

EAE

IDENTIFICATION

Product Code: MAINDEC- 15-DØHA-D(D)
Product Name: EAE Part II
Date Created: February 6, 197Ø
Maintainer: Diagnostic Group
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1. ABSTRACT

Part 2 of the PDP-15 EAE Diagnostic verifies only correct operation of the EAE multiply and divide instructions. Part 2 is written in two sections: Section 1 checks EAE instructions against predetermined results. This ranges from setup operation, through multiply and divide instructions executed back to back; Section 2 is a random-number check of the signed multiply and signed divide instructions.

Hardware malfunctions in Section 1 result in an error halt. Hardware malfunctions in Section 2 result in an error message on the teleprinter.

2. REQUIREMENTS

Storage

The program when loaded occupies locations 20 to 7500.

Subprograms and/or Subroutines

Teletype Output Package

Signed Multiply Subroutine (modified)

Signed Divide Subroutine (modified)

Equipment

Minimum configuration PDP-15 with EAE option installed

3. USAGE

3.1 Loading

- a. Set Bank Mode SW on 1
- b. Set address SW to 17700
- c. Press reset, press READ-IN.

3.2 Calling Sequence

The program halts after loading.

Set address switches to: 200 Section 1 (Constants)
 201 Section 2 (Random numbers)
 203 Switch Setting typeout,

Press Reset, press START.

If 203 is chosen, program halts at 6622 after typeout.
To continue, set 200, or 201 in address switches
Press reset, press START.

3.3

Switch Settings

AC Switches = 0 or Down

With all AC switches down, the program results in the following:

- a. Hardware malfunctions detected in Section 1 result in an error halt.
- b. Hardware malfunctions detected in Section 2 result in an error typeout.
- c. At the completion of the error typeout, the processor halts.
- d. The program completes whichever section of test it was started in, sequence from each subtest of the section to the next, without halting.

AC Switches 1 or Up

<u>SW</u>	<u>Operation</u>	<u>Description</u>
0	Delete error typeouts	The program will not type out error messages, but will ring bell on error.
1	Halt after EAE operation	The processor halts after each EAE operation is initiated and its results are verified. (Note: Press CONTINUE to proceed.)
2	Repeat EAE operation (Scope Loop)	The program repeats the last EAE operation, If SW2 is set during an error typeout or halt, the program repeats the operation that caused the error. (Note: SW1 is tested before SW2.)
3	Halt after EAE sequence	The processor halts after each sequence of testing an EAE operation.
4	Repeat EAE sequence	The program repeats the last sequence of testing an EAE operation; i.e., the program repeats the EAE AC sign test and does not proceed to multiply/divide test. (Note: The program tests SW3 before SW4.)
5	Cycle all sections	At the completion of 77 passes through the Set-Up Test, the program proceeds to the Random Multiply and Divide Test. At the completion of passes through Random Test the program repeats the Set-Up Test.
6		Print "OK" after each pass when SW5 = 1

3.4 Start-Up and/or Entry

Start up, Section 1

Set AC switches = 000000

Set address = 0200

Press Reset

Press START

Start up, Section 2

Set AC switch = 000000

Set address = 0201

Press Reset

Press START

3.5 Errors in Usage

Hardware malfunctions detected in Section 1 will result in an error halt. Refer to the listing using the address in the memory register to identify the error.

Hardware malfunctions detected in Section 2 will result in an error typeout on the teleprinter, and a processor halt.

- a. Error typeouts are in standard format and include the following information.
- b. Type of failure, multiply or divide.
- c. Initial problem set-up, contents of the AC, MQ, and the divisor and multiplicand.
- d. The results of the instruction, i.e., if divide, the quotient and remainder; if multiply, the high and low order product. A comparison of the results (software vs hardware).
- e. A printout of the ratio of failure, based on 100 octal iterations.
- f. If the ratio is small, it is recommended that CONTINUE be depressed to find a setup that produces a higher failure ratio.
- g. Then set the address register equal to the contents of the AC and depress START. This will generate a simulated printout of the EAE failure. After the printout the program will go into a scope loop, executing the instruction that failed.

3.5 (Continued)

The abbreviations used by the header are as follows:

<u>Abbreviation</u>	<u>Meaning</u>
C(L)	The information under this header is the contents of LINK.
C(AC)	The information under this header is the contents of AC.
C(MQ)	The information under this header is the contents of MQ.
C(SC)	The information under this header is the contents of SHIFT COUNT.
(DIVISOR)	The information under this header is the contents of MB-not sign corrected.
(MULTPLICAND)	The information under this header is the contents of MB-not sign corrected.

Error Typeout Examples:

a. Sign Multiply

MULS FAILED	MULTIPLIER	MULTPLICAND
	705722	167372
	HIGH ORDER PRODUCT	LOW ORDER PRODUCT
SOFTWARE	762343	133015
HARDWARE	762443	762343
OUT OF 100 CHECKS BAD 1		
6443XX	(XX = SHIFT COUNT)	

b. Sign Divide

DIVS	C(DIVISOR)	C(AC)	C(MQ)
	235012	223506	304176
	QUOTIENT	REMAINDER	
SOFTWARE	741320	146136	
HARDWARE	741320	146135	
OUT OF 100 CHECKS BAD 1			
6443XX	(XX = SHIFT COUNT)		

c. Example of Multiply Simulation

MULS FAILED	MULTIPLIER (AC)	MULTPLICAND
	235037	534247
	HIGH ORDER PRODUCT	LOW ORDER PRODUCT

SOFTWARE 754134 257305
 HARDWARE 754134 57305
 OUT OF 100 CHECK BAD 100
 657110 (10 SHIFTS)

C(L)	C(AC)	C(MQ)	C(SC)
0	0	235037	70 (2's compliment of 10)
0	121654	116417	71
0	172602	47207	72
0	217155	23503	73
0	231342	411641	74
0	236435	204720	75
0	117216	502350	76
0	47507	241164	77
0	754134	257305	0

d. Example of Divide Simulation

DIVS FAILED	C(DIVISOR)	C(AC)	C(MQ)
	317121	216663	Ø47735
	QUOTIENT	REMAINDER	LINK
SOFTWARE	477353	715731	1
HARDWARE	477353	715731	Ø
OUT OF 1ØØ	CHECK BAD 1ØØ		
6443Ø3			

(Program Halts. Set Address Register equal to AC then START. (3.5.g))

(Print out of simulated Divide)

C(L)	C(AC)	C(MQ)	C(SC)
Ø	216663	Ø47735	Ø75Initial AC & MQ after completing
Ø	677542	Ø47735	Ø751st subtract
1	5773Ø4	117672	Ø761st shift
ovflo 1	116425	117672	Ø762nd subtract-overflow caused
Ø	235Ø52	237565	Ø772nd shift
Ø	715731	237565	Ø773rd subtract
Ø	715731	477353	Ø773rd shift-overflow recog- nized.
1	715731	477353	Ø77Last cycle adjust.

3.6 Recovery from such Errors

In Section 1, a malfunction causes a processor halt. In Section 2, a malfunction will generate an error typeout, then halt the processor.

One of the following operations may be necessary if more information about the

3.6 (Continued)

failure is needed to repair the malfunction.

- a. Repeat the exact operation that detected the failure (possibly a scope loop).
- b. Continue normally in the test to generate more information about the failure.
- c. Repeat the sequence of operation, or data patterns that detected the failure.
- d. Produce a simulation printout of failing multiply or divide instruction.

AC switch control is built into the program to allow for any of these operations assuming the processor has halted after an error.

These operations may be accomplished as follows:

- a. Repeat same operation

Set AC switch 2 up or to a 1

Press CONTINUE

Not that AC switch 0 allows deletion of error typeout for a scope loop.

- b. Continue normally

Press CONTINUE

- c. Repeat Sequence

Set AC switch 4 up to a 1

Press CONTINUE

- d. Simulation Printout

Set Address Switch = C(AC)

(At completion of Printout the program goes to an automatic scope loop.)

4. PROGRAM DESCRIPTION

4.1 General

The PDP-15 EAE Diagnostic part 2 verifies correct operation of the Multiply and Divide EAE Instruction. Part 2 itself is written in two logical sections as follows:

Section 1 - Set up test using fixed number

Verifies correct operation of all EAE Multiply and Divide instructions with fixed numbers.

4.1 (Continued)

Section 2 - Random Number

Verifies correct operation of signed Multiply and Signed Divide instruction with random numbers.

The above sections are to be run sequentially; that is, Section 1 must run before Section 2.

4.2 Test Description

4.2.1 Section 1 Set-Up Test - The Set-Up Test incrementally verifies correct operation of the multiply and divide instruction.

a. "ADVP" Checks that the memory location following the multiply and/or divide instruction is not modified by the execution of the instruction and that the program address counter is properly incremented during the execution of the instruction.

b. "NEAE" Set up check - Checks the set-up of all EAE signed, unsigned, integer and fraction, multiply and divide instructions. These instructions are executed with a shift count of zero.

c. "SHCT" Shift Counter Test- Executes the Multiply instruction sequentially starting at a shift count of 1 and incrementing it up to a shift count of 22.

d. "STMUL" Sign multiply and divide test - Test all signed multiply and divide instructions.

e. "MULTST" Multiply and Divide Test - This test using worse-case number patterns acts as both a EAE and Adder Test.

f. "MSPEED" Speed Multiply and Divide - This test is in three operations: (1) a sequence of multiply instructions are executed back to back, (2) then a sequence of divide instructions are executed, (3) followed by a sequence of MUL, DIV, MUL, and DIV executed back to back.

4.2.2 Section 2 Random Data Multiply and Divide Test - The Random Data Test verifies

that the EAE will multiply and divide random numbers at shift counts 1 through maximum (22 for multiply, 23 for divide) and checks that the LINK is set on

4.2.2 (Continued)

divide overflow.

The sequence of testing is as follows:

- (a) Test the Multiply
 - (1) Generate a random number
 - (2) Do a software divide
 - (3) Do a software divide
 - (4) Compare the results of both operations
 - (5) LOOP BACK TO 1 TILL DONE

4.2.3

Extended Reliability Test -

- a. If it is desired to run an extended reliability test on the EAE and the computer is to be left unattended, the halts in Part II Section 2 should be changed.

MULCT-2 --- From a Halt to a NOP (6254)

TIMTEX-2 ---From a Halt to a NOP (6304)

- b. There is also a counter that counts pass completes "CTCMPT". This counter is cleared when starting the program or when restarting at "FIRST" or FIRST + 3 (CTCMPT = 7146).

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                                .TITLE EAE-II
                                /EAE PART II MULTIPLY AND DIVIDE-FOR POP 15
                                /
                                /START AT 200 FOR SECTION ONE (CONSTANTS)
                                /START AT 201 FOR SECTION TWO (RANDOM DATA)
                                /START AT 203 FOR SWITCH SETTING TYPEOUTS.
                                /

                                .ABS
                                .LOC 200
00200                                JMP RUN+1
00200    606624                        JMP RUN+4
00201    606627                        JMP FIRST
00202    607047                        JMP FIRST
00203    740000                        ADVP  NOP
00204    147176                        DZM  STEMA#           /CHECK FOR P HINCREMENT
00205    147177                        DZM  STEMB#           /WITH NO SHIFT
00206    207176                        LAC  STEMA
00207    673101                        MUL  -21
00210    740040                        HLT          /P NOT INCREMENTED      (105)
00211    741000                        SKP
00212    740040                        HLT          /P OVER INCREMENTED     (107)
00213    447176                        ISZ  STEMA
00214    600206                        JMP  .-6
00215    147176                        DZM  STEMA           /CHECK FOR P INCREMENT
00216    147177                        DZM  STEMB           /WITH 22 SHIFT COUNTS
00217    207176                        LAC  STEMA
00220    653122                        MUL
00221    740040                        HLT          /P NOT INCREMENTER      (116)
00222    741000                        SKP
00223    740040                        HLT          /P OVER INCREMENTED     (120)
00224    447177                        ISZ  STEMB
00225    600217                        JMP  .-6
00226    147176                        DZM  STEMA           /IS MEMORY RESTORED
00227    147177                        DZM  STEMB           /CORRECTLY
00230    207176                        LAC  STEMA
00231    653122                        MUL
00232    007177                        STEMB
00233    741000                        SKP
00234    740040                        HLT          /P OVER INCREMENTER      (132)
00235    207177                        LAC  STEMB
00236    547176                        SAD  STEMA
00237    741000                        SKP
00240    740040                        HLT          /VARIABLE NOT RESTORED CORRECT (136)
00241    447176                        ISZ  STEMA
00242    740000                        NOP
00243    447177                        ISZ  STEMB
00244    600230                        JMP  .-14
00245    740000                        NOP          /EXIT

                                .EJECT

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/BASIC EAE INSTRUCTION /NO SHIFTS /NO GSM
NEAE      JMS LOOP4           /HLT ADDRESS
          JMS LOOP2
          STL
          LAC (070707)
          LMQ
          LAC (252525)
          EAE 4100           /SPECIAL INST 644100
          000001
          DAC FIAC#
          LACQ
          DAC FIMQ#
          SAD (707070)
          SKP
          HLT           /BAD MQ, GOOD=707070   (160)
          LAC FIAC
          SAD (525252)
          SKP
          HLT           /BAD AC, GOOD=525252   (164)
          JMS HLOOPS
          NOP
          JMS LOOP2
          LAC (070707)
          LMQ
          LAC (252525)
          EAE 4100           /SPECIAL INST 644100
          777776
          DAC FIAC
          LACQ
          DAC FIMQ
          SAD (070707)
          SKP
          HLT           /BAD MQ, GOOD=070707   (202)
          LAC FIAC
          SAD (252525)
          SKP
          HLT           /BAD AC, GOOD=252525   (206)
          JMS HLOOPS
          JMS LOOP2
          NOP
          LAC (707070)
          LMQ
          LAC (252525)
          EAE 4100           /SPECIAL INST 644100
          000001
          DAC FIAC
          LACQ
          .EJECT

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00324	047157	DAC FIMQ
00325	547207	SAD (707070)
00326	741000	SKP
00327	740040	HLT /BAD MQ, GOOD=707070 (224)
00330	207156	LAC FIAC
00331	547206	SAD (252525)
00332	741000	SKP
00333	740040	HLT /BAD AC, GOOD=252525 (230)
00334	104130	JMS HLOOPS
00335	104157	JMS LOOP2
00336	740000	NOP
00337	207207	LAC (707070)
00340	652000	LMQ
00341	207210	LAC (525252)
00342	644100	EAE 4100 /SPECIAL INST 644100
00343	777776	777776
00344	047156	DAC FIAC
00345	641002	LACQ
00346	047157	DAC FIMQ
00347	547207	SAD (707070)
00350	741000	SKP
00351	740040	HLT /BAD MQ, GOOD=707070 (246)
00352	207156	LAC FIAC
00353	547210	SAD (525252)
00354	741000	SKP
00355	740040	HLT /BAD AC, GOOD=525252 (252)
00356	104130	JMS HLOOPS
00357	104157	JMS LOOP2
		.EJECT

00360	740000	NEAB	NOP	
00361	207205		LAC (070707)	
00362	652000		LMQ	
00363	207206		LAC (252525)	
00364	654100		EAE 14100	/SPECIAL INST 654100
00365	000001		000001	
00366	047156		DAC FIAC	
00367	641002		LACQ	
00370	047157		DAC FIMQ	
00371	547211		SAD (000000)	
00372	741000		SKP	
00373	740040		HLT	/BAD MQ, GOOD=000000 (270)
00374	207156		LAC FIAC	
00375	547206		SAD (252525)	
00376	741000		SKP	
00377	740040		HLT	/BAD AC, GOOD=252525 (274)
00400	104130		JMS HLOOPS	
00401	104157		JMS LOOP2	
00402	740000		NOP	
00403	207205		LAC (070707)	
00404	652000		LMQ	
00405	207206		LAC (252525)	
00406	654100		EAE 14100	/SPECIAL INST 654100
00407	777776		777776	
00410	047156		DAC FIAC	
00411	641002		LACQ	
00412	047157		DAC FIMQ	
00413	547211		SAD (000000)	
00414	741000		SKP	
00415	740040		HLT	/BAD MQ, GOOD=000000 (312)
00416	207156		LAC FIAC	
00417	547206		SAD (252525)	
00420	741000		SKP	
00421	740040		HLT	/BAD AC, GOOD=252525 (316)
00422	104130		JMS HLOOPS	
00423	104157		JMS LOOP2	
			.EJECT	

00424	740000	NOP	
00425	207207	LAC (707070)	
00426	652000	LMQ	
00427	654100	EAE 14100	/SPECIAL INST 654100
00430	000001	000001	
00431	047156	DAC FIAC	
00432	641002	LACQ	
00433	047157	DAC FIMQ	
00434	547211	SAD (000000)	
00435	741000	SKP	
00436	740040	HLT	/BAD MQ, GOOD=000000 (333)
00437	207156	LAC FIAC	
00440	547207	SAD (707070)	
00441	741000	SKP	
00442	740040	HLT	/BAD AC, GOOD=707070 (337)
00443	104130	JMS HLOOPS	
00444	104157	JMS LOOP2	
00445	740000	NOP	
00446	207207	LAC (707070)	
00447	652000	LMQ	
00450	207210	LAC (525252)	
00451	654100	EAE 14100	/SPECIAL INST 654100
00452	777776	777776	
00453	047156	DAC FIAC	
00454	641002	LACQ	
00455	047157	DAC FIMQ	
00456	547211	SAD (000000)	
00457	741000	SKP	
00460	740040	HLT	/BAD MQ, GOOD=000000 (355)
00461	207156	LAC FIAC	
00462	547210	SAD (525252)	
00463	741000	SKP	
00464	740040	HLT	/BAD AC, GOOD=525252 (361)
00465	104130	JMS HLOOPS	
00466	104157	JMS LOOP2	
		.EJECT	

00467	740000	NMUL	NOP	/MULTIPLY INSTRUCTIONS WITH NO SHIFTS
00470	207205		LAC (070707)	/CHECKING SETUP, THE FIRST ONE IS
00471	652000		LMQ	/AC MQ AC MQ
00472	207206		LAC (252525)	/(252525)X(,00001)=000000252525
00473	673100		MUL -22	
00474	000001		000001	
00475	047156		DAC FIAC	/DURING SETUP THE MQ IS SET TO SOME VALUE
00476	641002		LACQ	/THE EAE INSTRUCTION DOES AN AC EQUAL TO MQ TRANSFER
00477	047157		DAC FIMQ	
00500	547206		SAD (252525)	
00501	741000		SKP	
00502	740040		HLT	/BAD MQ, GOOD=252525 (377)
00503	207156		LAC FIAC	
00504	547211		SAD (000000)	
00505	741000		SKP	
00506	740040		HLT	/BAD AC, GOOD=000000 (403)
00507	104130		JMS HLOOPS	
00510	104157		JMS LOOP2	
00511	740000		NOP	
00512	207205		LAC (070707)	
00513	652000		LMQ	
00514	207206		LAC (252525)	
00515	673100		MUL -22	
00516	777776		777776	
00517	047156		DAC FIAC	
00520	641002		LACQ	
00521	047157		DAC FIMQ	
00522	547206		SAD (252525)	
00523	741000		SKP	
00524	740040		HLT	/BAD MQ, GOOD=252525 (421)
00525	207156		LAC FIAC	
00526	547211		SAD (000000)	
00527	741000		SKP	
00530	740040		HLT	/BAD AC, GOOD=000000 (425)
00531	104130		JMS HLOOPS	
00532	104157		JMS LOOP2	
00533	740000		NOP	
00534	207207		LAC (707070)	
00535	652000		LMQ	
00536	207210		LAC (525252)	
00537	673100		MUL -22	
00540	000001		000001	
00541	047156		DAC FIAC	
00542	641002		LACQ	
00543	047157		DAC FIMQ	
00544	547210		SAD (525252)	
00545	741000		SKP	
00546	740040		HLT	/BAD MQ, GOOD=525252 (443)
00547	207156		LAC FIAC	
00550	547211		SAD (000000)	
00551	741000		SKP	
00552	740040		HLT	/BAD AC, GOOD=000000 (447)
00553	104130		JMS HLOOPS	

.EJECT

00554 104157
00555 740000
00556 207207
00557 652000
00560 207210
00561 673100
00562 777776
00563 047156
00564 641002
00565 047157
00566 547210
00567 741000
00570 740040
00571 207156
00572 547211
00573 741000
00574 740040
00575 104130
00576 104157

JMS LOOP2
NOP
LAC (707070)
LMQ
LAC (525252)
MUL -22
777776
DAC FIAC
LACQ
DAC FIMQ
SAD (525252)
SKP
HLT /BAD MQ, GOOD=525252 (465)
LAC FIAC
SAD (000000)
SKP
HLT /BAD AC, GOOD=000000 (471)
JMS HLOOPS
JMS LOOP2
.EJECT

00577	740000	NMULS	NOP	
00600	207205		LAC (070707)	/SIGNED MULTIPLY NO SHIFTS
00601	652000		LMQ	
00602	207206		LAC (252525)	
00603	677100		MULS -22	
00604	000001		000001	
00605	047156		DAC FIAC	
00606	641002		LACQ	
00607	047157		DAC FIMQ	
00610	547206		SAD (252525)	
00611	741000		SKP	
00612	740040		HLT	/BAD MQ, GOOD=252525 (507)
00613	207156		LAC FIAC	
00614	547211		SAD (000000)	
00615	741000		SKP	
00616	740040		HLT	/BAD AC, GOOD=000000 (513)
00617	104130		JMS HLOOPS	
00620	104157		JMS LOOP2	
00621	740000		NOP	
00622	207205		LAC (070707)	
00623	652000		LMQ	
00624	207206		LAC (252525)	
00625	677100		MULS -22	
00626	777776		777776	
00627	047156		DAC FIAC	
00630	641002		LACQ	
00631	047157		DAC FIMQ	
00632	547206		SAD (252525)	
00633	741000		SKP	
00634	740040		HLT	/BAD MQ, GOOD=252525 (531)
			.EJECT	

00635	207156	LAC FIAC	
00636	547211	SAD (000000)	
00637	741000	SKP	
00640	740040	HLT	/BAD AC, GOOD=000000 (535)
00641	104130	JMS HLOOPS	
00642	104157	JMS LOOP2	
00643	740000	NOP	
00644	207207	LAC (707070)	
00645	652000	LMQ	
00646	207210	LAC (525252	
00647	677100	MULS -22	
00650	000001	000001	
00651	047156	DAC FIAC	
00652	641002	LACQ	
00653	047157	DAC FIMQ	
00654	547210	SAD (525252)	
00655	741000	SKP	
00656	740040	HLT	/BAD MQ, GOOD=525252 (553)
00657	207156	LAC FIAC	
00660	547212	SAD (777777)	
00661	741000	SKP	
00662	740040	HLT	/BAD AC, GOOD=777777 (557)
00663	104130	JMS HLOOPS	
00664	104157	JMS LOOP2	
00665	740000	NOP	
00666	207207	LAC (707070)	
00667	652000	LMQ	
00670	207210	LAC (525252)	
00671	677100	MULS -22	
00672	777776	777776	
00673	047156	DAC FIAC	
00674	641002	LACQ	
00675	047157	DAC FIMQ	
00676	547210	SAD (525252)	
00677	741000	SKP	
00700	740040	HLT	/BAD MQ, GOOD=525252 (575)
00701	207156	LAC FIAC	
00702	547212	SAD (777777)	
00703	741000	SKP	
00704	740040	HLT	/BAD AC, GOOD=777777 (601)
00705	104130	JMS HLOOPS	
00706	104157	JMS LOOP2	
		.EJECT	

00707	740000	NDIV	NOP	/DIVIDE INSTRUCTION NO SHIFTS
00710	207205		LAC (070707)	/THE EAE INSTRUCTIONS DOES NOT
				/CHANGE THE AC OR THE MQ
00711	652000		LMQ	
00712	207206		LAC (252525)	
00713	660300		DIV -23	
00714	000001		000001	
00715	047156		DAC FIAC	
00716	641002		LACQ	
00717	047157		DAC FIMQ	
00720	547205		SAD (070707)	
00721	741000		SKP	
00722	740040		HLT	/BAD MQ, GOOD=070707 (617)
00723	207156		LAC FIAC	
00724	547206		SAD (252525)	
00725	741000		SKP	
00726	740040		HLT	/BAD AC, GOOD=252525 (623)
00727	104130		JMS HLOOPS	
00730	104157		JMS LOOP2	
00731	740000		NOP	
00732	740000		NOP	
00733	207205		LAC (070707)	
00734	652000		LMQ	
00735	207206		LAC (252525)	
00736	660300		DIV -23	
00737	777776		777776	
00740	047156		DAC FIAC	
00741	641002		LACQ	
00742	047157		DAC FIMQ	
00743	547205		SAD (070707)	
00744	741000		SKP	
00745	740040		HLT	/BAD MQ, GOOD=070707 (642)
00746	207156		LAC FIAC	
00747	547206		SAD (252525)	
00750	741000		SKP	/BAD AC, GOOD=252525 (646)
00751	740040		HLT	
00752	104130		JMS HLOOPS	
00753	104157		JMS LOOP2	
			.EJECT	

00754	740000	NOP
00755	207207	LAC (707070)
00756	652000	LMQ
00757	207210	LAC (525252)
00760	660300	DIV -23
00761	000001	000001
00762	047156	DAC FIAC
00763	641002	LACQ
00764	047157	DAC FIMQ
00765	547207	SAD (707070)
00766	741000	SKP
00767	740040	HLT /BAD MQ, GOOD=707070 (664)
00770	207156	LAC FIAC
00771	547210	SAD (525252)
00772	741000	SKP
00773	740040	HLT /BAD AC, GOOD=525252 (670)
00774	104130	JMS HLOOPS
00775	104157	JMS LOOP2
00776	740000	NOP
00777	207207	LAC (707070)
01000	652000	LMQ
01001	207210	LAC (525252)
01002	660300	DIV -23
01003	777776	777776
01004	047156	DAC FIAC
01005	641002	LACQ
01006	047157	DAC FIMQ
01007	547207	SAD (707070)
01010	741000	SKP /BAD MQ, GOOD=707070 (706)
01011	740040	HLT
01012	207156	LAC FIAC
01013	547210	SAD (525252)
01014	741000	SKP /BAD AC, GOOD=525252 (712)
01015	740040	HLT
01016	104130	JMS HLOOPS
01017	104157	JMS LOOP2
		.EJECT

01020	740000	NDIVS	NOP	/NO SHIFTS DIVIDE SIGNED	
01021	207205		LAC (070707)		
01022	652000		LMQ		
01023	207206		LAC (252525		
01024	664300		DIVS -23		
01025	000001		000001		
01026	047156		DAC FIAC		
01027	641002		LACQ		
01030	047157		DAC FIMQ		
01031	547205		SAD (070707)		
01032	741000		SKP		
01033	740040		HLT	/BAD MQ, GOOD=070707	(730)
01034	207156		LAC FIAC		
01035	547206		SAD (252525)		
01036	741000		SKP		
01037	740040		HLT	/BAD AC, GOOD=252525	(734)
01040	104130		JMS HLOOPS		
01041	104157		JMS LOOP2		
01042	740000		NOP		
01043	207205		LAC (070707		
01044	652000		LMQ		
01045	207206		LAC (252525		
01046	664300		DIVS -23		
01047	777776		777776		
01050	047156		DAC FIAC		
01051	641002		LACQ		
01052	047157		DAC FIMQ		
01053	547205		SAD (070707		
01054	741000		SKP		
01055	740040		HLT	/BAD MQ, GOOD=070707	(752)
01056	207156		LAC FIAC		
01057	547206		SAD (252525)		
01060	741000		SKP		
01061	740040		HLT	/BAD AC, GOOD=252525	(756)
01062	104130		JMS HLOOPS		
			.EJECT		

01063	104157	JMS LOOP2
01064	740000	NOP
01065	207207	LAC (707070
01066	652000	LMQ
01067	207206	LAC (252525
01070	664300	DIVS -23
01071	000001	000001
01072	641002	LACQ
01073	047157	DAC FIMQ
01074	547207	SAD (707070)
01075	741000	SKP
01076	740040	HLT /BAD MQ, GOOD=707070 (773)
01077	207156	LAC FIAC
01100	547206	SAD (252525)
01101	741000	SKP
01102	740040	HLT /BAD AC, GOOD=252525 (777)
01103	104130	JMS HLOOPS
01104	104157	JMS LOOP2
01105	740000	NOP
01106	207207	LAC (707070
01107	652000	LMQ
01110	207210	LAC (525252
01111	664300	DIVS -23
01112	777776	777776
01113	047156	DAC FIAC
01114	641002	LACQ
01115	047157	DAC FIMQ
01116	547207	SAD (707070
01117	741000	SKP
01120	740040	HLT /BAD MQ, GOOD=707070 (1015)
01121	207156	LAC FIAC
01122	547210	SAD (525252)
01123	741000	SKP
01124	740040	HLT /BAD AC, GOOD=525252 (1021)
01125	104130	JMS HLOOPS
01126	104157	JMS LOOP2

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/INTEGER DIVIDE
/1 CLEAR MQ
/2 AC TO MQ
/3 CLEAR AC
.EJECT

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01127	740000	NIDIV	NOP	/NO SHIFT INTEGER DIVIDE
01130	207205		LAC (070707)	
01131	652000		LMQ	
01132	207206		LAC (252525	
01133	673300		IDIV -23	
01134	000001		000001	
01135	047156		DAC FIAC	
01136	641002		LACQ	
01137	047157		DAC FIMQ	
01140	547206		SAD (252525	
01141	741000		SKP	
01142	740040		HLT	/BAD MQ, GOOD=252525 (1037)
01143	207156		LAC FIAC	
01144	547211		SAD (000000)	
01145	741000		SKP	
01146	740040		HLT	/BAD AC, GOOD=000000 (1043)
01147	104130		JMS HLOOPS	
01150	104157		JMS LOOP2	
01151	740000		NOP	
01152	207205		LAC (070707	
01153	652000		LMQ	
01154	207206		LAC (252525	
01155	673300		IDIV -23	
01156	777776		777776	
01157	047156		DAC FIAC	
01160	641002		LACQ	
01161	047157		DAC FIMQ	
01162	547206		SAD (252525	
01163	741000		SKP	
01164	740040		HLT	/BAD MQ, GOOD=252525 (1061)
01165	207156		LAC FIAC	
01166	547211		SAD (000000)	
01167	741000		SKP	
01170	740040		HLT	/BAD AC, GOOD=000000 (1065)
01171	104130		JMS HLOOPS	
01172	104157		JMS LOOP2	
			.EJECT	

01173	740000	NOP	
01174	207207	LAC (707070	
01175	652000	LMQ	
01176	207206	LAC (252525)	
01177	673300	IDIV -23	
01200	000001	000001	
01201	047156	DAC FIAC	
01202	641002	LACQ	
01203	047157	DAC FIMQ	
01204	547206	SAD (252525	
01205	741000	SKP	
01206	740040	HLT /BAD MQ, GOOD=252525	(1103)
01207	207156	LAC FIAC	
01210	547211	SAD (000000)	
01211	741000	SKP	
01212	740040	HLT /BAD AC, GOOD=000000	(1107)
01213	104130	JMS HLOOPS	
01214	104157	JMS LOOP2	
01215	740000	NOP	
01216	207207	LAC (707070	
01217	652000	LMQ	
01220	207210	LAC (525252	
01221	673300	IDIV -23	
01222	777776	777776	
01223	047156	DAC FIAC	
01224	641002	LACQ	
01225	047157	DAC FIMQ	
01226	547210	SAD (525252	
01227	741000	SKP	
01230	740040	HLT /BAD MQ, GOOD=525252	(1125)
01231	207156	LAC FIAC	
01232	547211	SAD (000000)	
01233	741000	SKP	
01234	740040	HLT /BAD AC, GOOD=000000	(1131)
01235	104130	JMS HLOOPS	
01236	104157	JMS LOOP2	
		.EJECT	

01237	740000	NIDIVS	NOP	/NO SHIFTS INTEGFR DIVIDF SIGNFD	
01240	207205		LAC (070707)		
01241	652000		LMQ		
01242	207206		LAC (252525		
01243	677300		IDIVS -23		
01244	000001		000001		
01245	047156		DAC FIAC		
01246	641002		LACQ		
01247	047157		DAC FIMQ		
01250	547206		SAD (252525)		
01251	741000		SKP		
01252	740040		HLT	/BAD MQ, GOOD=252525	(1147)
01253	207156		LAC FIAC		
01254	547211		SAD (000000)		
01255	741000		SKP		
01256	740040		HLT	/BAD AC, GOOD=000000	(1153)
01257	104130		JMS HLOOPS		
01260	104157		JMS LOOP2		
01261	740000		NOP		
01262	207205		LAC (070707		
01263	652000		LMQ		
01264	207206		LAC (252525		
01265	677300		IDIVS -23		
01266	777776		777776		
01267	047156		DAC FIAC		
01270	641002		LACQ		
01271	047157		DAC FIMQ		
01272	547206		SAD (252525)		
01273	741000		SKP		
01274	740040		HLT	/BAD MQ, GOOD=252525	(1171)
01275	207156		LAC FIAC		
01276	547211		SAD (000000)		
01277	741000		SKP		
01300	740040		HLT	/BAD AC, GOOD=000000	(1175)
01301	104130		JMS HLOOPS		
01302	104157		JMS LOOP2		
			.EJECT		

01303	740000	NOP	
01304	207207	LAC (707070	
01305	652000	LMQ	
01306	207210	LAC (525252	
01307	677300	IDIVS -23	
01310	000001	000001	
01311	047156	DAC FIAC	
01312	641002	LACQ	
01313	047157	DAC FIMQ	
01314	547210	SAD (525252	
01315	741000	SKP	
01316	740040	HLT	/BAD MQ, GOOD=525252 (1213)
01317	207156	LAC FIAC	
01320	547212	SAD (777777	
01321	741000	SKP	
01322	740040	HLT	/BAD AC, GOOD=777777 (1217)
01323	104130	JMS HLOOPS	
01324	104157	JMS LOOP2	
01325	740000	NOP	
01326	207207	LAC (707070	
01327	652000	LMQ	
01330	207210	LAC (525252	
01331	677300	IDIVS -23	
01332	777776	777776	
01333	047156	DAC FIAC	
01334	641002	LACQ	
01335	047157	DAC FIMQ	
01336	547210	SAD (525252	
01337	741000	SKP	
01340	740040	HLT	/BAD MQ, GOOD=525252 (1235)
01341	207156	LAC FIAC	
01342	547212	SAD (777777)	
01343	741000	SKP	
01344	740040	HLT	/BAD AC, GOOD=777777 (1241)
01345	104130	JMS HLOOPS	
01346	104157	JMS LOOP2	
		/FRACTION DIVIDE	
		/1 CLEAR MQ	
		.EJECT	

01347	740000	NFRDIV	NOP	/NO SHIFT FRACTION DIVIDE	
01350	207205		LAC (070707)		
01351	652000		LMQ		
01352	207206		LAC (252525		
01353	670300		FRDIV -23		
01354	000001		000001		
01355	047156		DAC FIAC		
01356	641002		LACQ		
01357	047157		DAC FIMQ		
01360	547211		SAD (000000		
01361	741000		SKP		
01362	740040		HLT	/BAD MQ, GOOD=000000	(1257)
01363	207156		LAC FIAC		
01364	547206		SAD (252525)		
01365	741000		SKP		
01366	740040		HLT	/BAD AC, GOOD=252525	(1263)
01367	104130		JMS HLOOPS		
01370	104157		JMS LOOP2		
01371	740000		NOP		
01372	207205		LAC (070707		
01373	652000		LMQ		
01374	207206		LAC (252525		
01375	670300		FRDIV -23		
01376	777776		777776		
01377	047156		DAC FIAC		
01400	641002		LACQ		
01401	047157		DAC FIMQ		
01402	547211		SAD (000000)		
01403	741000		SKP		
01404	740040		HLT	/BAD MQ, GOOD=000000	(1301)
01405	207156		LAC FIAC		
01406	547206		SAD (252525)		
01407	741000		SKP		
01410	740040		HLT	/BAD AC, GOOD=252525	(1305)
01411	104130		JMS HLOOPS		
01412	104157		JMS LOOP2		
			.EJECT		

01413	740000	NOP	
01414	207207	LAC (707070)	
01415	652000	LMQ	
01416	207206	LAC (252525)	
01417	670300	FRDIV -23	
01420	000001	000001	
01421	047156	DAC FIAC	
01422	641002	LACQ	
01423	047157	DAC FIMQ	
01424	547211	SAD (000000)	
01425	741000	SKP	
01426	740040	HLT /BAD MQ, GOOD=000000	(1323)
01427	207156	LAC FIAC	
01430	547206	SAD (252525)	
01431	741000	SKP	
01432	740040	HLT /BAD AC, GOOD=252525	(1327)
01433	104130	JMS HLOOPS	
01434	104157	JMS LOOP2	
01435	740000	NOP	
01436	207207	LAC (707070)	
01437	652000	LMQ	
01440	207210	LAC (525252)	
01441	670300	FRDIV -23	
01442	777776	777776	
01443	047156	DAC FIAC	
01444	641002	LACQ	
01445	047157	DAC FIMQ	
01446	547211	SAD (000000)	
01447	741000	SKP	
01450	740040	HLT /BAD MQ, GOOD=000000	(1345)
01451	207156	LAC FIAC	
01452	547210	SAD (525252)	
01453	741000	SKP	
01454	740040	HLT /BAD AC, GOOD=525252	(1351)
01455	104130	JMS HLOOPS	
01456	104157	JMS LOOP2	
/PDP-15 EAE II - TAPE 2			
/			
01457	740000	NFRDVS NOP	/NO SHIFTS FRACTION DIVIDE SIGNED
01460	207205	LAC (070707)	
01461	652000	LMQ	
01462	207206	LAC (252525)	
01463	674300	FRDIVS -23	
01464	000001	000001	
01465	047156	DAC FIAC	
01466	641002	LACQ	
01467	047157	DAC FIMQ	
01470	547211	SAD (000000)	
01471	741000	SKP	
01472	740040	HLT /BAD MQ, GOOD=000000	(1367)
01473	207156	LAC FIAC	
01474	547206	SAD (252525)	
01475	741000	SKP	
01476	740040	HLT /BAD AC, GOOD=252525	(1373)
01477	104130	JMS HLOOPS	

01500	104157	JMS LOOP2	
01501	740000	NOP	
01502	207205	LAC (070707	
01503	652000	LMQ	
01504	207206	LAC (252525	
01505	674300	FRDIVS -23	
01506	777776	777776	
01507	047156	DAC FIAC	
01510	641002	LACQ	
01511	047157	DAC FIMQ	
01512	547211	SAD (000000)	
01513	741000	SKP	
01514	740040	HLT /BAD MQ, GOOD=000000	(1411)
01515	207156	LAC FIAC	
01516	547206	SAD (252525)	
01517	741000	SKP	
01520	740040	HLT /BAD AC,; +99 :252525	(1415)
01521	104130	JMS HLOOPS	
01522	104157	JMS LOOP2	
		.EJECT	

01523	740000	NOP	
01524	207207	LAC (707070	
01525	652000	LMQ	
01526	207206	LAC (252525	
01527	674300	FRDIVS -23	
01530	000001	000001	
01531	047156	DAC FIAC	
01532	641002	LACQ	
01533	047157	DAC FIMQ	
01534	547211	SAD (000000)	
01535	741000	SKP	
01536	740040	HLT /BAD MQ, GOOD=000000	(1433)
01537	207156	LAC FIAC	
01540	547206	SAD (252525)	
01541	741000	SKP	
01542	740040	HLT /BAD AC, GOOD=252525	(1437)
01543	104130	JMS HLOOPS	
01544	104157	JMS LOOP2	
01545	740000	NOP	
01546	207207	LAC (707070	
01547	652000	LMQ	
01550	207210	LAC (525252	
01551	674300	FRDIVS -23	
01552	777776	777776	
01553	047156	DAC FIAC	
01554	641002	LACQ	
01555	047157	DAC FIMQ	
01556	547212	SAD (777777)	
01557	741000	SKP	
01560	740040	HLT /BAD MQ, GOOD=777777	(1455)
01561	207156	LAC FIAC	
01562	547210	SAD (525252)	
01563	741000	SKP	
01564	740040	HLT /BAD AC, GOOD=525252	(1461)
01565	104130	JMS HLOOPS	
01566	104134	JMS HLOOPM	
01567	104162	JMS LOOP4	
01570	104157	JMS LOOP2	
		.EJECT	

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/SHIFT COUNTER TEST
SHCT1  CLL /MULTIPLY WITH SHIFT OF ONE
        LAC (777777
        MUL -21
        000001
        DAC FIAC#
        SAD (000000
        SKP
        HLT /BAD AC, GOOD=000000 (1475)
        LACQ
        DAC FIMQ#
        SAD (777777
        SKP
        HLT /BAD MQ, GOOD=777777 (1502)
        LACS
        SZA
        HLT /BAD SC, GOOD=000000 (1505)
SHCT2  JMS HLOOPS
        JMS LOOP2 /MULTIPLY WITH SHIFT OF TWO
        LAC (777777
        MUL -20
        000002
        DAC FIAC
        SAD (000001
        SKP
        HLT /BAD AC, GOOD=000001 (1516)
        LACQ
        DAC FIMQ
        SAD (577777
        SKP
        HLT /BAD MQ, GOOD=577777 (1523)
        LACS
        SZA
        HLT /BAD SC, GOOD=000000 (1526)
SHCT3  JMS HLOOPS
        JMS LOOP2 /MULTIPLY WITH SHIFT OF THREE
        LAC (777777
        MUL -17
        000004
        DAC FIAC
        SAD (000003
        SKP
        HLT /BAD AC, GOOD=000003 (1537)
        LACQ
        DAC FIMQ
        SAD (477777
        SKP
        HLT /BAD MQ, GOOD=477717 (1544)
        LACS
        SZA
        HLT /BAD SC, GOOD=000000 (1547)
        JMS HLOOPS
        .EJECT

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01654	104157	SHCT4	JMS LOOP2	/SHIFT OF FOUR	
01655	207212		LAC (777777		
01656	673104		MUL -16		
01657	000010		000010		
01660	047156		DAC FIAC		
01661	547217		SAD (000007		
01662	741000		SKP		
01663	740040		HLT	/BAD AC, GOOD=000007	(1560)
01664	641002		LACQ		
01665	047157		DAC FIMQ		
01666	547220		SAD (437777		
01667	741000		SKP		
01670	740040		HLT	/BAD MQ, GOOD=437777	(1565)
01671	641001		LACS		
01672	740200		SZA		
01673	740040		HLT	/BAD SC, GOOD=000000	(1574)
01674	104130		JMS HLOOPS		
01675	104157	SHCT5	JMS LOOP2	/SHIFT OF FIVE	
01676	207212		LAC (777777		
01677	673105		MUL -15		
01700	000020		000020		
01701	047156		DAC FIAC		
01702	547221		SAD (000017		
01703	741000		SKP		
01704	740040		HLT	/BAD AC, GOOD=000017	(1601)
01705	641002		LACQ		
01706	047157		DAC FIMQ		
01707	547222		SAD (417777		
01710	741000		SKP		
01711	740040		HLT	/BAD MQ, GOOD=417777	(1606)
01712	641001		LACS		
01713	740200		SZA		
01714	740040		HLT	/BAD SC, GOOD=000000	(1611)
01715	104130		JMS HLOOPS		
01716	104157	SHCT6	JMS LOOP2	/SHIFT OF SIX	
01717	207212		LAC (777777		
01720	673106		MUL -14		
01721	000040		000040		
01722	047156		DAC FIAC		
01723	547223		SAD (000037		
01724	741000		SKP		
01725	740040		HLT	/BAD AC, GOOD=000037	(1622)
01726	641002		LACQ		
01727	047157		DAC FIMQ		
01730	547224		SAD (407777		
01731	741000		SKP		
01732	740040		HLT	/BAD MQ, GOOD=407777	(1627)
01733	641001		LACS		
01734	740200		SZA		
01735	740040		HLT	/BAD SC, GOOD=000000	(1632)
01736	104130		JMS HLOOPS		
			.EJECT		

01737	104157	SHCT7	JMS LOOP2	/SHIFT OF SEVEN	
01740	207212		LAC (777777		
01741	673107		MUL -13		
01742	000100		000100		
01743	047156		DAC FIAC		
01744	547225		SAD (000077		
01745	741000		SKP		
01746	740040		HLT	/BAD AC, GOOD=000077	(1643)
01747	641002		LACQ		
01750	047157		DAC FIMQ		
01751	547226		SAD (403777		
01752	741000		SKP		
01753	740040		HLT	/BAD MQ, GOOD=403777	(1650)
01754	641001		LACS		
01755	740200		SZA		
01756	740040		HLT	/BAD SC, GOOD=000000	(1653)
01757	104130		JMS HLOOPS		
01760	104157	SHCT10	JMS LOOP2	/SHIFT OF TEN	
01761	207212		LAC (777777		
01762	673110		MUL -12		
01763	000200		000200		
01764	047156		DAC FIAC		
01765	547227		SAD (000177		
01766	741000		SKP		
01767	740040		HLT	/BAD AC, GOOD=000177	(1664)
01770	641002		LACQ		
01771	047157		DAC FIMQ		
01772	547230		SAD (401777		
01773	741000		SKP		
01774	740040		HLT	/BAD MQ, GOOD=401777	(1671)
01775	641001		LACS		
01776	740200		SZA		
01777	740040		HLT	/BAD SC, GOOD=000000	(1674)
02000	104130		JMS HLOOPS		
02001	104157	SHCT11	JMS LOOP2	/SHIFT OF ELEVEN	
02002	207212		LAC (777777		
02003	673111		MUL -11		
02004	000400		000400		
02005	047156		DAC FIAC		
02006	547231		SAD (000377		
02007	741000		SKP		
02010	740040		HLT	/BAD AC, GOOD=000377	(1705)
02011	641002		LACQ		
02012	047157		DAC FIMQ		
02013	547232		SAD (400777		
02014	741000		SKP		
02015	740040		HLT	/BAD MQ, GOOD=400777	(1712)
02016	641001		LACS		
02017	740200		SZA		
02020	740040		HLT	/BAD SC, GOOD=000000	(1715)
02021	104130		JMS HLOOPS		
			.EJECT		

02022	104157	SHCT12	JMS LOOP2	/SHIFT OF TWELVE	
02023	207212		LAC (777777		
02024	673112		MUL -10		
02025	001000		001000		
02026	047156		DAC FIAC		
02027	547233		SAD (000777		
02030	741000		SKP		
02031	740040		HLT	/BAD AC, GOOD=000777	(1726)
02032	641002		LACQ		
02033	047157		DAC FIMQ		
02034	547234		SAD (400377		
02035	741000		SKP		
02036	740040		HLT	/BAD MQ, GOOD=400377	(1733)
02037	641001		LACS		
02040	740200		SZA		
02041	740040		HLT	/BAD SC, GOOD=000000	(1736)
02042	104130		JMS HLOOPS		
02043	104157	SHCT13	JMS LOOP2	/SHIFT OF THIRTEEN	
02044	207212		LAC (777777		
02045	673113		MUL -7		
02046	002000		002000		
02047	047156		DAC FIAC		
02050	547235		SAD (001777		
02051	741000		SKP		
02052	740040		HLT	/BAD AC, GOOD=001777	(1747)
02053	641002		LACQ		
02054	047157		DAC FIMQ		
02055	547236		SAD (400177		
02056	741000		SKP		
02057	740040		HLT	/BAD MQ, GOOD=400177	(1754)
02060	641001		LACS		
02061	740200		SZA		
02062	740040		HLT	/BAD SC, GOOD=000000	(1757)
02063	104130		JMS HLOOPS		
02064	104157	SHCT14	JMS LOOP2	/SHIFT OF FOURTEEN	
02065	207212		LAC (777777		
02066	673114		MUL -6		
02067	004000		004000		
02070	047156		DAC FIAC		
02071	547237		SAD (003777		
02072	741000		SKP		
02073	740040		HLT	/BAD AC, GOOD=003777	(1770)
02074	641002		LACQ		
02075	047157		DAC FIMQ		
02076	547240		SAD (400077		
02077	741000		SKP		
02100	740040		HLT	/BAD MQ, GOOD=400077	(1775)
02101	641001		LACS		
02102	740200		SZA		
02103	740040		HLT	/BAD SC, GOOD=000000	(2000)
02104	104130		JMS HLOOPS		
			.EJECT		

02105	104157	SHCT15	JMS LOOP2	/SHIFT OF FIFTEEN	
02106	207212		LAC (777777		
02107	673115		MUL -5		
02110	010000		010000		
02111	047156		DAC FIAC		
02112	547241		SAD (007777		
02113	741000		SKP		
02114	740040		HLT	/BAD AC, GOOD=007777	(2011)
02115	641002		LACQ		
02116	047157		DAC FIMQ		
02117	547242		SAD (400037		
02120	741000		SKP		
02121	740040		HLT	/BAD MQ, GOOD=400037	(2016)
02122	641001		LACS		
02123	740200		SZA		
02124	740040		HLT	/BAD SC, GOOD=000000	(2021)
02125	104130		JMS HLOOPS		
02126	104157	SHCT16	JMS LOOP2	/SHIFT OF SIXTEEN	
02127	207212		LAC (777777		
02130	673116		MUL -4		
02131	020000		020000		
02132	047156		DAC FIAC		
02133	547243		SAD (017777		
02134	741000		SKP		
02135	740040		HLT	/BAD AC, GOOD=017777	(2032)
02136	641002		LACQ		
02137	047157		DAC FIMQ		
02140	547244		SAD (400017		
02141	741000		SKP		
02142	740040		HLT	/BAD MQ, GOOD=400017	(2037)
02143	641001		LACS		
02144	740200		SZA		
02145	740040		HLT	/BAD SC, GOOD=000000	(2042)
02146	104130		JMS HLOOPS		
02147	104157	SHCT17	JMS LOOP2	/SHIFT OF SEVENTEEN	
02150	207212		LAC (777777		
02151	673117		MUL -3		
02152	040000		040000		
02153	047156		DAC FIAC		
02154	547245		SAD (037777		
02155	741000		SKP		
02156	740040		HLT	/BAD AC, GOOD=037777	(2053)
02157	641002		LACQ		
02160	047157		DAC FIMQ		
02161	547246		SAD (400007		
02162	741000		SKP		
02163	740040		HLT	/BAD MQ, GOOD=400007	(2060)
02164	641001		LACS		
02165	740200		SZA		
02166	740040		HLT	/BAD SC, GOOD=000000	(2063)
02167	104130		JMS HLOOPS		
			.EJECT		

02170	104157	SHCT20	JMS LOOP2	/SHIFT OF TWENTY	
02171	207212		LAC (777777		
02172	673120		MUL -2		
02173	100000		100000		
02174	047156		DAC FIAC		
02175	547247		SAD (077777		
02176	741000		SKP		
02177	740040		HLT	/BAD AC, GOOD=077777	(2074)
02200	641002		LACQ		
02201	047157		DAC FIMQ		
02202	547250		SAD (400003		
02203	741000		SKP		
02204	740040		HLT	/BAD MQ, GOOD=400003	(2101)
02205	641001		LACS		
02206	740200		SZA		
02207	740040		HLT	/BAD SC, GOOD=000000	(2104)
02210	104130		JMS HLOOPS		
02211	104157	SHCT21	JMS LOOP2	/SHIFT OF TWENTYONE	
02212	207212		LAC (777777		
02213	673121		MUL -1		
02214	200000		200000		
02215	047156		DAC FIAC		
02216	547251		SAD (177777		
02217	741000		SKP		
02220	740040		HLT	/BAD AC, GOOD=177777	(2115)
02221	641002		LACQ		
02222	047157		DAC FIMQ		
02223	547252		SAD (400001		
02224	741000		SKP		
02225	740040		HLT	/BAD MQ, GOOD=400001	(2122)
02226	641001		LACS		
02227	740200		SZA		
02230	740040		HLT	/BAD SC, GOOD=000000	(2125)
02231	104130		JMS HLOOPS		
02232	104157	SHCT22	JMS LOOP2	/SHIFT OF TWENTYTWO	
02233	207212		LAC (777777)		
02234	653122		MUL		
02235	400000		400000		
02236	047156		DAC FIAC		
02237	547253		SAD (377777		
02240	741000		SKP		
02241	740040		HLT	/BAD AC, GOOD=377777	(2136)
02242	641002		LACQ		
02243	047157		DAC FIMQ		
02244	547254		SAD (400000		
02245	741000		SKP		
02246	740040		HLT	/BAD MQ, GOOD=400000	(2143)
02247	641001		LACS		
02250	740200		SZA		
02251	740040		HLT	/BAD SC, GOOD=000000	(2146)
02252	104130		JMS HLOOPS		
02253	104134		JMS HLOOPM		
02254	104162		JMS LOOP4		
			.EJECT		

02255	104157	/DIVIDE SHIFT TEST	
02256	207255	DSC1	JMS LOOP2
02257	652000		LAC (52523
02260	207256		LMQ
02261	640301		LAC (052524
02262	377777		DIV-22
02263	047156		377777
02264	547256		DAC FIAC#
02265	741000		SAD (052524
02266	740040		SKP
02267	641002		HLT
02270	047157		LACQ
02271	547257		DAC FIMQ#
02272	741000		SAD (125246
02273	740040		SKP
02274	104130		HLT
			JMS HLOOPS
		/	
02275	104157	DSC2	JMS LOOP2
02276	207255		LAC (52523
02277	652000		LMQ
02300	207256		LAC (052524
02301	640302		DIV-21
02302	377777		377777
02303	047156		DAC FIAC
02304	547260		SAD (125250
02305	741000		SKP
02306	740040		HLT
02307	641002		LACQ
02310	047157		DAC FIMQ
02311	547261		SAD (252514
02312	741000		SKP
02313	740040		HLT
02314	104130		JMS HLOOPS
			.EJECT

/SHIFT OF ONE

/BAD AC; GOOD = 052524

/BAD MQ; GOOD = 125246

/SHIFT OF TWO

/BAD AC; GOOD = 125250

/BAD MQ; GOOD = 252514

02315	104157	DSC3	JMS LOOP2	/SHIFT OF THREE
02316	207255		LAC (52523	
02317	652000		LMQ	
02320	207256		LAC (052524	
02321	640303		DIV-20	
02322	377777		377777	
02323	047156		DAC FIAC	
02324	547262		SAD (252520	
02325	741000		SKP	
02326	740040		HLT	/BAD AC; GOOD = 252520
02327	641002		LACQ	
02330	047157		DAC FIMQ	
02331	547263		SAD (525230	
02332	741000		SKP	
02333	740040		HLT	/BAD MQ; GOOD = 525230
02334	104130		JMS HLOOPS	
/				
02335	104157	DSC4	JMS LOOP2	/SHIFT OF FOUR
02336	207255		LAC (52523	
02337	652000		LMQ	
02340	207256		LAC (052524	
02341	640304		DIV-17	
02342	377777		377777	
02343	047156		DAC FIAC	
02344	547264		SAD (125241	
02345	741000		SKP	
02346	740040		HLT	/BAD AC; GOOD = 125241
02347	641002		LACQ	
02350	047157		DAC FIMQ	
02351	547265		SAD (252461	
02352	741000		SKP	
02353	740040		HLT	/BAD MQ; GOOD = 252461
02354	104130		JMS HLOOPS	
/				
02355	104157	DSC5	JMS LOOP2	/SHIFT OF FIVE
02356	207255		LAC (52523	
02357	652000		LMQ	
02360	207256		LAC (052524	
02361	640305		DIV-16	
02362	377777		377777 *	
02363	047156		DAC FIAC	
02364	547266		SAD (252503	
02365	741000		SKP	
02366	740040		HLT	/BAD AC; GOOD = 252503
02367	641002		LACQ	
02370	047157		DAC FIMQ	
02371	547267		SAD (525142	
02372	741000		SKP	
02373	740040		HLT	/BAD MQ; GOOD = 525142
02374	104130		JMS HLOOPS	
			.EJECT	

02375	104157	DSC6	JMS LOOP2	/SHIFT OF SIX
02376	207255		LAC (52523	
02377	652000		LMQ	
02400	207256		LAC (052524	
02401	640306		DIV-15	
02402	377777		377777	
02403	047156		DAC FIAC	
02404	547270		SAD (125207	
02405	741000		SKP	
02406	740040		HLT	/BAD AC; GOOD = 125207
02407	641002		LACQ	
02410	047157		DAC FIMQ	
02411	547271		SAD (252305	
02412	741000		SKP	
02413	740040		HLT	/BAD MQ; GOOD = 252305
02414	104130		JMS HLOOPS	
/				
02415	104157	DSC7	JMS LOOP2	/SHIFT OF SEVEN
02416	207255		LAC (52523	
02417	652000		LMQ	
02420	207256		LAC (052524	
02421	640307		DIV-14	
02422	377777		377777	
02423	047156		DAC FIAC	
02424	547272		SAD (252417	
02425	741000		SKP	
02426	740040		HLT	/BAD AC; GOOD = 252417
02427	641002		LACQ	
02430	047157		DAC FIMQ	
02431	547273		SAD (524612	
02432	741000		SKP	
02433	740040		HLT	/BAD MQ; GOOD = 524612
02434	104130		JMS HLOOPS	
/				
02435	104157	DSC10	JMS LOOP2	/SHIFT OF TEN
02436	207255		LAC (52523	
02437	652000		LMQ	
02440	207256		LAC (052524	
02441	640310		DIV-13	
02442	377777		377777	
02443	047156		DAC FIAC	
02444	547274		SAD (125037	
02445	741000		SKP	
02446	740040		HLT	/BAD AC; GOOD = 125037
02447	641002		LACQ	
02450	047157		DAC FIMQ	
02451	547275		SAD (251425	
02452	741000		SKP	
02453	740040		HLT	/BAD MQ; GOOD = 251425
02454	104130		JMS HLOOPS	
			.EJECT	

02455	104157	DSC11	JMS LOOP2	/SHIFT OF ELEVEN
02456	207255		LAC (52523	
02457	652000		LMQ	
02460	207256		LAC (052524	
02461	640311		DIV-12	
02462	377777		377777	
02463	047156		DAC FIAC	
02464	547276		SAD (252077	
02465	741000		SKP	
02466	740040		HLT	/BAD AC; GOOD = 252077
02467	641002		LACQ	
02470	047157		DAC FIMQ	
02471	547277		SAD (523052	
02472	741000		SKP	
02473	740040		HLT	/BAD MQ; GOOD = 523052
02474	104130		JMS HLOOPS	
/				
02475	104157	DSC12	JMS LOOP2	/SHIFT OF TWELVE
02476	207255		LAC (52523	
02477	652000		LMQ	
02500	207256		LAC (052524	
02501	640312		DIV-11	
02502	377777		377777	
02503	047156		DAC FIAC	
02504	547300		SAD (124177	
02505	741000		SKP	
02506	740040		HLT	/BAD AC; GOOD = 124177
02507	641002		LACQ	
02510	047157		DAC FIMQ	
02511	547301		SAD (246125	
02512	741000		SKP	
02513	740040		HLT	/BAD MQ; GOOD = 246125
02514	104130		JMS HLOOPS	
/				
02515	104157	DSC13	JMS LOOP2	/SHIFT OF THIRTEEN
02516	207255		LAC (52523	
02517	652000		LMQ	
02520	207256		LAC (052524	
02521	640313		DIV-10	
02522	377777		377777	
02523	047156		DAC FIAC	
02524	547302		SAD (250377	
02525	741000		SKP	
02526	740040		HLT	/BAD AC; GOOD = 250377
02527	641002		LACQ	
02530	047157		DAC FIMQ	
02531	547303		SAD (514252	
02532	741000		SKP	
02533	740040		HLT	/BAD MQ; GOOD = 514252
02534	104130		JMS HLOOPS	
			.EJECT	

02535	104157	DSC14	JMS LOOP2	/SHIFT OF FOURTEEN
02536	207255		LAC (52523	
02537	652000		LMQ	
02540	207256		LAC (052524	
02541	640314		DIV-7	
02542	377777		377777	
02543	047156		DAC FIAC	
02544	547304		SAD (120777	
02545	741000		SKP	
02546	740040		HLT	/BAD AC; GOOD = 120777
02547	641002		LACQ	
02550	047157		DAC FIMQ	
02551	547305		SAD (230525	
02552	741000		SKP	
02553	740040		HLT	/BAD MQ; GOOD = 230525
02554	104130		JMS HLOOPS	
/				
02555	104157	DSC15	JMS LOOP2	/SHIFT OF FIFTEEN
02556	207255		LAC (52523	
02557	652000		LMQ	
02560	207256		LAC (052524	
02561	640315		DIV-6	
02562	377777		377777	
02563	047156		DAC FIAC	
02564	547306		SAD (241777	
02565	741000		SKP	
02566	740040		HLT	/BAD AC; GOOD = 241777
02567	641002		LACQ	
02570	047157		DAC FIMQ	
02571	547307		SAD (461252	
02572	741000		SKP	
02573	740040		HLT	/BAD MQ; GOOD = 461252
02574	104130		JMS HLOOPS	
/				
02575	104157	DSC16	JMS LOOP2	/SHIFT OF SIXTEEN
02576	207255		LAC (52523	
02577	652000		LMQ	
02600	207256		LAC (052524	
02601	640316		DIV-5	
02602	377777		377777	
02603	047156		DAC FIAC	
02604	547310		SAD (103777	
02605	741000		SKP	
02606	740040		HLT	/BAD AC; GOOD = 103777
02607	641002		LACQ	
02610	047157		DAC FIMQ	
02611	547311		SAD (142525	
02612	741000		SKP	
02613	740040		HLT	/BAD MQ; GOOD = 142525
02614	104130		JMS HLOOPS	
			.EJECT	

02615	104157	DSC17	JMS LOOP2	/SHIFT OF SEVENTEEN
02616	207255		LAC (52523	
02617	652000		LMQ	
02620	207256		LAC (052524	
02621	640317		DIV-4	
02622	377777		377777	
02623	047156		DAC FIAC	
02624	547312		SAD (207777	
02625	741000		SKP	
02626	740040		HLT	/BAD AC; GOOD = 207777
02627	641002		LACQ	
02630	047157		DAC FIMQ	
02631	547313		SAD (305252	
02632	741000		SKP	
02633	740040		HLT	/BAD MQ; GOOD = 305252
02634	104130		JMS HLOOPS	
/				
02635	104157	DSC20	JMS LOOP2	/SHIFT OF TWENTY
02636	207255		LAC (52523	
02637	652000		LMQ	
02640	207256		LAC (052524	
02641	640320		DIV-3	
02642	377777		377777	
02643	047156		DAC FIAC	
02644	547243		SAD (017777	
02645	741000		SKP	
02646	740040		HLT	/BAD AC; GOOD = 017777
02647	641002		LACQ	
02650	047157		DAC FIMQ	
02651	547314		SAD (612525	
02652	741000		SKP	
02653	740040		HLT	/BAD MQ; GOOD = 612525
02654	104130		JMS HLOOPS	
/				
02655	104157	DSC21	JMS LOOP2	/SHIFT OF TWENTYONE
02656	207255		LAC (52523	
02657	652000		LMQ	
02660	207256		LAC (052524	
02661	640321		DIV-2	
02662	377777		377777	
02663	047156		DAC FIAC	
02664	547315		SAD (037776	
02665	741000		SKP	
02666	740040		HLT	/BAD AC; GOOD = 037776
02667	641002		LACQ	
02670	047157		DAC FIMQ	
02671	547316		SAD (425252	
02672	741000		SKP	
02673	740040		HLT	/BAD MQ; GOOD = 425252
02674	104130		JMS HLOOPS	
02675	104134		JMS HLOOPI	
02676	104162		JMS LOOP4	

/EAE PART II TAPE 2A
/EAE SIGN TEST

/

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/MULS SIGN TEST
/EAE AC SIGN FF TEST
/
02677 104157          STMUL   JMS LOOP2           /(HLT ADDRESS)
02700 207317          LAC (000002
02701 664000          GSM           /GSM=0 AC=0
02702 653122          MUL
02703 777776          777776
02704 741100          SPA
02705 740040          HLT           /SHOULD BE POSITIVE (2160)
02706 207320          LAC (777775
02707 664000          GSM           /GSM=1 AC=1
02710 207320          LAC (777775
02711 653122          MUL
02712 777776          777776
02713 740100          SMA
02714 740040          HLT           /SHOULD BE NEGATIVE (2167)
02715 104130          JMS HLOOPS
02716 104157          STMULS  JMS LOOP2
02717 207213          LAC (000001
02720 664000          GSM           /GSM=0 AC=0
02721 657122          MULS
02722 000002          000002
02723 741100          SPA
02724 740040          HLT           /SHOULD BE POSITIVE (2177)
02725 207321          LAC (777776
02726 664000          GSM           /GSM=1 AC=0
02727 207317          LAC (000002
02730 657122          MULS
02731 777776          777776
02732 741100          SPA
02733 741000          SKP
02734 740040          HLT           /SHOULD BE NEGATIVE (2207)
02735 207320          LAC (777775
02736 664000          GSM           /GSM=1 AC=1
02737 207320          LAC (777775
02740 657122          MULS
02741 777776          777776
02742 741100          SPA
02743 740040          HLT           /SHOULD BE POSITIVE (2216)
02744 207213          LAC (000001
02745 664000          GSM           /GSM=0 AC=1
02746 207320          LAC (777775
02747 657122          MULS
02750 000002          000002
02751 741100          SPA
02752 741000          SKP
02753 740040          HLT           /SHOULD BE NEGATIVE (2226)
.EJECT

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02754 104130
02755 104157
02756 207322
02757 652000
02760 202764
02761 664000
02762 207211
02763 644323
02764 000004
02765 741400
02766 740040
02767 047156
02770 547213
02771 741000
02772 740040
02773 641002
02774 047157
02775 547213
02776 741000
02777 740040
03000 104130

/DIVIDE SIGN TEST DIVS
JMS HLOOPS
STDIVS JMS LOOP2
LAC (000005
LMQ
LAC .+4
GSM
LAC (000000
DIVS
000004
SZL
HLT /BAD LINK, GOOD LINK=0 (2241)
DAC FIAC#
SAD (000001
SKP
HLT /BAD AC, GOOD=000001 (2245)
LACQ
DAC FIMQ#
SAD (000001
SKP
HLT /BAD MQ, GOOD=000001 (2252)
JMS HLOOPS
.EJECT
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03001	104157	SIGNA	JMS LOOP2		
03002	207322		LAC (000005		
03003	652000		LMQ		
03004	207323		LAC (777773		
03005	664000		GSM		
03006	207211		LAC (0)		
03007	644323		DIVS		
03010	000004		000004		
03011	741400		SZL		
03012	740040		HLT	/BAD LINK, GOOD LINK=0	(2265)
03013	047156		DAC FIAC		
03014	547213		SAD (000001		
03015	741000		SKP		
03016	740040		HLT	/BAD AC, GOOD=000001	(2271)
03017	641002		LACQ		
03020	047157		DAC FIMQ		
03021	547321		SAD (777776		
03022	741000		SKP		
03023	740040		HLT	/BAD MQ, GOOD=777776	(2276)
03024	104130		JMS HLOOPS		
03025	104157	SIGNB	JMS LOOP2		
03026	207324		LAC (777772		
03027	652000		LMQ		
03030	203034		LAC .+4		
03031	664000		GSM		
03032	207212		LAC (777777		
03033	644323		DIVS		
03034	000004		000004		
03035	741400		SZL		
03036	740040		HLT	/BAD LINK, GOOD LINK=0	(2311)
03037	047156		DAC FIAC#		
03040	547321		SAD (777776		
03041	741000		SKP		
03042	740040		HLT	/BAD AC, GOOD=777776	(2315)
03043	641002		LACQ		
03044	047157		DAC FIMQ#		
03045	547321		SAD (777776		
03046	741000		SKP		
03047	740040		HLT	/BAD MQ, GOOD=777776	(2322)
03050	104130		JMS HLOOPS		
			.EJECT		

03051	104157	SIGNC	JMS LOOP2	
03052	207324		LAC (777772)	
03053	652000		LMQ	
03054	207323		LAC (777773)	
03055	664000		GSM	
03056	207212		LAC (777777)	
03057	644323		DIVS	
03060	000004		000004	
03061	741400		SZL	
03062	740040		HLT	/BAD LINK, GOOD LINK=0 (2335)
03063	047156		DAC FIAC	
03064	547321		SAD (777776)	
03065	741000		SKP	
03066	740040		HLT	/BAD AC, GOOD=777776 (2341)
03067	641002		LACQ	
03070	047157		DAC FIMQ	
03071	547213		SAD (000001)	
03072	741000		SKP	
03073	740040		HLT	/BAD MQ, GOOD=000001 (2346)
03074	104130		JMS HLOOPS	
			.EJECT	

		/DIVIDE SIGN TEST IDIVS	
03075	104157	STIDVS	JMS LOOP2
03076	207212		LAC (777777)
03077	652000		LMQ
03100	203104		LAC .+4
03101	664000		GSM
03102	207322		LAC (000005)
03103	657323		IDIVS
03104	000004		000004
03105	741400		SZL
03106	740040		HLT /BAD LINK (2361)
03107	047156		DAC FIAC#
03110	547213		SAD (000001)
03111	741000		SKP
03112	740040		HLT /BAD AC, GOOD=000001 (2365)
03113	641002		LACQ
03114	047157		DAC FIMQ#
03115	547213		SAD (000001)
03116	741000		SKP
03117	740040		HLT /BAD MQ, GOOD=000001 (2372)
03120	104130		JMS HLOOPS
03121	104157	SIGND	JMS LOOP2
03122	207211		LAC (000000)
03123	652000		LMQ
03124	207321		LAC (777776)
03125	664000		GSM
03126	207322		LAC (000005)
03127	657323		IDIVS
03130	000004		000004
03131	741400		SZL
03132	740040		HLT /BAD LINK, (2405)
03133	047156		DAC FIAC
03134	547213		SAD (000001)
03135	741000		SKP
03136	740040		HLT /BAD AC, GOOD=000001 (2411)
03137	641002		LACQ
03140	047157		DAC FIMQ
03141	547321		SAD (777776)
03142	741000		SKP
03143	740040		HLT /BAD MQ, GOOD=777776 (2416)
03144	104130		JMS HLOOPS
			.EJECT

03145	104157	SIGNE	JMS LOOP2	
03146	207212		LAC (777777)	
03147	652000		LMQ	
03150	203154		LAC .+4	
03151	664000		GSM	
03152	207324		LAC (777772)	
03153	657323		IDIVS	
03154	000004		000004	
03155	741400		SZL	
03156	740040		HLT /BAD LINK	(2431)
03157	047156		DAC FIAC#	
03160	547321		SAD (777776)	
03161	741000		SKP	
03162	740040		HLT /BAD AC, GOOD=777776	(2435)
03163	641002		LACQ	
03164	047157		DAC FIMQ#	
03165	547321		SAD (777776)	
03166	741000		SKP	
03167	740040		HLT /BAD MQ, GOOD=777776	(2442)
03170	104130		JMS HLOOPS	
03171	104157	SIGNF	JMS LOOP2	
03172	207212		LAC (777777)	
03173	652000		LMQ	
03174	207323		LAC (777773)	
03175	664000		GSM	
03176	207324		LAC (777772)	
03177	657323		IDIVS	
03200	000004		000004	
03201	741400		SZL	
03202	740040		HLT /BAD LINK,	(2455)
03203	047156		DAC FIAC	
03204	547321		SAD (777776)	
03205	741000		SKP	
03206	740040		HLT /BAD AC, GOOD=777776	(2461)
03207	641002		LACQ	
03210	047157		DAC FIMQ	
03211	547213		SAD (000001)	
03212	741000		SKP	
03213	740040		HLT /BAD MQ, GOOD=000001	(2466)
03214	104130		JMS HLOOPS	
			.EJECT	

		/DIVIDE SIGN TEST FDIVS	
03215	104157	STFDVS	JMS LOOP2
03216	207211		LAC (000000)
03217	652000		LMQ
03220	203224		LAC .+4
03221	664000		GSM
03222	207322		LAC (000005)
03223	654323		FRDIVS
03224	000004		000004
03225	740400		SNL
03226	740040		HLT /BAD LINK (2501)
03227	047156		DAC FIAC#
03230	547325		SAD (777774)
03231	741000		SKP
03232	740040		HLT /BAD AC, GOOD=777774 (2505)
03233	641002		LACQ
03234	047157		DAC FIMQ#
03235	547215		SAD (000003)
03236	741000		SKP
03237	740040		HLT /BAD MQ, GOOD=000003 (2512)
03240	104130		JMS HLOOPS
03241	104157	SIGNG	JMS LOOP2
03242	207210		LAC (525252)
03243	652000		LMQ
03244	207321		LAC (777776)
03245	664000		GSM
03246	207322		LAC (000005)
03247	654323		FRDIVS
03250	000001		000001
03251	740400		SNL
03252	740040		HLT /BAD LINK (2525)
03253	047156		DAC FIAC
03254	547326		SAD (000016)
03255	741000		SKP
03256	740040		HLT /BAC AC, GOOD = 000016 (2531)
03257	641002		LACQ
03260	047157		DAC FIMQ
03261	547320		SAD (777775)
03262	741000		SKP
03263	740040		HLT /BAD MQ, GOOD = 777775 (2536)
03264	104130		JMS HLOOPS
			.EJECT

03265	104157	SIGNH	JMS LOOP2		
03266	207206		LAC (252525		
03267	652000		LMQ		
03270	203274		LAC .+4		
03271	664000		GSM		
03272	207324		LAC (777772		
03273	654323		FRDIVS		
03274	000004		000004		
03275	740400		SNL		
03276	740040		HLT	/BAD LINK	(2551)
03277	047156		DAC FIAC#		
03300	547215		SAD (000003		
03301	741000		SKP		
03302	740040		HLT	/BAD AC, GOOD = 000003	(2555)
03303	641002		LACQ		
03304	047157		DAC FIMQ#		
03305	547325		SAD (777774		
03306	741000		SKP		
03307	740040		HLT	/BAD MQ, GOOD=777774	(2526)
03310	104130		JMS HLOOPS		
03311	104157	SIGNI	JMS LOOP2		
03312	207211		LAC (000000		
03313	652000		LMQ		
03314	207323		LAC (777773		
03315	664000		GSM		
03316	207324		LAC (777772		
03317	654323		FRDIVS		
03320	000004		000004		
03321	740400		SNL		
03322	740040		HLT	/BAD LINK	(2575)
03323	047156		DAC FIAC		
03324	547215		SAD (000003		
03325	741000		SKP		
03326	740040		HLT	/BAD AC, GOOD=000003	(2601)
03327	641002		LACQ		
03330	047157		DAC FIMQ		
03331	547215		SAD (000003		
03332	741000		SKP		
03333	740040		HLT	/BAD MQ, GOOD=000003	(2606)
03334	104130		JMS HLOOPS		
03335	104134		JMS HLOOPM		
			.EJECT		

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/MULTIPLY DIVIDE TEST
/MULTIPLY TEST USING 22 SHIFTS
03336 104162
03337 104157
03340 207212
03341 652000
03342 207210
03343 653122
03344 000001
03345 047156
03346 547211
03347 741000
03350 740040
03351 641002
03352 047157
03353 547210
03354 741000
03355 740040
03356 104130
03357 104157
03360 207212
03361 652000
03362 207212
03363 653122
03364 100000
03365 047156
03366 547247
03367 741000
03370 740040
03371 641002
03372 047157
03373 547327
03374 741000
03375 740040
03376 104130

MULTST
JMS LOOP4
JMS LOOP2
LAC (777777)
LMQ
LAC (525252)
MUL
000001
DAC FIAC#
SAD (000000)
SKP
HLT /BAD AC, GOOD=000000 (2623)
LACQ
DAC FIMQ#
SAD (525252)
SKP
HLT /BAD MQ, GOOD=525252 (2630)

MULA
JMS HLOOPS
JMS LOOP2
LAC (777777)
LMQ
LAC (777777)
MUL
100000
DAC FIAC
SAD (077777)
SKP
HLT /BAD AC, GOOD=077777 (2643)
LACQ
DAC FIMQ
SAD (700000)
SKP
HLT /BAD MQ, GOOD=700000 (2650)
JMS HLOOPS
.EJECT

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03377	104157	MULB	JMS LOOP2		
03400	207212		LAC (777777		
03401	652000		LMQ		
03402	207210		LAC (525252		
03403	653122		MUL		
03404	777777		777777		
03405	047156		DAC FIAC#		
03406	547330		SAD (525251		
03407	741000		SKP		
03410	740040		HLT	/BAD AC, GOOD=525251	(2663)
03411	641002		LACQ		
03412	047157		DAC FIMQ#		
03413	547331		SAD (252526		
03414	741000		SKP		
03415	740040		HLT	/BAD MQ, GOOD=252526	(2670)
03416	104130		JMS HLOOPS		
03417	104157	MULC	JMS LOOP2		
03420	207212		LAC (777777		
03421	652000		LMQ		
03422	207212		LAC (777777		
03423	653122		MUL		
03424	252525		252525		
03425	047156		DAC FIAC		
03426	547332		SAD (252524)		
03427	741000		SKP		
03430	740040		HLT	/BAD AC, GOOD=252524	(2703)
03431	641002		LACQ		
03432	047157		DAC FIMQ		
03433	547333		SAD (525253)		
03434	741000		SKP		
03435	740040		HLT	/BAD MQ, GOOD=525253	(2710)
03436	104130		JMS HLOOPS		
			.EJECT		

03437	104157	MULD	JMS LOOP2	
03440	207212		LAC (777777)	
03441	652000		LMQ	
03442	207213		LAC (000001)	
03443	653122		MUL	
03444	777777		777777	
03445	047156		DAC FIAC#	
03446	547211		SAD (000000)	
03447	741000		SKP	
03450	740040		HLT /BAD AC, GOOD=000000	(2723)
03451	641002		LACQ	
03452	047157		DAC FIMQ#	
03453	547212		SAD (777777)	
03454	741000		SKP	
03455	740040		HLT /BAD MQ, GOOD=777777	(2730)
03456	104130		JMS HLOOPS	
03457	104157	MULE	JMS LOOP2	
03460	207212		LAC (777777)	
03461	652000		LMQ	
03462	207212		LAC (777777)	
03463	653122		MUL	
03464	000001		000001	
03465	047156		DAC FIAC	
03466	547211		SAD (000000)	
03467	741000		SKP	
03470	740040		HLT /BAD AC, GOOD=000000	(2743)
03471	641002		LACQ	
03472	047157		DAC FIMQ	
03473	547212		SAD (777777)	
03474	741000		SKP	
03475	740040		HLT /BAD MQ, GOOD=777777	(2750)
03476	104130		JMS HLOOPS	
			/PDP-15 EAE II - TAPE 3	
			/	
			/DIVIDE TEST USING 23 SHIFTS	
			/	
03477	104157	DIVTST	JMS LOOP2	
03500	207211		LAC (000000)	
03501	652000		LMQ	
03502	207211		LAC (000000)	
03503	640323		DIV	
03504	000000		000000	
03505	047156		DAC FIAC#	
03506	547211		SAD (000000)	
03507	741000		SKP	
03510	740040		HLT /BAD AC, GOOD=000000	(2763)
03511	641002		LACQ	
03512	047157		DAC FIMQ#	
03513	547317		SAD (000002)	
03514	741000		SKP	
03515	740040		HLT /BAD MQ, GOOD=000002	(2770)
03516	104130		JMS HLOOPS	
03517	104157	DIVA	JMS LOOP2	
03520	207212		LAC (777777)	
03521	652000		LMQ	

03522 207334
03523 640323
03524 000000
03525 047156
03526 547253
03527 741000
03530 740040
03531 641002
03532 047157
03533 547321
03534 741000
03535 740040
03536 104130

LAC (677777
DIV
000000
DAC FIAC
SAD (377777
SKP
HLT
LACQ
DAC FIMQ
SAD (777776
SKP
HLT
JMS HL00PS
.EJECT

/BAD AC, GOOD=377777 (3003)

/BAD MQ, GOOD=777776 (3010)

03537	104157	DIVB	JMS LOOP2		
03540	207212		LAC (777777)		
03541	652000		LMQ		
03542	207334		LAC (677777)		
03543	640323		DIV		
03544	000001		000001		
03545	047156		DAC FIAC#		
03546	547335		SAD (377771)		
03547	741000		SKP		
03550	740040		HLT	/BAD AC, GOOD=377771	(3023)
03551	641002		LACQ		
03552	047157		DAC FIMQ#		
03553	547321		SAD (777776)		
03554	741000		SKP		
03555	740040		HLT	/BAD MQ, GOOD=777776	(3030)
03556	104130		JMS HLOOPS		
03557	104157	DIVC	JMS LOOP2		
03560	207211		LAC (000000)		
03561	652000		LMQ		
03562	207211		LAC (000000)		
03563	640323		DIV		
03564	000001		000001		
03565	047156		DAC FIAC		
03566	547211		SAD (000000)		
03567	741000		SKP		
03570	740040		HLT	/BAD AC, GOOD=000000	(3043)
03571	641002		LACQ		
03572	047157		DAC FIMQ		
03573	547211		SAD (000000)		
03574	741000		SKP		
03575	740040		HLT	/BAD MQ, GOOD=000000	(3050)
03576	104130		JMS HLOOPS		
			.EJECT		

03577	104157	DIVD	JMS LOOP2	/SUB-SUB	
03600	207334		LAC (677777		
03601	652000		LMQ		
03602	207211		LAC (000000		
03603	640323		DIV		
03604	677777		677777		
03605	047156		DAC FIAC#		
03606	547211		SAD (000000		
03607	741000		SKP		
03610	740040		HLT	/BAD AC, GOOD=000000	(3063)
03611	641002		LACQ		
03612	047157		DAC FIMQ#		
03613	547213		SAD (000001		
03614	741000		SKP		
03615	740040		HLT	/BAD MQ, GOOD=000001	(3070)
03616	104130		JMS HLOOPS		
03617	104157	DIVE	JMS LOOP2	/ADD-ADD	
03620	207333		LAC (525253)		
03621	652000		LMQ		
03622	207332		LAC (252524)		
03623	640323		DIV		
03624	252525		252525		
03625	047156		DAC FIAC		
03626	547211		SAD (000000		
03627	741000		SKP		
03630	740040		HLT	/BAD AC, GOOD=000000	(3103)
03631	641002		LACQ		
03632	047157		DAC FIMQ		
03633	547212		SAD (777777		
03634	741000		SKP		
03635	740040		HLT	/BAD MQ, GOOD=777777	(3110)
03636	104130		JMS HLOOPS		
			.EJECT		

03637	104157	DIVF	JMS LOOP2	/ADD-SUB-ADD-SUB
03640	207333		LAC (525253)	
03641	652000		LMQ	
03642	207332		LAC (252524)	
03643	640323		DIV	
03644	777777		777777	
03645	047156		DAC FIAC#	
03646	547211		SAD (000000)	
03647	741000		SKP	
03650	740040		HLT /BAD AC, GOOD=000000	(3123)
03651	641002		LACQ	
03652	047157		DAC FIMQ#	
03653	547206		SAD (252525)	
03654	741000		SKP	
03655	740040		HLT /BAD MQ, GOOD=252525	(3130)
03656	104130		JMS HLOOPS	
03657	104157	DIVG	JMS LOOP2	
03660	207331		LAC (252526)	/ADD-SUB-ADD-SUB
03661	652000		LMQ	
03662	207330		LAC (525251)	
03663	640323		DIV	
03664	777777		777777	
03665	047156		DAC FIAC	
03666	547211		SAD (0)	
03667	741000		SKP	
03670	740040		HLT /BAD AC, GOOD=000000	(3143)
03671	641002		LACQ	
03672	047157		DAC FIMQ	
03673	547210		SAD (525252)	
03674	741000		SKP	
03675	740040		HLT /BAD MQ, GOOD=525252	(3150)
03676	104130		JMS HLOOPS	
03677	104134		JMS HLOOPM	
03700	104162		JMS LOOP4	
			.EJECT	

/MUL AND DIV INSTRUCTION DONE BACK TO BACK
/

03701	104157	MSPEED	/SPEED MULTIPLY	
03702	207212		JMS LOOP2	
03703	652000		LAC (777777)	
03704	207206		LMQ	
03705	673102		LAC (252525)	
03706	777777		MUL -20	
03707	673102		777777	
03710	777777		MUL -20	
03711	673102		777777	
03712	777777		MUL -20	
03713	673102		777777	
03714	777777		MUL -20	
03715	673102		777777	
03716	777777		777777	
03717	047156		DAC FIAC#	
03720	547214		SAD (577777)	
03721	741000		SKP	
03722	740040		HLT /BAD AC, GOOD=577777	(3175)
03723	641002		LACQ	
03724	047157		DAC FIMQ#	
03725	547336		SAD (337777)	
03726	741000		SKP	
03727	740040		HLT /BAD MQ, GOOD=337777	(3202)
03730	207206		LAC (252525)	
03731	653122		MUL	
03732	520000		520000	
03733	653122		MUL	
03734	520000		520000	
03735	653122		MUL	
03736	520000		520000	
03737	653122		MUL	
03740	520000		520000	
03741	653122		MUL	
03742	520000		520000	
03743	047156		DAC FIAC	
03744	547337		SAD (024613)	
03745	741000		SKP	
03746	740040		HLT /BAD AC, GOOD=024613	(3221)
03747	641002		LACQ	
03750	047157		DAC FIMQ	
03751	547340		SAD (140000)	
03752	741000		SKP	
03753	740040		HLT /BAD MQ, GOOD=140000	(3226)
03754	104130		JMS HLOOPS	
			.EJECT	

		/	/SPEED DIVIDE		
03755	104157	DSPEED	JMS LOOP2		
03756	207212		LAC (777777		
03757	652000		LMQ		
03760	207206		LAC (252525		
03761	660302		DIV -21		
03762	000002		000002		
03763	660302		DIV -21		
03764	000002		000002		
03765	660302		DIV -21		
03766	000002		000002		
03767	660302		DIV -21		
03770	000002		000002		
03771	660302		DIV -21		
03772	000002		000002		
03773	047156		DAC FIAC		
03774	547341		SAD (525005		
03775	741000		SKP		
03776	740040		HLT	/BAD AC, GOOD=525005	(3251)
03777	641002		LACQ		
04000	047157		DAC FIMQ		
04001	547342		SAD (777252		
04002	741000		SKP		
04003	740040		HLT	/BAD MQ, GOOD=777252	(3256)
04004	104130		JMS HLOOPS		
04005	104157		JMS LOOP2		
04006	207206		LAC (252525		
04007	652000		LMQ		
04010	207206		LAC (252525		
04011	640323		DIV		
04012	000052		000052		
04013	640323		DIV		
04014	000052		000052		
04015	640323		DIV		
04016	000052		000052		
04017	640323		DIV		
04020	000052		000052		
04021	640323		DIV		
04022	000052		000052		
04023	047156		DAC FIAC		
04024	547343		SAD (002651		
04025	741000		SKP		
04026	740040		HLT	/BAD AC, GOOD=002651	(3301)
04027	641002		LACQ		
04030	047157		DAC FIMQ		
04031	547344		SAD (253252		
04032	741000		SKP		
04033	740040		HLT	/BAD MQ, GOOD=253252	(3306)
04034	104130		JMS HLOOPS		
			.EJECT		

/SPEED MULTIPLY AND DIVIDE

04035	104157	/	SPMUOV	JMS LOOP2		
04036	207212			LAC (777777)		
04037	652000			LMQ		
04040	207251			LAC (177777)		
04041	664000			GSM		
04042	653122			MUL		
04043	252525			252525		
04044	640323			DIV		
04045	252525			252525		
04046	047156			DAC FIAC		
04047	547211			SAD (0)		
04050	741000			SKP		
04051	740040			HLT	/BAD AC, GOOD=000000	(3324)
04052	641002			LACQ		
04053	047157			DAC FIMQ		
04054	547251			SAD (177777)		
04055	741000			SKP		
04056	740040			HLT	/BAD MQ, GOOD=177777	(3331)
04057	104130			JMS HLOOPS		
04060	104157			JMS LOOP2		
04061	207247			LAC (077777)		
04062	653122			MUL		
04063	252525			252525		
04064	640323			DIV		
04065	000025			000025		
04066	653122			MUL		
04067	252525			252525		
04070	640323			DIV		
04071	000025			000025		
04072	653122			MUL		
04073	252525			252525		
04074	640323			DIV		
04075	000252			000252		
04076	653122			MUL		
04077	252525			252525		
04100	640323			DIV		
04101	000252			000252		
04102	653122			MUL		
04103	252525			252525		
04104	640323			DIV		
04105	000052			000052		
04106	047156			DAC FIAC		
04107	547345			SAD (405476)		
04110	741000			SKP		
04111	740040			HLT	/BAD AC, GOOD=405476	(3364)
04112	641002			LACQ		
04113	047157			DAC FIMQ		
04114	547346			SAD (117162)		
04115	741000			SKP		
04116	740040			HLT	/BAD MQ, GOOD=117162	(3371)
04117	104130			JMS HLOOPS		
04120	104134			JMS HLOOPM		
04121	741000			SKP		

.EJECT

04122	777700	LOOPA	777700
04123	444122		ISZ .-1
04124	600246		JMP NEAE
04125	207347		LAC (777700
04126	044122		DAC LOOPA
04127	620203		JMP* ADVP
			.EJECT

```

/INCREMENT ERROR LOCATION ON ERROR
/
00020          .LOC 20
/
00020  740040  HLT
00021  750001  CLA!CMA
00022  340020  TAD 20          /SUBTRACT 1 FROM (20)
00023  040025  DAC .+2
00024  741000  SKP
00025  740000  NOP          /ERROR LOCATION
00026  460025  ISZ* .-1      /INCREMENT
00027  620020  JMP* 20      /EXIT

/
/SMALL LOOP HALT
04130          .LOC LOOPA+6
04130  740040  HLOOPS  HLT
04131  104202  JMS HLTS
04132  104226  JMS LOOPS
04133  624130  JMP* HLOOPS

/
/MEDIUM HLT LOOP
04134  740040  HLOOPM  HLT
04135  104212  JMS HLTM
04136  104234  JMS LOOPM
04137  624134  JMP* HLOOPM

/
/LARGE HLT LOOP
04140  740040  HLOOPL  HLT
04141  104143  JMS LOOPL
04142  624140  JMP* HLOOPL

/
LOOPL  NOP
04143  740000  LAS
04144  750004  AND (010000)  /SWITCH 5 NOT SET
04145  507350  SNA
04146  741200  JMP* LOOP5      /LOOP
04147  624164  JMP* LOOPL      /CONTINUE
04150  624143

/
SWIT6  HLT
04151  740040  LAS
04152  750004  AND (400000)  /SWITCH ZERO
04153  507254  SZA
04154  740200  HLT          /PRINT ROUTINE
04155  740040  JMP* SWIT6      /CONTINUE
04156  624151

/
LOOP2  0
04157  000000  CLL
04160  744000  JMP* .-2      /SCOPE LOOP TAG
04161  624157

/
LOOP4  0          /SUBROUTINE TAG
04162  000000  JMP* .-1
04163  624162
04164  000000  LOOP5  0          /ROUTINE TAG
04165  624164  JMP* .-1
.EJECT

```

04166	104166	IOR	JMS .	
04167	044200		DAC .+11	
04170	224166		LAC* IOR	
04171	044201		DAC .+10	
04172	204200		LAC .+6	
04173	740001		CMA	
04174	524201		AND* .+5	
04175	344200		TAD .+3	
04176	444166		ISZ IOR	
04177	624166		JMP* IOR	
04200	000000		0	
04201	000000		0	
		/		
04202	740000	HLTS	NOP	
04203	750004		LAS	
04204	507351		AND (200000	/SW1
04205	741200		SNA	
04206	604211		JMP .+3	
04207	204202		LAC HLTS	
04210	740040		HLT	
04211	624202		JMP* HLTS	/CONTINUE
		/		
04212	740000	HLTM	NOP	
04213	750004		LAS	
04214	507352		AND (040000	/SW3
04215	740200		SZA	
04216	740040		HLT	
04217	624212		JMP* .-5	/CONTINUE
		/		
04220	740000	HLTL	NOP	
04221	750004		LAS	
04222	507353		AND (004000	/SW6
04223	740200		SZA	
04224	740040		HLT	
04225	624220		JMP* .-5	/CONTINUE
		/		
04226	740000	LOOPS	NOP	
04227	750004		LAS	
04230	507354		AND (100000	/SWITCH 2
04231	744200		SZA!CLL	
04232	624157		JMP* LOOP2	/LOOP
04233	624226		JMP* LOOPS	/CONTINUE
		/		
04234	740000	LOOPM	NOP	
04235	750004		LAS	/SWITCH 4
04236	507355		AND (020000	/SWITCH 4
04237	740200		SZA	
04240	624162		JMP* LOOP4	/LOOP
04241	624234		JMP* LOOPM	/CONTINUE
			.EJECT	


```

/LOOK UP OR HALT
04242 740000 SWIT7 NOP
04243 750004 LAS
04244 507356 AND (002000 /SWITCH 7
04245 740200 SZA
04246 444242 ISZ SWIT7 /IF SET GO TO P+2
04247 624242 JMP* SWIT7 /IF NOT SET GO TO P+1

/
/FILL ERROR LOCATIONS WITH ZERO
04250 740000 FILZER NOP
04251 205023 LAC LENGTH
04252 047142 DAC ADDCT# /FIELD COUNTER
04253 207357 LAC (LAC ERWOR
04254 044255 DAC .+1
04255 204376 LAC ERWOR
04256 047145 DAC CTADD#
04257 167145 DZM* CTADD /CURRENT ADDRESS
04260 444255 ISZ .-3
04261 447142 ISZ ADDCT
04262 604255 JMP .-5
04263 624250 JMP* FILZER /EXIT

/
/FILL ERROR LOCATION WITH HLT
04264 740000 FILHLT NOP
04265 205023 LAC LENGTH
04266 047142 DAC ADDCT /FIELD COUNTER
04267 207360 LAC (LAC ERWOR
04270 044271 DAC .+1
04271 204376 LAC ERWOR /ADDRESS OF LHE
04272 047145 DAC CTADD
04273 207361 LAC (HLT
04274 067145 DAC* CTADD /CURRENT ADDRESS
04275 444271 ISZ .-4
04276 447142 ISZ ADDCT
04277 604271 JMP .-6
04300 624264 JMP* FILHLT /EXIT

/
/SET BIT IN BITWORD IF ERROR
04301 740000 SETBIT NOP
04302 204376 LAC ERWOR
04303 047145 DAC CTADD
04304 227145 LAC* CTADD /CURRENT ADDRESS OF ERROR WORD
04305 741200 SNA
04306 604313 JMP .+5
04307 207155 LAC ERBIT#
04310 104166 JMS IOR
04311 740040 XX /MODIFIED
04312 064311 DAC* .-1
04313 444302 ISZ SETBIT+1
04314 624301 JMP* SETBIT /EXIT
.EJECT

```

```

/SCAN FOR 00 OR 77 SET FLAG ON ERROR
SCAN      NOP
          CLA
          DAC ERFLAG
          DAC ASTRIC
          LAC LENGTH
          DAC ADDCT
          LAC (LAC ERWOR
          DAC .+1
          LAC ERWOR
          DAC CTADD
          LAC* CTADD
          SAD (0           /CHECK FOR ZERO
          JMP .+5          /YES

04315     740000
04316     750000
04317     047154
04320     047143
04321     205023
04322     047142
04323     207362
04324     044325
04325     204376
04326     047145
04327     227145
04330     547211
04331     604336

04332     547363          SA0 (100 /CHECK FOR 100
04333     741000          SKP
04334     447143          ISZ ASTRIC#       /INTERMITTENT
04335     447154          ISZ ERFLAG#       /SET FLAG
04336     444325          ISZ .-11
04337     447142          ISZ ADDCT
04340     604325          JMP .-13
04341     624315          JMP* SCAN

/
/CHECK FLAG
CKFLAG    NOP
          LAC ERFLAG           /HOW MANY TEST FAILED
          SNA
          JMP* BEGIN          /NO ERROR
          JMP* CKFLAG         /# OF BIT WORDS

/
/SET UP COUNTS AND COUNTERS
SETUP     NOP
          LAC (WORDA           /1ST BIT STORAGE LOCATION
          DAC SETBIT+10        /CURRENT WORD ADESS
          LAC (777755
          DAC BITCT           /BIT COUNTER
          LAC (400000          /INITIAL BIT
          DAC ERFBIT          /CURRENT BIT POSITION
          LAC (LAC ERWOR       /LHE ADDRESS OF FIELD
          DAC SETBIT+1         /COUNTER
          LAC LENGTH           /LENGTH OF FIELD
          DAC ADDCT           /FIELD COUNTER
          JMP* SETUP           /EXIT
          .EJECT

```

/ROTATE BIT AND CHECK WORD COUNT

```
/
RBCW      NOP
          LAC ERRBIT
          RAR
          ISZ BITCT#
          JMP .+5
          ISZ SETBIT+10
          LAC (777755
          DAC BITCT
          LAC (400000
          DAC ERRBIT
          JMP* RBCW
          .EJECT
```

04376	000263	ERWOR	NEAE 15
04377	000267		NEAE 21
04400	000305		NEAE 37
04401	000311		NEAE 43
04402	000327		NEAE 61
04403	000333		NEAE 65
04404	000351		NEAE 103
04405	000355		NEAE 107
04406	000373		NEAB 13
04407	000377		NEAB 17
04410	000415		NEAB 35
04411	000421		NEAB 41
04412	000436		NEAB 56
04413	000442		NEAB 62
04414	000460		NEAB 100
04415	000464		NEAB 104
04416	000502		NMUL 13
04417	000506		NMUL 17
04420	000524		NMUL 35
04421	000530		NMUL 41
04422	000546		NMUL 57
04423	000552		NMUL 63
04424	000570		NMUL 101
04425	000574		NMUL 105
04426	000612		NMULS 13
04427	000616		NMULS 17
04430	000634		NMULS 35
04431	000640		NMULS 41
04432	000656		NMULS 57
04433	000662		NMULS 63
04434	000700		NMULS 101
04435	000704		NMULS 105
04436	000722		NDIV 13
04437	000726		NDIV 17
04440	000745		NDIV 36
04441	000751		NDIV 42
04442	000767		NDIV 60
04443	000773		NDIV 64
04444	001011		NDIV 102
04445	001015		NDIV 106
04446	001033		NDIVS 13
04447	001037		NDIVS 17
04450	001055		NDIVS 35
04451	001061		NDIVS 41
04452	001076		NDIVS 56
04453	001102		NDIVS 62
04454	001120		NDIVS 100
04455	001124		NDIVS 104

.EJECT

04456	001142	NIDIV	13
04457	001146	NIDIV	17
04460	001164	NIDIV	35
04461	001170	NIDIV	41
04462	001206	NIDIV	57
04463	001212	NIDIV	63
04464	001230	NIDIV	101
04465	001234	NIDIV	105
04466	001252	NIDIVS	13
04467	001256	NIDIVS	17
04470	001274	NIDIVS	35
04471	001300	NIDIVS	41
04472	001316	NIDIVS	57
04473	001322	NIDIVS	63
04474	001340	NIDIVS	101
04475	001344	NIDIVS	105
04476	001362	NFRDIV	13
04477	001366	NFRDIV	17
04500	001404	NFRDIV	35
04501	001410	NFRDIV	41
04502	001426	NFRDIV	57
04503	001432	NFRDIV	63
04504	001450	NFRDIV	101
04505	001454	NFRDIV	105
04506	001472	NFRDVS	13
04507	001476	NFRDVS	17
04510	001514	NFRDVS	35
04511	001520	NFRDVS	41
04512	001536	NFRDVS	57
04513	001542	NFRDVS	63
04514	001560	NFRDVS	101
04515	001564	NFRDVS	105
04516	001600	SHCT1	7
04517	001605	SHCT1	14
04520	001610	SHCT1	17
04521	001621	SHCT2	7
04522	001626	SHCT2	14
04523	001631	SHCT2	17
04524	001642	SHCT3	7
04525	001647	SHCT3	14
04526	001652	SHCT3	17
04527	001663	SHCT4	7
04530	001670	SHCT4	14
04531	001673	SHCT4	17

.EJECT

04532	001704	SHCT5	7
04533	001711	SHCT5	14
04534	001714	SHCT5	17
04535	001725	SHCT6	7
04536	001732	SHCT6	14
04537	001735	SHCT6	17
04540	001746	SHCT7	7
04541	001753	SHCT7	14
04542	001756	SHCT7	17
04543	001767	SHCT10	7
04544	001774	SHCT10	14
04545	001777	SHCT10	17
04546	002010	SHCT11	7
04547	002015	SHCT11	14
04550	002020	SHCT11	17
04551	002031	SHCT12	7
04552	002036	SHCT12	14
04553	002041	SHCT12	17
04554	002052	SHCT13	7
04555	002057	SHCT13	14
04556	002062	SHCT13	17
04557	002073	SHCT14	7
04560	002100	SHCT14	14
04561	002103	SHCT14	17
04562	002114	SHCT15	7
04563	002121	SHCT15	14
04564	002124	SHCT15	17
04565	002135	SHCT16	7
04566	002142	SHCT16	14
04567	002145	SHCT16	17
04570	002156	SHCT17	7
04571	002163	SHCT17	14
04572	002166	SHCT17	17
04573	002177	SHCT20	7
04574	002204	SHCT20	14
04575	002207	SHCT20	17
04576	002220	SHCT21	7
04577	002225	SHCT21	14
04600	002230	SHCT21	17
04601	002241	SHCT22	7
04602	002246	SHCT22	14
04603	002251	SHCT22	17

.EJECT

04604	002266	DSC1	10+1
04605	002273	DSC1	15+1
04606	002306	DSC1	27+2
04607	002313	DSC1	34+2
04610	002326	DSC1	46+3
04611	002333	DSC1	53+3
04612	002346	DSC1	65+4
04613	002353	DSC1	72+4
04614	002366	DSC1	104+5
04615	002373	DSC1	111+5
04616	002406	DSC1	123+6
04617	002413	DSC1	130+6
04620	002426	DSC1	142+7
04621	002433	DSC1	147+7
04622	002446	DSC1	161+10
04623	002453	DSC1	166+10
04624	002466	DSC1	200+11
04625	002473	DSC1	205+11
04626	002506	DSC1	217+12
04627	002513	DSC1	224+12
04630	002526	DSC1	236+13
04631	002533	DSC1	243+13
04632	002546	DSC1	255+14
04633	002553	DSC1	262+14
04634	002566	DSC1	274+15
04635	002573	DSC1	301+15
04636	002606	DSC1	313+16
04637	002613	DSC1	320+16
04640	002626	DSC1	332+17
04641	002633	DSC1	337+17
04642	002646	DSC1	351+20
04643	002653	DSC1	356+20
04644	002666	DSC1	370+21
04645	002673	DSC1	375+21
04646	002705	STMUL	6
04647	002714	STMUL	15
04650	002724	STMULS	6
04651	002734	STMULS	16
04652	002743	STMULS	25
04653	002753	STMULS	35
04654	002766	STDIVS	11
04655	002772	STDIVS	15
04656	002777	STDIVS	22
04657	003012	SIGNA	11
04660	003016	SIGNA	15
04661	003023	SIGNA	22
		.EJECT	

04662	003036	SIGNB 11
04663	003042	SIGNR 15
04664	003047	SIGNR 22
04665	003062	SIGNC 11
04666	003066	SIGNC 15
04667	003073	SIGNC 22
04670	003106	STIDVS 11
04671	003112	STIDVS 15
04672	003117	STIDVS 22
04673	003132	SIGND 11
04674	003136	SIGND 15
04675	003143	SIGND 22
04676	003156	SIGNE 11
04677	003162	SIGNE 15
04700	003167	SIGNE 22
04701	003202	SIGNF 11
04702	003206	SIGNF 15
04703	003213	SIGNF 22
04704	003226	STFDVS 11
04705	003232	STFDVS 15
04706	003237	STFDVS 22
04707	003252	SINGN 11
04710	003256	SINGN 15
04711	003263	SINGN 22
04712	003276	SIGNH 11
04713	003302	SIGNH 15
04714	003307	SIGNH 22
04715	003322	SIGNI 11
04716	003326	SIGNI 15
04717	003333	SIGNI 22
04720	003350	MULTST 11
04721	003355	MULTST 16
04722	003370	MULA 11
04723	003375	MULA 16
04724	003410	MULB 11
04725	003415	MULB 16
04726	003430	MULC 11
04727	003435	MULC 16
04730	003450	MULD 11
04731	003455	MULD 16
04732	003470	MULE 11
04733	003475	MULE 16
04734	003510	DIVTST 11
04735	003515	DIVTST 16
04736	003530	DIVA 11
04737	003535	DIVA 16
04740	003550	DIVB 11
04741	003555	DIVB 16
04742	003570	DIVC 11
04743	003575	DIVC 16
		.EJECT

04744	003610		DIVD 11
04745	003615		DIVD 16
04746	003630		DIVE 11
04747	003635		DIVE 16
04750	003650		DIVF 11
04751	003655		DIVF 16
04752	003670		DIVG 11
04753	003675		DIVG 16
04754	003722		MSPEED 21
04755	003727		MSPEED 26
04756	003746		MSPEED 45
04757	003753		MSPEED 52
04760	003776		DSPEED 21
04761	004003		DSPEED 26
04762	004026		DSPEED 51
04763	004033		DSPEED 56
04764	004051		SPMUDV 14
04765	004056		SPMUDV 21
04766	004111		SPMUDV 54
04767	004116		SPMUDV 61
04770	004116		SPMUDV 61
04771	004116		SPMUDV 61
04776			.LOC ERWOR+400
04776	000000	WORDA	0 /BUFFER FOR BIT WORDS
05023			.LOC WORDA+25
05023	777406	LENGTH	777406
			.EJECT

```

05024 740000 BEGIN NOP
05025 740000 NOP /WAS JMS SWIT7(NOT USED)
05026 605047 JMP FACT /HERE IF NOT SET
05027 605031 JMP LOOKUP /HERE IF SET
/
05030 000000 /COUNTER
05031 104250 LOOKUP JMS FILZER /FILL ERROR LOK WITH CAL
05032 105052 JMS CLBUF /CL BUFFER
05033 100203 JMS ADVP /GO TO MUL, DIV ROUTINES
05034 104315 JMS SCAN /SCAN FOR 00 OR 77 FLAG ANY ERROR
05035 104342 JMS CKFLAG
05036 205023 LAC LENGTH
05037 045030 DAC LOOKUP-1
05040 104347 JMS SETUP /SET UP COUNTS AND COUNTERS
05041 104301 JMS SETBIT /SET BIT IF ERROR
05042 104363 JMS RBCW /ROTATE BIT AND CHECK WORD
05043 445030 ISZ LOOKUP-1
05044 605041 JMP .-3
05045 105064 JMS STABUF /PRINT OUT ERROR STATUS
05046 625024 JMP* BEGIN
/
05047 104264 FACT JMS FILHLT
05050 100203 JMS ADVP
05051 625024 JMP* BEGIN
/
/CL BUFFER
CLBUF HLT
05052 740040 LAC (WORDA /RHE
05053 207364 DAC CLBUF+11
05054 045063 LAC (WORDA+24 /LHE
05055 207370 DZM* CLBUF+11 /DEPOSIT ZEROS
05056 165063 SAD CLBUF+11 /RHE=LHE
05057 545063 JMP* CLBUF /EXIT YES
05060 625052 ISZ CLBUF+11 /NO
05061 445063 JMP .-4
05062 605056 0
05063 000000 0
.EJECT

```

```

/ROUTINE TO PRINT ERROR BUFFER
/
05064 740040 STABUF HLT
05065 107026 JMS PRINT /CHECK FOR PRINT
05066 105110 JMS ANDBUF /AND THEM
05067 105144 JMS IORBUF /"OR" THEM
05070 105126 JMS TADBUF /TAD THEM
05071 105412 TIN
05072 205125 LAC ANDBUF+15
05073 105314 JMS OPS /PRINT THE "AND"
05074 105345 TYT
05075 205143 LAC TADBUF+15
05076 105314 JMS OPS /PRINT THE "TAD"
05077 105345 TYT
05100 205162 LAC IORBUF+16
05101 105314 JMS OPS /PRINT THE "IOR"
05102 207143 LAC ASTRIC
05103 741200 SNA
05104 625064 JMP* STABUF /EXIT
05105 765724 LAW TEXTI /PRINT THE ASTRIC
05106 105225 TSR
05107 625064 JMP* STABUF /EXIT

/
/"AND" ERROR WORDS
ANDBUF HLT
05110 740040 CLC /PERMIT "AND" FUNCTION
05111 750001 DAC ANDBUF+15 /CLEAR TEM STORAGE
05112 045125 LAC (LAC WORDA /L.L. WORD
05113 207371 DAC .+1
05114 045115 LAC WORDA
05115 204776 AND ANDBUF+15
05116 505125 DAC ANDBUF+15
05117 045125 LAC (LAC WORDA+14 /U.L. WORD
05120 207372 SAD ANDBUF+5 /LL=UL
05121 545115 JMP* ANDBUF /YES EXIT
05122 625110 ISZ ANDBUF+5 /NO
05123 445115 JMP ANDBUF+5 /LOOP
05124 605115 0 /TEMP STORAGE
05125 000000

/
.EJECT

```

```

/TAD ERROR WORDS
05126 740040 TADBUF HLT
05127 754000 CLL:CLA
05130 045143 DAC TADBUF+15
05131 207371 LAC (LAC WORDA /U.L.
05132 045133 DAC .+1
05133 204776 LAC WORDA
05134 345143 TAD TADBUF+15 /ADD THEM
05135 045143 DAC TADBUF+15
05136 207373 LAC (LAC WORDA+21 /U.L.
05137 545133 SAD TADBUF+5 /L.L.=U.L.
05140 625126 JMP* TADBUF /YES EXIT
05141 445133 ISZ TADBUF+5 /NO
05142 605133 JMP TADBUF+5 /LOOP
05143 000000 0 /SUM OF ERROR

/
/IOR ERROR WORDS
05144 740040 IORBUF HLT
05145 754000 CLL:CLA
05146 045162 DAC IORBUF+16
05147 207371 LAC (LAC WORDA /L.L.
05150 045151 DAC .+1
05151 204776 LAC WORDA
05152 104166 JMS IOR /"OR"
05153 005162 IORBUF+16
05154 045162 DAC IORBUF+16
05155 207373 LAC (LAC WORDA+21 /U.L.
05156 545151 SAD IORBUF+5 /U.L.=U.L.
05157 625144 JMP* IORBUF /YES
05160 445151 ISZ IORBUF+5 /NO
05161 605151 JMP IORBUF+5 /LOOP
05162 000000 0 /INCLUSIVE OR OF WORDS

.EJECT

```

```

05163 740040 /MULTIPLY SIMULATION CONTROL
05164 765710 MSC HLT
05165 105225 LAW TEXTH
05166 207374 TSR
05167 046362 LAC (JMS MULSIM
05170 046406 DAC MP4-1
05171 046411 DAC MPSIGN+6
05172 106065 JMS SOFMUL /GENERATE SIMULATION
05173 207375 LAC (NOP
05174 046362 DAC MP4-1
05175 046406 DAC MPSIGN+6
05176 046411 DAC MP7+2
05177 106075 JMS HARMUL
05200 605177 JMP .-1 /LOOP

```

```

/
/DIVIDE SIMULATION CONTROL
05201 740040 DISC HLT
05202 765710 LAW TEXTH
05203 105225 TSR
05204 207376 LAC (JMS DIVSIM
05205 046443 DAC DSP1
05206 046465 DAC DSP2
05207 046453 DAC DSP3
05210 046523 DAC DSP4
05211 046531 DAC DSP5
05212 046546 DAC DSP6
05213 106170 JMS SOFDIV /GENERATE SIMULATION
05214 207375 LAC (NOP
05215 046443 DAC DSP1
05216 046465 DAC DSP2
05217 046453 DAC DSP3
05220 046523 DAC DSP4
05221 046531 DAC DSP5
05222 046546 DAC DSP6
05223 106156 JMS HARDIV
05224 605223 JMP .-1 /LOOP

```

```

/TAPE 3A
/TYPE STRING OF CHARACTERS
/EOM=??=?
IDIVS=657323
05225 657323 TYPTSR JMP .
05226 507241 AND (7777)
05227 047203 DAC TEMY1#
05230 227203 LAC* TEMY1
05231 447203 ISZ TEMY1
05232 045307 DAC TYP5AV
05233 742020 RTR
05234 742020 RTR
05235 742020 RTR
05236 045310 DAC TYP5AV+1
05237 742020 RTR
05240 742020 RTR
05241 742020 RTR

```

05242	105250		JMS TYPCHR	
05243	205310		LAC TYP SAV+1	
05244	105250		JMS TYPCHR	
05245	205307		LAC TYP SAV	
05246	105250		JMS TYPCHR	
05247	605230		JMP TYPTSR+3	
05250	740040	TYPCHR	HLT	
05251	045311		DAC TYP SAV+2	/ACTIVE
05252	205307		LAC TYP SAV	/TEST FOR CRLF
05253	507347		AND (777700	
05254	547377		SAD (151200	/CRLF?
05255	741000		SKP	/YES
05256	605264		JMP .+6	/NO
05257	205307		LAC TYP SAV	/CORRECT IT FOR NEXT TIME
05260	507225		AND (000077	
05261	045307		DAC TYP SAV	
05262	105412		JMS TYCRLF	/DO CRLF
05263	605245		JMP TYPCHR-3	/TYPE LAST CHARACTER
05264	205311		LAC TYP SAV+2	
05265	507225		AND (77	
05266	547225		SAD (77	/END OF MESSAGE?
05267	625225		JMP* TYPTSR	/YES
05270	741200		SNA	/IF ZERO IGNOR
05271	625250		JMP* TYPCHR	/IGNOR
05272	744001		CMA:CLL	
05273	347400		TAD (40	
05274	741400		SZL	
05275	605302		JMP .+5	
05276	205311		LAC TYP SAV+2	
05277	507225		AND (77	
05300	347401		TAD (200	
05301	605305		JMP TYP SAV-2	
05302	205311		LAC TYP SAV+2	
05303	507225		AND (77	
05304	347402		TAD (300	
05305	106562		JMS OTY	
05306	625250		JMP* TYPCHR	
05307	000000	TYP SAV	0	/3RD
05310	000000		0	/2ND
05311	000000		0	/ACTIVE CHAR
05312	000000		0	
05313	000000		0	
			.EJECT	

		/TYPE CONTENTS OF THE AC IN OCTAL
05314	605314	TYPCON JMP .
05315	105360	JMS DECONT
05316	105401	JMS TYPOCT
05317	205313	LAC TYP SAV+4
05320	105401	JMS TYPOCT
05321	205312	LAC TYP SAV+3
05322	105401	JMS TYPOCT
05323	205311	LAC TYP SAV+2
05324	105401	JMS TYPOCT
05325	205310	LAC TYP SAV+1
05326	105401	JMS TYPOCT
05327	205307	LAC TYP SAV
05330	105401	JMS TYPOCT
05331	105406	JMS SPACE2
05332	625314	JMP* TYPCON
		/TYPE OUT LOWEST 3 CHAR IN OCTAL
05333	605333	TYP C03 JMP .
05334	105360	JMS DECONT
05335	205311	LAC TYP SAV+2
05336	105401	JMS TYPOCT
05337	205310	LAC TYP SAV+1
05340	105401	JMS TYPOCT
05341	205307	LAC TYP SAV
05342	105401	JMS TYPOCT
05343	105406	JMS SPACE2
05344	625333	JMP* TYP C03
05345	605345	TYPTYT JMP .
05346	105354	TSP
05347	105354	TSP
05350	105354	TSP
05351	105354	TSP
05352	105354	TSP
05353	625345	JMP* TYPTYT
05354	605354	SPAC JMP .
05355	207403	LAC (240
05356	106562	JMS OTY
05357	625354	JMP* SPAC
		.EJECT

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05360 605360 DECONT JMP .
05361 045307 DAC TYP SAV
05362 742020 RTR
05363 740020 RAR
05364 045310 DAC TYP SAV+1
05365 742020 RTR
05366 740020 RAR
05367 045311 DAC TYP SAV+2
05370 742020 RTR
05371 740020 RAR
05372 045312 DAC TYP SAV+3
05373 742020 RTR
05374 740020 RAR
05375 045313 DAC TYP SAV+4
05376 742020 RTR
05377 740020 RAR
05400 625360 JMP* DECONT
05401 605401 TYPOCT JMP .
05402 507217 AND (7
05403 347404 TAD (260
05404 106562 JMS OTY
05405 625401 JMP* TYPOCT
05406 605406 SPACE2 JMP .
05407 767225 LAW (77
05410 105225 TSR
05411 625406 JMP* SPACE2
05412 605412 TYCRLF JMP .
05413 207405 LAC (215
05414 106562 JMS OTY
05415 207406 LAC (212
05416 106562 JMS OTY
05417 625412 JMP* TYCRLF
105401 TDIGIT=JMS TYPOCT
105354 TSP=JMS SPAC
105225 TSR=JMS TYPTSR /STRING
105412 TCR=JMS TYCRLF /CR,LF
105412 TIN=TCR
005314 OPS=TYPCON /CONTENTS OF AC IN OCTAL
105345 TYT=JMS TYPTYT /TAB
005314 OPT=OPS
/
.EJECT

```


05420	151215	TEXTA	.SIXBT	<15><12>'MULTIPLY-DIVIDE TEST,PART 2.
05421	251424			
05422	112014			
05423	315504			
05424	112611			
05425	040540			
05426	240523			
05427	245420			
05430	012224			
05431	406256			
05432	151220		.SIXBT	<15><12>'PART 1 SHOULD BE RUN PRIOR TO THIS SECTION
05433	012224			
05434	406140			
05435	231017			
05436	251404			
05437	400205			
05440	402225			
05441	164020			
05442	221117			
05443	224024			
05444	174024			
05445	101123			
05446	402305			
05447	032411			
05450	171600			
05451	151223		.SIXBT	<15><12>'SW0=1=DELETE ERROR TYPQUTS.
05452	276075			
05453	617504			
05454	051405			
05455	240540			
05456	052222			
05457	172240			
05460	243120			
05461	172524			
05462	235600			
05463	151223		.SIXBT	<15><12>'SW1=1=HALT AFTER EACH EAE OPERATION.
05464	276175			
05465	617510			
05466	011424			
05467	400106			
05470	240522			
05471	400501			
05472	031040			
05473	050105			
05474	401720			
05475	052201			
05476	241117			
05477	165600			
05500	151223		.SIXBT	<15><12>'SW2=1=REPEAT LAST EAE OPERATION.
05501	276275			
05502	617522			
05503	052005			
05504	012440			
05505	140123			
05506	244005			

05507	010540	
05510	172005	
05511	220124	
05512	111716	
05513	560000	
05514	151223	.SIXBT <15><12>'SW3=1=HALT AFTER EACH EAE SEQUENCE.
05515	276375	
05516	617510	
05517	011424	
05520	400106	
05521	240522	
05522	400501	
05523	031040	
05524	050105	
05525	402305	
05526	212505	
05527	160305	
05530	560000	
05531	151223	.SIXBT <15><12>'SW4=1=REPEAT EACH EAE SEQUENCE.
05532	276475	
05533	617522	
05534	052005	
05535	012440	
05536	050103	
05537	104005	
05540	010540	
05541	230521	
05542	250516	
05543	030556	
05544	151223	.SIXBT <15><12>'SW5=1=CYCLE COMPLETE TEST.
05545	276575	
05546	617503	
05547	310314	
05550	054003	
05551	171520	
05552	140524	
05553	054024	
05554	052324	
05555	560000	
05556	151223	.SIXBT <15><12>'SW6=1=PRINT "OK" AT END OF PASS, WHEN SW5=1'<77>
05557	276675	
05560	617520	
05561	221116	
05562	244042	
05563	171342	
05564	400124	
05565	400516	
05566	044017	
05567	064020	
05570	012323	
05571	544027	
05572	100516	
05573	402327	
05574	657561	
05575	770000	

05576	151215	TEXTB	.SIXBT	<15><12>'MULS FAILED	MULTIPLIER (AC)	MULTIPLICAND?'
05577	251423					
05600	400601					
05601	111405					
05602	044040					
05603	401525					
05604	142411					
05605	201411					
05606	052240					
05607	500103					
05610	514015					
05611	251424					
05612	112014					
05613	110301					
05614	160477	TEXTC	.SIXBT	'HIGH ORDER PRODUCT	LOW ORDER PRODUCT'	<77>
05615	101107					
05616	104017					
05617	220405					
05620	224020					
05621	221704					
05622	250324					
05623	404014					
05624	172740					
05625	172204					
05626	052240					
05627	202217					
05630	042503					
05631	247700					
05632	151210	TEXTD	.SIXBT	<15><12>'HARDWARE'		<77>
05633	012204					
05634	270122					
05635	057700					
05636	151204	TEXTE	.SIXBT	<15><12>'DIVS FAILED C(DIVISOR)	C(AC)	C(MQ)'
05637	112623					<15><12>
05640	400601					
05641	111405					
05642	044003					
05643	500411					
05644	261123					
05645	172251					
05646	404040					
05647	035001					
05650	035140					
05651	404040					
05652	400350					
05653	152151					
05654	151200					
05655	770000	TEXTF	.SIXBT	<77>		
05656	212517		.SIXBT	'QUOTIENT	REMAINDER LINK'	<15><12>'SOFTWARE?'
05657	241105					<77>
05660	162440					
05661	404040					
05662	404040					
05663	220515					
05664	011116					

05665 040522
 05666 404014
 05667 111613
 05670 151223
 05671 170624
 05672 270122
 05673 057777
 05674 151214
 05675 111613
 05676 401617
 05677 244023
 05700 052440
 05701 171640
 05702 041126
 05703 110405
 05704 401726
 05705 052206
 05706 141727
 05707 777700
 05710 151203
 05711 501451
 05712 404040
 05713 035001
 05714 035140
 05715 404040
 05716 404003
 05717 501521
 05720 514040
 05721 404003
 05722 502303
 05723 517700
 05724 520000
 05725 151217
 05726 252440
 05727 170640
 05730 616060
 05731 400310
 05732 050313
 05733 400201
 05734 047700

TEXTG .SIXBT <15><12>'LINK NOT SET ON DIVIDE OVERFLOW?'<77>

TEXTH .SIXBT <15><12>'C(L) C(AC) C(MQ) C(SC)'<<77>

TEXTI .SIXBT /*/
 TEXTJ .SIXBT <15><12>'OUT OF 100 CHECK BAD?'

/PDP-15 EAE II - TAPE 4
 /RANDOM CONTROL MUL/DIV
 /

05735 740000
 05736 740000
 05737 104162
 05740 105747
 05741 104134
 05742 104162
 05743 106120
 05744 104134
 05745 740000
 05746 625735

EXRAN NOP
 NOP /SET UP FOR RANDOM LOOP
 JMS LOOP4 /SET UP FOR LOOP
 JMS MULSHT /RANDOM MULTIPLY
 JMS HLOOPM /CHECK FOR HALT AND LOOP
 JMS LOOP4 /SET UP FOR LOOP
 JMS DIVSHT /RANDOM DIVIDE
 JMS HLOOPM /CHECK FOR HALT AND LOOP
 NOP /CHECK FOR LOOP
 JMP* EXRAN

/MULTIPLY SHIFT CONTROL

05747	740040	MULSHT	XX	
05750	207407		LAC (MULS-21	/ONE SHIFT
05751	046334		DAC HMPY+4	/HARDWARE INSERT
05752	777777		LAW -1	/ONE
05753	046360		DAC MP4-3	/SOFTWARE INSERT
05754	105765		JMS EXMUL	/GO TO MULTIPLY
05755	206334		LAC HMPY+4	/MULTIPLY INSTRUCTION
05756	547410		SAD (MULS	/22 SHIFTS
05757	625747		JMP* MULSHT	/YES EXIT
05760	446334		ISZ HMPY+4	/INCREMENT HARDWARE SHIFT
05761	750001		CLC	
05762	346360		TAD MP4-3	
05763	046360		DAC MP4-3	/INCREMENT SOFTWARE SHIFT
05764	605754		JMP .-10	
		/MULTIPLY	RANDOM NUMBERS (RAN2 X RAN3)	
05765	740000	EXMUL	NOP	
05766	207411		LAC (770000	
05767	047147		DAC CTRAN#	/RANDOM NUMBER COUNTER 4096
05770	207412		LAC (003466	
05771	046021		DAC RAN1	
05772	207413		LAC (153501	
05773	046022		DAC RAN2	
05774	207414		LAC (210762	
05775	046023		DAC RAN3	
05776	106007		JMS RAN	/RANDOM NUMBER GENERATOR
05777	104157		JMS LOOP2	/LOOP SET UP
06000	106065		JMS SOFMUL	/SOFTWARE MULTIPLY
06001	106075		JMS HARMUL	/HARDWARE MULTIPLY
06002	106105		JMS MULCOM	/HARDWARE=SOFTWARE
06003	104130		JMS HLOOPS	/HALT-LOOP?
06004	447147		ISZ CTRAN	
06005	605776		JMP .-7	
06006	625765		JMP* EXMUL	/EXIT
			.EJECT	

```

/RANDOM NUMBER GENERATOR
06007 000000 RAN 0
06010 206021 LAC RAN1
06011 106024 JMS RDGEN
06012 046021 DAC RAN1 /FIRST NUMBER
06013 106024 JMS RDGEN
06014 046022 DAC RAN2 /SECOND NUMBER
06015 106024 JMS RDGEN
06016 046023 DAC RAN3 /THIRD NUMBER
06017 626007 JMP* RAN

/
06020 335671 RNO 335671
06021 003466 RAN1 003466
06022 153501 RAN2 153501
06023 210762 RAN3 210762

/
06024 000000 RDGEN 0
06025 046064 DAC RWRK
06026 206052 LAC RANDEX
06027 547415 SAD (RANTBL+10)
06030 741000 SKP
06031 606041 JMP RANTAD
06032 207416 LAC (RANTBL
06033 046052 DAC RANDEX
06034 206051 LAC RANCON
06035 744010 CLL!RAL
06036 741400 SZL
06037 347213 TAD (1
06040 046051 DAC RANCON
06041 226052 RANTAD LAC* RANDEX
06042 346051 TAD RANCON
06043 066052 DAC* RANDEX
06044 206064 LAC RWRK
06045 740020 RAR
06046 366052 TAD* RANDEX
06047 446052 ISZ RANDEX
06050 626024 JMP* RDGEN
.EJECT

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06051	123456	RANCON	123456
06052	006063	RANDEX	RANTBL+10
06053	654321	RANTBL	654321
06054	361416		361416
06055	055363		055363
06056	546060		546060
06057	243035		243035
06060	762572		762572
06061	453237		453237
06062	150214		150214
06063	000000		0
06064	000000	RWRK	0
			.EJECT

```

/SOFTWARE MULTIPLY (RAN2 X RAN3)
06065 740000 SOFMUL NOP
06066 206022 LAC RAN2
06067 136340 JMS MULT
06070 206023 LAC RAN3 /LOW ORDER IN AC HIGH ORDER IN MP5
06071 047164 DAC LPRODS# /LOW ORDER
06072 207170 LAC MP5
06073 047161 DAC HPRODS /HIGH ORDER
06074 626065 JMP* SOFMUL /EXIT

/HARDWARE MULTIPLY
06075 740000 HARMUL NOP
06076 206023 LAC RAN3 /MULTIPLIER
06077 106330 JMS HMPY
06100 206022 LAC RAN2 /MULTIPLICAND
06101 047160 DAC HPRODH /HIGH ORDER
06102 641002 LACQ
06103 047163 DAC LPRODH /LOW ORDER
06104 626075 JMP* HARMUL /EXIT

/
/COMPARE PRODUCT OF SOFTWARE + HARDWARE
06105 740000 MULCOM NOP
06106 207160 LAC HPRODH#
06107 547161 SAD HPRODS#
06110 741000 SKP
06111 606115 JMP .+4 /HIGH ORDER NOT EQUAL
06112 207163 LAC LPRODH#
06113 547164 SAD LPRODS
06114 606117 JMP .+3
06115 106750 JMS BADMUL /LOW ORDER NOT EQUAL
06116 106256 JMS MULCT /LOW ORDER NOT EQUAL
06117 626105 JMP* MULCOM

/
/DIVIDE SHIFT CONTROL
06120 740040 DIVSHT HLT
06121 207417 LAC (DIVS-22 /ONE SHIFT COUNT
06122 046324 DAC HDIVID+6 /HARDWARE INSERT
06123 777777 LAW -1 /ONE
06124 046436 DAC DV4+4 /SOFTWARE INSERT
06125 106136 JMS EXDIV /GO TO DIVIDE
06126 206324 LAC HDIVID+6 /DIVIDE INSTRUCTION
06127 547420 SAD (DIVS /23 SHIFTS
06130 626120 JMP* DIVSHT /YES EXIT
06131 446324 ISZ HDIVID+6 /INC HARDWARE SHIFT
06132 750001 CLC
06133 346436 TAD DV4+4 /INC SOFTWARE SHIFT
06134 046436 DAC DV4+4
06135 606125 JMP .-10
.EJECT

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06136 740000 /DIVIDE RANDOM NUMBERS (RAN1,RAN3)/(RAN2)
06137 207411 EXDIV NOP
06140 047147 LAC (770000
06141 207413 DAC CTRAN /RANDOM NUMBER COUNTER 4096
06142 046022 LAC (153501
06143 207414 DAC RAN2
06144 046023 LAC (210762
06145 106007 DAC RAN3
06146 104157 JMS RAN /RANDOM NUMBER GENERATOR
06147 106170 JMS LOOP2 /LOOP SETUP
06150 106156 JMS SOFDIV /SOFTWARE DIVIDE
06151 106201 JMS HARDIV /HARDWARE DIVIDE
06152 104130 JMS DIVCOM /HARDWARE=SOFTWARE
06153 447147 JMS HLOOPS /CHECK HALT LOOP
06154 606145 ISZ CTRAN
06155 626136 JMP .-7
JMP* EXDIV
.EJECT
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/HARDWARE DIVIDE
06156 740000 HARDIV NOP
06157 206023 LAC RAN3
06160 652000 LMQ /DIVIDEND LOW ORDER
06161 206021 LAC RAN1 /DIVIDEND HIGH ORDER
06162 106316 JMS HDIVID
06163 206022 LAC RAN2 /DIVISOR
06164 047174 DAC REMH /HARDWARE REMAINDER
06165 641002 LACQ
06166 047172 DAC QUOTH /HARDWARE QUOTIENT
06167 626156 JMP* HARDIV

/
/SOFTWARE DIVIDE (RAN1,RAN3)/(RAN2)
06170 740000 SOFDIV NOP
06171 206021 LAC RAN1 /HIGH ORDER DIVIDEND
06172 106413 JMS DIVIDE
06173 206023 LAC RAN3 /LOW ORDER DIVIDEND
06174 206022 LAC RAN2 /DIVISOR
06175 047173 DAC QUOTS /SOFTWARE QUOTIENT
06176 207150 LAC DVD
06177 047175 DAC REMS /SOFTWARE REMAINDER
06200 626170 JMP* SOFDIV

/
/COMPARE QUOTIENT AND REMAINDERS
06201 740000 DIVCOM NOP
06202 206156 LAC HARDIV /GET LINK FROM SOFTWARE DIVIDE
06203 741400 SZL /CHECK LINK FROM HARDWARE DIVIDE
06204 740001 CMA /HDW LINK=1, SO COMPL SOFW LINK.
06205 741100 SPA /AC SHOULD BE PLUSE FOE EQUAL LINKS
06206 606216 JMP DVCMER /LINKS NOT EQUAL, REPORT ERROR.
06207 207172 LAC QUOTH#
06210 547173 SAD QUOTS#
06211 741000 SKP
06212 606216 JMP .+4 /QUOTIENT NOT EQUAL
06213 207174 LAC REMH#
06214 547175 SAD REMS#
06215 606220 JMP .+3
06216 106664 DVCMER JMS BADDIV /REMAINDER NOT EQUAL
06217 106221 JMS DIVCT /PERCENT OF TIMES
06220 626201 JMP* DIVCOM

/
.EJECT

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/NUMBER OF TIMES DIVS BAD
DIVCT      HLT
06221      740040
06222      107026      JMS PRINT
06223      207347      LAC (-100           /TIMES CHECK
06224      047153      DAC EAEDON#        /TIMES COUNTER
06225      147204      DZM XBAD#          /CL TIMES FOUND BAD
06226      106170      JMS SOFDIV
06227      106156      JMS HARDIV
06230      206156      LAC HARDIV         /GET SFTW LINK
06231      741400      SZL                /CHECK HDW LINK
06232      740001      CMA                /HDW LINK=1, SO COMPL SFT LINK
06233      741100      SPA                /AC MUST BE PLUS FOR EQUAL LINES
06234      606244      JMP DCTER /NOT EQUAL, GO TO ERROR.
06235      207172      LAC QUOTH
06236      547173      SAD QUOTS
06237      741000      SKP                /GOOD
06240      606244      JMP .+4            /BAD
06241      207174      LAC REMH
06242      547175      SAD REMS
06243      741000      SKP                /GOOD
06244      447204      DCTER ISZ XBAD     /BAD INCREMENT TIMES FOUND
06245      447153      ISZ EAEDON        /LIMITS
06246      606226      JMP DIVCT+5       /LOOP
06247      106306      JMS TIMTEX        /PRINT ROUTINE
06250      105412      TCR
06251      206324      LAC HDIVID+6
06252      105314      JMS OPT
06253      207421      LAC (DISC+1
06254      740040      HLT
06255      626221      JMP* DIVCT        /EXIT

/NUMBER OF TIMES MULS BAD
MULCT      HLT
06256      740040
06257      107026      JMS PRINT
06260      207347      LAC (-100           /TIMES CHECK
06261      047153      DAC EAEDON        /TIMES COUNTER
06262      147204      DZM XBAD          /CL TIMES FOUND BAD
06263      106065      JMS SOFMUL
06264      106075      JMS HARMUL
06265      207160      LAC HPRODH
06266      547161      SAD HPRODS
06267      741000      SKP                /GOOD
06270      606274      JMP .+4            /BAD
06271      207163      LAC LPRODH
06272      547164      SAD LPRODS
06273      741000      SKP                //GOOD
06274      447204      ISZ XBAD          /BAD INCREMENT TIMES FOUND
06275      447153      ISZ EAEDON        /LIMITS
06276      606263      JMP MULCT+5       /LOOP
06277      106306      JMS TIMTEX        /PRINT ROUTINE
06300      105412      TCR
06301      206334      LAC HMPY+4
06302      105314      JMS OPT
06303      207422      LAC (MSC+1
06304      740040      HLT

```

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EAE-II

06305 626256

JMP* MULCT
.EJECT

/EXIT

```

/PRINT ROUTINE OF TIME BAD
06306 740040 TIMTEX HLT
06307 107026 JMS PRINT
06310 765725 LAW TEXTJ /OUT OF 100 CHECKS BAD XX.
06311 105225 TSR
06312 105354 TSP
06313 207204 LAC XBAD /XX
06314 105333 JMS TYP03
06315 626306 JMP* TIMTEX /EXIT

/
/HARDWARE ARITHMETIC SUBROUTINES
/SIGNED DIVIDE SUBROUTINE
/CALLING SEQUENCE
/DIVIDE IN AC AND HQ
/JMS HDIVIDE
/PICKUP OTHER FACTOR
/
06316 000000 HDIVID 0 /ENTRY TO SUBROUTINE
06317 047202 DAC TEM#
06320 426316 XCT* HDIVID
06321 664000 GSM
06322 046325 DAC HDIVL
06323 207202 LAC TEM
06324 644323 DIVS
06325 000000 HDIVL 0 /LOCATION OF DIVISOR
06326 446316 ISZ HDIVID
06327 626316 JMP* HDIVID
.EJECT

```

```

/SIGNED MULTIPLY SUBROUTINE
/CALLING SFQUENCF.
/ONE FACTOR IN AC
/JMS HMPY
/PICK UP OTHER FACTOR
/
HMPY      0
          GSM
          DAC .+3
          XCT* HMPY
          MULS
          0
          ISZ HMPY
          JMP* HMPY
          .EJECT

/LACXXX ON LAC I XXX
/ENTRY TO SUBROUTINE
/FIX MULTIPLIER MAGNITUDE
/LAC MULTIPLICAND
/LOCATION OF MULTIPLIER
/INDEX RETURN
```

```

/PDP-15 ONE'S COMPLEMENT SINGLE PRECISION MULTIPLICATION SUBROUTINE
/HARDWARE SIMULATION
/CALLING SEQUENCE:
  /LAC MULTIPLIER
  /JMS MULT
  /LAC MULTIPLICAND
  /RETURN; LOW ORDER PRODUCT IN AC, HIGH ORDER PRODUCT
  /IN MP5

```

06340	000000	MULT	Ø
06341	147170		DZM MP#5
06342	741200		SNA
06343	740000		NOP
06344	745100		SPA:CLL
06345	740003		CMA:CML
06346	047165		DAC M#P1
06347	426340		XCT* MULT
06350	741200		SNA
06351	740000		NOP
06352	741100		SPA
06353	740003		CMA:CML
06354	047166		DAC MP#2
06355	207423		LAC (360000
06356	740010		RAL
06357	046400		DAC MPSIGN
06360	777756		LAW -22
06361	047167		DAC MP#3
06362	740000		NOP
06363	207165	MP4	LAC MP1
06364	740020		RAR
06365	207170		LAC MP5
06366	745400		SZL:CLL
06367	347166		TAD MP2
06370	740020		RAR
06371	047170		DAC MP5
06372	207165		LAC MP1
06373	740020		RAR
06374	047165		DAC MP1
06375	207170		LAC MP5
06376	447167		ISZ MP3
06377	606411		JMP MPZ+2
06400	000000	MPSIGN	Ø
06401	047170		DAC MP5
06402	207165		LAC MP1
06403	740000		NOP
06404	406400		XCT MPSIGN
06405	047165		DAC MP1
06406	740000		NOP
06407	446340	MPZ	ISZ MULT
06410	626340		JMP* MULT
06411	740000		NOP
06412	606363		JMP MP4
			.EJECT

```

/PDP-15 ONE'S COMPLEMENT DIVIDE SUBROUTINE HARWARE SIMULATION
/CALLING SFQUENCE,
/
/   LAC HIGH ORDER DIVIDEND/   JMS DIVIDE
/   LAC LOW ORDER DIVIDEND
/   LAC DIVISOR
/   RETURN,QUOT. IN AB, REM. IN D#VD
/IF HIGH DIVIDEND S GREATER OR EQUAL TO DIVISOR, DIVIDE TAKES
/PLACE AND LINK IS SET TO 1.
DIVIDE   0   /HIGH ORDER DIVIDEND IN AC

06413   000000
06414   745100   SPA:CLL   /IS DIVIDEND POSITIVE
06415   740003   CMA:CML   /NO, COMPLEMENT AC AND LINK
06416   047150   DAC D#VD   /STORE HIGH ORDER DIVIDEND
06417   426413   XCT* DIVIDE /FETCH LOW ORDER DIVIDEND
06420   741400   SZL       /DIVIDEND SIGN BIT POSITIVE?
06421   740001   CMA       /NO, COMPLEMENT LOW ORDER DIVIDEND
06422   047171   DAC Q#10  /STORE LOW ORDER DIVIDEND
06423   106424   JMS DV5   /DEPOSIT DIVIDEND SIGN BIT INTO DV5M
06424   000000   DV5      0   /REMAINDER HAS SIGN OF DIVIDEND
06425   446413   ISZ DIVIDE
06426   426413   XCT* DIVIDE /FETCH DIVISOR
06427   741100   SPA       /SKIP IF SIGN POSITIVE
06430   740003   CMA:CML   /COMPLEMENT AC AND LINK
06431   106432   JMS DV4   /DEPOSIT QUOTIENT SIGN BIT INTO DV4
06432   000000   DV4      0   /CONTAINS SIGN BIT OF QUOTIENT
06433   744000   CLL       /CLEAR LINK
06434   047151   DAC D#VS  /SAVE DIVISOR
06435   446413   ISZ DIVIDE /INCREMENT TO EXIT ADDRESS
06436   777755   LAW -23   /SET UP "STEP COUNTER"
06437   047152   DAC DV#1
06440   206503   LAC SVCB
06441   046476   DAC SVC0  /SET SAVE CARRY SWITCH TO INITIAL
06442   147200   DZM SVCRY /CLEAR SAVED CARRY.
06443   740000   DSP1     NOP
06444   207151   LAC DVS   /FETCH DIVISOR
06445   606460   JMP DV2A-1 /START DIVISION
.EJECT

```


06446	206475	DV2	LAC QHIB	/GET SAVED HI QUOTIENT BIT
06447	740010		RAL	/PUT BIT INTO LINK
06450	207150		LAC DVD	/GET DIVIDEND
06451	740010		RAL	/INSERT HI QUOT INTO DIVIDEND
06452	047150		DAC DVD	/STORE NEW DIVIDEND
06453	740000	DSP3	NOP	
06454	206464		LAC DCRY	/GET LAST CARRY
06455	740010		RAL	/PUT INTO LINK
06456	207151		LAC DVS	/GET DIVISOR
06457	745400		SZL:CLL	/IF LINK IS 1, ADD NEG DIVISOR,
06460	740031		CMA:IAC	/IF LINK IS 0, ADD POS DIVISOR,
06461	347150	DV2A	TAD DVD	/ADD DIVISOR (+,-) TO DIVIDEND
06462	047150		DAC DVD	/STORE NEW DIVIDEND
06463	106464		JMS .+1	
06464	000000	DCRY	0	/SAVE CARRY
06465	740000	DSP2	NOP	
06466	207200		LAC SVCRY	/CHECK LAST
06467	741100		SPA	/CARRY,=1 IF OVERFLOW
06470	740002		CML	/IF OVERFLOW ERROR LAST CYCLE, /COMPLEMENT THIS INSERT BIT,
06471	207171		LAC QUO	/GET QUOTIENT
06472	740010		RAL	/INSERT CARRY INTO QUOTIENT.
06473	047171		DAC QUO	/STORE NEW QUOTIENT.
06474	106475		JMS .+1	/SAVE HI BIT FOR
06475	000000	QHIB	0	/INSERTION INTO DIVIDEND.
06476	740040	SVC0	HLT	
06477	606513		JMP SVC2	/1ST - SAVE EXTRA SIGN BIT
06500	606510		JMP SVC1	/2ND - SAVE SIGN BIT, CHECK XSIGN BIT
06501	606504		JMP SVC1A	/3RD - CHECK SIGN BIT.
06502	606516		JMP SVC3	/OTHERS - CONTINUE
06503	606477	SVCB	JMP	SVC0+1
06504	207200	SVC1A	LAC SVCRY	
06505	741100		SPA	
06506	606550		JMP OVRFLO	
06507	606515		JMP SVC3-1	
06510	207200	SVC1	LAC S#VCRY	/TEST SAVED SIGN BIT
06511	741100		SPA	/MUST=0
06512	606550		JMP OVRFLO	/NOT=0, OVERFLOW
06513	206464	SVC2	LAC DCRY	
06514	047200		DAC SVCRY	/SAVE CARRY FOR TEST NEXT CYCLE
06515	446476		ISZ SVC0	/INCREMENT SWITCH
06516	447152	SVC3	ISZ DV1	/INCREMENT STEP COUNTER
06517	606446		JMP DV2	/GO TO NEXT DIVIDE CYCLE
			.EJECT	

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                                /STEP COUNTER=0
06520 206464 LAC DCRY /TEST LAST CARRY
06521 741100 SPA
06522 606527 JMP DV3 /IF=1 NO CORRECTIONS NEEDED
06523 740000 NOP
06524 207151 LAC DVS /WAS 0
                                /ADD (+) DIVISOR TO CORRECT
                                /DVD VALUE FOR REMAINDER
06525 347150 TAD DVD
06526 047150 DAC DVD
06527 206424 DV3 LAC DV5 /CHECK DIVIDEND SIGN
06530 740010 RAL /
06531 740000 DSP5 NOP
06532 207150 LAC DVD /
06533 741401 SZL:CMA /IF MINUS, COMPLEMENT REMAINDER
06534 047150 DAC DVD /
06535 206432 LAC DV4 /CHECK DIVISOR SIGN
06536 740010 RAL
06537 207171 LAC QUO
06540 741400 SZL /IF MINUS, COMPLEMENT QUOTIENT
06541 740001 CMA
06542 047171 DAC QUO
06543 207200 LAC SVCRY /SET LINK TO DETERMINED VALUE
06544 740010 RAL
06545 207171 LAC QUO
06546 740000 DSP6 NOP
06547 626413 JMP* DIVIDE
                                /OVERFLOW OCCURRED
06550 207152 OVRFLO LAC DV1
06551 740030 IAC
06552 740100 SMA
06553 606527 JMP DV3
06554 206475 LAC QHIB /GET SAVED HI QUOTIENT BIT
06555 740010 RAL
06556 207150 LAC DVD /PUT INTO DIVIDEND
06557 740010 RAL
06560 047150 DAC DVD /STORE NEW DIVIDEND
06561 606527 JMP DV3 /GO TO ADJUST SIGNS
                                .EJECT

```

```

/OUTPUT ROUTINE FOR TTY
06562 000000 OTY 0
06563 707704 LEM
06564 700406 TLS
06565 700401 TSF
06566 606565 JMP .-1
06567 626562 JMP* OTY

/MAKE THREE CHARACTERS OUT OF AN AC WORD
/ABCD ENTRANCE TO SUBROUTINE
/XXXX LHE OF ADDRESS FIELD
//XXXX RHE OF ADDRESS FELD
ABCD JMS .
DAC IACW
ISZ ABCD
LAC* ARCD
DAC TACW#
ISZ ABCD
LAC* IACW#
ISZ ABCD
LAC* IACW
SAD TACW
JMP* ARCD
ISZ IACW
JMP .-6

/OCTAL OUTPUT SUBROUTINE
/OCTOUT ENTRANCE TO ROUTINE
/XXXX LHE OF ADDRESS FIELD
/XXXX RHE OF ADDRESS FIELD
/OCTOUT JMS .
LAC* OCTOUT
DAC IACW
ISZ OCTOUT
LAC* OCTOUT
DAC TACW
ISZ OCTOUT
LAC* IACW
JMS OPS
LAC IACW
SAD TACW
JMP* OCTOUT
ISZ IACW
JMP .-6
.EJECT

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06623	740040	RUN	HLT	
06624	104164		JMS LOOP5	/LOOP SET UP
06625	105024		JMS BEGIN	/TEST WITH CONSTANTS
06626	104140		JMS HLOOPL	/HALT LOOP
06627	104164		JMS LOOP5	/LOOP SET UP
06630	105735		JMS EXRAN	/TEST WITH RANDOMS
06631	104140		JMS HLOOPL	/JMS HLOOPL
06632	106642		JMS PROK	
06633	447146		ISZ CTCMPT#	/PASS COMPLETE COUNTER
06634	606624		JMP RUN+1	/LOOP
06635	606624		JMP RUN+1	
			/BELL AT END OF PASS	
06636	740040	BELL	HLT	
06637	207424		LAC (207207	/RING BELL
06640	106562		JMS OTY	
06641	626636		JMP* BELL	
		/		
			/PRINT "OK" AT END OF PASS	
06642	740040	PROK	HLT	
06643	750004		LAS	
06644	507353		AND (004000	
06645	741200		SNA	
06646	626642		JMP* PROK	
06647	446663		ISZ OKCTR	
06650	606654		JMP .+4	
06651	105412		TCR	
06652	207425		LAC (-30)	
06653	046663		DAC OKCTR	
06654	207426		LAC (317	
06655	106562		JMS OTY	
06656	207427		LAC (313	
06657	106562		JMS OTY	
06660	207403		LAC (240	
06661	106562		JMS OTY	
06662	626642		JMP* PROK	
06663	777777	OKCTR	777777	
			/TEXT FOR RAD DIVS	
06664	740040	BADDIV	HLT	
06665	107026		JMS PRINT	/PRINT?
06666	105412		TIN	
06667	765636		LAW TEXTE	/DIVS FAILED
06670	105225		TSR	
06671	105345		TYT	
06672	105345		TYT	
06673	105354		TSP	
06674	105354		TSP	
06675	206022		LAC RAN2	/DIVISOR
06676	105314		JMS OPS	
06677	105345		TYT	
06700	206021		LAC RAN1	/C (AC) HIGH ORDER DIVIDEND
06701	105314		JMS OPS	
06702	105345		TYT	/TAB
06703	206023		LAC RAN3	/C (MQ) LOW ORDER DIVIDEND
06704	105314		JMS OPS	
06705	105412		TCR	/CR. LF

06706	105345	TYT	
06707	105345	TYT	
06710	765656	LAW TEXTF	/QUOTIENT
06711	105225	TSR	
06712	105354	TSP	
06713	105354	TSP	
06714	207173	LAC QUOTS	/QUOTIENT (SOFT)
06715	105314	JMS OPS	
06716	105345	TYT	/TAB
06717	105345	TYT	
06720	207175	LAC REMS	/REMAINDER (SOFT)
06721	105314	JMS OPS	
06722	105345	TYT	
06723	206156	LAC HARDIV	/GET SFTW LINK
06724	740010	RAL	
06725	750010	CLA:RAL	/CLEAR AC AND PUT LINK IN AC17
06726	105401	TDIGIT	/TYPE
06727	765632	LAW TEXTD	
06730	105225	TSR	
06731	105354	TSP	
06732	105354	TSP	
06733	207172	LAC QUOTH	/QUOTIENT (HARD)
06734	105314	JMS OPS	
06735	105345	TYT	
06736	105345	TYT	
06737	207174	LAC REMH	/REMAINDER (HARD)
06740	105314	JMS OPS	
06741	105345	TYT	
06742	206201	LAC DIVCOM	/GET HDW LINK
06743	740010	RAL	
06744	750010	CLA:RAL	/CLEAR AC AND PUT LINK IN AC17
06745	105401	TDIGIT	/TYPE
06746	105412	TCR	
06747	626664	JMP* BADDIV	
		.EJECT	

			/TEXT FOR RAD MULS	
06750	740040	BADMUL	HLT	
06751	107026		JMS PRINT	/PRINT?
06752	105412		TIN	
06753	765576		LAW TEXTB	/MULS FAILED, MULTIPLIER, MULTIPLICAND
06754	105225		TSR	
06755	105412		TCR	
06756	105345		TYT	
06757	105345		TYT	
06760	105345		TYT	
06761	206022		LAC RAN2	/MULTIPLIER
06762	105314		JMS OPS	
06763	105345		TYT	/TAB
06764	105354		TSP	
06765	105345		TYT	
06766	206023		LAC RAN3	/MULTIPLICAND
06767	105314		JMS OPS	
06770	105412		TCR	
06771	105345		TYT	
06772	105345		TYT	
06773	105345		TYT	
06774	765615		LAW TEXTC	/HIGH ORDER, LOW ORDER
06775	105225		TSR	
06776	765666		LAW TEXTF+10	
06777	105225		TSR	/SOFTWARE
07000	105345		TYT	
07001	105345		TYT	
07002	207161		LAC HPRODS	/HIGH ORDER PRODUCT SOFT
07003	105314		JMS OPS	
07004	105345		TYT	/TAB
07005	105345		TYT	
07006	105345		TYT	
07007	207164		LAC LPRODS	/LOW ORDER PRODUCT (SOFT)
07010	105314		JMS OPS	
07011	765632		LAW TEXTD	
07012	105225		TSR	
07013	105345		TYT	
07014	105345		TYT	
07015	207160		LAC HPRODH	/HIGH ORDER PRODUCT (HARD)
07016	105314		JMS OPS	
07017	105345		TYT	
07020	105345		TYT	
07021	105345		TYT	/TAB
07022	207163		LAC LPRODH	/LOW ORDER PRODUCT (HARD)
07023	105314		JMS OPS	
07024	105412		TCR	
07025	626750		JMP* BADMUL	/RETURN
			.EJECT	

07026	740000	PRINT	/CHECK FOR PRINTOUT
07027	750004		NOP
07030	507254		LAS
07031	741200		AND (400000
07032	627026		SNA
07033	207026		JMP* PRINT
07034	347321		LAC PRINT
07035	047026		TAD (777776
07036	227026		DAC PRINT
07037	047026		LAC* PRINT
07040	106636		DAC PRINT
07041	627026		JMS BELL
			JMP* PRINT
		/	
07042	740040	BALINK	/TEXT FOR BAD LINK DURING DIVIDE
07043	107026		HLT
07044	765674		JMS PRINT
07045	105225		LAW TEXTG
07046	627042		TSR
		/	
07047	105412	FIRST	/INITIAL TEXT
07050	765420		TIN
07051	105225		LAW TEXTA
07052	147146		TSR
07053	606623		DZM CTCMPT
			JMP RUN
			.EJECT

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/ROUTINES FOR SIMULATION OF TYPEOUT
/ SIMULATION SETUP
SETSIM  HLT
        TIN
        LAW TEXTH           /L C(AC)  C(MQ)   C(SCA)
        TSR
        JMP* SETSIM
/
/PRINT OUT MULTIPLY SIMULATION
MULSIM  HLT
        JMS STACLK         /STORE AC AND LINK
        TIN
        LAC (0)           /LINK=0
        TDIGIT
        TYT
        LAC MP5           /(AC)
        JMS OPS
        TyT
        LAC MP1           /(MQ)
        JMS OPS
        TYT
        LAC MP3           /(SCA)
        AND (000077
        JMS TYP03
        JMS FTACLK         /RESTORE AC AND LINK
        JMP* MULSIM
/
/PRINTOUT FOR DIVIDE SIMULATION
DIVSIM  HLT
        JMS STACLK         /STORE AC AND LINK
        TIN
        LAC DIVSIM
        SMA
        JMP .+4
        LAC (1)
        TDIGIT
        JMP .+3
        LAC (0)
        .EJECT

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07054  740040
07055  105412
07056  765710
07057  105225
07060  627054

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07061  740040
07062  107131
07063  105412
07064  207211
07065  105401
07066  105345
07067  207170
07070  105314
07071  105345
07072  207165
07073  105314
07074  105345
07075  207167
07076  507225
07077  105333
07100  107135
07101  627061

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07102  740040
07103  107131
07104  105412
07105  207102
07106  740100
07107  607113
07110  207213
07111  105401
07112  607115
07113  207211

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07114 105401 TDIGIT
07115 105345 TYT
07116 207150 LAC DV0 / (AC)
07117 105314 JMS OPS
07120 105345 TYT
07121 207171 LAC QU0 / (MQ)
07122 105314 JMS OPS
07123 105345 TYT
07124 207152 LAC DV1 / (SCA)
07125 507225 AND (000077)
07126 105333 JMS TYPC03
07127 107135 JMS FTACKL /RESTORE AC AND LINK
07130 627102 JMP* DIVSIM

/
07131 740040 STACKL /STORE AC AND LINK
07132 047134 XX /LINK STORED IN MSB
07133 627131 DAC STACKL+3
07134 000000 JMP* STACKL /STORE AC
0

/
07135 740040 FTACKL /FETCH AC AND LINK
07136 207131 XX /
07137 740010 LAC STACKL /GET STORED LINK
07140 207134 RAL /RESTORE LINK
07141 627135 LAC STACKL+3 /RESTORE AC
JMP* FTACKL /EXIT

/
07205 000000 .END
07206 070707 *L
07207 252525 *L
07210 707070 *L
07211 525252 *L
07212 000000 *L
07213 777777 *L
07214 000001 *L
07215 577777 *L
07216 000003 *L
07217 477777 *L
07220 000007 *L
07221 437777 *L
07222 000017 *L
07223 417777 *L
07224 000037 *L
07225 407777 *L
07226 000077 *L
07227 403777 *L
07228 000177 *L
07230 401777 *L
07231 000377 *L
07232 400777 *L
07233 000777 *L
07234 400377 *L
07235 001777 *L
07236 400177 *L
07237 003777 *L

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07240	400077	*L
07241	007777	*L
07242	400037	*L
07243	217777	*L
07244	400017	*L
07245	037777	*L
07246	400007	*L
07247	077777	*L
07250	400003	*L
07251	177777	*L
07252	400001	*L
07253	377777	*L
07254	400000	*L
07255	052523	*L
07256	052524	*L
07257	125246	*L
07260	125250	*L
07261	252514	*L
07262	252520	*L
07263	525230	*L
07264	125241	*L
07265	252461	*L
07266	252503	*L
07267	525142	*L
07270	125207	*L
07271	252305	*L
07272	252417	*L
07273	524612	*L
07274	125037	*L
07275	251425	*L
07276	252077	*L
07277	523052	*L
07300	124177	*L
07301	246125	*L
07302	250377	*L
07303	514252	*L
07304	120777	*L
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07306	241777	*L
07307	461252	*L
07310	103777	*L
07311	142525	*L
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07314	612525	*L
07315	037776	*L
07316	425252	*L
07317	000002	*L
07320	777775	*L
07321	777776	*L
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07323	777773	*L
07324	777772	*L
07325	777774	*L
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07327	700000	*L
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07331	252526	*L
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07334	677777	*L
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07354	100000	*L
07355	020000	*L
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07357	204376	*L
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07367	004776	*L
07370	005022	*L
07371	204776	*L
07372	205012	*L
07373	205017	*L
07374	107061	*L
07375	740000	*L
07376	107102	*L
07377	151200	*L
07400	000040	*L
07401	000200	*L
07402	000300	*L
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07405	000215	*L
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07407	657101	*L
07410	657122	*L
07411	770000	*L
07412	003466	*L
07413	153501	*L
07414	210762	*L
07415	006063	*L

07416	006053	*L
07417	644301	*L
07420	644323	*L
07421	005202	*L
07422	005164	*L
07423	360000	*L
07424	207207	*L
07425	777750	*L
07426	000317	*L
07427	000313	*L

NO ERROR LINES

ABCD	06570
ADDCT	07142
ADVP	00203
ANDBUF	05110
ASTRIC	07143
RADDIV	06664
RADMJL	06750
RALINK	07042
REGIN	05024
RELL	06636
RITCT	07144
CKFLAG	04342
CLBUF	05052
CLOF	700004
CLON	700044
CLSF	700001
CTADD	07145
CTCMPT	07146
CTRAN	07147
DCRY	06464
DCTER	06244
DECONT	05360
DISC	05201
DIVA	03517
DIVB	03537
DIVC	03557
DIVCOM	06201
DIVCT	06221
DIVD	03577
DIVE	03617
DIVF	03637
DIVG	03657
DIVIDE	06413
DIVSHT	06120
DIVSIM	07102
DIVTST	03477
DSC1	02255
DSC10	02435
DSC11	02455
DSC12	02475
DSC13	02515
DSC14	02535
DSC15	02555
DSC16	02575
DSC17	02615
DSC2	02275
DSC20	02635
DSC21	02655
DSC3	02315
DSC4	02335
DSC5	02355
DSC6	02375
DSC7	02415
SPEED	03755
1	06443

DSP2	06465
DSP3	06453
DSP4	06523
DSP5	06531
DSP6	06546
DVCMER	06216
DVD	07150
DVS	07151
DV1	07152
DV2	06446
DV2A	06461
DV3	06527
DV4	06432
DV5	06424
EAEDON	07153
ERFLAG	07154
ERRBIT	07155
FRWOR	04376
FXDIV	06136
EXMUL	05765
EXRAN	05735
FACT	05047
FIAC	07156
FILHLT	04264
FILZER	04250
FIMO	07157
FIRST	07047
FTACK	07135
HARDIV	06156
HARMUL	06075
HDIVID	06316
HDIVL	06325
HLOOPL	04140
HLOOPM	04134
HLOOPS	04130
HLTL	04220
HLTM	04212
HLTS	04202
HMPY	06330
HPRODH	07160
HPRODS	07161
IACW	07162
IDIVS	657323
IOR	04166
IORBUF	05144
KRB	700312
KSF	700301
LENGTH	05023
LOOKUP	05031
LOOPA	04122
LOOPL	04143
LOOPM	04234
LOOPS	04226
LOOP2	04157
LOOP4	04162

LOOP5	04164
LPRODH	07163
LPRODS	07164
MPSIGN	06400
MPZ	06407
MP1	07165
MP2	07166
MP3	07167
MP4	06363
MP5	07170
MSC	05163
MSPEED	03701
MULA	03357
MULB	03377
MULC	03417
MULCOM	06105
MULCT	06256
MULD	03437
MULE	03457
MULSHT	05747
MULSIM	07061
MULT	06340
MULTST	03337
NDIV	00707
NDIVS	01020
NEAB	00360
NEAE	00246
NFRDIV	01347
NFRDVS	01457
NIDIV	01127
NIDIVS	01237
NMUL	00467
NMULS	00577
OCTOUT	06605
OKCTR	06663
OPS	005314
OPT	005314
QTY	06562
OVRFLO	06550
PCF	700202
PRINT	07026
PROK	06642
PSA	700204
PSB	700244
PSF	700201
QHIB	06475
QUO	07171
QUOTH	07172
QUOTS	07173
RAN	06007
RANCON	06051
RANDEX	06052
RANTAD	06041
RANTBL	06053
RAN1	06021

RAN2	06022
RAN3	06023
RBCW	04363
RCF	700102
RDGEN	06024
REMH	07174
REMS	07175
RNO	06020
RRB	700112
RSA	700104
RSR	700144
RSF	700101
RUN	06623
RWRK	06064
SCAN	04315
SETBIT	04301
SETSIM	07054
SETUP	04347
SHCT1	01571
SHCT10	01760
SHCT11	02001
SHCT12	02022
SHCT13	02043
SHCT14	02064
SHCT15	02105
SHCT16	02126
SHCT17	02147
SHCT2	01612
SHCT20	02170
SHCT21	02211
SHCT22	02232
SHCT3	01633
SHCT4	01654
SHCT5	01675
SHCT6	01716
SHCT7	01737
SIGNA	03001
SIGNB	03025
SIGNC	03051
SIGND	03121
SIGNE	03145
SIGNF	03171
SINGG	03241
SINGH	03265
SIGNI	03311
SOFDIV	06170
SOFMUL	06065
SPAC	05354
SPACE2	05406
SPMUNV	04035
STABUF	05064
STACLK	07131
STDIVS	02755
STEMA	07176
STEMB	07177

STFOVS	03215
STIDVS	03075
STMUL	02677
STMULS	02716
SVCB	06503
SVCRY	07200
SVC0	06476
SVC1	06510
SVC1A	06504
SVC2	06513
SVC3	06516
SWIT6	04151
SWIT7	04242
TACW	07201
TADBUF	05126
TCF	700402
TCR	105412
TDIGIT	105401
TEM	07202
TEMY1	07203
TEXTA	05420
TEXTB	05576
TEXTC	05615
TEXTD	05632
TEXTE	05636
TEXTF	05656
TEXTG	05674
TEXTH	05710
TEXTI	05724
TEXTJ	05725
TIMTEX	06306
TIN	105412
TLS	700406
TSF	700401
TSP	105354
TSR	105225
TYCRLF	05412
TYPCHR	05250
TYPCON	05314
TYPC03	05333
TYPOCT	05401
TYP SAV	05307
TYPTSR	05225
TYPTYT	05345
TYT	105345
WORDA	04776
XBAD	07204

IORBUF	05144
MSC	05163
DISC	05201
TYPTSR	05225
TYPCHR	05250
TYPSAV	05307
OPS	005314
OPT	005314
TYPCON	05314
TYPC03	05333
TYPTYT	05345
SPAC	05354
DECONT	05360
TYPOCT	05401
SPACE2	05406
TYCRLF	05412
TEXTA	05420
TEXTB	05576
TEXTC	05615
TEXTD	05632
TEXTE	05636
TEXTF	05656
TEXTG	05674
TEXTH	05710
TEXTI	05724
TEXTJ	05725
EXRAN	05735
MULSHT	05747
FXMUL	05765
RAN	06007
RNO	06020
RAN1	06021
RAN2	06022
RAN3	06023
RDGEN	06024
RANTAD	06041
RANCON	06051
RANDEX	06052
RANTBL	06053
RWRK	06064
SOFMUL	06065
HARMUL	06075
MULCOM	06105
DIVSHT	06120
FXDIV	06136
HARDIV	06156
SOFDIV	06170
DIVCOM	06201
DVCMER	06216
DIVCT	06221
DCTER	06244
MULCT	06256
TIMTEX	06306
HDIVID	06316
HDIV!	06325

HMPY	06330
MULT	06340
MP4	06363
MPSIGN	06400
MPZ	06407
DIVIDE	06413
DV5	06424
DV4	06432
DSP1	06443
DV2	06446
DSP3	06453
DV2A	06461
DCRY	06464
DSP2	06465
QHIB	06475
SVC0	06476
SVCB	06503
SVC1A	06504
SVC1	06510
SVC2	06513
SVC3	06516
DSP4	06523
DV3	06527
DSP5	06531
DSP6	06546
OVRFLO	06550
OTY	06562
ABCD	06570
ACTOUT	06605
RUN	06623
BELL	06636
PROK	06642
OKCTR	06663
BADDIV	06664
BADMUL	06750
PRINT	07026
BALINK	07042
FIRST	07047
SETSIM	07054
MULSIM	07061
DIVSIM	07102
STACLK	07131
FTACLK	07135
ADDCT	07142
ASTRIC	07143
RITCT	07144
CTADD	07145
CTCMPT	07146
CTAN	07147
DVD	07150
DVS	07151
DV1	07152
EAEDON	07153
ERELAG	07154
ERELAG T	07155

FIAC	07156
FIMQ	07157
HPRDHD	07160
HPRODS	07161
IACW	07162
LPRDHD	07163
LPRODS	07164
MP1	07165
MP2	07166
MP3	07167
MP5	07170
QUO	07171
QUOTH	07172
QUOTS	07173
REMH	07174
REMS	07175
STEMA	07176
STFMB	07177
SVCRY	07200
TACW	07201
TEM	07202
TEMY1	07203
XBAD	07204
TSR	105225
TYT	105345
TSP	105354
TDIGIT	105401
TCR	105412
TIN	105412
IDIVS	657323
CLSF	700001
CLOF	700004
CLON	700044
RSF	700101
RCF	700102
RSA	700104
RRB	700112
RSR	700144
PSF	700201
PCF	700202
PSA	700204
PSR	700244
KSF	700301
KRR	700312
TSF	700401
TCF	700402
TLS	700406