 004767 002662    JSR    PC,$HLT     ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;WRONG REMAINDER
(3) 014232 000350          350
(1) 014234 021527 000267    CMP    (R5),#267
(1) 014240 001403          BEQ    .+10         ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 014242 004767 002646    JSR    PC,$HLT     ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;TEST IS IN WRONG SEQUENCE
(3) 014246 000351          351
(1) 014250 005215          INC    (R5)
(1)
1498
(1) ;*****
(1) ;TEST:270      DIV      0 100000 / #2 = 40000      REM = 0      PS = 0
(1) ;*****
(1)
(1) 014252 010701          TST270: SCOPE
(1) 014254 010501          MOV    R5,R1       ;SAVE R5
(1) 014256 012704 000000    MOV    #0,%4       ;LOAD HIGH ORDER WITH 0
(1) 014262 012705 100000    MOV    #100000,%4+1 ;LOAD LOW ORDER WITH 100000
(1) 014266 071427 000002    DIV    #2,%4       ;DIVIDE BY #2
(1) 014272          MFPS @#PSWORD     ;SAVE PS
(2) 014272 106737          .WORD 106700!..C
(1)
(1) 014276 122737 000000 000432 CMPB   #0,@#PSWORD ;IS PS = 0
(1) 014304 001403          BEQ    .+10
(3) 014306 004767 002602    JSR    PC,$HLT     ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;PS IS WRONG
(3) 014312 000352          352
(1)
(1) 014314 022704 040000    CMP    #40000,%4   ;IS QUOTIENT = 40000
(1) 014320 001403          BEQ    .+10
(3) 014322 004767 002566    JSR    PC,$HLT     ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;QUOTIENT IS WRONG
(3) 014326 000353          353
(1)
(1) 014330 022705 000000    CMP    #0,%4+1     ;IS REMAINDER = 0
(1) 014334 001403          BEQ    .+10
(3) 014336 004767 002552    JSR    PC,$HLT     ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;WRONG REMAINDER
(3) 014342 000354          354
(1) 014344 010105          MOV    R1,R5       ;RESTORE R5
(1) 014346 021527 000270    CMP    (R5),#270
(1) 014352 001403          BEQ    .+10
(3) 014354 004767 002534    JSR    PC,$HLT     ;IF IN WRONG SEQUENCE GO TO THE HLT
(3)                                ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;TEST IS IN WRONG SEQUENCE
(3) 014360 000355          355
(1) 014362 005215          INC    (R5)
    
```



```

(3)                                ;QUOTIENT IS WRONG
(3) 014544 000363                  363
(1)                                ;IS REMAINDER = 0
(1) 014546 022703 000000          CMP    #0,%2+1
(1) 014552 001403                 BEQ    .+10
(3) 014554 004767 002334          JSR    PC,$HLT                ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;WRONG REMAINDER
(3) 014560 000364                  364
(1) 014562 021527 000272          CMP    (R5),#272
(1) 014566 001403                 BEQ    .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 014570 004767 002320          JSR    PC,$HLT                ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;TEST IS IN WRONG SEQUENCE
(3) 014574 000365                  365
(1) 014576 005215                 INC    (R5)

```

```

1501
(1) :*****
(1) :TEST:273      DIV      0 77777 / #0 = DUMMY      REM = DUMMY      PS = 3
(1) :*****

```

```

(1) 014600 010701          TST273: SCOPE
(1) 014602 010501          MOV    R5,R1                ;SAVE R5
(1) 014604 012704 000000   MOV    #0,%4                ;LOAD HIGH ORDER WITH 0
(1) 014610 012705 077777   MOV    #77777,%4+1         ;LOAD LOW ORDER WITH 77777
(1) 014614 071427 000000   DIV    #0,%4                ;DIVIDE BY #0
(1) 014620          MFPS    @#PSWORD          ;SAVE PS
(2) 014620 106737          .WORD 106700!..C
(1) 014624 042737 000014 000432 BIC    #14,@#PSWORD
(1) 014632 122737 000003 000432 CMPB   #3,@#PSWORD          ;IS PS = 3
(1) 014640 001403                 BEQ    .+10
(3) 014642 004767 002246          JSR    PC,$HLT                ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;PS IS WRONG
(3) 014646 000366                  366
(1) 014650 010105          MOV    R1,R5                ;RESTORE R5
(1) 014652 021527 000273          CMP    (R5),#273
(1) 014656 001403                 BEQ    .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 014660 004767 002230          JSR    PC,$HLT                ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;TEST IS IN WRONG SEQUENCE
(3) 014664 000367                  367
(1) 014666 005215                 INC    (R5)

```

```

1502
(1) :*****
(1) :TEST:274      DIV      77777 177777 / #2 = DUMMY      REM = DUMMY      PS = 2
(1) :*****

```

```

(1) 014670 010701          TST274: SCOPE
(1) 014672 012700 077777   MOV    #77777,%0            ;LOAD HIGH ORDER WITH 77777
(1) 014676 012701 177777   MOV    #177777,%0+1        ;LOAD LOW ORDER WITH 177777
(1) 014702 071027 000002   DIV    #2,%0                ;DIVIDE BY #2
(1) 014706          MFPS    @#PSWORD          ;SAVE PS
(2) 014706 106737          .WORD 106700!..C
(1) 014712 042737 000014 000432 BIC    #14,@#PSWORD
(1) 014720 122737 000002 000432 CMPB   #2,@#PSWORD          ;IS PS = 2
(1) 014726 001403                 BEQ    .+10

```

```
(3) 014730 004767 002160      JSR      PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                370                        ;PS IS WRONG
(1) 014736 021527 000274      CMP      (R5),#274
(1) 014742 001403              BEQ      .+10          ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 014744 004767 002144      JSR      PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                371                        ;TEST IS IN WRONG SEQUENCE
(1) 014752 005215              INC      (R5)
(1) 1503 014754 012702 000002   MOV      #2,%2
1504 014760 012703 000474     MOV      #S9,%3
1505 014764 012704 000476     MOV      #S10,%4
```

```
1506
1507
(1) ;*****
(1) ;TEST:275      DIV      0 52525 / S9 = 25252      REM = 1      PS = 0
(1) ;*****
```

```
(1) TST275: SCOPE
(1) 014770 010701              MOV      #0,%0        ;LOAD HIGH ORDER WITH 0
(1) 014772 012700 000000      MOV      #52525,%0+1  ;LOAD LOW ORDER WITH 52525
(1) 014776 012701 052525      DIV      S9,%0        ;DIVIDE BY S9
(1) 015002 071067 163466      MFPS     @#PSWORD     ;SAVE PS
(2) 015006 106737              .WORD    106700!..C
(1) 015012 122737 000000 000432 CMPB     #0,@#PSWORD   ;IS PS = 0
(1) 015020 001403              BEQ      .+10
(3) 015022 004767 002066      JSR      PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                372                        ;PS IS WRONG
(1) 015026 000372
(1) 015030 022700 025252      CMP      #25252,%0    ;IS QUOTIENT = 25252
(1) 015034 001403              BEQ      .+10
(3) 015036 004767 002052      JSR      PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                373                        ;QUOTIENT IS WRONG
(1) 015042 000373
(1) 015044 022701 000001      CMP      #1,%0+1     ;IS REMAINDER = 1
(1) 015050 001403              BEQ      .+10
(3) 015052 004767 002036      JSR      PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                374                        ;WRONG REMAINDER
(3) 015056 000374
(1) 015060 021527 000275      CMP      (R5),#275
(1) 015064 001403              BEQ      .+10          ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 015066 004767 002022      JSR      PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                375                        ;TEST IS IN WRONG SEQUENCE
(1) 015072 000375
(1) 015074 005215              INC      (R5)
```

```
1508
(1) ;*****
(1) ;TEST:276      DIV      0 52525 / @S10 = 25252      REM = 1      PS = 0
(1) ;*****
```

```
(1) TST276: SCOPE
(1) 015076 010701              MOV      #0,%0        ;LOAD HIGH ORDER WITH 0
(1) 015100 012700 000000
```

```

(1) 015104 012701 052525      MOV      #52525,%0+1      ;LOAD LOW ORDER WITH 52525
(1) 015110 071077 163362      DIV      @S10,%0         ;DIVIDE BY @S10
(1) 015114                      MFPS     @#PSWORD        ;SAVE PS
(2) 015114 106737                      .WORD   106700!..C
(1)
(1) 015120 122737 000000 000432  CMPB     #0,@#PSWORD     ;IS PS = 0
(1) 015126 001403                      BEQ     .+10
(3) 015130 004767 001760      JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                               ;PS IS WRONG
(3) 015134 000376                      376
(1)
(1) 015136 022700 025252      CMP      #25252,%0       ;IS QUOTIENT = 25252
(1) 015142 001403                      BEQ     .+10
(3) 015144 004767 001744      JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                               ;QUOTIENT IS WRONG
(3) 015150 000377                      377
(1)
(1) 015152 022701 000001      CMP      #1,%0+1        ;IS REMAINDER = 1
(1) 015156 001403                      BEQ     .+10
(3) 015160 004767 001730      JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                               ;WRONG REMAINDER
(3) 015164 000400                      400
(1) 015166 021527 000276      CMP      (R5),#276
(1) 015172 001403                      BEQ     .+10
(3) 015174 004767 001714      JSR     PC,$HLT         ;IF IN WRONG SEQUENCE GO TO THE HLT
(3)                               ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                               ;TEST IS IN WRONG SEQUENCE
(3) 015200 000401                      401
(1) 015202 005215      INC     (R5)
(1)
1509
(1)
(1)
(1)
(1) 015204 010701      TST277: SCOPE
(1) 015206 012700 000000      MOV      #0,%0          ;LOAD HIGH ORDER WITH 0
(1) 015212 012701 052525      MOV      #52525,%0+1    ;LOAD LOW ORDER WITH 52525
(1) 015216 071037 000474      DIV      @#S9,%0        ;DIVIDE BY @#S9
(1) 015222                      MFPS     @#PSWORD        ;SAVE PS
(2) 015222 106737                      .WORD   106700!..C
(1)
(1) 015226 122737 000000 000432  CMPB     #0,@#PSWORD     ;IS PS = 0
(1) 015234 001403                      BEQ     .+10
(3) 015236 004767 001652      JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                               ;PS IS WRONG
(3) 015242 000402                      402
(1)
(1) 015244 022700 025252      CMP      #25252,%0       ;IS QUOTIENT = 25252
(1) 015250 001403                      BEQ     .+10
(3) 015252 004767 001636      JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                               ;QUOTIENT IS WRONG
(3) 015256 000403                      403
(1)
(1) 015260 022701 000001      CMP      #1,%0+1        ;IS REMAINDER = 1
(1) 015264 001403                      BEQ     .+10
(3) 015266 004767 001622      JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                               ;WRONG REMAINDER

```

```

:*****
:TEST:277      DIV      0 52525 / @#S9 = 25252      REM = 1      PS = 0
:*****

```

```

(3) 015272 000404          404
(1) 015274 021527 000277    CMP      (R5),#277
(1) 015300 001403          BEQ      .+10      ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 015302 004767 001606    JSR      PC,$HLT   ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;TEST IS IN WRONG SEQUENCE
(3) 015306 000405          405
(1) 015310 005215          INC      (R5)
    
```

```

1510
(1) ;*****
(1) ;TEST:300      DIV      0 52525 / %2 = 25252      REM = 1      PS = 0
(1) ;*****
    
```

```

(1) 015312 010701          TST300: SCOPE
(1) 015314 012700 000000    MOV      #0,%0      ;LOAD HIGH ORDER WITH 0
(1) 015320 012701 052525    MOV      #52525,%0+1 ;LOAD LOW ORDER WITH 52525
(1) 015324 071002          DIV      %2,%0      ;DIVIDE BY %2
(1) 015326          MFPS     @#PSWORD   ;SAVE PS
(2) 015326 106737          .WORD   106700!..C
(1)
(1) 015332 122737 000000 000432 CMPB     #0,@#PSWORD ;IS PS = 0
(1) 015340 001403          BEQ      .+10
(3) 015342 004767 001546    JSR      PC,$HLT   ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;PS IS WRONG
(3) 015346 000406          406
(1)
(1) 015350 022700 025252    CMP      #25252,%0  ;IS QUOTIENT = 25252
(1) 015354 001403          BEQ      .+10
(3) 015356 004767 001532    JSR      PC,$HLT   ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;QUOTIENT IS WRONG
(3) 015362 000407          407
(1)
(1) 015364 022701 000001    CMP      #1,%0+1   ;IS REMAINDER = 1
(1) 015370 001403          BEQ      .+10
(3) 015372 004767 001516    JSR      PC,$HLT   ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;WRONG REMAINDER
(3) 015376 000410          410
(1) 015400 021527 000300    CMP      (R5),#300
(1) 015404 001403          BEQ      .+10      ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 015406 004767 001502    JSR      PC,$HLT   ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;TEST IS IN WRONG SEQUENCE
(3) 015412 000411          411
(1) 015414 005215          INC      (R5)
    
```

```

1511
(1) ;*****
(1) ;TEST:301      DIV      0 52525 / (3)+ = 25252      REM = 1      PS = 0
(1) ;*****
    
```

```

(1) 015416 010701          TST301: SCOPE
(1) 015420 012700 000000    MOV      #0,%0      ;LOAD HIGH ORDER WITH 0
(1) 015424 012701 052525    MOV      #52525,%0+1 ;LOAD LOW ORDER WITH 52525
(1) 015430 071023          DIV      (3)+,%0    ;DIVIDE BY (3)+
(1) 015432          MFPS     @#PSWORD   ;SAVE PS
(2) 015432 106737          .WORD   106700!..C
(1)
(1) 015436 122737 000000 000432 CMPB     #0,@#PSWORD ;IS PS = 0
(1) 015444 001403          BEQ      .+10
    
```



```

(3) 015446 004767 001442 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;PS IS WRONG
(3) 015452 000412 412
(1)
(1) 015454 022700 025252 CMP #25252,%0 ;IS QUOTIENT = 25252
(1) 015460 001403 BEQ .+10
(3) 015462 004767 001426 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;QUOTIENT IS WRONG
(3) 015466 000413 413
(1)
(1) 015470 022701 000001 CMP #1,%0+1 ;IS REMAINDER = 1
(1) 015474 001403 BEQ .+10
(3) 015476 004767 001412 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;WRONG REMAINDER
(3) 015502 000414 414
(1) 015504 021527 000301 CMP (R5),#301
(1) 015510 001403 BEQ .+10 ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 015512 004767 001376 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;TEST IS IN WRONG SEQUENCE
(3) 015516 000415 415
(1) 015520 005215 INC (R5)

```

```

1512
(1) ;*****
(1) ;TEST:302 DIV 0 52525 / -(3) = 25252 REM = 1 PS = 0
(1) ;*****

```

```

(1) 015522 010701 TST302: SCOPE
(1) 015524 012700 000C00 MOV #0,%0 ;LOAD HIGH ORDER WITH 0
(1) 015530 012701 052525 MOV #52525,%0+1 ;LOAD LOW ORDER WITH 52525
(1) 015534 071043 DIV -(3),%0 ;DIVIDE BY -(3)
(1) 015536 MFPS @#PSWORD ;SAVE PS
(2) 015536 106737 .WORD 106700!..C
(1)
(1) 015542 122737 000000 000432 CMPB #0,@#PSWORD ;IS PS = 0
(1) 015550 001403 BEQ .+10
(3) 015552 004767 001336 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;PS IS WRONG
(3) 015556 000416 416
(1)
(1) 015560 022700 025252 CMP #25252,%0 ;IS QUOTIENT = 25252
(1) 015564 001403 BEQ .+10
(3) 015566 004767 001322 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;QUOTIENT IS WRONG
(3) 015572 000417 417
(1)
(1) 015574 022701 000001 CMP #1,%0+1 ;IS REMAINDER = 1
(1) 015600 001403 BEQ .+10
(3) 015602 004767 001306 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;WRONG REMAINDER
(3) 015606 000420 420
(1) 015610 021527 000302 CMP (R5),#302
(1) 015614 001403 BEQ .+10 ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 015616 004767 001272 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;TEST IS IN WRONG SEQUENCE
(3) 015622 000421 421
(1) 015624 005215 INC (R5)

```

```

(1)
1513
(1)
(1)
(1)
(1) 015626 010701
(1) 015630 012700 000000
(1) 015634 012701 052525
(1) 015640 071064 000002
(1) 015644
(2) 015644 106737
(1)
(1) 015650 122737 000000 000432
(1) 015656 001403
(3) 015660 004767 001230
(3)
(3) 015664 000422
(1)
(1) 015666 022700 025252
(1) 015672 001403
(3) 015674 004767 001214
(3)
(3) 015700 000423
(1)
(1) 015702 022701 000001
(1) 015706 001403
(3) 015710 004767 001200
(3)
(3) 015714 000424
(1) 015716 021527 000303
(1) 015722 001403
(3) 015724 004767 001164
(3)
(3) 015730 000425
(1) 015732 005215
    
```

```

:*****
:TEST:303 DIV 0 52525 / 2(4) = 25252 REM = 1 PS = 0
:*****
    
```

```

TST303: SCOPE
MOV #0,%0 ;LOAD HIGH ORDER WITH 0
MOV #52525,%0+1 ;LOAD LOW ORDER WITH 52525
DIV 2(4),%0 ;DIVIDE BY 2(4)
MFPS @#PSWORD ;SAVE PS
.WORD 106700!..C

CMPB #0,@#PSWORD ;IS PS = 0
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;PS IS WRONG

422

CMP #25252,%0 ;IS QUOTIENT = 25252
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;QUOTIENT IS WRONG

423

CMP #1,%0+1 ;IS REMAINDER = 1
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;WRONG REMAINDER

424
CMP (R5),#303
BEQ .+10 ;IF IN WRONG SEQUENCE GO TO THE HLT
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;TEST IS IN WRONG SEQUENCE

425
INC (R5)
    
```

```

(1)
1514
(1)
(1)
(1)
(1) 015734 010701
(1) 015736 012700 000000
(1) 015742 012701 052525
(1) 015746 071074 000000
(1) 015752
(2) 015752 106737
(1)
(1) 015756 122737 000000 000432
(1) 015764 001403
(3) 015766 004767 001122
(3)
(3) 015772 000426
(1)
(1) 015774 022700 025252
(1) 016000 001403
(3) 016002 004767 001106
    
```

```

:*****
:TEST:304 DIV 0 52525 / @ (4) = 25252 REM = 1 PS = 0
:*****
    
```

```

TST304: SCOPE
MOV #0,%0 ;LOAD HIGH ORDER WITH 0
MOV #52525,%0+1 ;LOAD LOW ORDER WITH 52525
DIV @ (4),%0 ;DIVIDE BY @ (4)
MFPS @#PSWORD ;SAVE PS
.WORD 106700!..C

CMPB #0,@#PSWORD ;IS PS = 0
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
;PS IS WRONG

426

CMP #25252,%0 ;IS QUOTIENT = 25252
BEQ .+10
JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
    
```

```

(3)                                     :QUOTIENT IS WRONG
(3) 016006 000427                       427
(1)                                     :IS REMAINDER = 1
(1) 016010 022701 000001                 CMP #1,%0+1
(1) 016014 001403                       BEQ .+10
(3) 016016 004767 001072                 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;WRONG REMAINDER
(3) 016022 000430                       430
(1) 016024 021527 000304                 CMP (R5),#304
(1) 016030 001403                       BEQ .+10 ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 016032 004767 001056                 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                     ;TEST IS IN WRONG SEQUENCE
(3) 016036 000431                       431
(1) 016040 005215                       INC (R5)

```

```

1515
(1) ;*****
(1) ;TEST:305 DIV 0 52525 / @ (4)+ = 25252 REM = 1 PS = 0
(1) ;*****

```

```

(1) 016042 010701 TST305: SCOPE
(1) 016044 012700 000000 MOV #0,%0 ;LOAD HIGH ORDER WITH 0
(1) 016050 012701 052525 MOV #52525,%0+1 ;LOAD LOW ORDER WITH 52525
(1) 016054 071034 DIV @ (4)+,%0 ;DIVIDE BY @ (4)+
(1) 016056 MFPS @#PSWORD ;SAVE PS
(2) 016056 106737 .WORD 106700!..C
(1) 016062 122737 000000 000432 CMPB #0,@#PSWORD ;IS PS = 0
(1) 016070 001403 BEQ .+10
(3) 016072 004767 001016 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;PS IS WRONG
(3) 016076 000432 432
(1) 016100 022700 025252 CMP #25252,%0 ;IS QUOTIENT = 25252
(1) 016104 001403 BEQ .+10
(3) 016106 004767 001002 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;QUOTIENT IS WRONG
(3) 016112 000433 433
(1) 016114 022701 000001 CMP #1,%0+1 ;IS REMAINDER = 1
(1) 016120 001403 BEQ .+10
(3) 016122 004767 000766 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;WRONG REMAINDER
(3) 016126 000434 434
(1) 016130 021527 000305 CMP (R5),#305
(1) 016134 001403 BEQ .+10 ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 016136 004767 000752 JSR PC,$HLT ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3) ;TEST IS IN WRONG SEQUENCE
(3) 016142 000435 435
(1) 016144 005215 INC (R5)

```

```

1516
(1) ;*****
(1) ;TEST:306 DIV 0 52525 / @-(4) = 25252 REM = 1 PS = 0
(1) ;*****

```

```

(1) 016146 010701 TST306: SCOPE
(1) 016150 012700 000000 MOV #0,%0 ;LOAD HIGH ORDER WITH 0

```

```

(1) 016154 012701 052525      MOV      #52525,%0+1      ;LOAD LOW ORDER WITH 52525
(1) 016160 071054              DIV      @-(4),%0        ;DIVIDE BY @-(4)
(1) 016162                      MFPS    @#PSWORD        ;SAVE PS
(2) 016162 106737              .WORD   106700!..C
(1)
(1) 016166 122737 000000 000432  CMPB    #0,@#PSWORD     ;IS PS = 0
(1) 016174 001403              BEQ     .+10
(3) 016176 004767 000712      JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                               ;PS IS WRONG
(3) 016202 000436              436
(1)
(1) 016204 022700 025252      CMP     #25252,%0       ;IS QUOTIENT = 25252
(1) 016210 001403              BEQ     .+10
(3) 016212 004767 000676      JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                               ;QUOTIENT IS WRONG
(3) 016216 000437              437
(1)
(1) 016220 022701 000001      CMP     #1,%0+1        ;IS REMAINDER = 1
(1) 016224 001403              BEQ     .+10
(3) 016226 004767 000662      JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                               ;WRONG REMAINDER
(3) 016232 000440              440
(1) 016234 021527 000306      CMP     (R5),#306
(1) 016240 001403              BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
(3) 016242 004767 000646      JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                               ;TEST IS IN WRONG SEQUENCE
(3) 016246 000441              441
(1) 016250 005215              INC     (R5)
(1)
1520
(1)
(2)
(1)
(1) 016252 132737 000040 000421  TST307: BITB   #40,@#SENVM ;IF TYPE OUTS HAS BEEN SUPPRESSED
(1) 016260 001100              BNE    EASH+2          ;THEN SKIP THIS TEST
(1) 016262 013702 000502      MOV    @#TTYOUT,R2
(1) 016266 012722 016340      MOV    #RTA307,(R2)+ ;SET INTERUPT VECTOR TO RTA307
(1) 016272 012712 000340      MOV    #340,(R2)     ;AND THE INTERUPT PSW AS 340
(1) 016276                      MTPS   #0
(2) 016276 106427              .WORD  106400!..C
(1) 016302 012737 000030 000434  MOV    #30,@#TEMP1    ;PREPARE TO EXECUTE THIS SUB TEST 30 TIMES
(1) 016310 005004              CLR    R4
(1) 016312 112777 000015 162164  MOVB   #15,@$TPB      ;OUT PUT A 'CR'
(1) 016320 112777 000100 162160  MOVB   #100,$$TPS     ;ENABLE TTY INTERUPT
(1) 016326 052704 000001          RTASH: BIS    #1,R4    ;PLACE A 1 IN R4
(1) 016332 072427 000020  ASHA:  ASH    #16,,R4  ;SHIFT R4 FOR 16 TIMES
(1) 016336 000773          BR     RTASH          ;STAY IN THE LOOP UNTIL INTERUPTED
(1) 016340 105077 162142  RTA307: CLRB   @$TPS   ;CLEAR TTY INTERUPT
(1) 016344 022716 016332      CMP    #ASHA,(SP)     ;IS THE RETURN ADDRESS = ASHA
(1) 016350 001415          BEQ    4$             ;IF SO THEN GO TO 4$
(1) 016352 012777 000015 162124  1$:   MOV    #15,$$TPB  ;OTHERWISE OUT PUT A 'CR'
(1) 016360 105777 162122  2$:   TSTB   @$TPS      ;LOOP HERE UNTIL DONE COMES ON
(1) 016364 100375          BPL    2$
(1) 016366 012777 000015 162110  MOV    #15,$$TPB     ;OUT PUT ANOTHER 'CR'
(1) 016374 012777 000100 162104  MOV    #100,$$TPS    ;ENABLE TTY INTERUPT
(1) 016402 000002          RTI
    
```

```

(1) 016404 020427 000001      4$:  CMP      R4,#1      ;CHECK R4 TO CONTAIN PROPER DATA
(1) 016410 001403              BEQ      6$
(3) 016412 004767 000476      JSR      PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;R4 WAS CHANGED DURING THE EXECUTION OF
(3) 016416 000442              442
(1)                                ;THE INSTRUCTION
(1) 016420 032766 000360 000002 6$:  BIT      #360,2(SP)  ;CHECK THE PSW BEFORE INTERUPT
(1) 016426 001406              BEQ      8$
(3) 016430 004767 000460      JSR      PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;PSW IS WRONG
(3) 016434 000443              443
(1) 016436 042766 000020 000002 8$:  BIC      #20,2(SP)  ;CLEAR THE T-BIT IF IT IS SET
(1) 016444 005337 000434      DEC      @#TEMP1
(1) 016450 001340              BNE     1$           ;IF THE SUB TEST HAS BEEN EXECUTED 30 TIMES
(1)                                ;THEN GO TO THE END OF THE TEST
(1) 016452 010277 162024              MOV      R2,@TTYOUT  ;RESTORE TTY INTERRUPT VECTOR
(1) 016456 005012              CLR      (R2)
(1) 016460 022626              EASH:  CMP      (SP)+,(SP)+ ;RESTORE THE STACK POINTER
(1) 016462 021527 000307      CMP      (R5),#307  ;CHECK THE TEST NUMBER
(1) 016466 001403              BEQ      +10
(3) 016470 004767 000420      JSR      PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
(3)                                ;TEST IS IN WRONG SEQUENCE
(3) 016474 000444              444
(1) 016476 005215              INC      (R5)
1521
(1)                                ;*****
(2)                                ;TEST:310 TEST THAT EIS ABORTS PROPERLY WHEN INTERRUPTED
(1)                                ;*****
(1) 016500 132737 000040 000421 TST310: BITB     #40,@#SENV  ;IF TYPE OUTS HAS BEEN SUPPRESSED
(1) 016506 001116              BNE     EMUL+2      ;THEN SKIP THIS TEST
(1) 016510 013702 000502              MOV      @#TTYOUT,R2
(1) 016514 012722 016572              MOV      #RTA310,(R2)+ ;SET INTERRUPT VECTOR TO RTA310
(1) 016520 012712 000340              MOV      #340,(R2)    ;AND THE INTERRUPT PSW AS 340
(1) 016524              MTPS     #10
(2) 016524 106427              .WORD   106400!...C
(1) 016530 012737 000030 000434      MOV      #30,@#TEMP1 ;PREPARE TO EXECUTE THIS SUB TEST 30 TIMES
(1) 016536 012704 077777              MOV      #77777,R4   ;PLACE THE MULTIPLIER IN R4
(1) 016542 012700 177777              MOV      #-1,R0      ;AND THE MULTIPLICAND IN R0
(1) 016546 012701 100001              MOV      #100001,R1  ;AND THE LOWER PART OF THE RESULT IN R1
(1) 016552 112777 000015 161724      MOV      #15,@$TPB   ;OUT PUT A 'CR'
(1) 016560 112777 000100 161720      MOV      #100,@$TPS  ;ENABLE TTY INTERRUPT
(1) 016566 070004              RTMUL:  MUL      R4,R0 ;MULTIPLY R0 BY R4
(1) 016570 000776              BR       RTMUL       ;STAY IN THE LOOP UNTIL INTERRUPTED
(1) 016572 105077 161710      RTA310: CLRB     @$TPS ;CLEAR TTY INTERRUPT
(1) 016576 022716 016566      CMP      #RTMUL,(SP) ;IS THE RETURN ADDRESS = RTMUL
(1) 016602 001415              BEQ      4$          ;IF SO THEN GO TO 4$
(1) 016604 012777 000015 161672 1$:  MOV      #15,@$TPB   ;OTHERWISE OUT PUT A 'CR'
(1) 016612 105777 161670      2$:  TSTB     @$TPS     ;LOOP HERE UNTIL DONE COMES ON
(1) 016616 100375              BPL     2$
(1) 016620 012777 000015 161656      MOV      #15,@$TPB   ;OUT PUT ANOTHER 'CR'
(1) 016626 012777 000100 161652      MOV      #100,@$TPS  ;ENABLE TTY INTERRUPT
(1) 016634 000002              RTI
(1) 016636 020427 077777      4$:  CMP      R4,#77777  ;CHECK R4 TO CONTAIN PROPER DATA
(1) 016642 001403              BEQ      6$
(3) 016644 004767 000244      JSR      PC,$HLT      ;SEEN AN ERROR, GO TO TH HALT ROUTINE
    
```



```

(1) 017030 000005          RESET                ;;CLEAR THE WORLD
(1) 017032 004710          $ENDAD: JSR      PC,(R0)           ;;GO TO MONITOR
(1) 017034 000240          NOP                    ;;SAVE ROOM
(1) 017036 000240          NOP                    ;;FOR
(1) 017040 000240          NOP                    ;;ACT11
(1) 017042                $DOAGN:                ;;
(1) 017042 000137          JMP      @(PC)+          ;;RETURN
(1) 017044 000600          $RTNAD: .WORD  BEGIN           ;;
(1) 017046      377      377      000          $ENULL: .BYTE  -1,-1,0       ;;NULL CHARACTER STRING
(1) 017051      015      042412  042116      $ENDMG: .ASCIZ  <15><12>/END PASS/
(1) 017056 050040 051501 000123

1523
1528 017006 000004          ENDCT: 4

1532
1533
1534                ;;*****
1535
1536                .SBTTL  POWER FAIL ROUTINE
1537
1538 017064 012737 017074 000024  $PWRDN: MOV      #$PWRUP,@#24
1539 017072 000000          HALT
1540
1541 017074 012706 000600          $PWRUP: MOV      #BEGIN,SP      ;RESTORE THE SP
1542 017100 012737 017064 000024  MOV      #$PWRDN,@#24
1543 017106 000004 000516          TYPE      'POWER'           ;GO AND TYPE 'POWER'
1544 017112 000753          BR      $DOAGN
1548
1549                ;*      HALT ROUTINE
1550                ;*      -----
1551                ;*
1552                ;*
1553                ;*      PROGRAM COMES HERE ON ENCOUNTERING ANY ERROR
1554                ;*
1555
1556 017114 017637 000000 000402  $HLT:  MOV      @(SP),@#$FATAL ;PLACE THE ERROR NUMBER AT LOCATION $FATAL
1557 017122 032737 020000 000422  BIT      #20000,@#$SWREG ;HAS THE OPERATOR ASKED TO SUPPRESS ERROR TYPE OUTS
1558 017130 001046          BNE      6$
1559 017132 000004 000510          TYPE      , $CRLF           ;GO AND TYPE A CR, LF, FOLLOWED BY 3 SPACES
1560 017136 010046          MOV      R0,-(SP)           ;SAVE R0
1561 017140 112767 000002 161303  MOVVB   #2,$TPCNT           ;ALLOW TYPE OUTS OF PC AND ERROR NUMBER
1562 017146 016600 000002          MOV      2(SP),R0           ;BRING THE RETURN PC IN R0
1563 017152 162700 000004          SUB      #4,R0
1564 017156 112737 000006 000450  2$:    MOVVB   #6,@#TYPCNT       ;ALLOW TYPE OUT OF 6 DIGITS
1565 017164 005046          CLR      -(SP)
1566 017166 000241          4$:    CLC
1567 017170 006100          ROL      R0
1568 017172 006116          ROL      (SP)               ;BRING THE C BIT FROM R0 IN (SP)
1569 017174 052716 000060          BIS      #6,(SP)           ;PREPARE TO TYPE IT OUT
1570 017200 004767 000130          JSR      PC,$TPCHR         ;AND GO TO OUT PUT A CHARACTER
1571 017204 005016          CLR      (SP)
1572 017206 006100          ROL      R0
1573 017210 006116          ROL      (SP)
1574 017212 006100          ROL      R0
1575 017214 006116          ROL      (SP)
1576 017216 105367 161226          DECB    TYPCNT             ;HAS ALL THE SIX CHARACTERS BEEN TYPED ?
1577 017222 001361          BNE     4$                 ;IF NOT THEN REPEAT FROM 4$

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1578 017224 005726          TST      (SP)+          ;RESTORE STACK POINTER
1579 017226 017600 000002    MOV      @2(SP),R0      ;PREPARE TO OUT PUT THE ERROR NUMBER
1580 017232 000004 000512    TYPE     , $CRLF+2     ;GO AND TYPE 3 SPACES
1581 017236 105367 161207    DECB    $TPCNT         ;IF BOTH PC AND ERROR NUMBER HAS NOT BEEN
1582 017242 001345          BNE      2$            ;REPORTED THEN REPEAT FROM 2$
1583 017244 012600          MOV      (SP)+,R0      ;RESTORE R0
1584 017246 105767 161146    6$:     TSTB   $ENV      ;IF WE ARE NOT UNDER APT. THEN GO TO
1585 017252 001403          BEQ      8$            ;8$
1586 017254 005237 000400    INC      @#$MSGTY      ;OTHERWISE INFORM APT. ABOUT SEEING THE ERROR
1587 017260 000777          BR       .             ;AND LOOP
1588 017262 005737 000422    8$:     TST      @#$SWREG ;IS IT REQUIRED TO HALT ON ERROR ?
1589 017266 100001          BPL      10$          ;IF NOT THEN GO TO 10$
1590 017270 000000          HALT
1591 017272 062716 000002    10$:    ADD      #2,(SP)      ;ADJUST THE RETURN ADDRESS
1592 017276 000207          RTS       PC          ;AND RETURN
1596
1597          :*          TYPE OUT ROUTINE
1598          :*          -----
1599          :*
1600          :*
1601          :*          THIS ROUTINE IS USED TO TYPE ASCIZ MESSAGES
1602          :*
1603
1604 017300 010046          $TYPE:  MOV      R0,-(SP) ;SAVE R0
1605 017302 017600 000002    MOV      @2(SP),R0    ;GET THE ADDRESS OF THE ASSCIZ STRING
1606 017306 112046          2$:     MOVB    (R0)+,-(SP) ;PUSH THE CHARACTER TO BE TYPED ONTO STACK
1607 017310 001005          BNE      4$            ;BRANCH IF IT IS NOT THE TERMINATOR
1608 017312 005726          TST      (SP)+
1609 017314 012600          MOV      (SP)+,R0    ;OTHERWISE RESTORE THE STACK AND R0
1610 017316 062716 000002    3$:     ADD      #2,(SP)  ;ADJUST THE RETURN PC
1611 017322 000002          RTI       .           ;AND RETURN
1612
1613 017324 004767 000004    4$:     JSR      PC,$TPCHR  ;GO TO TYPE A CHARACTER
1614 017330 005726          TST      (SP)+
1615 017332 000765          BR       2$            ;RESTORE THE STACK POINTER
1616                                     ;AND RETURN TO 2$
1617 017334 132737 000040 000421 $TPCHR: BITB   #40,@#$ENV  ;HAS THE CONSOLE OUTPUTS BEEN SUPPRESSED?
1618 017342 001006          BNE      4$            ;IF SO THEN RETURN FROM THE SUBROUTINE VIA 4$
1619 017344 105777 161136    2$:     TSTB   @$TPS      ;IS THE PRINTER AVAILABLE?
1620 017350 100375          BPL      2$            ;IF NOT THEN LOOP HERE
1621 017352 116677 000002 161124 MOVB    2(SP),@$TPB    ;OUT PUT THE CHARACTER
1622 017360 000207          RTS       PC
1623          .END

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TST211	006354	1331#
TST212	006454	1332#
TST213	006554	1333#
TST214	006654	1334#
TST215	006756	1335#
TST216	007060	1336#
TST217	007160	1337#
TST220	007260	1445#
TST221	007354	1446#
TST222	007450	1447#
TST223	007544	1448#
TST224	007644	1449#
TST225	007740	1450#
TST226	010034	1451#
TST227	010134	1452#
TST230	010230	1453#
TST231	010324	1454#
TST232	010420	1455#
TST233	010520	1456#
TST234	010614	1457#
TST235	010710	1458#
TST236	011004	1459#
TST237	011104	1460#
TST240	011200	1461#
TST241	011274	1462#
TST242	011410	1467#
TST243	011504	1468#
TST244	011600	1469#
TST245	011674	1470#
TST246	011766	1471#
TST247	012060	1472#
TST250	012152	1473#
TST251	012246	1474#
TST252	012342	1475#
TST253	012434	1476#
TST254	012526	1486#
TST255	012634	1487#
TST256	012742	1488#
TST257	013054	1489#
TST260	013162	1490#
TST261	013270	1491#
TST262	013402	1492#
TST263	013510	1493#
TST264	013616	1494#
TST265	013724	1495#
TST266	014036	1496#
TST267	014144	1497#
TST270	014252	1498#
TST271	014364	1499#
TST272	014472	1500#
TST273	014600	1501#
TST274	014670	1502#
TST275	014770	1507#
TST276	015076	1508#
TST277	015204	1509#
TST300	015312	1510#

TST301	015416	1511#																
TST302	015522	1512#																
TST303	015626	1513#																
TST304	015734	1514#																
TST305	016042	1515#																
TST306	016146	1516#																
TST307	016252	1520#																
TST310	016500	1521#																
TST37	002050	801	836	871	906	943	980	986#										
TST40	002104	987	993#															
TST41	002120	994	997#															
TST42	002136	998	1001#															
TST43	002172	1002	1008#															
TST44	002224	1009	1014#															
TST45	002256	1015	1020#															
TST46	002310	1021	1026#															
TST47	002346	1027	1033#															
TST50	002376	1034	1039#															
TST51	002454	1052#																
TST52	002534	1053#																
TST53	002614	1054#																
TST54	002674	1055#																
TST55	002752	1056#																
TST56	003030	1057#																
TST57	003106	1058#																
TST60	003166	1059#																
TST61	003246	1060#																
TST62	003324	1061#																
TTYOUT	000502	397#	1520*	1521*														
TYPCNT	000450	383#	1564*	1576*														
TYPE =	000004	357#	1522	1543	1559	1580												
\$APTHD	000430	366#	368															
\$CPUOP	000426	364#																
\$CRLF	000510	400#	1559	1580														
\$DEVCT	000410	364#	718															
\$DOAGN	017042	1522#	1544															
\$ENDAD	017032	342	1522#															
\$ENDCT	017006	1522#	1526															
\$ENDMG	017051	1522#																
\$ENULL	017046	1522#																
\$ENV	000420	364#	737	1584														
\$ENVM	000421	364#	1520	1521	1617													
\$EOP	016762	1522#																
\$EOPCT	017000	1522#																
\$ETABL	000420	364#																
\$ETEND	000430	364#	366															
\$FATAL	000402	364#	1556*															
\$GET42	017022	1522#																
\$HD =	000003	325																
\$HIBTS	000430	366#																
\$HLT	017114	783	787	819	823	854	858	889	893	925	929	962	966	1046				
		1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1105	1109	1113				
		1117	1148	1152	1156	1159	1191	1195	1199	1202	1311	1315	1316	1317				
		1318	1319	1320	1321	1322	1328	1329	1330	1331	1332	1333	1334	1335				
		1336	1337	1445	1446	1447	1448	1449	1450	1451	1452	1453	1454	1455				
		1456	1457	1458	1459	1460	1461	1462	1467	1468	1469	1470	1471	1472				

	1473	1474	1475	1476	1486	1487	1488	1489	1490	1491	1492	1493	1494	
	1495	1496	1497	1498	1499	1500	1501	1502	1507	1508	1509	1510	1511	
	1512	1513	1514	1515	1516	1520	1521	1556#						
\$MAIL	000400	364#	366	720										
\$MBADR	000432	366#												
\$MSGAD	000414	364#												
\$MSGLG	000416	364#												
\$MSGTY	000400	364#	1586*											
\$PASS	000406	364#	767	804	839	874	910	947	1090	1133	1176	1522*		
\$PASTM	000436	366#												
\$PWRDN	017064	717	1538#	1542										
\$PWRUP	017074	1538	1541#											
\$RTNAD	017044	1522#												
\$SETUP=	000020	403#	1522											
\$STUP =	177777	403#												
\$SVPC =	001000	342#												
\$SWR =	160000	325#	1522											
\$SWREG	000422	364#	1557	1588										
\$TESTN	000404	364#	726											
\$TN =	000001	325#												
\$TPB	000504	398#	1520*	1521*	1621*									
\$TPCHR	017334	1570	1613	1617#										
\$TPCNT	000451	384#	1561*	1581*										
\$TPS	000506	399#	739	1520*	1521*	1619								
\$TSTM	000434	366#												
\$TYPE	017300	361	1604#											
\$UNIT	000412	364#												
\$UNITM	000440	366#												
\$USWR	000424	364#												
\$\$GET4=	000000	1522#												
.	= 017362	332#	339	342#	360#	363#	366#	368#	370#	372#	374#	376#	378#	380#
		716#	724#	733#	777#	782	786	813#	818	822	848#	853	857	883#
		888	892	919#	924	928	956#	961	965	1045	1052#	1053#	1054#	1055#
		1056#	1057#	1058#	1059#	1060#	1061#	1099#	1104	1108	1111	1116	1142#	1147
		1151	1154	1158	1185#	1190	1194	1197	1201	1310	1315#	1316#	1317#	1318#
		1319#	1320#	1321#	1322#	1328#	1329#	1330#	1331#	1332#	1333#	1334#	1335#	1336#
		1337#	1445#	1446#	1447#	1448#	1449#	1450#	1451#	1452#	1453#	1454#	1455#	1456#
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		1474#	1475#	1476#	1486#	1487#	1488#	1489#	1490#	1491#	1492#	1493#	1494#	1495#
		1496#	1497#	1498#	1499#	1500#	1501#	1502#	1507#	1508#	1509#	1510#	1511#	1512#
		1513#	1514#	1515#	1516#	1520#	1521#	1522	1525	1526#	1530#	1587		
..X	= 000430	366#												
..A	= 016524	733#	777#	813#	848#	883#	919#	956#	1052#	1053#	1054#	1055#	1056#	1057#
		1058#	1059#	1060#	1061#	1099#	1142#	1185#	1315#	1316#	1317#	1318#	1319#	1320#
		1321#	1322#	1328#	1329#	1330#	1331#	1332#	1333#	1334#	1335#	1336#	1337#	1445#
		1446#	1447#	1448#	1449#	1450#	1451#	1452#	1453#	1454#	1455#	1456#	1457#	1458#
		1459#	1460#	1461#	1462#	1467#	1468#	1469#	1470#	1471#	1472#	1473#	1474#	1475#
		1476#	1486#	1487#	1488#	1489#	1490#	1491#	1492#	1493#	1494#	1495#	1496#	1497#
		1498#	1499#	1500#	1501#	1502#	1507#	1508#	1509#	1510#	1511#	1512#	1513#	1514#
		1515#	1516#	1520#	1521#									
..B	= 016530	733#	777#	813#	848#	883#	919#	956#	1052#	1053#	1054#	1055#	1056#	1057#
		1058#	1059#	1060#	1061#	1099#	1142#	1185#	1315#	1316#	1317#	1318#	1319#	1320#
		1321#	1322#	1328#	1329#	1330#	1331#	1332#	1333#	1334#	1335#	1336#	1337#	1445#
		1446#	1447#	1448#	1449#	1450#	1451#	1452#	1453#	1454#	1455#	1456#	1457#	1458#
		1459#	1460#	1461#	1462#	1467#	1468#	1469#	1470#	1471#	1472#	1473#	1474#	1475#
		1476#	1486#	1487#	1488#	1489#	1490#	1491#	1492#	1493#	1494#	1495#	1496#	1497#

..C = 000027	1498#	1499#	1500#	1501#	1502#	1507#	1508#	1509#	1510#	1511#	1512#	1513#	1514#
	1515#	1516#	1520#	1521#									
	733#	777#	813#	848#	883#	919#	956#	1052#	1053#	1054#	1055#	1056#	1057#
	1058#	1059#	1060#	1061#	1099#	1142#	1185#	1315#	1316#	1317#	1318#	1319#	1320#
	1321#	1322#	1328#	1329#	1330#	1331#	1332#	1333#	1334#	1335#	1336#	1337#	1445#
	1446#	1447#	1448#	1449#	1450#	1451#	1452#	1453#	1454#	1455#	1456#	1457#	1458#
	1459#	1460#	1461#	1462#	1467#	1468#	1469#	1470#	1471#	1472#	1473#	1474#	1475#
	1476#	1486#	1487#	1488#	1489#	1490#	1491#	1492#	1493#	1494#	1495#	1496#	1497#
	1498#	1499#	1500#	1501#	1502#	1507#	1508#	1509#	1510#	1511#	1512#	1513#	1514#
	1515#	1516#	1520#	1521#									

. ABS. 017362 000

ERRORS DETECTED: 0

CVKABB, CVKABB/CRF: SYM/NL: TOC=SYSMAC.SML/ML, CVKABB.P11
RUN-TIME: 10 11 .8 SECONDS
RUN-TIME RATIO: 83/23=3.5
CORE USED: 15K (30 PAGES)