

IDENTIFICATION

Product Code: Maindec 9A-D7AB-D
Product Name: PDP-9 Basic Exerciser
Date Created: November 27, 1967
Maintainer: Diagnostics Group
Author: J. W. Richardson



1. ABSTRACT

The PDP-9 Basic Exerciser is designed to exercise the CP, core memory and I/O devices associated with a basic PDP-9 configuration. Once initiated, the program will perform tests on all operate and memory reference instructions, tests on the adder, memory checkerboard patterns, tests on the real-time clock, punch, reader, Teletype and program interrupt.

The Basic Exerciser contains a condensed version of the PDP-9 Instruction Test, Parts 1 and 2, and a memory checkerboard test similar to the PDP-9 Basic Memory Checkerboard Test. These tests run continuously, and are interrupted by the punch, reader or Teletype at a device rate. The real-time clock will interrupt and suspend all operations at random time intervals. The instruction test or I/O device resumes operation after the clock interrupt has been serviced.

Nine ACS functions are provided to enable the operator to (1) inhibit the instruction and memory tests and run the real-time clock, program interrupt, and the punch, read, print sequence alone; (2) inhibit program interrupts and run the instruction and memory tests alone; (3) loop continuously on the adder test; (4) loop continuously on the memory checkerboard test; (5) inhibit program relocation; (6) inhibit the real-time clock, but continue testing with program interrupt and all other devices enabled; (7) run the instruction and memory tests, and the clock and punch with the read and print sequence inhibited; (8) run the reader, real-time clock and instruction and memory tests with the punch and Teletype inhibited; (9) run the read and print sequence, real-time clock and instruction and memory tests with the punch inhibited.

2. REQUIREMENTS

2.1 Equipment

A basic PDP-9 configuration.

2.2 Storage

The program requires all 8K of core memory to perform all tests. The program initially resides in memory locations 00000 to 7730. When the program is relocated to the higher 4K field, it occupies locations 10022 to 17730.

3. LOADING PROCEDURE

The tape supplied is punched in the HRI mode.

- a. Set the ADDRESS switches to 00000.
- b. Place all AC switches down.

- c. Place the HRI tape in the reader.
- d. Press I/O RESET, and then READ-IN.

The program is not self-starting.

4. STARTING PROCEDURE

4.1 Starting Addresses

22 or 10022 if the program is currently in the upper 4K field.

4.1.1 Restarting Addresses - 26 or 10026 if the program is currently in the upper 4K field.

4.2 Operator Action

FOR PDP-7, see below

- a. Set the ADDRESS switches to 22.
- b. Place all ACS down for normal program operation. See paragraph 5.1 for use of the ACS to inhibit certain portions of the program.
- c. Press I/O RESET, and then START.
- d. Approximately 3-1/2 feet of leader will be punched. This leader is blank except for one frame which has all channels punched.
- e. Place the punched frame directly over the reader drive sprocket, and position the tape between reader and punch for minimum binding.
- f. Press CONTINUE.
- g. The program will run until an error halt occurs, or manually stopped by the operator.
- h. Steps c through f above are similar to the procedure performed with the PDP-9 punch

test.

4.2.1 Restarting Procedure -

- a. Set the ADDRESS switches to 26.
- b. Place all ACS down for normal program operation. See paragraph 5.1 for use of the ACS to inhibit certain portions of the program. *Set sw's 6, 7, 8 up.*
- c. If the punch, read and print sequence is not inhibited, make sure there is tape in the reader. The tape does not have to be blank leader when restarting.
- d. Press ~~I/O RESET~~, and then START.
- e. The program will run until an error halt occurs, or manually stopped by the operator.

5. OPERATING PROCEDURE

5.1 Operational Switch Settings

Normal program operation is achieved by placing all ACS down before starting from locations 22 or 26.

The operator is provided nine options with which to modify the operation of the program. These may be selected by placing any one or a combination of ACS 0 through 8 up before starting from locations 22 or 26.

To make changes in the ACS settings, the program must be stopped by the operator before the changes are made. The program must then be restarted from location 26 (or 22 if new leader is desired). The program may not recognize the new ACS settings if the above procedure is not followed.

ACS Functions

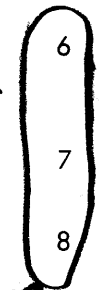
- | | | |
|---|-----|---|
| 0 | (1) | Run only the punch, read and print sequence plus the real-time clock. Program interrupt will be enabled. |
| 1 | (1) | Inhibit the punch, read and print sequence. Program interrupt is disabled. The real-time clock is on. The complete instruction test and memory checkerboard test will be performed. |
| 2 | (1) | Loop continuously on the "add random pairs" test. The real-time clock, punch, read and print sequence plus program interrupt will be enabled unless specified otherwise by an ACS. |
| 3 | (1) | Loop continuously on the memory checkerboard test. Program relocation will not take place. Program action otherwise is the same as that described for ACS 2. |
| 4 | (1) | Inhibit program relocation. Unless otherwise specified, the program will run in a normal way, but will not relocate from its current 4K field location to the opposite field after completing the memory checkerboard test. |
| 5 | (1) | Inhibit clock. Unless otherwise specified, program action is normal except that the clock should always be off. |
| 6 | (1) | Inhibit the reader and TTY. The punch will run continuously. Tape must be in the reader to prevent the no-tape indicator from being set. Program action is normal unless otherwise specified. |
| 7 | (1) | Inhibit the punch and TTY. The reader will run continuously. A loop or fan-fold tape with any data may be used. Program action is normal unless otherwise specified. |
| 8 | (1) | Inhibit the punch. The reader will read 52 characters at full speed and then halt. The TTY will then print the 52 characters read. Any tape loop or fan-fold tape may be used. Program action is normal unless otherwise specified. |

Any combination of the nine ACS may be used, as long as the operations do not conflict; i.e., if ACS 2 and 3 are both up, the add random pairs test would be looped. Memory checkerboard would not be run unless the program is restarted with ACS 3 alone.

If using tape loop, use Sw 8 only - Do not let reader run out of tape.

*Note: For PDP-7 operation,
Patch 162 to 600223.
(End of tape with reader not printing)*

PDP-7



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The I/O devices may be controlled with several combinations of ACS 6, 7 and 8. If ACS 7 and 8 are both up the reader will run continuously, as if ACS 7 only were up. If ACS 6 and 7 or 6 and 8 are up, all devices will be inhibited. Program interrupt and the real-time clock will be enabled unless otherwise specified.

5.2 Subroutine Abstracts

The PDP-9 Basic Exerciser may be thought of as three separate programs; i.e., the instruction and memory tests; punch, read and print sequence, and operation of the real-time clock. The instruction and memory tests will be interrupted, at a device rate, by the punch, reader or Teletype. The clock will randomly interrupt any of the above operations at a rate determined by the program. After each clock interrupt, the clock is reinitialized with a new number obtained by a random number generator. The clock interrupts should occur no less than 2 seconds apart, nor more than 9 seconds. The clock interrupts take first priority, followed by the Teletype, reader, and punch.

5.2.1 Instruction and Memory Tests - The instruction test portion of the Basic Exerciser performs tests on all operate group and memory reference instructions. The individual instructions are looped a random number of times before proceeding to the next test. The maximum number of loops made on any one test is 32,767.

The adder is tested using two different methods. The first performs bit by bit tests on the adder using the ADD instruction. Besides checking for correct results after an addition, the link is tested during overflow and no overflow conditions.

The second method, the "Add Random Pairs" test, tests the adder using one pair of random numbers (A and B) and their 1's complement values (-A and -B), and the ADD instruction. These four values are added in various combinations, the results of which are compared against precalculated results. The precalculated results are obtained by adding the two pairs together using the TAD instruction. Four additions are made, the results of which are used in the test. The link is tested after each addition. If it is a 1, a 1 is added to the result to simulate an end-around-carry.

The numbers added and their sums are indicated in the listing using the following symbols:

-B+(-A)	=	SUMNEG
A+B	=	SUMPOS
B-A	=	BMASUM
A-B	=	AMBSUM

The values of A, -A, B and -B plus their sums are used to test the combinations of ADD's shown below.

<u>ADD</u>	<u>SUM SHOULD EQUAL</u>
A + B	SUMPOS
-B + A	AMBSUM
-B + (-A)	SUMNEG
B - A	BMASUM
(A + B) - A	BPOS (B)
(B - A) - B	ANEG (-A)
(-A - B) + A	BNEG (-B)
(A - B) + B	APOS (A)
777777 + A	APOS
A + B - A	BPOS
A + B -A -A	BMASUM (B - A)
A + B -A -A -B	ANEG
A + B -A -A -B -B	SUMNEG (-A -B)
A + B -A -A -B -B + A	BNEG
A + B -A -A -B -B + A + A	AMBSUM (-B + A)
A + B -A -A -B -B + A + A + B	APOS

After completing one pass of the above tests, a second pass is made on the same tests. The second pass makes all "B" constants "A", and all "A" constants "B" before repeating.

Immediately following the second pass, one random number and its 1s complement is obtained and saved in APOS and ANEG, respectively. Bit 0 of APOS is tested for equaling 0 or 1. If the value is 1, the bit remains unchanged, and the respective bit in the complement number is changed to equal a 1. The two numbers are then added together, the sum of which should equal all 0s except for bit 0. If the ADD is successful, the program continues testing all other bit positions in the same manner.

Example: (Bit 0 altered)

<u>Step</u>	<u>APOS Value</u>	<u>ANEG Value</u>
1	577776	200001
2	577776	600001 (bit 0 altered)
3	Add together. Result should = altered bit.	
	$ \begin{array}{r} 101 \ 111 \ 111 \ 111 \ 111 \ 110 \\ + 110 \ 000 \ 000 \ 000 \ 000 \ 001 \\ \hline 011 \ 111 \ 111 \ 111 \ 111 \ 111 \\ + 1 \text{ (end around carry)} \\ \hline 100 \ 000 \ 000 \ 000 \ 000 \ 000 \end{array} $	

The sum equals the altered bit position.

After completing the adder tests, the remaining memory reference instructions are tested. The last test performed by the exerciser is the memory checkerboard test. This routine writes and reads four different checkerboard patterns similar to the Basic Memory Checkerboard program. The memory test is looped three times before program relocation takes place.

After completing the memory checkerboard test, the program relocates the entire Basic Exerciser to the opposite 4K field. All memory reference instructions and memory locations used for testing are adjusted accordingly. All locations within the program which reference any memory location between 0 and 21 are not adjusted. These locations are used during program interrupts, autoindexing tests, etc., and must not be altered. Program interrupt is disabled while relocation is taking place.

After relocation of the program is completed, the exerciser is automatically restarted at location 70 (or 10067). This location is tagged SEQUEN. The operator is able to determine the location of the program by observing MB bit 5. This bit will glow brightly when the program is in the higher 4K field, as compared to when residing in the lower 4K field.

The Teletype BELL will ring once for each completed pass of the program. One pass is defined as the program performing all tests from each 4K field, and then relocating back to the field in which the program was first initiated.

When operating the Basic Exerciser with program interrupt inhibited (ACS 1 up), the message "COMPLETE" will be printed after five complete passes of the program. This message is printed after ten passes when ACS 4 (inhibit relocation) as well as ACS 1 is up. This feature is included as a means to determine the number of successful passes completed by the program if it is to be run for extended periods of time.

5.2.2 Punch, Read, Print Sequence - The instruction and memory tests will be interrupted, at a device rate, by the punch, reader, or Teletype. The data punched consists of the alphabet characters, followed by numbers 0 through 9, with a space character being punched between each letter or numeral character. The reader will read the tape at punch speed, storing away any punched character. Frames of all 0s are ignored. The punch and read sequence consists of 52 ASCII characters punched, read and stored away in an input buffer (tagged TTBUFA). After reading the 52nd character, the contents of TTBUFA are transferred directly to another 52 - location buffer tagged TTBUFB. This second buffer is provided to enable the operator to stop the program and compare the contents of either buffer A or buffer B with the punched data on tape. Punch and read operation is halted after the 52nd character is read and stored. The contents of TTBUFB are then printed on the Teletype. The punch and read sequence continues immediately after the 52nd character is printed. The data punched and read should appear on the Teletype as the example below.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	0	1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	0	1	2	3	4	5	6	7	8	9

The punch and read sequence generates 72 characters altogether, even though only 52 are punched, read and printed at one time. The alphabet and numbers sets with a space between each character enables a full line to be printed. The spacing also enables the operator to more easily detect a misprinted character. Each group of 72 characters is separated by 8 blank frames. The group which is positioned in the reader is the current line being printed. A carriage return and a line feed is punched at the end of each group. The program will punch 6 extra blank frames between two groups, approximately every fourteenth group, to enable the slack between reader and punch to remain constant.

5.2.3 Use of the Real Time Clock - The instruction and memory tests, and the punch, read and print sequence are both interrupted randomly by the real-time clock. When a clock interrupt occurs, all other operations are halted until the clock interrupt has been serviced. The program allows the clock to continue incrementing for 1/2 second after the interrupt occurs. This is evident during every clock interrupt by observing MB indicators 12 through 17 incrementing. Immediately after the clock has incremented, an additional 1/2 second, it is reset to a new random value. This value is chosen by the program to ensure that the clock interrupts no sooner than 2 seconds, nor later than 9 seconds. The clock is again enabled after being reset to a new value, and the instruction test or read, punch and print sequence is allowed to continue from the point of interrupt.

At times, the Basic Exerciser may appear to be caught in a loop after a clock interrupt occurs. The console indicators will show the clock and PIE as being disabled, and the punch, read and print sequence will be halted for several seconds. The program during this time is attempting to generate a number for the clock which falls within the 2 to 9 second limit. All operations will be resumed as soon as a suitable random value is found.

The operator may disable the clock interrupts by restarting from location 26 with ACS 5 up.

5.2.4 Interrupt Service Routine - Program interrupts by the clock, punch, reader or Teletype are all serviced by a common routine. A common routine for reentering the instruction test is also used.

Locations 0 through 6 are used to save the contents of the AC and PC immediately after an interrupt occurs. The contents of the AC are stored in the location tagged SAVAC. The contents of the link and PC are stored in the location tagged RJMP. The program then enters a routine which determines which of the four devices interrupted the program. This routine is tagged SRVINT. SRVINT will test for device flags in the following order: clock, Teletype, no-tape flags, reader, punch. The first device flag found to be set indicates the device which must be reinitiated by the program.

Immediately after selecting the proper device, a routine is entered which will restore the contents of the link and AC at the time of the program interrupt. The routine is tagged RTNIT. RTNIT first restores the AC (from SAVAC); restores the link (by testing bit 0 of RJMP); enables program interrupt; and then returns to the instruction test by a JMP indirect on the contents of RJMP.

The operator may disable program interrupts by restarting from location 26 with ACS 1 up.

5.3 Program and Operator Action

See Sections 4.2 and 5.2.

6. ERRORS

6.1 Error Halts and Description

Reference the program listing for all error halts.

All error halts are tagged EXXX, and are commented to aid debugging. Each test is self-contained, and may be looped. See Section 6.2.1 for looping instructions.

Unless a solution is obvious from following the listing, the proper MAINDEC diagnostic for the device in error should be run. This should be necessary mainly when errors are caused by one of the I/O devices. The diagnostics for the I/O devices are listed below:

<u>Device</u>	<u>Program</u>
Real-Time Clock	Instruction Test Part 1
Program Interrupt	Instruction Test Part 1
Punch	Punch Test (9A-D2DB)
Reader	Reader Test (9A-D2CB)
Teletype	TTY Test (9A-D2BB)

Incorrect operation of the real-time clock will appear as clock interrupts occurring sooner than 2 seconds apart, or greater than 9 seconds, or possibly no clock interrupts will occur. Also, after a clock interrupt, the clock should not increment further for any longer than approximately 1/2 second.

Printing of incorrect data may be caused by the data being incorrectly punched, read, or printed. Storage registers, and their locations in the program, which the punch, read, print sequence use are listed below.

<u>Tag</u>	<u>Function</u>
SAVAC (7643)	Saves contents of AC after a program interrupt.
RJMP (7644)	Saves contents of PC and link after a program interrupt.
WORK (7600)	Bit 1 if set indicates TTY is in use.
GOPNCH (6763)	Contains contents of PC at exit from punch routine.
SETCLK (6604)	Routine which sets a random value in clock register 7 when program interrupt is disabled.
CLKSET (6621)	Same function as SETCLK, but is used only after a clock interrupt.
TTOUT (7326)	Location pointer for TTBUFB when printing.
TTIN (7327)	Location pointer for TTBUFA when reading.

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<u>Tag</u>	<u>Function</u>
TTBUFA (7361 to 7444)	Storage buffer for characters read.
TTBUFB (7445 to 7531)	Storage for characters to be printed. Contents should equal TTBUFA.
STORE (7336)	Contains character punched.
SETTY (7037)	Routine which is entered after 52 characters have been punched and read. Sets up TTBUFB before printing.
GENRAN (6101)	Random number generator used when PI is disabled.
RANGEN (6133)	Same as GENRAN, but used only after an interrupt.

When data is incorrectly printed, stop the program during print-out. This will enable both TTBUFA and TTBUFB to remain unchanged. TTBUFA will be changed as soon as reading begins.

The data punched is in ASCII mode, and one printed line is indicated on the paper tape by 8 blank frames separating each line. The punched data starts with character A (301) and ends with a line feed (212). A space (240) is punched between all alphabet and number characters.

The line of punched characters in the reader is the line currently being printed. The operator may inspect the tape for an incorrect character punched. If it appears correctly on the tape, it may have been read or printed incorrectly. The characters read are stored in a 52-word buffer beginning at location 7330 (tagged TTBUFA). The characters being printed are stored in a 52-word buffer beginning at location 7414 (tagged TTBUFB). If the program was stopped during printing, these two buffers should contain exactly the same information. The first character read or printed is stored in the first location of either buffer. One character is stored per location. If the data was read incorrectly, the contents of TTBUFA will not equal the last 52 characters on the tape. If the data on tape, and in TTBUFA and TTBUFB are equal, the teleprinter may be at fault.

6.2 Error Recovery

Press CONTINUE to receive further error halts or to continue testing, as indicated by the listing.

Recovery from error halts in the Add Random Pairs test is accomplished by pressing CONTINUE one or more times, depending on the type of error encountered. Pressing CONTINUE after a halt due to an incorrect sum will result in a second halt. The AC will equal the incorrect sum at the first halt, and the sum used for comparison at the second halt. If the error halt is the result of a LINK error, the next test in sequence will be executed.

Recovery from memory checkerboard errors is accomplished by pressing CONTINUE four times. The memory test is restarted after each error halt.

The contents of the AC after each halt will equal the information below.

<u>C (PC)</u>	<u>C (AC)</u>
6351	The address at which the memory error occurred.
6353	What the location should equal (000000 or 777777).
6355	The data as read.
6362	The pattern control word used.

Bit suppression may be accomplished by placing the corresponding ACS up after the halt at location 6354. Place all other ACS down, press CONTINUE, place all ACS down again, and then restore ACS 0 through 5 if needed. The bits selected will not be tested again during the memory test. The selected bits must be reselected after each error halt.

The memory checkerboard test may be continuously looped by restarting from location 26 with ACS 3 up. Program relocation will not take place.

6.2.1 Looping on Individual Tests - Looping on individual tests, except for the interrupt routines, Add Random Pairs test and Memory test, is accomplished by placing a JMP instruction in the first location of the next test in sequence. The address in the JMP instruction should equal the first location of the test to be looped. Restart the program at location 26, if program interrupt is to be enabled. Restart at the first location of the test to be looped, if interrupts are not wanted.

The complete series of tests for any one instruction may be looped by placing a NOP in the location which contains ISZ WORK3. This instruction appears at the end of each series of tests for each instruction. Restart at location 26, or at the beginning of the test to be looped.

6.2.2 Looping on Add Random Pairs - The complete series of tests may be looped by restarting from location 26 with ACS 2 up.

The individual tests may be looped by changing the LAW instruction, appearing after each test, to a JMP. For example, to loop on $(A-B) + B = A$ (tagged AMBPBT), change the LAW AMBPBT instruction to JMP AMBPBT. Restart from location 26, or AMBPBT.

6.2.3 Looping on Memory Checkerboard - Place ACS 3 up, and restart from location 26.

6.2.4 Error Print-outs - The program continually tests for reader or punch no tape indicators being set. When either indicator is set the message "R NO TAPE", or "P NO TAPE" will be printed. The program continues on in sequence after either print-out.

7. OPERATING RESTRICTIONS

All MAINDEC diagnostics which apply to a basic PDP-9 configuration should be run before attempting to run this program.

8. MISCELLANEOUS

8.1 Execution Time

Approximately 1-1/2 minutes are required to execute all tests for one 4K field.

9. PROGRAM DESCRIPTION

The Basic Exerciser performs tests on all operate and memory reference instructions plus core memory.

During normal operation (all ACS down) the program exercises the real-time clock, punch, reader, Teletype and program interrupt while the instruction test portion is running. The MB indicators will change according to the portion of the instruction test currently being executed. When a clock interrupt occurs the MB bits 12 to 17 will increment for 1/2 second (due to clock counts), after which the MB indicators will return to their original state upon re-entering the instruction test.

When the punch, read and print sequence is operated with the instruction test inhibited (ACS 0 up) the MB will indicate a constant 600131 (JMP 131). On the listing this is written as JMP. at location 131. At location 130 the program interrupt is enabled, and all device interrupts will cause an interrupt immediately after the execution of the JMP. instruction. The interrupts are handled in the same manner as if the instruction test portion were operating; the difference being that the interrupt service routine (RTNIT) always returns to location 131 after reinitiating the device which caused the interrupt, instead of returning to the instruction test portion.

The instruction test portion of the program consists of MAINDEC 9A-D01A and D02A (Instruction Test, Parts 1 and 2) condensed onto one tape. Refer to the program listing or flow chart for the testing sequence.

The memory test is executed after the instruction test portion is completed. This test is similar to MAINDEC 9A-D1AA Basic Memory Checkerboard Test. This test is performed three times, after which a routine is entered which relocates the Basic Exerciser to the opposite 4K field in core memory (unless ACS 4 is up). The Exerciser is automatically restarted after relocation is completed.

If no errors occur, the Basic Exerciser will run until stopped by the operator.

10. LISTING

BASEX9 PAGE 1

.TITLE BASEX9
/PDP-9 BASIC EXERCISFR
/

00000

.ARS
.LOC 0

/PDP-9 INSTRUCTION TEST (CONDENSED)

00000 000000
00001 741000
00002 740040

E1

0
SKP
HALT

/ERROR. PC INCREMENTED BY
/2 AT TIME OF P. I.
/SAVE AC

00003 047643
00004 200000
00005 047644
00006 606536

DAC SAVAC
LAC 0
DAC RJMP
JMP SRVINT

/SAVE PC AND LINK
/SERVICE INTERRUPT

740000
740000
740000
740040

/NOP1=NOP
NOP2=NOP
NOP3=NOP
HALT=HLT

00022

.LOC (22)

/REGIN

00022 107171
00023 107203
00024 107171
00025 740040
00026 147635
00027 147312
00030 703302
00031 147631
00032 146763
00033 206676
00034 047327
00035 047326
00036 447326
00037 167326
00040 207326
00041 546677
00042 741000
00043 600036
00044 206676
00045 047326
00046 206124
00047 047313
00050 777737
00051 047242
00052 447313
00053 167313
00054 447242
00055 600052

JMS PNLEDR
JMS PNMARK
JMS PNLEDR
HALT
DZM WORK4
DZM BREAK
CAF
DZM WORK
DZM GOPNCH
LAC DATARL
DAC TTIN
DAC TTOUT
ISZ TTOUT
DZM* TTOUT
LAC TTOUT
SAD ENDBIN
SKP
JMP .-5
LAC DATARL
DAC TTOUT
LAC ENDBIN
DAC WDCNT
LAW -41
DAC CRLF
ISZ WDCNT
DZM* WDCNT
ISZ CRLF
JMP .-3
.EJECT

/PRESS CONTINUE TO
/CLEAR GOPNCH

/SETUP POINTERS

/CLEAR TTY BIN

/RESTORE POINTER

/CLEAR ERROR TABLE

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00056	700002	I OF	/PI OFF
00057	750000	CLA	
00060	700104	RSA	/INITIALIZE READER, PUNCH
00061	750004	LAS	
00062	507547	AND K3K	
00063	741200	SNA	/IF ACS 7 OR 8 A 1, DON'T PUNCH
00064	700204	PSA	
00065	200130	LAC INITPI	/INITPI = PNSTR
00066	046763	DAC GPNCH	
00067	047644	DAC RJMP	/(RJMP) = PNSTR
00070	207617	LAC KSKP	/RESTORE ADDRESS 1 (SKP)
00071	040001	DAC 1	
00072	206533	LAC SAV3	/RESTORE ADDRESS 3
00073	040003	DAC 3	
00074	207652	LAC SAV4	/RESTORE ADDRESS 4
00075	040004	DAC 4	
00076	206534	LAC SAV5	/RESTORE ADDRESS 5
00077	040005	DAC 5	
00100	206535	LAC SAV6	/RESTORE ADDRESS 6
00101	040006	DAC 6	
00102	207650	LAC KHALT	/RESTORE ADDRESS 2 (HALT)
00103	040002	DAC 2	
00104	447635	ISZ WORK4	/PASS COUNTER
00105	750004	LAS	
00106	507556	AND K10K	
00107	741200	SNA	/CHECK ACS 5 FOR INHIBIT CLOCK
00110	106604	JMS SETCLK	
00111	750004	LAS	
00112	741100	SPA	
00113	600131	JMP INHIT	/INHIBIT INST. TEST
00114	740010	RAL	
00115	740100	SMA	/CHECK FOR INHIBIT PI
00116	700042	ION	/PI ON
00117	750004	LAS	
00120	507321	AND K100K	
00121	740200	SZA	/CHECK LOOP ON RANDOM ADD
00122	602360	JMP RANADD-2	/LOOP
00123	750004	LAS	
00124	507553	AND K40K	
00125	740200	SZA	/CHECK LOOP ON CHECKERBOARD
00126	606055	JMP E641+3	/LOOP
00127	600133	JMP TOTST-2	
00130	006702	/	
		INITPI PNSTR	
		/	
00131	700042	/INHIBIT INSTRUCTION TEST	
00132	600132	INHIT ION	
		JMP .	/WAIT FOR PI
		EJECT	

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/TEST CLEAR AC AT EVENT TIME 1 WITH MB 14.
/
00133      106102      JMS GENRAN      /GET NO. FOR LOOP
00134      106126      JMS CKNO
TOTST      CLA: CMA      /AC = 777777
           700110
           SZA      /AC = 0
F24      HALT      /ERROR. AC NOT 0
/
           CLA: CMA      /AC = 777777
           700210
           SZA      /AC = 0
F25      HALT      /ERROR. AC NOT 0
/
           CLA: CMA      /AC = 777777
           700310
           SZA      /AC = 0
F26      HALT      /ERROR. AC NOT 0
/
           CLA: CMA      /AC = 777777
           700010
           SZA      /AC = 0
F27      HALT      /ERROR. AC NOT 0
/
00155      447634      ISZ WORK3      /CHECK DONE LOOPING
00156      600135      JMP TOTST      /LOOP
00157      106102      JMS GENRAN      /GET NO. FOR NEXT TEST
00160      106126      JMS CKNO
           .EJECT

```

		/TEST IOT 3344 (DBR), L = 0	
		/	
00161	744000	TSDBR	CLL
00162	100204		JMS DBRX JMP 223
00163	741400		SZL
00164	740040	F28	HALT
		/	/ERROR. DBR FAILED; LINK NOT 0
		/TEST IOT 3344 (DBR), < = 1	
		/	
00165	744002		CLL:CML
00166	100204		JMS DBRX
00167	740400		SNL
00170	740040	F29	HALT
		/	/ERROR. DBR FAILED. LINK NOT 1
		/TEST IOT 3344 (DBR), L = 0	
		/	
00171	754000		CLL:CLA
00172	100207		JMS DBRXX
00173	740400		SNL
00174	740040	F30	HALT
		/	/ERROR. DBR FAILED, LINK NOT 1
		/TEST IOT 3344 (DBR), L = 1	
		/	
00175	754002		CLL:CML:CLA
00176	100215		JMS DBRXXX
00177	751400		CLA:SZL
00200	740040	E31	HALT
00201	447634		ISZ WORK3
00202	600161		JMP TSDBR
00203	600223		JMP OPRAT
		/	/ERROR. DBR FAILED, LINK NOT 0
00204	000000		/CHECK DONE LOOPING
00205	703344		/LOOP
00206	620204		/START INSTRUCTION TEST
		/	
00207	000000	DBRX	0
00210	200207		/LEAVE LINK ALONE
00211	347554		/DBR
00212	040207		
00213	703344		
00214	620207		
		/	
00215	000000	DBRXX	0
00216	200215		LAC DBRXX
00217	507627		TAD K400K
00220	040215		DAC DBRXX
00221	703344		703344
00222	620215		JMP DBRXX
		/	/SET LINK TO A ONE
		DBRXXX	0
			LAC DBRXXX
			AND M400K
			DAC DBRXXX
			703344
			JMP DBRXXX
			/CLEAR LINK
			/DBR
			.EJECT

		/TEST OPERATE GROUP	
		/	
00223	106100	OPRAT JMS GENRAN	/GET NO. FOR LOOP ON TEST
00224	106126	JMS CKNO	
00225	777777	OPERAT LAW 17777	/AC = 777777
		/	
00226	741000	SKP	/TEST SKP
00227	740040	F32 HALT	/ERROR; SKP FAILED TO SKIP
		/	
		/TEST CLA - SZA	
00230	750000	CLA	/AC = 0
00231	740200	SZA	
00232	740040	F33 HALT	/ERROR; CLA OR SZA FAILED TO SKIP
		/	
		/TEST SMA	
00233	750000	CLA	/AC = 0
00234	740100	SMA	
00235	741000	SKP	
00236	740040	F34 HALT	/ERROR; SAME SKIPPED
		/	
		/TEST SPA	
00237	750000	CLA	
00240	741100	SPA	
00241	740040	F35 HALT	/ERROR; SPA FAILED TO SKIP
		/	
		/TEST SNA	
00242	750000	CLA	
00243	741200	SNA	
00244	741000	SKP	
00245	740040	F36 HALT	/ERROR; SNA SKIPPED
		/	
		/TEST SZL - CLL	
00246	744000	CLL	/LINK = 0
00247	741400	SZL	
00250	740040	F37 HALT	/ERROR; SZL FAILED TO SKIP OR /CLL FAILED TO CLEAR LINK
		/	
		/TEST SNL	
00251	744000	CLL	/LINK = 0
00252	740400	SNL	
00253	741000	SKP	
00254	740040	F38 HALT	/ERROR; SNL SKIPPED
		.EJECT	

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00255	754000	/TEST CLA CLL	/AC, LINK = 0
00256	740200	CLA:CLL	
00257	740040	SZA	
		F39 HALT	/ERROR; AC NOT 0
		/	
00260	754000	/TEST CLA CLL	/AC AND LINK = 0
00261	741400	CLA:CLL	
00262	740040	SZL	
		F40 HALT	/ERROR; LINK NOT 0
		/	
00263	750000	/TEST SKP SPA	
00264	741100	CLA	
00265	740040	SKP:SPA	
		F41 HALT	/ERROR; SKP:SPA FAILED TO SKIP
		/	
00266	750000	/TEST SKP SNA	
00267	741200	CLA	
00270	741000	SKP:SNA	
00271	740040	SKP	
		F42 HALT	/ERROR; SKP:SNA SKIPPED
		/	
00272	744000	/TEST SKP SZL	/LINK = 1
00273	741400	CLL	
00274	740040	SKP:SZL	
		F43 HALT	/ERROR; SKP:SZL FAILED TO SKIP
		/	
00275	750000	/TEST SPA SNA	
00276	741300	CLA	
00277	741000	SPA:SNA	
00300	740040	SKP	
		F44 HALT	/ERROR; SPA:SNA SKIPPED
		/	
00301	754000	/TEST SPA SZL	/LINK AND AC = 0
00302	741500	CLA:CLL	
00303	740040	SPA:SZL	
		F45 HALT	/ERROR; SPA:SZL FAILED TO SKIP
		/	
00304	754000	/TEST SNA SZL	/LINK AND AC = 0
00305	741600	CLA:CLL	
00306	741000	SNA:SZL	
00307	740040	SKP	
		F46 HALT	/ERROR; SNA:SZL SKIPPED
		/	
00310	754000	/TEST SNA, SPA, SKP, SZL	/AC AND LINK = 0
00311	741700	CLA:CLL	
00312	741000	SKP:SPA:SZL:SNA	
00313	740040	SKP	
		F47 HALT	/ERROR; SNA:SPA:SKP:SZL SKIPPED
		.EJECT	

00314	750000	/TFST SMA SZA	
00315	740300	CLA	
00316	740040	SMA:SZA	
		E48 HALT	/ERROR; SMA SZA FAILED TO SKIP
		/	
00317	754000	/TFST SMA SNL	
00320	740500	CLA:CLL	/LINK AND AC = 0
00321	741000	SMA:SNL	
00322	740040	SKP	
		E49 HALT	/ERROR; SMA:SNL SKIPPED
		/	
00323	754000	/TFST SZA SNL	
00324	740600	CLA:CLL	
00325	740040	SZA:SNL	
		F50 HALT	/ERROR; SZA:SNL SKIPPED
		/	
00326	754000	/TFST SMA SZA SNL	
00327	740700	CLA:CLL	
00330	740040	SMA:SZA:SNL	
		F51 HALT	/ERROR; SMA:SZA:SNL FAILED TO SKIP
		/	
00331	744000	/TFST CML - SZL	
00332	740000	CLL	/LINK = 0
00333	741400	CML	/LINK = 1
00334	741000	SZL	
00335	740040	SKP	
		F52 HALT	/ERROR; SZL SKIPPED OR /CML FAILED TO SET LINK
		/	
00336	744000	/TFST CLL	
00337	740000	CLL	/LINK = 0
00340	744000	CML	/LINK = 1
00341	741400	CLL	/LINK = 0
00342	740040	SZL	
		F53 HALT	/ERROR; CLL FAILED TO CLEAR LINK
		/	
00343	744000	/TFST CML	
00344	740000	CLL	/LINK = 0
00345	740000	CML	/LINK = 1
00346	741400	CML	/LINK = 0
00347	740040	SZL	
		F54 HALT	/ERROR; CML FAILED TO SET LINK
		/	
00350	744000	/TFST CLL CML	
00351	740000	CLL	/LINK = 1
00352	744000	CML	/LINK = 1
00353	741400	CLL:CML	/LINK = 1
00354	741000	SZL	
00355	740040	SKP	
		F55 HALT	/ERROR; CLL:CML FAILED TO SET LINK
		.EJECT	

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00356	744000	/TEST CLL CML	
00357	740002	CLL	/LINK = 0
00360	744000	CML	/LINK = 1
00361	744002	CLL	/LINK = 0
00362	741400	CLL:CML	/LINK = 1
00363	741000	SZL	
00364	740040	SKP	
		F56 HALT	/ERROR: CLL:CML FAILED TO SET LINK
		/	
00365	744000	/TFST SKP SZL	
00366	741400	CLL	/LINK = 0
00367	740040	SKP:SZL	
		F57 HALT	/ERROR: SKP:SZL FAILED TO SKIP
		/	
00370	750000	/TFST SZL SNA	
00371	744002	CLA	/AC = 0
00372	741600	CLL:CML	/LINK = 1
00373	741000	SZL:SNA	
00374	740040	SKP	
		F58 HALT	/ERROR: SZL:SNA SKIPPED
		/	
00375	750000	/TFST SZL SPA	
00376	744002	CLA	/AC = 0
00377	741500	CLL:CML	/LINK = 1
00400	741000	SZL:SPA	
00401	740040	SKP	
		F59 HALT	/ERROR: SZL:SPA SKIPPED
		/	
00402	754002	/TEST CLA CLL CML	
00403	741400	CLA:CLL:CML	/AC = 0, LINK = 1
00404	741000	SZL	
00405	740040	SKP	
		E60 HALT	/ERROR: LINK NOT 1
		/	
00406	754002	/TEST CLA CLL CML	
00407	740200	CLA:CLL:CML	/AC = 0, LINK = 1
00410	740040	SZA	
		F61 HALT	/ERROR: AC NOT 0
		/	
00411	754002	/TFST SNL SZA	
00412	740600	CLA:CLL:CML	/AC = 0, LINK = 1
00413	740040	SNL:SZA	
		F62 HALT	/ERROR: SNL:SZA FAILED TO SKIP
		/	
00414	754002	/TFST SNL SMA	
00415	740500	CLA:CLL:CML	/AC = 0, LINK = 1
00416	740040	SNL:SMA	
		E63 HALT	/ERROR: SNL:SMA FAILED TO SKIP
		.EJECT	

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00417	754002	/TEST SNL SZA SMA	
00420	740700	CLA:CLL:CML	/AC = 0, LINK = 1
00421	740040	SNI:SZA:SMA	
		F64 HALT	/ERROR: SNL:SZA:SMA FAILED TO SKIP
		/	
00422	750000	/TEST CMA CLA	
00423	740001	CLA	/AC = 0
00424	750000	CMA	/AC = ONES
00425	741200	CLA	
00426	741000	SNA	
00427	740040	SKP	
		F65 HALT	/ERROR: CLA FAILED TO CLEAR AC
		/	
00430	750000	/TEST CMA SPA	
00431	740001	CLA	/AC = 0
00432	741100	CMA	/AC = ONES
00433	741000	SPA	
00434	740040	SKP	
		F66 HALT	/ERROR: SPA SKIPPED OR
		/	/CMA FAILED TO SET AC BIT 0
00435	750000	/TEST CMA SNA	
00436	740001	CLA	/AC = 0
00437	741200	CMA	/AC = ONES
00440	740040	SNA	
		F67 HALT	/ERROR: SNA FAILED TO SKIP
		/	/OR CMA FAILED TO SET ANY AC BIT
00441	750000	/TEST CMA	
00442	740001	CLA	/AC = 0
00443	740001	CMA	/AC = ONES
00444	741200	CMA	/AC = 0
00445	741000	SNA	
00446	740040	SKP	
		F68 HALT	/ERROR: CMA FAILED TO
		/	/COMPLEMENT AC TO 0
00447	750001	/TEST CLA CMA	
00450	741200	CLA:CMA	/AC = ONES
00451	740040	SNA	
		E69 HALT	/ERROR: CLA:CMA FAILED TO
			/SET ANY AC BIT
		.EJECT	

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00452	750001	/TEST SZA	CLA:CMA	/AC = ONES
00453	740200		SZA	
00454	741000		SKP	
00455	740040	E70	HALT	/ERROR; SZA SKIPPED
		/		
		/TEST SMA	CLA:CMA	/AC = ONES
00456	750001		SMA	
00457	740100			
00460	740040	E71	HALT	/ERROR; SMA FAILED TO SKIP
		/		
		/TEST SKP SPA	CLA:CMA	/AC = ONES
00461	750001		SKP:SPA	
00462	741100		SKP	
00463	741000			
00464	740040	E72	HALT	/ERROR; SKP:SPA SKIPPED
		/		
		/TEST SKP SNA	CLA:CMA	/AC = ONES
00465	750001		SKP:SNA	
00466	741200			
00467	740040	E73	HALT	/ERROR; SKP:SNA FAILED TO SKIP
		/		
		/TEST SPA SNA	CLA:CMA	/AC = ONES
00470	750001		SPA:SNA	
00471	741300		SKP	
00472	741000			
00473	740040	E74	HALT	/ERROR; SPA:SNA SKIPPED
		/		
		/TEST SKP SNA SPA	CLA:CMA:CLL:CML	/AC = ONES, LINK = 1
00474	754003		SNA:SPA:SKP:SZL	
00475	741700		SKP	
00476	741000			
00477	740040	E75	HALT	/ERROR; SKP:SNA:SPA:SZL SKIPPED
		/		
		/TEST SMA:SZA	CLA:CMA	/AC = ONES
00500	750001		SMA:SZA	
00501	740300			
00502	740040	E76	HALT	/ERROR; SMA:SZA FAILED TO SKIP
		/		
		/TEST SMA SZA SNL	CLA:CMA:CLL:CML	/AC = ONE, LINK = 1
00503	754003		SMA:SZA:SNL	
00504	740700			
00505	740040	E77	HALT	/ERROR; SMA:SZA:SNL
		/		
		/TEST NOP	CLA:CMA	/AC = ONES
00506	750001		NOP	
00507	740000		CMA	/AC = 0
00510	740001		SZA	
00511	740200			
00512	740040	E78	HALT	/ERROR; NOP ALTERED THE AC
		/		
			.EJECT	

350001 1F712-1

PC 012000

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00513	750000	/TFST NOP	CLA	/AC = 0
00514	740000		NOP	
00515	740200		SZA	
00516	740040	F79	HALT	/ERROR; NOP SET AN AC BIT
		/		
		/TFST NOT	CLL:CML	/LINK = 1
00517	744002		NOP	
00520	740000		SNL	
00521	740400		HALT	/ERROR; NO CLEARED THE LINK
00522	740040	E80		
		/		
		/TFST NOP	CLL	/LINK = 0
00523	744000		NOP	
00524	740000		SZL	
00525	741400		HALT	/ERROR; NOP SET THE LINK
00526	740040	E81		
		/		
		/TFST SZA	CMA	/AC = 0
00527	750000		CLA	/AC = ONES
00530	740201		SZA:CMA	/ERROR; SZA FAILED TO SKIP
00531	740040	F82	HALT	
		/		
		/TFST SZA	CLA	/AC = ONES
00532	750001		CLA:CMA	/AC = 0
00533	750200		SZA:CLA	
00534	741000		SKP	
00535	740040	E83	HALT	/ERROR; SZA SKIPPED
		/		
		/TEST SZL	CML	/LINK = 0
00536	744000		CLL	
00537	741402		SZL:CML	
00540	740040	F84	HALT	/ERROR; SZL FAILED TO SKIP
		/		
		/TFST SZL	CLL	/LINK = 1
00541	744002		CLL:CML	
00542	745400		SZL:CLL	
00543	741000		SKP	
00544	740040	F85	HALT	/ERROR; SZL SKIPPED
		/		
		/TEST SKP	SZL SPA CLA CLL	/AC = ONES, LINK = 1
00545	754003		CLA:CMA:CLL:CML	/AC = 0, LINK = 0
00546	755500		SKP:SZL:SPA:CLA:CLL	
00547	741000		SKP	
00550	740040	F86	HALT	/ERROR; SKP:SZL:SPA SKIPPED
			.EJECT	

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00551	754002	/TEST SZA SNL CMA CLL	
00552	744601	CLA:CLL:CML	/AC = 0, LINK = 1
00553	740040	SZA:SNL:CMA:CLL	/AC=ONFS, LINK =0
		F87 HALT	/ERROR, SZA:SNL FAILED TO SKP
		/	
00554	750001	/TEST CLA SKP	
00555	751000	CLA:CMA	/AC = ONES
00556	740000	SKP:CLA	/AC = 0
00557	740200	NOP	
00560	740040	SZA	
		F88 HALT	/ERROR, CLA FAILED TO CLEAR AC
		/	
00561	750000	/TEST SKP CLA CMA	
00562	751001	CLA	/AC = 0
00563	740000	SKP:CLA:CMA	/AC = ONES
00564	740001	NOP	
00565	740200	CMA	
00566	740040	SZA	
		F89 HALT	/ERROR, CLA:CMA FAILED TO /COMPLEMENT THE AC
		/	
00567	744000	/TEST SKP CLL CML	
00570	745002	CLL	/LINK = 0
00571	740000	SKP:CLL:CML	/LINK = 1
00572	740400	NOP	
00573	740040	SNL	
		F90 HALT	/ERROR, CLL:CML FALED TO SET THE LINK
		/	
00574	750001	/TEST CMA SERIES	
00575	740001	CLA:CMA	/AC = ONES
00576	740001	CMA	/AC = 0
00577	740001	CMA	/AC = ONFS
00600	740001	CMA	/AC = 0
00601	740001	CMA	/AC = ONFS
00602	740200	CMA	/AC = 0
00603	740040	SZA	
		F91 HALT	/ERROR, AC NOT 0 CMA FAILED
		/	
00604	744002	/TEST CML SERIES	
00605	740002	CLL:CML	/LINK = 1
00606	740002	CML	/LINK = 0
00607	740002	CML	/LINK = 1
00610	740002	CML	/LINK = 0
00611	740002	CML	/LINK = 1
00612	741400	CML	/LINK = 0
00613	740040	SZL	
		F92 HALT	/ERROR, LINK NOT 0 CML FAILED
		/	
00614	447634	IS7 WORK3	/CHECK DONE LOOPING
00615	600225	JMP OPERAT	/LOOP
00616	106102	JMS GENRAN	/GET NO, FOR NEXT LOOP
00617	106126	JMS CKNO	
		.EJECT	

↑↑↑↑

		/	
		/TEST RAR SERIES AND LINK	
00620	754002	RTAT	CLA:CLL:CML
00621	740020		/AC = 0, LINK = 1
00622	740020		
00623	740020		
00624	740020		
00625	740020		
00626	740020		
00627	740020		
00630	740020		
00631	740020		
00632	740020		
00633	740020		
00634	740020		
00635	740020		
00636	740020		
00637	740020		
00640	740020		
00641	740020		
00642	740020		
00643	741600		
00644	740040	E113	SNALSZL
			HALT
			/ERROR: AC BIT 17 NOT 1, OR LINK = 1
			/AFTER ROTATE SERIES
			.EJECT

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00645	754002	/TFST RAL SERIES AND LINK	
00646	740010	CLA:CLL:CML	/AC = 0, LINK = 1
00647	740010	RAL	
00650	740010	RAL	
00651	740010	RAL	
00652	740010	RAL	
00653	740010	RAL	
00654	740010	RAL	
00655	740010	RAL	
00656	740010	RAL	
00657	740010	RAL	
00660	740010	RAL	
00661	740010	RAL	
00662	740010	RAL	
00663	740010	RAL	
00664	740010	RAL	
00665	740010	RAL	
00666	740010	RAL	
00667	740010	RAL	
00670	741600	SNA:SZL	
00671	740040	E114 HALT	/ERROR: AC BIT 0 NOT 1, OR LINK = 1 /AFTER ROTATE SERIES
/			
00672	754002	/TFST RTL SERIES AND LINK	
00673	742010	CLA:CLL:CML	/AC = 0, LINK = 1
00674	742010	RTL	
00675	742010	RTL	
00676	742010	RTL	
00677	742010	RTL	
00700	742010	RTL	
00701	742010	RTL	
00702	742010	RTL	
00703	742010	RTL	
00704	741600	SNA:SZL	
00705	740040	F115 HALT	/ERROR: AC BIT 0 NOT 1, OR LINK = 1 /AFTER ROTATE SERIES
/			
00706	754002	/TEST RTR SERIES AND LINK	
00707	742020	CLA:CLL:CML	/AC = 0, LINK = 1
00710	742020	RTR	
00711	742020	RTR	
00712	742020	RTR	
00713	742020	RTR	
00714	742020	RTR	
00715	742020	RTR	
00716	742020	RTR	
00717	742020	RTR	
00720	741600	SNA:SZL	
00721	740040	F116 HALT	/ERROR: AC BIT 17 NOT 1, OR LINK = 1 /AFTER ROTATE SERIES

.EOT

/PDP-9 BASIC EXERCISER - TAPE 2

/

/RAR SERIES

RTSS

CLA!CMA!CLL

/AC = ONES, LINK = 0

RAR; RAR;

RAR; RAR

00722 754001
00723 740020
00724 740020
00725 740020
00726 740020
00727 740020
00730 740020
00731 740020
00732 740020
00733 740020
00734 740020
00735 740020
00736 740020
00737 740020
00740 740020
00741 740020
00742 740020
00743 740020
00744 740020
00745 740003
00746 741600
00747 740040

RAR; RAR; RAR; RAR

RAR; RAR; RAR; RAR

RAR; RAR; RAR; RAR

RAR; RAR

CMA!CML

/AC = 000001, LINK = 0

SNA!SZL

F140

HALT

/ERROR; AC BIT 17 NOT 1, OR LINK = 0
/AFTER ROTATE SERIES

/

/

/TFST RAL SERIES TEST

CLA!CMA!CLL

/AC = ONES, LINK = 0

RAL; RAL;

RAL; RAL

00750 754001
00751 740010
00752 740010
00753 740010
00754 740010
00755 740010
00756 740010
00757 740010
00760 740010
00761 740010
00762 740010
00763 740010
00764 740010
00765 740010
00766 740010
00767 740010
00770 740010
00771 740010
00772 740010
00773 740002
00774 741500
00775 740040

RAL; RAL; RAL; RAL

RAL; RAL; RAL; RAL

RAL; RAL; RAL; RAL

RAL; RAL; CML /AC = 377777, LINK = 0

SPA!SZL

F141

HALT

/ERROR; AC BIT 0 NOT 0, OR LINK = 0
/AFTER ROTATE SERIES

.EJECT

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00776 754001
00777 742010
01000 742010
01001 742010
01002 742010
01003 742010
01004 742010
01005 742010
01006 742010
01007 742010
01010 740002
01011 741500
01012 740040

```

/TEST RTL SERIES

```

CLA:CMA:CLL
RTL;      RTL;

```

```

/AC = ONES, LINK = 0
RTL;      RTL

```

```

RTL;      RTI;

```

```

RTL;      RTL

```

```

RTL;      CML

```

```

/LINK = 0

```

```

SPA:SZL
F142  HALT

```

```

/ERROR: AC BIT 0 NOT 0, OR LINK = 0
/AFTER ROTATE SERIES

```

/

/TEST RTR SERIES

```

CLA:CMA:CLL
RTR;      RTR;

```

```

/AC = ONES, LINK = 0
RTR;      RTR

```

```

RTR;      RTR;

```

```

RTR;      RTR

```

```

RTR
CMA:CML
SNA:SZL
F143  HALT

```

```

/AC = 000001, LINK = 0

```

```

/ERROR: AC BIT 17 NOT 1, OR LINK = 0
/AFTER ROTATE SERIES

```

.EJECT

		/		
		/TEST RAL:SNA		
01030	754002	CLA:CLL:CML	/AC = 0, LINK = 1	
01031	741210	RAL:SNA		
01032	741000	SKP		
01033	740040	F162 HALT	/ERROR: SNA SKIPPED	
		/		
		/TEST RAR:SNA		
01034	754002	CLA:CLL:CML	/AC = 0, LINK = 1	
01035	741220	RAR:SNA		
01036	741000	SKP		
01037	740040	F163 HALT	/ERROR: SNA SKIPPED	
		/		
		/TEST RTL:SNA		
01040	754002	CLA:CLL:CML	/AC = 0, LINK = 1	
01041	743210	RTL:SNA		
01042	741000	SKP		
01043	740040	F164 HALT	/ERROR: SNA SKIPPED	
		/		
		/TEST RTR:SNA		
01044	754002	CLA:CLL:CML	/AC = 0, LINK = 1	
01045	743220	RTR:SNA		
01046	741000	SKP		
01047	740040	F165 HALT	/ERROR: SNA SKIPPED	
		/		
		/TEST RAL:SNA		
01050	754002	CLA:CLL:CML	/AC = 0, LINK = 1	
01051	740020	RAR	/AC = 400000	
01052	741210	SNA:RAL		
01053	740040	F166 HALT	/ERROR: SNA FAILED TO SKIP	
		/		
		/TEST RAR:SNA		
01054	754002	CLA:CLL:CML	/AC = 0, LINK = 1	
01055	740010	RAL	/AC = 000001	
01056	741220	SNA:RAR		
01057	740040	F167 HALT	/ERROR: SNA FAILED TO SKIP	
		.EJECT		

01060 754002
 01061 742020
 01062 743210
 01063 740040

01064 754002
 01065 742010
 01066 743220
 01067 740040

01070 754001
 01071 751220
 01072 740040
 01073 447634
 01074 600620
 01075 106102
 01076 106126

/TEST RTL:SNA
 CLA:CLL:CML
 RTR
 SNA:RTL
 F168 HALT

/TEST RTR:SNA
 CLA:CLL:CML
 RTL
 SNA:RTR
 F169 HALT

/TEST CLL:SNA:RAR
 CLA:CMA:CLL
 CLA:SNA:RAR
 F170 HALT
 IS7 WORK3
 JMP RTAT
 JMS GENRAN
 JMS CKNO

.EJECT

/AC = 0, LINK = 1
 /AC = 200000

/ERROR: SNA FAILED TO SKIP

/AC = 0, LINK = 1

/ERROR: SNA FAILED TO SKIP

/AC = ONES, LINK = 0

/ERROR: SNA FAILED TO SKIP
 /CHECK DONE LOOPING
 /LOOP

/GFT NO FOR NEXT LOOP

		/		
		/TEST LAW 760000		
01077	754000	TLAW	CLA:CLI	/AC = 0
01100	760000		LAW 00000	/AC = 760000
01101	740010		RAL	/AC = 740000
01102	744400		SNL:CLL	/LINK = 1
01103	740040	F206	HALT	/ERROR: AC NOT 0 NOT A 1, /LAW 760000 FAILED
01104	740010		RAL	/AC = 700000
01105	744400		SNL:CLL	/LINK = 1
01106	740040	F207	HALT	/ERROR: AC BIT 1 NOT A 1 /LAW 760000 FAILED
01107	740010		RAL	/AC = 600000
01110	744400		SNL:CLL	/LINK = 1
01111	740040	F208	HALT	/ERROR: AC BIT 2 NOT A 1 /LAW 760000 FAILED
01112	740010		RAL	/AC = 400000
01113	744400		SNL:CLL	/LINK = 1
01114	740040	F209	HALT	/ERROR: AC BIT 3 NOT A 1 /LAW 760000 FAILED
01115	740010		RAL	/AC = 000000
01116	744400		SNL:CLL	/LINK = 1
01117	740040	F210	HALT	/ERROR: AC BIT 4 NOT A 1 /LAW 760000 FAILED
01120	740200		SZA	/AC = 000000
01121	740040	F211	HALT	/ERROR: AC BITS 5-17 NOT 0 /LAW 760000 FAILED
		/		
		/TEST LAW 760000, AC = ONES		
01122	754001		CLA:OMA:CLL	/AC = ONES, LINK = 0
01123	760000		LAW 00000	/AC = 760000
01124	741400		SZI	
01125	740040	F212	HALT	/ERROR: LINK NOT A 0, LAW SET LINK
01126	740010		RAL	/AC = 740000
01127	744400		SNL:CLL	/LINK = 1
01130	740040	F213	HALT	/ERROR: AC BIT 0 NOT A 1, /LAW 760000 FAILED
01131	740010		RAL	/AC = 700000
01132	744400		SNL:CLL	/LINK = 1
01133	740040	F214	HALT	/ERROR: AC BIT 1 NOT A 1 /LAW 760000 FAILED
		/		
01134	740010		RAL	/AC = 600000
01135	744400		SNL:CLL	/LINK = 1
01136	740040	F215	HALT	/ERROR: AC BIT 2 NOT A 1 /LAW 760000 FAILED
01137	740010		RAL	/AC = 400000
01140	744400		SNL:CLL	/LINK = 1
01141	740040	F216	HALT	/ERROR: AC BIT 3 NOT A 1, LAW 760000 FAILED
01142	740010		RAL	/AC = 000000
01143	744400		SNL:CLL	/LINK = 1
01144	740040	F217	HALT	/ERROR: AC BIT 4 NOT A 1, LAW 760000 FAILED
01145	740200		SZA	/AC = 000000
01146	740040	F218	HALT	/ERROR: AC BITS 5-17 NOT 0

.EJECT

/LAW 760000 FAILED

01147	754000	/TEST LAW 777777, AC=0, L=0	
01150	777777	CLA:CLL	/AC = 0
01151	740001	LAW 17777	/AC = 760200
01152	740200	CMA	
01153	740040	SZA	
		F219 HALT	/ERROR, AC NOT 0
			/LAW 17777 FAILED
01154	741400	SZL	/AC = 400760
01155	740040	F220 HALT	/LINK NOT 0
		/	
		/TEST LAW 777777, AC=0, L=1	
01156	754002	CLA:CLL:CML	/AC = 0
01157	777777	LAW 17777	
01160	740001	CMA	
01161	740200	SZA	
01162	740040	F221 HALT	/ERROR, LINK NOT 0
01163	740400	SNL	
01164	740040	F222 HALT	/ERROR, LINK NOT 0
		/	
		/TEST LAW 777777, AC=1, L=0	
01165	754001	CLA:CMA:CLL	/AC = 0
01166	777777	LAW 17777	
01167	740001	CMA	
01170	740200	SZA	
01171	740040	F223 HALT	/ERROR, AC NOT 0
01172	741400	SZL	/AC = 100760
01173	740040	F224 HALT	/ERROR, LINK NOT 0
		.EJECT	

01174	754003	/TEST LAW 777777, AC=1, L=1	
01175	777777	CLA!CMA!CLL!CML	/AC = 0
01176	740001	LAW 17777	
01177	740200	CMA	
01200	740040	SZA	
01201	740400	F225 HALT	/ERROR, AC NOT 0
01202	740040	F226 SNL	
01203	447634	HALT	/ERROR, LINK NOT 1
01204	601077	ISZ WORK3	/CHECK DONE LOOPING
01205	106102	JMP TLAW	/LOOP
01206	106126	JMS GENRAN	/GET NO. FOR NEXT LOOP
		JMS CKNO	
		.EJECT	

```

/TEST LAC 0'S
/
LACK      CLA:CLL      /AC = 0, LINK = 0
          LAC K0      /000000
          SZA
F258      HALT        /ERROR, AC NOT 0 AFTER LAC K0
          SZL
F259      HALT        /ERROR, LINK NOT 0 AFTER LAC K0
/
          CLA:CLL:CML  /AC = 0, LINK = 1
          LAC K0
          SZA
F260      HALT        /ERROR, AC NOT 0
          SNL
F261      HALT        /ERROR, LINK NOT 1 AFTER LAC K0
/
          CLA:CMA:CLL  /AC = 1'S, LIN = 0
          LAC K0
          SZA
F262      HALT        /ERROR, AC NOT 0 AFTER LAC K0
          SZL
F263      HALT        /ERROR, LINK NOT 0 AFTER LAC K0
/
          CLA:CMA:CLL:CML /AC = 1'S, LINK = 1
          LAC K0
          SZA
F264      HALT        /ERROR, AC NOT 0
          SNL
F265      HALT        /ERROR, LINK NOT 1
/
/TEST LAC 1'S
/
          CLA:CLL      /AC = 0, LINK = 0
          LAC K7S      /777777
          CMA
          SZA
F266      HALT        /ERROR, AC NOT 0 LAC K7S FAILED
          SZL
F267      HALT        /ERROR, LINK NOT 0 AFTER LAC K7S
/
          CLA:CLL:CML  /AC = 0, LINK = 1
          LAC K7S
          CMA
          SZA
F268      HALT        /ERROR, AC NOT 0
          SNL
F269      HALT        /ERROR, LINK NOT 1 AFTER LAC K7S
          .EJECT

```

01255	754001		CLA!CMA!CLL	/AC = 1'S, LINK = 0
01256	207573		LAC K7S	
01257	740001		CMA	
01260	740200		SZA	
01261	740040	F270	HALT	/ERROR, AC NOT 0, LAC K7S FAILED
01262	741400		SZL	
01263	740040	F271	HALT	/ERROR, LINK NOT 1 AFTER LAC K7S
		/		
01264	754003		CLA!CMA!CLL!CML	/AC = 1'S, LINK = 1
01265	207573		LAC K7S	
01266	740001		CMA	
01267	740200		SZA	
01270	740040	F272	HALT	/ERROR, AC NOT 0
01271	740400		SNL	
01272	740040		HALT	/ERROR, LINK NOT 1 AFTER LAC K7S
		/		
01273	750000		CLA	
01274	207606		LAC K101	/AC = 525252
01275	207605		LAC K010	/AC = 252525
01276	207573		LAC K7S	/AC = 777777
01277	740001		CMA	
01300	740200		SZA	
01301	740040	F273	HALT	/ERROR, AC NOT 0
01302	447634		ISZ WORK3	/CHECK FOR DONE LOOPING
01303	601207		JMP LACK	/LOOP
01304	106102		JMS GENRAN	/GET NO. FOR LOOP
01305	106126		JMS CKNO	
		/		
		/TFST AND		
		/		
01306	750000	ANDAC	CLA	/AC = 0
01307	507531		AND K0	
01310	740200		SZA	
01311	740040	F274	HALT	/ERROR, AC NOT 0 AFTER AND K0
		/		
01312	750001		CLA!CMA	/AC = 1'S
01313	507531		AND K0	
01314	740200		SZA	
01315	740040	F275	HALT	/ERROR, AC NOT 0 AFTER AND K0
		/		
01316	750000		CLA	/AC = 0
01317	507573		AND K7S	
01320	740200		SZA	
01321	740040	F276	HALT	/ERROR, AC NOT 0 AFTER AND K7S
		/		
01322	750001		CLA!CMA	/AC = 1'S
01323	507573		AND K7S	
01324	740001		CMA	
01325	740200		SZA	
01326	740040	F277	HALT	/ERROR, AC NOT 0 AFTER AND K7S
			.EJECT	

		/SEQUENTIAL AND		
		/		
01327	754002		CLA:CLL:CML	/AC = 0, LINK = 1
01330	507531		AND K0	
01331	507573		AND K7S	
01332	507606		AND K101	
01333	507605		AND K010	
01334	740001		CMA	
01335	507531		AND K0	
01336	507573		AND K7S	
01337	507606		AND K101	
01340	507605		AND K010	
01341	740200		SZA	
01342	740040	E278	HALT	/ERROR, AC NOT 0
01343	740400		SNL	
01344	740040	F279	HALT	/ERROR, LINK NOT 1
01345	447634		ISZ WORK3	/CHECK FOR DONE LOOPING
01346	601306		JMP ANDAC	/LOOP
01347	106102		JMS GENRAN	/GET NO, FOR NEXT LOOP
01350	106126		JMS CKNO	
		/		
		/TEST XOR		
		/		
01351	750000		XORAC CLA	/AC = 0
01352	247531		XOR K0	
01353	740200		SZA	
01354	740040	F280	HALT	/ERROR, AC NOT 0 AFTER XOR K0
		/		
01355	750001		CLA:CMA	/AC = 1'S
01356	247531		XOR K0	
01357	740001		CMA	
01360	740200		SZA	
01361	740040	F281	HALT	/ERROR, AC NOT 0
		/		
01362	750000		CLA	/AC = 0
01363	247573		XOR K7S	/777777
01364	740001		CMA	
01365	740200		SZA	
01366	740040	F282	HALT	/ERROR, AC NOT 0 AFTER XOR K7S
		/		
01367	750001		CLA:CMA	/AC = 1'S
01370	247573		XOR K7S	
01371	740200		SZA	
01372	740040	F283	HALT	/ERROR, AC NOT 0 AFTER XOR K7S
		.EJECT		

		/SEQUENTIAL XOR		
	/			
01373	750000		CLA	/AC = 0
01374	247606		XOR K101	/525252
01375	247605		XOR K010	/252525
01376	247531		XOR K0	/000000
01377	247573		XOR K7S	/777777
01400	247605		XOR K010	
01401	247606		XOR K101	
01402	247606		XOR K101	
01403	247605		XOR K010	
01404	740200		SZA	
01405	740040	F284	HALT	/ERROR. AC NOT 0
	/			
01406	447634		ISZ WORK3	/CHECK FOR DONE LOOPING
01407	601351		JMP XORAC	/LOOP
01410	106102		JMS GENRAN	/GET NO. FOR NEXT LOOP
01411	106126		JMS CKNO	
	/			
	/TEST TAD			
	/			
01412	754000	TADAC	CLA:CLL	/AC = 0, LINK = 0
01413	347531		TAD K0	
01414	740200		SZA	
01415	740040	F285	HALT	/ERROR. AC NOT 0 AFTER TAD K0
01416	741400		SZL	
01417	740040	F286	HALT	/ERROR. LINK NOT 0 AFTER TAD K0
	/			
01420	754001		CLA:CMA:CLL	/AC = 1'S, LINK = 0
01421	347531		TAD K0	
01422	740001		CMA	
01423	740200		SZA	
01424	740040	F287	HALT	/ERROR.AC NOT 0
01425	741400		SZL	
01426	740040	F288	HALT	/ERROR. LINK NOT 0
	/			
01427	754002		CLA:CLL:CML	/AC = 0, LINK = 1
01430	347573		TAD K7S	/777777
01431	740001		CMA	
01432	740200		SZA	
01433	740040	F289	HALT	/ERROR. TAD K7S FAILED
01434	740400		SNL	
01435	740040	F290	HALT	/ERROR. CARRY OUT OR OVERFLOW /FAILED. LINK NOT 0
	/			
01436	754001		CLA:CMA:CLL	/AC = 1'S, LINK = 0
01437	347573		TAD K7S	
01440	740020		RAR	
01441	740001		CMA	
01442	740200		SZA	
01443	740040	F291	HALT	/ERROR. TAD K7S TO 1'S FAILED
01444	741400		SZL	
01445	740040	F292	HALT	/ERROR. LINK NOT 0
			.EJECT	

```

/TEST OVERFLOW
/
01446      754001      CLA:CMA:CLL      /AC = 1'S, LINK = 0
01447      347532      TAD K1      /000001
01450      740200      SZA
01451      740040      F293      HALT      /ERROR. AC NOT 0 AFTER TAD K1
01452      740400      SNL
01453      740040      F294      HALT      /ERROR. LINK NOT 1 OVERFLOW FAILED
/
01454      754003      CLA:CMA:CLL:CML      /AC = 1'S, LINK = 1
01455      347532      TAD K1
01456      740200      SZA
01457      740040      F295      HALT      /ERROR. AC NOT 0
01460      741400      SZL
01461      740040      F296      HALT      /ERROR. LINK NOT 0 OVERFLOW FAILED
/
/TAD 525252, AC = 252525, LINK = 0
/
01462      754000      CLA:CLL
01463      347605      TAD K010
01464      347606      TAD K101      /AC = 1'S
01465      740001      CMA
01466      740200      SZA
01467      740040      E297      HALT      /ERROR. AC NOT 0
01470      741400      SZL
01471      740040      E298      HALT      /ERROR. LINK NOT 0
/
/TAD 252525, AC = 525252, LINK = 1
/
01472      754002      CLA:CLL:CML
01473      347606      TAD K101
01474      347605      TAD K010      /AC = 1'S
01475      740001      CMA
01476      740200      SZA
01477      740040      F299      HALT      /ERROR. AC NOT 0
01500      740400      SNL
01501      740040      F300      HALT      /ERROR. LINK NOT 0
/
/SFQUENTIAL LAC, TAD, XOR
/
01502      754000      CLA:CLL      /AC = 0, LINK = 0
01503      207605      LAC K010
01504      347606      TAD K101      /AC = 1'S
01505      247605      XOR K010
01506      347605      TAD K010      /AC = 1'S
01507      347532      TAD K1
01510      740400      SNL
                     .EJECT

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01511	740040	F301	HALT	/ERROR. LINK NOT 1
01512	207606		LAC K101	
01513	247573		XOR K7S	
01514	347606		TAD K101	
01515	247573		XOR K7S	
01516	740200		SZA	
01517	740040	F302	HALT	/ERROR. AC NOT 0
01520	447634		ISZ WORK3 /CHECK DONE LOOPING	
01521	601412		JMP TADAC	/LOOP
01522	106102		JMS GENRAN	/GFT NO. FOR NEXT LOOP
01523	106126		JMS CKNO	
		/		
		/		
		/TEST ADD		
01524	754000	/TEST ADD	K1S TO K6S, LINK = 0	
01525	307565	ADNAC	CLA:CLL	/AC = 0, LINK = 0
01526	307572		ADD K1S	/111111
01527	740001		ADD K6S	/666666
01530	740200		CMA	/AC = 0
01531	740040		SZA	
01532	741400	F303	HALT	/ERROR: ADD K1S TO K6S FAILED
01533	740040		SZL	
		F304	HALT	/ERROR: LINK NOT A0
		/		
		/TEST ADD	K2S TO K5S, LINK = 0	
01534	754000		CLA:CLL	/AC, LINK = 0
01535	307566		ADD K2S	/22222
01536	307571		ADD K5S	/555555
01537	740001		CMA	/AC = 0
01540	740200		SZA	
01541	740040	F305	HALT	/ERROR: ADD K2S TO K5S FAILED
01542	741400		SZL	
01543	740040	F306	HALT	/ERROR: LINK NOT A 0
		/		
		/TEST ADD	K3S TO K4S, LINK = 0	
01544	754000		CLA:CLL	/AC, LINK = 0
01545	307567		ADD K3S	/33333
01546	307570		ADD K4S	/444444
01547	740001		CMA	/AC = 0
01550	740200		SZA	
01551	740040	F307	HALT	/ERROR: ADD K3S TO K4S FAILED
01552	741400		SZL	
01553	740040	F308	HALT	/ERROR: LINK NOT A0
		/		
		/TEST ADD	K4S TO K3S, LINK = 0	
01554	754000		CLA:CLL	/AC, LINK = 0
01555	307570		ADD K4S	/444444
01556	307567		ADD K3S	/333333
01557	740001		CMA	/AC = 0
01560	740200		SZA	
01561	740040	F309	HALT	/ERROR: AND K4S TO K3S FAILED
01562	741400		SZL	
01563	740040	F310	HALT	/ERROR: LINK NOT A0
			.EJECT	

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01634 754001 /TEST ADD K7S, AC = K400K, LINK = 0
01635 207554 CLA:CMA:CLL /AC = ONES, LINK = 0
01636 307573 LAC K400K /AC = 400K
01637 507573 ADD K7S /ONES
01640 247554 AND K7S /AC = 400K
01641 740200 XOR K400K
01642 740040 SZA /AC = 0
01643 741400 F321 HALT /ERROR; ADD-0 TO K400K FAILED
01644 740040 SZI
F322 HALT /ERROR; LINK NOT A 0, CARRY FAILED
/
01645 754001 /TEST ADD K200K, AC = K200K, LINK = 0
01646 207560 CLA:CMA:CLL /AC = ONES, LINK = 0
01647 307560 LAC K200K /AC = 200K
01650 507573 ADD K200K /ONES
01651 247554 AND K7S /AC = 400K
01652 740200 XOR K400K
01653 740040 SZA /AC = 0
01654 740400 F323 HALT /ERROR; ADD K200K TO K200K FAILED
01655 740040 SNI
F324 HALT /ERROR; LINK NOT A ONES, CARRY FAILED
/
01656 754003 /TEST ADD K7S, AC = K100K, LINK = 1
01657 207321 CLA:CMA:CLL:CML /AC = ONES, LINK = 1
01660 307573 LAC K100K /AC = 100K
01661 507573 ADD K7S /ONES
01662 247321 AND K7S /AC = 100K
01663 740200 XOR K100K
01664 740040 SZA /AC = 0
01665 740400 F325 HALT /ERROR; ADD-0 TO K100K FAILED
01666 740040 SNI
F326 HALT /ERROR; LINK NOT A ONE, LINK RESFT
/
01667 754001 /TEST ADD K7S, AC = K40K, LINK = 0
01670 207553 CLA:CMA:CLL /AC = ONES, LINK = 0
01671 307573 LAC K40K /AC = 40K
01672 507573 ADD K7S /ONES
01673 247553 AND K7S /AC = 40K
01674 740200 XOR K40K
01675 740040 SZA /AC = 0
01676 741400 F327 HALT /ERROR; ADD-0 TO K40K FAILED
01677 740040 SZI
F328 HALT /ERROR; LINK NOT A ZERO, CARRY FAILED
.EJECT

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01700	754001	/TEST ADD K7S, AC = K20K, LINK = 0	
01701	207557	CLA!CMA!CLL	/AC = ONES, LINK = 0
01702	307573	LAC K20K	/AC = 20K
01703	507573	ADD K7S	/ONES
01704	247557	AND K7S	/AC = 20K
01705	740200	XOR K20K	
01706	740040	SZA	/AC = 0
01707	741400	E329 HALT	/ERROR; ADD-0 TO K20K FAILED
01710	740040	E330 S2L	/ERROR; LINK NOT A ZERO, CARRY FAILED
		/	
		/TEST AND K7S, AC = K10K, LINK = 0	
01711	754001	CLA!CMA!CLL	/AC = ONES, LINK = 0
01712	207556	LAC K10K	/AC = 10K
01713	307573	ADD K7S	/ONES
01714	507573	AND K7S	/AC = 10K
01715	247556	XOR K10K	
01716	740200	SZA	/AC = 0
01717	740040	F331 HALT	/ERROR; ADD-0 TO K10K FAILED
01720	741400	S2L	
01721	740040	F332 HALT	/ERROR; LINK NOT A ZERO, CARRY FAILED
		/	
		/TEST ADD K7S, AC = K4K, LINK = 0	
01722	754001	CLA!CMA!CLL	/AC = ONES, LINK = 0
01723	207550	LAC K4K	/AC = 4K
01724	307573	ADD K7S	/ONES
01725	507573	AND K7S	/AC = 4K
01726	247550	XOR K4K	
01727	740200	SZA	/AC = 0
01730	740040	F333 HALT	/ERROR; ADD-0 TO K4K FAILED
01731	741400	S2L	
01732	740040	F334 HALT	/ERROR; LINK NOT A ZERO, CARRY FAILED
		/	
		/TEST ADD K7S, AC = K2K, LINK = 0	
01733	754001	CLA!CMA!CLL	/AC = ONES, LINK = 0
01734	207546	LAC K2K	/AC = 2K
01735	307573	ADD K7S	/ONES
01736	507573	AND K7S	/AC = 2K
01737	247546	XOR K2K	
01740	740200	SZA	/AC = 0
01741	740040	E335 HALT	/ERROR; ADD-0 TO K2K2 FAILED
01742	741400	S2L	
01743	740040	E336 HALT	/ERROR; LINK NOT A ZERO, CARRY FAILED
		.EJECT	

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01744	754001	/TEST ADD K7S, AC = K1K, LINK = 0	
01745	2075403	CLA:CMALCLL	/AC = ONES, LINK = 0
01746	3075702	LAC K1K	/AC = 1K
01747	5075702	ADD K7S	/ONES
01750	2475403	AND K7S	/AC = 1K
01751	740200	XOR K1K	
01752	740040	SZA	/AC = 0
01753	741400	F337 HALT	/ERROR; ADD-0 TO K1K FAILED
01754	740040	SZL	
		F338 HALT	/ERROR; LINK NOT A ZERO, CARRY FAILED
		/	
01755	754001	/TEST ADD K7S, AC = K400, LINK = 0	
01756	207545	CLA:CMALCLL	/AC = ONES, LINK = 0
01757	307570	LAC K400	/AC = 400
01760	507573	ADD K7S	/ONES
01761	247545	AND K7S	/AC = 400
01762	740200	XOR K400	
01763	740040	SZA	/AC = 0
01764	741400	F339 HALT	/ERROR; ADD-0 TO K400 FAILED
01765	740040	SZL	
01766	447634	F340 HALT	/ERROR; LINK NOT A ZERO, CARRY FAILED
01767	601524	ISX WORK3	/CHECK DONE LOOPING
01770	106102	JMP ADDAC	/LOOP
01771	106126	JMS GENRAN	/GET NO, FOR NEXT LOOP
		JMS CKNO	
		.EJECT	

01772 754001
01773 207541
01774 307573
01775 507541
01776 247541
01777 740200
02000 740040
02001 741400
02002 740040

/TEST ADD K7S, AC = K20, LINK = 0
ADDAC1 CLA!CMA!CLL /AC = ONES, LINK = 0
LAC K20 /AC = 20
ADD K7S /ONES
AND K20 /AC = 20
XOR K20
SZA /AC = 0
E347 HALT /ERROR: ADD -0 TO K20 FAILED
SZL
E348 HALT /ERROR: LINK NOT A ZERO, CARRY FAILED
/

02003 754001
02004 207535
02005 307573
02006 507573
02007 247535
02010 740200
02011 740040
02012 741400
02013 740040

/TEST ADD K7S, AC = K10, LINK = 0
CLA!CMA!CLL /AC = ONES, LINK = 0
LAC K10 /AC = 10
ADD K7S /ONES
AND K7S /AC = 10
XOR K10
SZA /AC = 0
E349 HALT /ERROR: ADD = 0 TO K10 FAILED
SZL
E350 HALT /ERROR: LINK NOT A ZERO, CARRY FAILED
/

02014 754001
02015 207534
02016 307573
02017 507573
02020 247534
02021 740200
02022 740040
02023 741400
02024 740040

/TEST ADD K7S, AC = 4, LINK = 0
CLA!CMA!CLL /AC = ONES, LINK = 0
LAC K4 /AC = 4
ADD K7S /ONES
AND K7S /AC = 4
XOR K4
SZA /AC = 0
E351 HALT /ERROR: ADD -0 TO K4 FAILED
SZL
E352 HALT /ERROR: LINK NOT A ZERO, CARRY FAILED
/

02025 754001
02026 207533
02027 307573
02030 507573
02031 247533
02032 740200
02033 740040
02034 741400
02035 740040

/TEST ADD K7S, AC = K2, LINK = 0
CLA!CMA!CLL /AC = ONES, LINK = 0
LAC K2 /AC = 2
ADD K7S /ONES
AND K7S /AC = 2
XOR K2
SZA /AC = 0
E353 HALT /ERROR: ADD -0 TO K2 FAILED
SZL
E354 HALT /ERROR: LINK NOT A ZERO, CARRY FAILED
/

02036 754001
02037 207532
02040 307573
02041 507573
02042 247532
02043 740200
02044 740040
02045 741400
02046 740040

/TEST ADD K7S, AC = K1, LINK = 0
CLA!CMA!CLL /AC = ONES, LINK = 0
LAC K1 /AC = 1
ADD K7S /ONES
AND K7S /AC = 1
XOR K1
SZA /AC = 0
E355 HALT /ERROR: ADD -0 TO K1 FAILED
SZL
E356 HALT /ERROR: LINK NOT A ZERO, CARRY FAILED

.EJECT

↑↑↑↑

02047	744000	/TFST ADD K400K, AC = ONES, LINK = 0	
02050	777777	CLL	/LINK = 0
02051	507573	LAW 17777	/AC = ONES
02052	307554	AND K7S	/AC = ONES
02053	247554	ADD K400K	/400K
02054	740200	XOR K400K	
02055	740040	SZA	/AC = 0
02056	741400	F357 HALT	/ERROR: ADD K400K TO -0 FAILED
02057	740040	SZL	
		F358 HALT	/ERROR: LINK NOT A ZERO, CARRY FAILED
		/	
		/TFST ADD K200K, AC = ONES, LINK = 1	
02060	744002	CLL:CML	/LINK = 1
02061	777777	LAW 17777	/AC = ONES
02062	507573	AND K7S	/AC = ONES
02063	307560	ADD K200K	/200K
02064	247560	XOR K200K	
02065	740200	SZA	/AC = 0
02066	740040	F359 HALT	/ERROR: ADD K200K TO -0 FAILED
02067	740400	SNL	
02070	740040	F360 HALT	/ERROR: LINK NOT A ONE, LINK RESET
		/	
		/TFST ADD K100K, AC = ONES, LINK = 1	
02071	744002	CLL:CML	/LINK = 1
02072	777777	LAW 17777	/AC = ONES
02073	507573	AND K7S	/AC = ONES
02074	307321	ADD K100K	/100K
02075	247321	XOR K100K	
02076	740200	SZA	/AC = 0
02077	740040	F361 HALT	/ERROR: ADD K100K TO -0 FAILED
02100	740400	SNL	
02101	740040	F362 HALT	/ERROR: LINK NOT A ONE, LINK RESET
		/	
		/TFST ADD K40K, AC = ONES, LINK = 1	
02102	744002	CLL:CML	/LINK = 1
02103	777777	LAW 17777	/AC = ONES
02104	507573	AND K7S	/AC = ONES
02105	307553	ADD K40K	/40K
02106	247553	XOR K40K	
02107	740200	SZA	/AC = 0
02110	740040	F363 HALT	/ERROR: ADD K40K TO -0 FAILED
02111	740400	SNL	
02112	740040	F364 HALT	/ERROR: LINK NOT A ONE, LINK RESET
		/	
		/TFST ADD K20K, AC = ONES, LINK = 1	
02113	744002	CLL:CML	/LINK = 1
02114	777777	LAW 17777	/AC = ONES
02115	507573	AND K7S	/AC = ONES
02116	307557	ADD K20K	/20K
02117	247557	XOR K20K	
02120	740200	SZA	/AC = 0
02121	740040	F365 HALT	/ERROR: ADD K20K TO -0 FAILED
02122	740400	SNL	
02123	740040	F366 HALT	/ERROR: LINK NOT A ONE, LINK RESET

.EOT

/PDP-9 BASIC EXERCISER - TAPE 3

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02124      744002
02125      777777
02126      507573
02127      307556
02130      247556
02131      740200
02132      740040
02133      740400
02134      740040

02135      744002
02136      777777
02137      507573
02140      307550
02141      247550
02142      740200
02143      740040
02144      740400
02145      740040

02146      744002
02147      777777
02150      507573
02151      307546
02152      247546
02153      740200
02154      740040
02155      740400
02156      740040

02157      744002
02160      777777
02161      507573
02162      307544
02163      247544
02164      740200
02165      740040
02166      740400
02167      740040

02170      744002
02171      777777
02172      507573
02173      307545
02174      247545
02175      740200
02176      740040
02177      740400
02200      740040

      CLLCML      /LINK = 1
      LAW 17777   /AC = ONES
      AND K7S     /AC = ONES
      ADD K10K    /10K
      XOR K10K
      SZA        /AC = 0
      E367      HALT      /ERROR; ADD K10, TO -0 FAILED
      SNL
      E368      HALT      /ERROR; LINK NOT A ONE, LINK RESET
      /
      /TEST ADD K4K, AC = ONES, LINK = 1
      CLLCML      /LINK = 1
      LAW 17777   /AC = ONES
      AND K7S     /AC = ONES
      ADD K4K     /4K
      XOR K4K
      SZA        /AC = 0
      E369      HALT      /ERROR; ADD K4K TO -0 FAILED
      SNL
      F370      HALT      /ERROR; LINK NOT A ONE, LINK RESET
      /
      /TEST ADD K2K, AC = ONES, LINK = 1
      CLLCML      /LINK = 1
      LAW 17777   /AC = ONES
      AND K7S     /AC = ONES
      ADD K2K     /2K
      XOR K2K
      SZA        /AC = 0
      F371      HALT      /ERROR; AC K2K TO -0 FAILED
      SNL
      F372      HALT      /ERROR; LINK NOT A ONE, LINK RESET
      /
      /TEST ADD K1K, AC = ONES, LINK = 1
      CLLCML      /LINK = 1
      LAW 17777   /AC = ONES
      AND K7S     /AC = ONES
      ADD K1K     /1K
      XOR K1K
      SZA        /AC = 0
      F373      HALT      /ERROR; ADD K1K TO -0 FAILED
      SNL
      E374      HALT      /ERROR; LINK NOT A ONE, LINK RESET
      /
      /TEST ADD K400, AC = ONES, LINK = 1
      CLLCML      /LINK = 1
      LAW 17777   /AC = ONES
      AND K7S     /AC = ONES
      ADD K400    /400
      XOR K400
      SZA        /AC = 0
      F375      HALT      /ERROR; ADD K400 TO -0 FAILED
      SNL
      F376      HALT      /ERROR; LINK NOT A ONE, LINK RESET

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.EJECT

02201	744002	/TFST ADD K200, AC = ONES, LINK = 1	
02202	777777	CLL:CML	/LINK = 1
02203	507573	LAW 17777	/AC = ONES
02204	307552	AND K7S	/AC = ONES
02205	247552	ADD K200	/200
02206	740200	XOR K200	
02207	740040	SZA	/AC = 0
02210	740400	F377 HALT	/ERROR: ADD K200 TO -0 FAILED
02211	740040	SNL	
		F378 HALT	/ERROR: LINK NOT A ONE, LINK RESET
		/	
		/TFST ADD K100, AC = ONES, LINK = 1	
02212	744002	CLL:CML	/LINK = 1
02213	777777	LAW 17777	/AC = ONES
02214	507573	AND K7S	/AC = ONES
02215	307540	ADD K100	/100
02216	247540	XOR K100	
02217	740200	SZA	/AC = 0
02220	740040	F379 HALT	/ERROR: ADD K100 TO -0 FAILED
02221	740400	SNL	
02222	740040	E380 HALT	/ERROR: LINK NOT A ONE, LINK RESET
		/	
		/TFST ADD K40, AC = ONES, LINK = 1	
02223	744002	CLL:CML	/LINK = 1
02224	777777	LAW 17777	/AC = ONES
02225	507573	AND K7S	/AC = ONES
02226	307543	ADD K40	/40
02227	247543	XOR K40	
02230	740200	SZA	/AC = 0
02231	740040	F381 HALT	/ERROR: ADD K40 TO -0 FAILED
02232	740400	SNL	
02233	740040	E382 HALT	/ERROR: LINK NOT A ONE, LINK RESET
		/	
		/TFST ADD K20, AC = ONES, LINK = 1	
02234	744002	CLL:CML	/LINK = 1
02235	777777	LAW 17777	/AC = ONES
02236	507573	AND K7S	/AC = ONES
02237	307541	ADD K20	/20
02240	247541	XOR K20	
02241	740200	SZA	/AC = 0
02242	740040	F383 HALT	/ERROR: ADD K20 TO -0 FAILED
02243	740400	SNL	
02244	740040	E384 HALT	/ERROR: LINK NOT A ONE, LINK RESET
		/	
		/TFST ADD K10, AC = ONES, LINK = 1	
02245	744002	CLL:CML	/LINK = 1
02246	777777	LAW 17777	/AC = ONES
02247	507573	AND K7S	/AC = ONES
02250	307535	ADD K10	
02251	247535	XOR K10	
02252	740200	SZA	/AC = 0
02253	740040	F385 HALT	/ERROR: ADD K10 TO -0 FAILED
02254	740400	SNL	
02255	740040	F386 HALT	/ERROR: LINK NOT A ONE, LINK RESET

.EJECT

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02256	744002	/TFST ADD K4, AC = ONES, LINK = 1	
02257	777777	CLL!CML	/LINK = 1
02260	507573	LAW 17777	/AC = ONES
02261	307534	AND K7S	/AC = ONFS
02262	247534	ADD K4	/4
02263	740200	XOR K4	
02264	740040	SZA	/AC = 0
02265	740400	F387 HALT	/ERROR: ADD K4 TO -0 FAILED
02266	740040	SNL	
		F388 HALT	/ERROR: LINK NOT A ONE, LINK RESET
		/	
02267	744002	/TFST ADD K2, AC = ONES, LINK = 1	
02270	777777	CLL!CML	/LINK = 1
02271	507573	LAW 17777	/AC = ONFS
02272	307533	AND K7S	/AC = ONES
02273	247533	ADD K2	/2
02274	740200	XOR K2	
02275	740040	SZA	/AC = 0
02276	740400	F389 HALT	/ERROR: ADD K2 TO -0 FAILED
02277	740040	SNL	
		F390 HALT	/ERROR: LINK NOT A ONE, LINK RESET
		/	
02300	744002	/TFST ADD K1, AC = ONES, LINK = 1	
02301	777777	CLL!CML	/LINK = 1
02302	507573	LAW 17777	/AC = ONES
02303	307532	AND K7S	/AC = ONES
02304	247532	ADD K1	/1
02305	740200	XOR K1	
02306	740040	SZA	/AC = 0
02307	740400	F391 HALT	/ERROR: ADD K1 TO -0 FAILED
02310	740040	SNL	
		F392 HALT	/ERROR: LINK NOT A ONE, LINK RESET
		/	
02311	744000	/TFST ADD K7S, AC = ONES, LINK = 0	
02312	207573	CLL	/LINK = 0
02313	307573	LAC K7S	/AC = ONES
02314	740001	ADD K7S	/ONES
02315	740200	CMA	/AC = ONFS
02316	740040	SZA	/AC = 0
02317	741400	F393 HALT	/ERROR: ADD K7S TO ALL ONES FAILED
02320	740040	SZL	
		F394 HALT	/ERROR: LINK NOT A ONE, LINK RESET
		/	
02321	744002	/TFST ADD 525253, AC = 252525, LINK = 1	
02322	207605	CLL!CML	/LINK = 1
02323	307607	LAC K010	/AC = 252525
02324	247532	ADD K53	/525253
02325	740200	XOR K1	/000001
02326	740040	SZA	/AC = 0
02327	740400	F395 HALT	/ERROR: ADD K5253 TO K5252 FAILED
02330	740040	SNL	
		F396 HALT	/ERROR: LINK NOT A ONE, LINK RESET
		.EJECT	

02331	744000	/TEST ADD 252525, AC = 525253, LINK RESET	CLI	/LINK = 0
02332	207607		LAC K53	/AC = 525253
02333	307605		ADD K010	/252525
02334	247532		XOR K1	/000001
02335	740202		SZA	/AC = 0
02336	740040	F397	HALT	/ERROR: ADD K2525 TO K5253 FAILED
02337	741400		SZL	
02340	740040	F398	HALT	/ERROR: LINK NOT A ZERO, CARRY FAILED
		/		
		/TEST ADD SERIES		
02341	754000		CLA:CLI	/LINK = 0, AC = 0
02342	307565		ADD K1S	/AC = 111111
02343	307566		ADD K2S	/AC = 333333
02344	307567		ADD K3S	/AC = 666666
02345	307570		ADD K4S	/AC = 333333, LINK = 1
02346	307571		ADD K5S	/AC = 111111
02347	307572		ADD K6S	/AC = 777777
02350	307573		ADD K7S	/AC = 777777
02351	740001		CMA	/AC = 0
02352	740200		SZA	
02353	740040	F399	HALT	/ERROR: ADD SERIES FAILED
02354	740400		SNI	
02355	740040	F400	HALT	/ERROR: LINK NOT A 1
02356	447634		ISZ WORK3	/CHECK DONE LOOPING
02357	601772		JMP ADDAC1	/LOOP
02360	106102		JMS GENRAN	/GET NO. FOR NEXST LOOP
02361	106126		JMS CKNO	
			.EJECT	

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02362 106102
02363 741100
02364 740001
02365 741200
02366 602362
02367 043016
02370 740001
02371 043017
02372 106102
02373 741100
02374 740001
02375 741200
02376 602372
02377 043020
02400 740001
02401 043021
02402 777777
02403 043027
02404 744000
02405 203021
02406 343017
02407 741400
02410 347532
02411 043022

02412 203016
02413 744000
02414 343020
02415 741400
02416 347532
02417 043023

/ADD RANDOM PAIRS TEST
/
RANADD JMS GENRAN
SPA
CMA
SNA
JMP RANADD
DAC APOS
CMA
MINUSA DAC ANEG
JMS GENRAN
SPA
CMA
SNA
JMP MINUSA+1
DAC BPOS
CMA
MINUSB DAC BNEG
LAW -1
DAC PASS2
CLL
LAC RNEG
TAD ANEG
SZL
TAD K1
MINSAB DAC SUMNEG
/
/NOW GFNERATE A + B
LAC APOS
CLL
TAD BPOS
SZL
TAD K1
APLUSB DAC SUMPOS
.EJECT

/GET RANDOM NUMBER
/+ NO
/- MAKE IT +
/0 NOT ALLOWED

/IT IS + A
/1 COMPLEMENT
/IT IS -A
/GET NEXT RANDOM

/+ NO
/- MAKE +
/0 NOT ALLOWED

/IT IS + B
/MAKE 1'S COMP
/IT IS - B

/RESTART HERE TO REGENERATE NEW COMPARE
/-R -A
/EOC IF ADD
/YES MAKE CARRY
/SAVE -A -B

/GET +A
/+B
/EOC IF ADD
/YES ADD CARRY

```

02420	203020	/NOW GENERATE R-A	
02421	744000	LAC BPOS	/GET B
02422	343017	CLL	
02423	741400	TAD ANEG	/B-A
02424	347532	SZL	/EOC
02425	043024	TAD K1	/YES ADD CARRY
		RMINSB DAC RMASUM	/SAVE B-A
		/	
02426	203016	/NOW GENERATE A-B	
02427	744000	LAC APOS	/GET A
02430	343021	CLL	
02431	741400	TAD BNEG	/-B
02432	347532	SZL	/EOC
02433	043025	TAD K1	/YES ADD CARRY
		AMINSB DAC AMRSUM	/A-B
		/	
		/IF A+B IS AN OVERFLOW SITUATION	
		/MAKE OFLOW TESTS THAT APPLY = SNL	
		/IF A+B IS NOT OVERFLOW MAKE	
		/OVERFLOW TEST THAT APPLY = SZL	
		/	
02434	203023	LAC SUMPOS	/GET A+B
02435	751100	SPA:CLA	/STILL POS RESULT
02436	207654	LAC KSNL	/NEG RESULT IS OVERFLOW
02437	741200	SNA	/AC = SNL IS OVERFLOW
02440	207653	LAC KSZL	/+ RESULT IS NO OVERFLOW
02441	042464	DAC OFLCK1	/SET UP ALL OFLOW
02442	042512	DAC OFLCK3	/TESTS WHERE OFLOW
02443	042627	DAC OFLCH1	/MAY OR MAY NOT OCCUR
02444	042644	DAC OFLCH2	/AC = SNL IS A+B OFLOW
02445	042662	DAC OFLCH3	/AC = SZL IS A+B NOT OFLOW
02446	042701	DAC OFLCH4	/IF A+B OFLOW -A-B DOES ALSO
02447	042721	DAC OFLCH5	/IF A+B NOT OFLOW
02450	042742	DAC OFLCH6	/THEN NONE OF THESE
02451	042764	DAC OFLCH7	/ADDS CAN OVERFLOW
02452	042540	DAC OFLCK5	
02453	042566	DAC OFLCK7	
		.EJECT	

		/NOW DO A COMPLETE SERIES OF		
		/ONES COMP ADDITIONS		
		/SHOULD GET THE SAME RESULTS AS		
		/THE TAD'S WITH FOC TAD (1		
		/		
		/FIRST TEST A+B		
		/		
02454	744000	APLSRT	CLL	/FOR OVERFLOW CHECK
02455	203016		LAC APOS	/GET A
02456	303020		ADD RPOS	/A+B
02457	543023		SAD SUMPOS	/SHOULD = PREVIOUS A+B
02460	602464		JMP .+4	/OK
02461	740040	F401	HLT	/DISPLAY 1'S A+B
02462	203023		LAC SUMPOS	/GET 2'S COMP GEN
02463	740040		HLT	/DISPLAY 2'S A+B
02464	741400	OFLCK1	SZL	/OR SNL IF OVERFLOW
02465	740040	F402	HLT	/LINK OR OVERFLOW FAILED
02466	762454		LAW APLSRT	/MAKE JUMP FOR SCOPE LOOP
			.EJECT	

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02467 744000
 02470 203021
 02471 303016
 02472 543025
 02473 602477
 02474 740040
 02475 203025
 02476 740040
 02477 741400
 02500 740040
 02501 762467

02502 744000
 02503 203017
 02504 303021
 02505 543022
 02506 602512
 02507 740040
 02510 203022
 02511 740040
 02512 741400
 02513 740040
 02514 762502

02515 744000
 02516 203020
 02517 303017
 02520 543024
 02521 602525
 02522 740040
 02523 203024
 02524 740040
 02525 741400
 02526 740040
 02527 762515

/2ND TEST -B+A

AMNSRT CLL
 LAC BNEG
 ADD APOS
 SAD AMBSUM
 JMP .+4
 F403 HLT
 LAC AMBSUM
 HLT
 OFLCK2 SZL
 F404 HLT
 LAW AMNSRT

/GET A
 /A-B
 /SHOULD = PREVIOUS A-B
 /OK
 /DISPLAY 1'S A-B
 /DISPLAY 2'S A-B
 /SHOULD NOT OVERFLOW

/MAKE JMP FOR SCOPE

/NOW 3RD TEST IS -A -B

MAPLMB CLL
 LAC ANFG
 ADD RNFG
 SAD SUMNEG
 JMP .+4
 F405 HLT
 LAC SUMNEG
 HLT
 OFLCK3 SZL
 F406 HLT
 LAW MAPLMB

/GET -A
 /PLS -B
 /SHOULD = PREVIOUS -A-B
 /OK
 /DISPLAY 1'S -A-B

/DISPLAY 2'S -A-B
 /OR SNL
 /LINK FAILED

/MAKE JMP FOR SCOPE

/FOURTH TEST IN THIS SERIES

/IS TEST B-A

RMNSAT CLL
 LAC RPOS
 ADD ANFG
 SAD RMASUM
 JMP .+4
 HLT
 LAC RMASUM
 HLT
 SZL
 HLT
 LAW RMNSAT
 .EJECT

/GET B
 /ADD -A
 /SHOULD = PREVIOUS B-A
 /OK
 /DISPLAY 1'S B-A
 /DISPLAY 2'S B-A
 /CAN NOT OVERFLOW
 /OVERFLOW FAILED
 /MAKE JMP FOR SCOPE

```

02530 744000 /FIFTH TEST IN THIS SERIES
02531 203023 /IS TEST (A+R)-A = B
02532 303017 ABMATS CLL
02533 543020 LAC SUMPOS
02534 602540 ADD ANEG
02535 740040 SAD RPOS
02536 203020 JMP .+4
02537 740040 F407 HLT
02540 741400 LAC RPOS
02541 740040 HLT
02542 762530 OFLCK5 SZL /CAN OVERFLOW SNL IF A+B OVERFLOW
F408 HLT /ILLEGAL LINK
LAW ABMATS /MAKE JMP FOR SCOPE
/
/SIXTH TEST IN THIS SERIES
02543 744000 /IS TEST (R-A)-B = -A
02544 203024 BMAMRT CLL
02545 303021 LAC RMASUM
02546 543017 ADD RNFG
02547 602553 SAD ANEG
02550 740040 JMP .+4
02551 203017 F409 HLT
02552 740040 LAC ANEG
02553 741400 HLT
02554 740040 OFLCK6 SZL /CAN NOT OVERFLOW
02555 762543 F410 HLT
LAW BMAMRT /MAKE JMP FOR SCOPE
/
/SEVENTH TEST IN THIS SERIES
02556 744000 /IS (-A-R)+A = -R
02557 203022 MARPAT CLL
02560 303016 LAC SUMNFG
02561 543021 ADD APOS
02562 602566 SAD RNFG
02563 740040 JMP .+4
02564 203021 E411 HLT
02565 740040 LAC RNFG
02566 741400 HLT
02567 740040 OFLCK7 SZL /CAN BE OVERFLOW IF A+R OVERFLOW THEN IS
02570 762556 F412 HLT /ILLEGAL LINK
LAW MARPAT /MAKE JMP FOR SCOPE
.EJECT

```

02571 744000
02572 203025
02573 303020
02574 543016
02575 602601
02576 740040
02577 203016
02600 740040
02601 741400
02602 740040
02603 762571

/EIGHTH TEST OF THE SERIES

/IS (A-B) +B = A

AMHPRT CLI
LAC AMHSUM
ADD RPOS
SAD APOS
JMP .+4
E413 HLT
LAC APOS
HLT
OFLOCK8 SZL
E414 HLT
LAW AMHPRT

/CAN NOT OVERFLOW

/MAKE JMP FOR SCOPE

/

/9TH TEST OF SERIES

/NOW TEST AC = 777777 + A = A

/

02604 754001
02605 303016
02606 543016
02607 602613
02610 740040
02611 203016
02612 740040
02613 741400
02614 740040
02615 762604

M0ACPA CLL!CLA!CMA
ADD APOS
SAD APOS
JMP .+4
E415 HLT
LAC APOS
HLT
OFLOCK9 SZL
E416 HLT
LAW M0ACPA
.EJECT

/SET AC = 777777

/+ A

/SHOULD = A

/TEST LINK

/FAILED RESULTS

/DISPLAY A

/CANNOT OVERFLOW

/OVERFLOW FAILED L - 1

/MAKE JMP FOR SCOPE

/THE NEXT SERIES OF TESTS
/ARE ADD SEQUENCES THE RESULTS
/OF WHICH HAVE ALREADY BEEN
/COMPUTED AND VERIFIED

/

/FIRST SERIES TESTS A+B OK, THEN (A+B)-A = B
/SFE ARMATS FOR SHORTER TEST OR APLSRT OR M0ACPA
/NOW TRY A+B-A = B

02616 754001
02617 303016
02620 303020
02621 303017
02622 543020
02623 602627
02624 740040
02625 203020
02626 740040
02627 741400
02630 740040
02631 762616

SERS01 CLL:CLA:DMA

ADD APDS

ADD BPDS

ADD ANFG

SAD BPDS

JMP .+4

E417

HLT

LAC BPDS

HLT

0FLCH1

SZL

/OR SNL IF A+B OVERFLOW

F418

HLT

/LINK FAILURE

LAW SERS01

/MAKE JMP FOR SCOPE

/

/HAVE TESTED B-A PREVIOUS
/SFE BMNSAT FOR SHORTER TEST
/NOW TRY A+B-A-A = B-A

02632 754001
02633 303016
02634 303020
02635 303017
02636 303017
02637 543024
02640 602644
02641 740040
02642 203024
02643 740040
02644 740400
02645 740040
02646 762632

SERS02 CLL:CLA:DMA

ADD APDS

ADD BPDS

ADD ANFG

ADD ANFG

SAD RMASUM

JMP .+4

F419

HLT

LAC RMASUM

HLT

0FLCH2

SNL

/OR SZL IF NO OVERFLOW

F420

HLT

LAW SERS02

/MAKE JMP FOR SCOPE

.EJECT

↑↑↑↑

02647 754001
 02650 303016
 02651 303020
 02652 303017
 02653 303017
 02654 303021
 02655 543017
 02656 602662
 02657 740040
 02660 203017
 02661 740040
 02662 741400
 02663 740040
 02664 762647

/HAVE TESTED (R-A)-B = -A PREVIOUS
 /SEE BMAMBT FOR SHORTER TEST
 /NOW TRY A+B-A-A-B = -A

SERS03 CLI:CLA:CMA

ADD APOS

ADD RPOS

ADD ANFG

ADD ANFG

ADD RNFG

SAD ANFG

JMP .+4

F421

HLT

LAC ANEG

HLT

DFLCH3

SZL

/SNL IF A+B OVERFLOW

F422

HLT

/OVERFLOW FAILED

LAW SERS03

/MAKE JMP FOR SCOPE

/

/HAVE TEST -A-R NOW TRY A+B-A-A-B-R = -A-B

/SEE MAPLMR FOR SHORTER TEST

SERS04 CLI:CLA:CMA

ADD APOS

ADD RPOS

ADD ANFG

ADD ANFG

ADD RNFG

ADD RNFG

SAD SUMNFG

JMP .+4

F423

HLT

LAC SUMNFG

HLT

DFLCH4

SZL

/SNL IF A+B OVERFLOW

F424

HLT

/OVERFLOW FAILED OR LINK FAILED

LAW SERS04

/MAKE JMP FOR SCOPE LOOP

.EJECT

02665 754001
 02666 303016
 02667 303020
 02670 303017
 02671 303017
 02672 303021
 02673 303021
 02674 543022
 02675 602701
 02676 740040
 02677 203022
 02700 740040
 02701 741400
 02702 740040
 02703 762665

!!!!

```

/HAVE TESTED (-A-B)+A = -B NOW A+B-A-A-B-B+A = -B
/USE MAHPAT FOR SHORTER TEST
SERS05  CLL!CLA!CMA
        ADD APOS
        ADD RPOS
        ADD ANEG
        ADD ANEG
        ADD RNFG
        ADD RNFG
        ADD APOS
        ADD ANEG
        JMP .+4
F425    HLT
        LAC RNFG
        HLT
OFLCH5  SNL
E426    HLT
        LAW SERS05
/
/MAKE JMP FOR SCOPE

/
/HAVE DONE -R+A PREVIOUSLY
/NOW DO A+B-A-A-R-R+A+A = -R+A
/USE AMNSBT FOR SHORTER TEST
SERS06  CLL!CLA!CMA
        ADD APOS
        ADD RPOS
        ADD ANEG
        ADD ANEG
        ADD RNFG
        ADD RNFG
        ADD APOS
        ADD APOS
        SAD AMRSUM
        JMP .+4
E427    HLT
        LAC AMRSUM
        HLT
OFLCH6  SZL
E428    HLT
        LAW SERS06
        .EJECT
/MAKE JMP FOR SCOPE

```

```

02704  754001
02705  303016
02706  303020
02707  303017
02710  303017
02711  303021
02712  303021
02713  303016
02714  543021
02715  602721
02716  740040
02717  203021
02720  740040
02721  740040
02722  740040
02723  762704

```

```

02724  754001
02725  303016
02726  303020
02727  303017
02730  303017
02731  303021
02732  303021
02733  303016
02734  303016
02735  543025
02736  602742
02737  740040
02740  203025
02741  740040
02742  741400
02743  740040
02744  762724

```

++++

```

/ HAVE DONE (-B+A)+B PREVIOUSLY
/ NOW DOE A+B-A-A-B-B+A+A+B = A
/ USE AMBPRT FOR SHORTER EST
SER507    CLL:CLA:CMA
          ADD APOS
          ADD RPOS
          ADD ANEG
          ADD ANFG
          ADD RNFG
          ADD RNFG
          ADD APOS
          ADD APOS
          ADD RPOS
          ADD RPOS
          SAD APOS
          JMP .+4
E429      HLT
          LAC APOS
          HLT
OF1CH7    SNI
E430      HLT
          LAW SER507

/
/ AFTER ONE PASS
/ MAKE ALL R CONSTANTS A
/ AND MAKE ALL A CONSTANTS R
/
CONCHG     ISZ PASS2
          JMP CKLP
          LAC APOS
          DAC RPOS
          LAC RNFG
          DAC RNFG
          CMA
          DAC APOS
          LAC RPOS
          CMA
          DAC RNFG
          LAC RMASUM
          DAC 10
          LAC AMRSUM
          DAC RMASUM
          LAC 10
          DAC AMRSUM
          JMP API.SRT
          .EJECT

/ 2ND PASS
/ YES DONE 2ND
/ A
/ IS NOW B
/ RNEG
/ IS ANEG
/ R IS A
/ ANEG
/ IS NEG
/ A-B
/ IS NOW A-B
/ B-A
/ IS NOW A-B
/ OVERFLOW SERUP

```

```

02745      754001
02746      303016
02747      303020
02750      303017
02751      303017
02752      303021
02753      303021
02754      303016
02755      303016
02756      303020
02757      543016
02760      602764
02761      740040
02762      203016
02763      740040
02764      740400
02765      740040
02766      762745

```

```

02767      443027
02770      603011
02771      203016
02772      043020
02773      203021
02774      043017
02775      740001
02776      043016
02777      203020
03000      740001
03001      043021
03002      203024
03003      040010
03004      203025
03005      043024
03006      200010
03007      043025
03010      602454

```

↑↑↑↑

03011	447634	CKLP	IS7 WORK3	/CHECK DONE LOOPING
03012	602362		JMP RANADD	/LOOP
03013	106102		JMS GENRAN	/GFT NO. FOR NEXT LOOP
03014	106126		JMS CKNO	
03015	603030		JMP ADFDON	
		/		
		/		
03016	000000	APOS	0	/A
03017	000000	ANEG	0	/-A
03020	000000	RPOS	0	/B
03021	000000	RNEG	0	/-B
03022	000000	SUMNEG	0	/-A+(-B)
03023	000000	SUMPOS	0	/A+B
03024	000000	RMASUM	0	/B+(-A)
03025	000000	AMRSUM	0	/A+(-B)
		/		
03026	000000	MSKBIT	0	
			.EJECT	

03027 000000

PASS2 0

/GET A RANDOM NUMBER AND ITS 1'S COMPLEMENT
 /EACH BIT WILL HAVE A 0 IN ONE OF THE TWO NUMBERS
 /MAKE THE 0 BIT = 1 AND ADD THE NUMBERS BOTH WAYS
 /FIRST ADD IS THE (AC) IS THE ALTERED 0 = 1
 /SECOND ADD IS THE (MB) IS THE ALTERED 0 = 1
 /THE RESULT OF BOTH ADDS SHOULD = THE ALTERED BIT = 1

03030 106102
 03031 043016
 03032 740001
 03033 043017

/ADFDON JMS GENRAN /GET RANDOM NUMBER
 DAC APOS /SAVE IT
 CMA /MAKE ONES COMPLEMENT
 DAC ANFG /AND SAVE IT

03034 207554
 03035 043026

/THE FIRST BIT TO BE ALTERED IS 0 THEN CONTINUE TO 17
 LAC K400K
 DAC MSKBIT

03036 203016
 03037 503026
 03040 740200
 03041 603050
 03042 203016
 03043 243026
 03044 043020
 03045 203017
 03046 043021
 03047 603055

/SFT UP NEXT BIT TO TEST - ALTERED NUMBER GOES TO RPOS
 R1SETU LAC APOS

AND MSKBIT

SZA

/DOES APOS BIT = 0

/NO ALTER ANFG

JMP MODNFG

LAC APOS

XOR MSKBIT

DAC RPOS

/MODIFIED NUMBER GOES TO APOS

LAC ANFG

DAC BNFG

/UNMOD NUMBER GOES TO BNFG

JMP RITTS1

03050 203017
 03051 243026
 03052 043020
 03053 203016
 03054 043021

/THE ONES COMP NUMBER HAS THE 0 BIT MODIFY IT

MODNFG LAC ANFG

XOR MSKBIT

DAC RPOS

/MOD NUMBER TO BPOS

LAC APOS

DAC BNFG

/UNMOD NUMBER TO BNFG

/COMPLEMENTED BIT TEST1 (AC) = MODIFIED NUMBER AT ADD

03055 744000
 03056 203020
 03057 303021
 03060 543026
 03061 603065
 03062 740040
 03063 203026
 03064 740040
 03065 741400
 03066 740040
 03067 763055

/RITTS1 CLL

LAC RPOS

/GET MODIFIED NUMBER

ADD BNFG

/ADD UNMODIFIED

SAD MSKBIT

/RESULT SHOULD = BIT CHANGED

JMP .+4

F431

HLT

/DISPLAY INCORRECT RESULTS

LAC MSKBIT

HLT

/DISPLAY BIT ALTERED AND EXP

OFIC8

SZL

/NO OVERFLOW

F432

HLT

/OVERFLOW NOT ALLOWED

LAW RITTS1

/MAKE JMP FOR SCOPE LOOP

.EJECT

```

/COMP BIT TEST 2 (MB) = MODIFIED NUMBER AT ADD
/
03070      744000
03071      203021
03072      303020
03073      543026
03074      603100
03075      740040
03076      203026
03077      740040
03100      741400
03101      740040
03102      763070

RITTS2     CLL
           LAC RNFG      /GET UNMODIFIED NUMBER
           ADD RPOS      /ADD MODIFIED
           SAD MSKBIT     /RESULT SHOULD = BIT CHANGED
           JMP .+4        /OK
F433       HLT           /DISPLAY INCORRECT RESULTS
           LAC MSKBIT
           HLT
OFLCH9     S&L           /DISPLAY BIT ALTERED AND EXP
F434       HLT           /SHOULD NOT OVERFLOW
           LAW RITTS2     /MAKE JMP FOR SCOPE LOOP
/
/POSITION MASK BIT OVER 1 PLACE
/IF 17 HAS BEEN DONE CONTINUE
/
03103      203026
03104      744020
03105      043026
03106      740200
03107      603036

           LAC MSKBIT     /GET LAST
           RCR            /POSITION
           DAC MSKBIT     /SAVE
           SZA            /DONE ALL BITS
           JMP RISETU     /DO FOR NEXT BIT
/
/END OF TEST SEQUENCE
/
03110      447634
03111      603030
03112      106102
03113      106126
03114      750004
03115      742010
03116      741100
03117      602362

IS7 WORK3  /CHECK DONE LOOPING
JMP ADFDON /LOOP
JMS GENRAN /GET NO. FOR NEXT LOOP
JMS CKNO
LAS        /CHECK FOR CONTINUOUS LOOP
RTL        /CK ACS ?
SPA
JMP RANADD /LOOP
.EOT

```

/PDP-9 BASIC EXERCISER - TAPF 4
/TEST SAD

03120	207531	/		
03121	547531	SADAC	LAC K0	/AC = 0
03122	741000		SAD K0	
03123	740040		SKP	
		F435	HALT	/ERROR. SAD K0 SKIPPED
		/		
03124	207531		LAC K0	/AC = 0
03125	547573		SAD K7S	
03126	740040	F436	HALT	/ERROR. SAD K7S FAILED TO SKIP
		/		
03127	207573		LAC K7S	/AC = 1'S
03130	547531		SAD K0	
03131	740040	F437	HALT	/ERROR. SAD K0 FAILED TO SKIP
		/		
03132	207573		LAC K7S	/AC = 1'S
03133	547573		SAD K7S	
03134	741000		SKP	
03135	740040	F438	HALT	/ERROR. SAD K7S SKIPPED
		/		
		/SAD, TAD		
		/		
03136	750000		CLA	/AC = 0
03137	347531		TAD K0	
03140	547531		SAD K0	
03141	741000		SKP	
03142	740040	F439	HALT	/ERROR. SAD K0 SKIPPED
		/		
03143	750000		CLA	/AC = 0
03144	347531		TAD K0	
03145	547573		SAD K7S	
03146	740040	F440	HALT	/ERROR. SAD K7S FAILED TO SKIP
		/		
03147	750000		CLA	/AC = 0
03150	347573		TAD K7S	
03151	547531		SAD K0	
03152	740040	F441	HALT	/ERROR. SAD K0 FAILED TO SKIP
		/		
03153	750000		CLA	/AC = 0
03154	347573		TAD K7S	
03155	547573		SAD K7S	
03156	741000		SKP	
03157	740040	F442	HALT	/ERROR. SAD K7S SKIPPED
		/		
			.EJECT	

++++

/SEQUENTIAL SAD

03160	207531	LAC K0	/AC = 0
03161	547573	SAD K7S	
03162	760001	LAW 1	/760001
03163	547573	SAD K7S	
03164	760002	LAW 2	/760002
03165	547573	SAD K7S	
03166	760004	LAW 4	/760004
03167	547573	SAD K7S	
03170	760010	LAW 10	/760010
03171	547573	SAD K7S	
03172	760020	LAW 20	/760020
03173	547573	SAD K7S	
03174	760040	LAW 40	/760040
03175	740200	SZA	
03176	740040	HALT	/ERROR, AC NT 0. CONTENTS OF

F443

/AC = LAST SAD THAT FAILED

/TEST SAD, SKP SERIES

03177	750000	-CLA	/AC = 0
03200	547573	SAD K7S	
03201	760001	LAW 1	/760001
03202	741000	SKP	
03203	760002	LAW 2	/760002
03204	547573	SAD K7S	
03205	760004	LAW 4	/760004
03206	741000	SKP	
03207	760010	LAW 10	/760010
03210	547573	SAD K7S	
03211	760020	LAW 20	/760020
03212	741000	SKP	
03213	760040	LAW 40	/760040
03214	740200	SZA	
03215	740040	HALT	/ERROR, AC NOT 0. CONTENTS

F444

/OF AC = LAST SAD OR SKP

03216	447634	-ISZ WORK3	/CHECK DONE LOOPING
03217	603120	JMP SADAC	/LOOP
03220	106102	JMS GENRAN	/GET NO. FOR NEXT LOOP
03221	106126	JMS CKNO	

.EJECT

1111

```

/TEST D2M
/
03222 207650 D2MAC LAC KHALT /AC = 740040
03223 151111 D2M 11111 /ADDR 1111 OR 01111
03224 211111 LAC 11111
03225 740200 SZA
03226 740040 F445 HALT /ERROR, D2M FAILED AT 1111
/ /OR 01111

03227 207650 / LAC KHALT /AC = 740040
03230 152222 D2M 12222
03231 212222 LAC 12222
03232 740200 SZA
03233 740040 F446 HALT /ERROR, D2M FAILED AT 1222 OR
/ /02222

03234 207650 / LAC KHALT /AC = 740040
03235 153333 D2M 13333
03236 213333 LAC 13333
03237 740200 SZA
03240 740040 F447 HALT /ERROR, D2M FAILED AT 13333 OR
/ /03333

03241 207650 / LAC KHALT /AC = 740040
03242 154444 D2M 14444
03243 214444 LAC 14444
03244 740200 SZA
03245 740040 F448 HALT /ERROR, D2M FAILED AT 14444
/ /OR 04444

03246 207650 / LAC KHALT /AC = 740040
03247 155555 D2M 15555
03250 215555 LAC 15555
03251 740200 SZA
03252 740040 F449 HALT /ERROR, D2M FAILED AT 15555
/ /OR 05555

03253 207650 / LAC KHALT /AC = 740040
03254 156666 D2M 16666
03255 216666 LAC 16666
03256 740200 SZA
03257 740040 F450 HALT /ERROR, D2M FAILED AT 16666
/ /OR 06666

03260 207650 / LAC KHALT /AC = 740040
03261 157777 D2M 17777
03262 217777 LAC 17777
03263 740200 SZA
03264 740040 F451 HALT /ERROR, D2M FAILED AT 17777
/ /OR 07777

.EJECT

```

03265 207650
03266 152525
03267 212525
03270 740200
03271 740040

/
LAC KHALT /AC = 740040
DZM 12525
LAC 12525
SZA
F452 HALT /ERROR. DZM FAILED AT 12525
/OR 02525

03272 207650
03273 155252
03274 215252
03275 740200
03276 740040

/
LAC KHALT /AC = 740040
DZM 15252
LAC 15252
SZA
F453 HALT /ERROR. DZM FAILED AT 15252 OR 05252

/
/
/TEST AC AFTER A DZM
/

03277 207573
03300 157777
03301 740001
03302 740200
03303 740040

/
LAC K7S /AC = 777777
DZM 17777
CMA
SZA
F454 HALT /ERROR. AC CHANGED AFTER A DZM

/
//TEST AC, LINK, ADR. 17777 OR 07777 AFTER A DZM
/

03304 754001
03305 307573
03306 157777
03307 740001
03310 740200
03311 740040
03312 741400
03313 740040
03314 217777
03315 740200
03316 740040

/
CLA:CMA:CLL /AC = 1'S, LINK = 0
ADD K7S
DZM 17777
CMA
SZA
F455 HALT /ERROR. AC NOT 1'S AFTER A DZM
SZA
F456 HALT /ERROR. LINK NOT 0
LAC 17777
SZA
F457 HALT /ERROR. DZM FAILED AT 177777 OR 07777

/
/
/SEQUENTIAL DZM
/

03317 207573
03320 152525
03321 155252
03322 157777
03323 150000
03324 740001
03325 750200
03326 740040

/
LAC K7S /AC = 1'S
DZM 12525
DZM 15252
DZM 17777
DZM 10000
CMA
/AC = 0
CLA:SZA
F458 HALT /ERROR. AC NOT 1'S AFTER
/DZM SERIES

.EJECT

↑↑↑↑

03327	352525		TAD 12525	
03330	355252		TAD 15252	
03331	357777		TAD 17777	
03332	350000		TAD 10000	
03333	740200		SZA	
03334	740040	F459	HALT	/ERROR, D2M FAILED
		/		
03335	447634		ISZ WORK3	/CHECK DONE LOOPING
03336	603222		JMP D2MAC	/LOOP
03337	106102		JMS GENRAN	/GET NO, FOR NEXT LOOP
03340	106126		JMS CKNO	
		/		
		/		
		/TEST DAC		
		/		
03341	207574	DACAC	LAC K51S	/AC = 11111
03342	051111		DAC 11111	
03343	551111		SAD 11111	
03344	741000		SKP	
03345	740040	E460	HALT	/ERROR, DAC ADR CONTENTS NOT EQUAL
				/TO AC, DAC FAILED
03346	207575		LAC K12S	/AC = 12222
03347	052222		DAC 12222	
03350	552222		SAD 12222	
03351	741000		SKP	
03352	740040	F461	HALT	/ERROR, 122222 OR 022222 CONTENTS
				/NOT = TO AC, DAC FAILED
03353	207576		LAC K13S	/AC = 13333
03354	053333		DAC 13333	
03355	553333		SAD 13333	
03356	741000		SKP	
03357	740040	F462	HALT	/ERROR, 13333 OR 03333 CONTENTS
				/NOT = TO AC DAC FAILED
03360	207577		LAC K14S	/AC = 14444
03361	054444		DAC 14444	
03362	554444		SAD 14444	
03363	741000		SKP	
03364	740040	F463	HALT	/ERROR, 14444 OR 03333 CONTENTS
				/NOT = TO AC, DAC FAILED
03365	207600		LAC K15S	/AC = 15555
03366	055555		DAC 15555	
03367	555555		SAD 15555	
03370	741000		SKP	
03371	740040	F464	HALT	/ERROR, 15555 OR 05555 CONTENTS
				/NO = AC, DAC FAILED
			.EJECT	

03372	207601		LAC K16S	/AC = 166666
03373	056666		DAC 16666	
03374	556666		SAD 16666	
03375	741000		SKP	
03376	740040	F465	HALT	/ERROR. 16666 OR 06666 CONTENTS /NOT = AC. DAC FAILED /AC = 17777
03377	207602		LAC K17S	
03400	057777		DAC 17777	
03401	557777		SAD 17777	
03402	741000		SKP	
03403	740040	F466	HALT	/ERROR. 17777 OR 07777 CONTENTS /NOT = AC. DAC FAILED /AC = 252525
03404	207605		LAC K010	
03405	052525		DAC 12525	
03406	552525		SAD 12525	
03407	741000		SKP	
03410	740040	F467	HALT	/ERROR. 12525 OR 02525 CONTENTS /AC = AC. DAC FAILED /AC = 525252
03411	207606		LAC K101	
03412	055252		DAC 15252	
03413	555252		SAD 15252	
03414	741000		SKP	
03415	740040	F468	HALT	/ERROR. 15252 OR 05252 CONTENTS /NOT = AC. DAC FAILED
		/		
		/		
		/SFQUENTIAL DAC		
		/		
03416	744000		CLL	/L = 0
03417	207577 ²		LAC K7S	/AC = 1'S
03420	052525		DAC 12525	
03421	055252		DAC 15252	
03422	057777		DAC 17777	
03423	051000		DAC 11000	
03424	051111		DAC 11111	
03425	740001		CMA	/AC = 0
03426	750200		CLASZA	
03427	740040	F469	HALT	/ERROR. AC NOT 1'S AFTER DAC SERIES
03430	312525		ADD 12525	/ONES
03431	315252		ADD 15252	/ONES
03432	317777		ADD 17777	/ONES
03433	311000		ADD 11000	/ONES
03434	311111		ADD 11111	/ONES
03435	740001		CMA	/AC = 0
03436	740200		SZA	
03437	740040	F470	HALT	/ERROR. DAC FAILED. ONE OR MORE /ADDRESSES NOT ONES
		/		
03440	447634		ISZ WORK3	/CHECK DONE LOOPING
03441	603341		JMP DACAC	/LOOP
03442	106102		JMS GENRAN	/GET NO. FOR NEXT LOOP
03443	106126		JMS CKNO	
			.EJECT	

```

/TEST ISZ
/
ISZAC LAC K0 /AC = 0
DAC 10100
ISZ 10100
SKP:CLA:CMA
F471 HALT /ERROR. ISZ SKIPPED
AND K1 /AC = 1
SAD 10100
SKP
F472 HALT /ERROR. 10100 OR 00100 NOT 1
/ISZ FAILED
/AC = 377777
LAC M400K
DAC 10100
ISZ 10100
SKP:CLA:CMA
F473 HALT /ERROR. ISZ SKIPPED
AND K400K
SAD 10100
SKP
F474 HALT /ERROR. 10100 OR 00100 NOT 400000
/ISZ FAILED
/AC = 777776
LAC M1
DAC 10100
ISZ 10100
SKP:CLA:CMA
F475 HALT /ERROR. ISZ SKIPPED
AND K7S
SAD 10100
SKP
F476 HALT /ERROR. 10100 OR 00100 NOT 777777
/ISZ FAILED
/AC = 777776
LAC M1
DAC 17777
ISZ 17777
SKP:CLA:CMA
F477 HALT /ERROR. ISZ SKIPPED
AND K7S
SAD 17777
SKP
F478 HALT /ERROR. 1777 OR 07777 NOT 777777
/ISZ FAILED
/AC = 377777
LAC M400K
DAC 17777
ISZ 17777
SKP:CLA:CMA
F479 HALT /ERROR. ISZ SKIPPED
AND K400K
SAD 17777
SKP
.EJECT

```

03520	740040	F480	HALT	/ERROR. 17777 OR 0777 NOT 400000 /ISZ FAILED
03521	207531		LAC K0	
03522	057777		DAC 17777	
03523	457777		ISZ 17777	
03524	751001		SKP!CLA!CMA	
03525	740040	F481	HALT	/ERROR. ISZ SKIPPED
03526	507532		AND K1	
03527	557777		SAD 17777	
03530	741000		SKP	
03531	740040	F482	HALT	/ERROR. 17777 OR 07777 NOT 1 /ISZ FAILED
03532	750000		CLA	/AC = 0
03533	247573		XOR K7S	/AC = 1'S
03534	051111		DAC 11111	
03535	451111		ISZ 11111	
03536	740040	F483	HALT	/ERROR. ISZ FAILED TO SKIP
03537	211111		LAC 11111	
03540	740200		SZA	
03541	740040	F484	HALT	/ERROR. 11111 OR 01111 NOT 0 /ISZ FAILED
03542	750000		CLA	/AC = 0
03543	247573		XOR K7S	/AC = 1'S
03544	052222		DAC 12222	
03545	452222		ISZ 12222	
03546	740040	E485	HALT	/ERROR. ISZ FAILED TO SKIP
03547	212222		LAC 12222	
03550	740200		SZA	
03551	740040	F486	HALT	/ERROR. 12222 OR 02222 NOT 0 /ISZ FAILED
03552	750000		CLA	
03553	247573		XOR K7S	/AC = 1'S
03554	053333		DAC 13333	
03555	453333		ISZ 13333	
03556	740040	F487	HALT	/ERROR. ISZ DID NOT SKIP
03557	213333		LAC 13333	
03560	740200		SZA	
03561	740040	F488	HALT	/ERROR. 13333 OR 03333 NOT 0 /ISZ FAILED
03562	750000		CLA	
03563	247573		XOR K7S	/AC = 1'S
03564	054444		DAC 14444	
03565	454444		ISZ 14444	
03566	740040	E489	HALT	/ERROR. ISZ DID NOT SKIP
03567	214444		LAC 14444	
03570	740200		SZA	
03571	740040	F490	HALT	/ERROR. 14444 OR 04444 NOT 0 /ISZ FAILED
			.EJECT	

03572	750000		CLA	
03573	247573		XOR K7S	/AC = 1'S
03574	055555		DAC 15555	
03575	455555		ISZ 15555	
03576	740040	F491	HALT	/ERROR. ISZ DID NOT SKIP
03577	215555		LAC 15555	
03600	740200		SZA	
03601	740040	F492	HALT	/ERROR. 15555 OR 05555 NOT 0 /ISZ FAILED
03602	750000		CLA	
03603	247573		XOR K7S	/AC = 1'S
03604	056666		DAC 16666	
03605	456666		ISZ 16666	
03606	740040	F493	HALT	/ERROR. ISZ DID NOT SKIP
03607	216666		LAC 16666	
03610	740200		SZA	
03611	740040	F494	HALT	/ERROR. 16666 OR 06666 NOT 0 /ISZ FAILED
03612	750000		CLA	
03613	247573		XOR K7S	/AC = 1'S
03614	057777		DAC 17777	
03615	457777		ISZ 17777	
03616	740040	F495	HALT	/ERROR. ISZ DID NOT SKIP
03617	217777		LAC 17777	
03620	740200		SZA	
03621	740040	F496	HALT	/ERROR. 17777 OR 07777 NOT 0 /ISZ FAILED
03622	750000		CLA	
03623	247573		XOR K7S	/AC = 1'S
03624	052525		DAC 12525	
03625	452525		ISZ 12525	
03626	740040	F497	HALT	/ERROR. ISZ DID NOT SKIP
03627	212525		LAC 12525	
03630	740200		SZA	
03631	740040	F498	HALT	/ERROR. 12525 OR 02525 NOT 0 /ISZ FAILED
03632	750000		CLA	
03633	247573		XOR K7S	/AC = 1'S
03634	055252		DAC 15252	
03635	455252		ISZ 15252	
03636	740040	F499	HALT	/ERROR. ISZ DID NOT SKIP
03637	215252		LAC 15252	
03640	740200		SZA	
03641	740040	F500	HALT	/ERROR. 15252 OR 05252 NOT 0 /ISZ FAILED

.EJECT

/TFST ISZ, SKP

03642 2075732
03643 052525
03644 055252
03645 057777
03646 051000
03647 050100
03650 452525
03651 741000
03652 455252
03653 741000
03654 457777
03655 741000
03656 451000
03657 741000
03660 450100
03661 740040
03662 312525
03663 315252
03664 317777
03665 311000
03666 310100
03667 740001
03670 740200
03671 740040

F501

LAC K7S
DAC 12525
DAC 15252
DAC 17777
DAC 11000
DAC 10100
ISZ 12525
SKP
ISZ 15252
SKP
ISZ 17777
SKP
ISZ 11000
SKP
ISZ 10100
HALT
ADD 12525
ADD 15252
ADD 17777
ADD 11000
ADD 10100
CMA
SZA
HALT

/AC = 1'S
/12525 OR 02525
/15252 OR 05252
/17777 OR 07777
/11000 OR 01000
/10100 OR 00100

/ERROR. ISZ DID NOT SKIP

F502

/ERROR. ALL ADRES. NOT 0

/

/SEQUENTIAL ISZ, NO-SKP

/

03672 2076236
03673 052525
03674 055252
03675 057777
03676 051000
03677 050100
03700 452525
03701 455252
03702 457777
03703 451000
03704 450100
03705 750000
03706 312525
03707 315252
03710 317777
03711 311000
03712 310100
03713 2475554
03714 740200
03715 740040

F503

LAC M400K
DAC 12525
DAC 15252
DAC 17777
DAC 11000
DAC 10100
ISZ 12525
ISZ 15252
ISZ 17777
ISZ 11000
ISZ 10100
CLA
ADD 12525
ADD 15252
ADD 17777
ADD 11000
ADD 10100
XOR K402K
SZA
HALT
EJECT

/AC = 377777
/OR 02525 -400000
/OR 05252 "
/OR 07777 "
/OR 01000 -377777
/OR 00100 "

/AC = 0

/RESULT = 400002

/ERROR. ALL ADDRES. NOT 400000

++++

		/TFST ISZ-SKP, SKIP	
		/	
03716	207573	LAC K7S	/AC = 1'S
03717	055252	DAC 15252	
03720	455252	ISZ 15252	
03721	741000	SKP	
03722	741000	SKP	
03723	740040	E504 HALT	/ERROR. ISZ-SKP DID NOT SKIP
		/	
		/TFST SKP-ISZ, SKIP	
		/	
03724	207573	LAC K7S	/AC = 17S
03725	055252	DAC 15252	
03726	741000	SKP	
03727	740000	NOP	
03730	455252	ISZ 15252	
03731	740040	E505 HALT	/ERROR. SKP-ISZ DID NOT SKIP
		/	
		/TFST SKP-ISZ, NO-SKIP	
		/	
03732	207531	LAC K0	/AC = 0
03733	055252	DAC 15252	
03734	741000	SKP	
03735	740000	NOP	
03736	455252	ISZ 15252	
03737	741000	SKP	
03740	740040	E506 HALT	/ERROR. SKP-ISZ SKIPPED
		/	
03741	447634	ISZ WORK3	/CHECK DONE LOOPING
03742	603444	JMP ISZAC	/LOOP
03743	106102	JMS GENRAN	/GET NO. FOR NEXT LOOP
03744	106126	JMS CKNO	
		.EJECT	

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/TFST JMP
/
03745      207667      LAC JMPRET
03746      740200      SZA
03747      740040      F507 HALT      /ERROR JMP .-7, .+4 OR .+5 FAILED
03750      204130      INIT4K LAC JMPSEQ
03751      047667      DAC JMPRET      /LOAD 4K WITH JMP TO 22
03752      203752      LAC .
03753      507556      AND K10K      /SFE IF IN UPPER 4K NOW
03754      740200      SZA
03755      603761      JMP .+4      /IN UPPER 4K
03756      207556      LAC K10K      /LOWER 4K
03757      047630      DAC RJCNT
03760      603765      JMP .+5
03761      207541      LAC K20
03762      047630      DAC RJCNT
03763      741000      SKP
03764      147667      D2M JMPRET      /CLEAR ERROR TABLE
03765      204130      LAC JMPSFQ
03766      067630      DAC* RJCNT      /STORE JMP 22
03767      447630      ISZ RJCNT      /INCR. ADDRESS
03770      207630      LAC RJCNT
03771      546061      SAD K17777      /WILL = SAD 07777 WHEN IN
03772      741000      SKP      / UPPER 4K
03773      603764      JMP .-7
03774      207667      LAC JMPRET
03775      740200      SZA
03776      740040      F508 HALT      /ERROR. JMPP.+4, .+5 OR .-7 FAILED
03777      204131      LAC MON      /PRESS CONTINUE TO DETERMINE
04000      043745      DAC E507-2      /JMP FAILURE
04001      740000      MONX NOP
/
04002      207670      LAC J111
04003      740200      SZA
04004      740040      F509 HALT      /ERROR. RJMP OR JMP TO 11111
/OR 01111 FAILED
04005      204132      LAC RJ111
04006      047670      DAC J111      /STORE JMP ADDRESS IN TABLE
04007      051111      DAC 11111
04010      611111      JMP 11111      /JMP TO 11111 OR 01111
04011      741000      SKP
04012      147670      RJMP1 D2M J111      /CLEAR ERROR WORD TABLE
04013      207671      LAC J222
04014      740200      SZA
04015      740040      F510 HALT      /ERROR. RJMP OR JMP TO 12222
/OR 02222 FAILED
04016      204133      LAC RJ222
04017      047671      DAC J222
04020      052222      DAC 12222
04021      612222      JMP 12222      /JMP 1222 OR 02222
04022      741000      SKP
04023      147671      RJMP2 D2M J222      /CLEAR ERROR TABLE
      .EJECT

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04024	207672		LAC J333	
04025	740200		SZA	
04026	740040	F511	HALT	/ERROR. RJMP OR JMP TO 13333 /OR 03333 FAILED
04027	204134		LAC RJ333	
04030	047672		DAC J333	
04031	053333		DAC 13333	
04032	613333		JMP 13333	/JMP TO 13333 OR 03333
04033	741000		SKP	
04034	147672	RJMP3 /	DZM J333	/CLEAR ERROR TABLE
04035	207673		LAC J444	
04036	740200		SZA	
04037	740040	F512	HALT	/ERROR. RJMP OR JMP TO 14444 /OR 04444 FAILED
04040	204135		LAC RJ444	
04041	047673		DAC J444	
04042	054444		DAC 14444	
04043	614444		JMP 14444	/JMP TO 14444 OR 04444
04044	741000		SKP	
04045	147673	RJMP4 /	DZM J444	/CLEAR ERROR TABLE
04046	207674		LAC J555	
04047	740200		SZA	
04050	740040	F513	HALT	/ERROR. RJMP OR JMP TO 15555 /OR 05555 FAILED
04051	204136		LAC RJ555	
04052	047674		DAC J555	
04053	055555		DAC 15555	
04054	615555		JMP 15555	/JMP TO 15555 OR 05555
04055	741000		SKP	
04056	147674	RJMP5 /	DZM J555	/CLEAR ERROR TABLE
04057	207675		LAC J666	
04060	740200		SZA	
04061	740040	F514	HALT	/ERROR. RJMP OR JMP TO 16666 /OR 06666 FAILED
04062	204137		LAC RJ666	
04063	047675		DAC J666	
04064	056666		DAC 16666	
04065	616666		JMP 16666	/JMP TO 16666 OR 06666
04066	741000		SKP	
04067	147675	RJMP6 /	DZM J666	/CLEAR ERROR TABLE

.EJECT

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04070	207676		LAC J777	
04071	740200		SZA	
04072	740040	F515	HALT	/ERROR. RJMP OR JMP TO 17777 /OR 07777 FAILED
04073	204140		LAC RJ777	
04074	047676		DAC J777	
04075	057777		DAC 17777	
04076	617777		JMP 17777	/JMP TO 17777 OR 07777
04077	741000		SKP	
04100	147676	RJMP7	DZM J777	/CLEAR ERROR TABLE
		/		
04101	207700		LAC J252	
04102	740200		SZA	
04103	740040	F516	HALT	/ERROR. RJMP OR MP TO 12525 /OR 02525 FAILED
04104	204141		LAC RJ252	
04105	047700		DAC J252	
04106	052525		DAC 12525	
04107	612525		JMP 12525	/JMP TO 12525 OR 02525
04110	741000		SKP	
04111	147700	RJMPH	DZM J252	/CLEAR ERROR TABLE
		/		
04112	207677		LAC J525	
04113	740200		SZA	
04114	740040	E517	HALT	/ERROR. RJMP OR JMP TO 15252 /OR 05252 FAILED
04115	204142		LAC RJ525	
04116	047677		DAC J525	
04117	055252		DAC 15252	
04120	615252		JMP 15252	/JMP TO 15252 OR 05252
04121	741000		SKP	
04122	147677	RJMP0	DZM J525	/CLEAR ERROR TABLE
		/		
04123	447634		ISZ WORK3	/CHECK DONE LOOPING
04124	604002		JMP MONX+1	/LOOP
04125	106102		JMS GENRAN	/GET NO. FOR NEXT LOOP
04126	106126		JMS CKNO	
04127	604143		JMP TSCAL	/TEST CAL
		/		
		/	JMP CONSTANTS. THESE ARE MODIFIED WHEN IN HI 4K	
		/		
04130	600070	JMPSEQ	JMP SEQUEN	
04131	604002	MON	JMP MONX+1	
04132	604012	RJ111	JMP RJMP1	
04133	604023	RJ222	JMP RJMP2	
04134	604034	RJ333	JMP RJMP3	
04135	604045	RJ444	JMP RJMP4	
04136	604056	RJ555	JMP RJMP5	
04137	604067	RJ666	JMP RJMP6	
04140	604100	RJ777	JMP RJMP7	
04141	604111	RJ252	JMP RJMP8	
04142	604122	RJ525	JMP RJMP9	
			.EJECT	

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/TFST CAL
/
04143 2077040 TSCAL LAC CAL0
04144 740200 SZA
04145 740040 F518 HALT /ERROR. CAL FROM 17757 OR 07757
04146 707704 LEM /CLEAR EXTEND MODE
04147 754000 CLA:CLL /AC = 0, LINK = 0
04150 770020 LAW 10020 /AC = 770020
04151 150704 DZM 10704 /CAL AT 10704 OR 00704
04152 207563 LAC K2021
04153 047701 DAC CAL0 /STORE ERROR CODE 2021
04154 204215 LAC RCAL0
04155 040021 DAC 21 /RJMP FROM CAL
04156 610704 JMP 10704 /JMP TO 10704 OR 00704
04157 147701 RCALS0 DZM CAL0 /CLEAR ERROR TABLE
04160 200020 LAC 20
04161 544216 SAD KCAL0 /10705 OR 00705
04162 741000 SKP
04163 740040 F519 HALT /ERROR. (20) NOT 10705 OR 00705
04164 210704 LAC 10704
04165 740200 SZA
04166 740040 F519A HALT /ERROR (10704 OR 00704) NOT 0
/
/TFST CAL LINK = 1
/
04167 207704 LAC CAL1
04170 740200 SZA
04171 740040 F520 HALT /ERROR. CAL FROM 10704 OR 00704
04172 744002 CLL:CLL /LINK = 1
04173 207563 LAC K2120
04174 047701 DAC CAL1 /STORE ERROR CODE 2120
04175 204217 LAC RCAL1
04176 040021 DAC 21 /RJMP FROM CAL
04177 610704 JMP 10704 /JMP TO 10704 OR 00704
04200 147701 RCALS1 DZM CAL1 /CLEAR ERROR TABLE
04201 200020 LAC 20
04202 544220 SAD KCALE /410705 OR 400705
04203 741000 SKP
04204 740040 F521 HALT /ERROR. (20) NOT 410705 OR 400705
04205 210704 LAC 10704
04206 740200 SZA
04207 740040 F521A HALT /ERROR (10704 OR 00704) NOT 0
/
04210 447634 ISZ WORK3 /CHECK DONE LOOPING
04211 604143 JMP TSCAL /LOOP
04212 106102 JMS GENRAN /GET NO. FOR NEXT LOOP
04213 106126 JMS CKNO
04214 604221 JMP TSJMS /TFST JMS
/
.EJECT

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/CAL CONSTANTS. THESE ARE MODIFIED WHEN IN HI 4K

04215	604157
04216	010705
04217	604200
04220	410705

/	
RCAL0	JMP RCALS0
KCAL0	10705
PCAL1	JMP RCALS1
KCALF	410705
	.EJECT

		/TFST JMS		
		/		
04221	207703	TSJMS	LAC JSM71	
04222	740200		SZA	
04223	740040	F522	HALT	/ERROR. JMS FROM 07777 TO 11111
				/OR FROM 17777 TO 01111
				/LINK = 0
04224	744000		CLL	
04225	204537		LAC RJSM71	/JMP TO RJMS71
04226	051112		DAC 11112	/RJMP FROM JMS DEST'N
04227	204540		LAC RSM71	/JMS 11111
04230	047777		DAC 07777	
04231	047703		DAC JSM71	
04232	771112		LAW 11112	/AC = 771112
04233	607777		JMP 07777	
04234	147703	RJMS71	DZM JSM71	/CLEAR ERROR TABLE
04235	211111		LAC 11111	
04236	544541		SAD K10000	
04237	741000		SKP	
04240	740040	F523	HALT	/ERROR. (11111 OR 01111) NOT
				/10000 OR 00000
04241	207704		LAC JSM72	
04242	740200		SZA	
04243	740040	F524	HALT	/ERROR. JMS FROM 07776 TO 12222
				/OR FROM 17776 TO 02222
04244	707704		LEM	
04245	744000		CLL	
04246	204542		LAC RJSM72	/JMP TO RJMS72
04247	052223		DAC 12223	
04250	204543		LAC RSM72	/JMS 12222
04251	047776		DAC 07776	
04252	047704		DAC JSM72	
04253	772223		LAW 12223	/AC = 772223
04254	607776		JMP 07776	
04255	147704	RJMS72	DZM JSM72	/CLEAR ERROR TABLE
04256	212222		LAC 12222	
04257	544544		SAD K77	
04260	741000		SKP	
04261	740040	F525	HALT	/ERROR. (12222 OR 02222) NOT
				/07777 OR 17777
04262	207705		LAC JSM73	
04263	740200		SZA	
04264	740040	F526	HALT	/ERROR. JMS FROM 07775 TO 13333
				/OR FROM 17775 TO 03333
04265	707704		LEM	
04266	744000		CLL	
04267	204545		LAC RJSM73	/JMP TO RJMS73
04270	053334		DAC 13334	
04271	204546		LAC RSM73	/JMS 13333
04272	047775		DAC 07775	
04273	047705		DAC JSM73	
04274	773334		LAW 13334	/AC = 773334
04275	607775		JMP 07775	
			.EJECT	

04276	147705	RJMS73	DZM JSM73	/CLEAR ERROR TABLE
04277	213333		LAC 13333	
04300	544547		SAD K76	
04301	741000		SKP	
04302	740040	F527	HALT	/ERROR. (13333 OR 03333) NOT /07776 OR 17776
04303	207706		LAC JSM74	
04304	740200		SZA	
04305	740040	F528	HALT	/ERROR. JMS FROM 07774 TO 14444 /OR FROM 17774 TO 04444
04306	707704		LEM	
04307	744000		CLL	
04310	204550		LAC RJSM74	/JMP RJMS74
04311	054445		DAC 14445	
04312	204551		LAC RSM74	/JMS 14444
04313	047774		DAC 07774	
04314	047706		DAC JSM74	
04315	774445		LAW 14445	/AC = 774445
04316	607774		JMP 07774	
04317	147706	RJMS74	DZM JSM74	/CLEAR ERROR TABLE
04320	214444		LAC 14444	
04321	544552		SAD K75	
04322	741000		SKP	
04323	740040	F529	HALT	/ERROR. (14444 OR 04444) NOT /07775 OR 17775
04324	207707		LAC JSM75	
04325	740200		SZA	
04326	740040	F530	HALT	/ERROR. JMS FROM 07773 TO 15555 /OR FROM 17773 TO 05555
04327	707704		LEM	
04330	744000		CLL	
04331	204553		LAC RJSM75	/JMP TO RJMS75
04332	055556		DAC 15556	
04333	204554		LAC RSM75	/JMS 15555
04334	047773		DAC 07773	
04335	047707		DAC JSM75	
04336	775556		LAW 15556	/AC = 775556
04337	607773		JMP 07773	
04340	147707	RJMS75	DZM JSM75	/CLEAR ERROR TABLE
04341	215555		LAC 15555	
04342	544555		SAD K74	
04343	741000		SKP	
04344	740040	F531	HALT	/ERROR. (15555 OR 05555) NOT /07774 OR 17774
04345	207710		LAC JSM76	
04346	740200		SZA	
04347	740040	F532	HALT	/ERROR. JMS FROM 07772 TO 16666 /OR 17772 TO 06666
			.EJECT	

04350	707704		LEM	
04351	744000		CLL	
04352	204556		LAC RJSM76	/JMP TO RJMS76
04353	056667		DAC 16667	
04354	204557		LAC RSM76	/JMS 16666
04355	047772		DAC 07772	
04356	047710		DAC JSM76	
04357	776667		LAW 16667	/AC = 776667
04360	607772		JMP 07772	
04361	147710	RJMS76	DZM JSM76	/CLEAR ERROR TABLE
04362	216666		LAC 16666	
04363	544560		SAD K73	
04364	741000		SKP	
04365	740040	F533	HALT	/ERROR. (16666 OR 06666) NOT /07773 OR 17773
04366	207711		LAC JSM77	
04367	740200		SZA	
04370	740040	F534	HALT	/ERROR. JMS FROM 07771 TO 17777 /OR 17771 TO 07777
04371	707704		LEM	
04372	744000		CLL	
04373	700004		CLOF	
04374	700002		TOF	/PI OFF FOR THIS TEST
04375	204561		LAC RJSM77	/JMP TO RJMS77
04376	040000		DAC 0000	
04377	204562		LAC RSM77	/JMS 17777
04400	047771		DAC 07771	
04401	047711		DAC JSM77	
04402	760000		LAW 0	/AC = 760000
04403	607771		JMP 07771	
04404	147711	RJMS77	DZM JSM77	/CLEAR ERROR TABLE
04405	217777		LAC 17777	
04406	544563		SAD K72	
04407	741000		SKP	
04410	740040	F535	HALT	/ERROR (17777 OR 07777) NOT /07772 OR 17772
04411	750004		LAS	
04412	740010		RAI	
04413	740100		SMA	
04414	700042		TON	/PI RACK ON
04415	507557		AND K20K	
04416	741200		SNA	/CHECK ACS 5
04417	106604		JMS SETCLK	/CLOCK BACK ON
04420	207712		LAC JS252	
04421	740200		SZA	
04422	740040	F536	HALT	/ERROR. JMS FROM 12525 TO 15252 /OR FROM 02525 TO 05252
			.EJECT	

04423	744002		CLL: CML	/LINK = 1
04424	204564		LAC RJSM25	/JMP TO RJMS14
04425	055253		DAC 15253	
04426	204565		LAC RSM25	/JMS 15252
04427	052525		DAC 12525	
04430	047712		DAC JS252	
04431	775253		LAW 15253	/AC = 775253
04432	612525		JMP 12525	
04433	147712	RJMS14	DZM JS252	/CLEAR ERROR TABLE
04434	215252		LAC 15252	
04435	544566		SAD K426	/412526 OR 402526
04436	741000		SKP	
04437	740040	F537	HALT	/ERROR. (15252 OR 05252) NOT /412526 OR 402526
04440	207713		LAC JS525	
04441	740200		SZA	
04442	740040	F538	HALT	/ERROR. JMS FROM 15252 TO 12525 /OR 05252 TO 02525 /LINK = 1 /RJMP TO RJMS15
04443	744002		CLL: CML	
04444	204567		LAC RJSM52	
04445	052526		DAC 12526	/JMS 12525
04446	204570		LAC RSM52	
04447	055252		DAC 15252	
04450	047713		DAC JS525	
04451	772526		LAW 12526	/AC = 772526
04452	615252		JMP 15252	
04453	147713	RJMS15	DZM JS525	/CLEAR ERROR TABLE
04454	212525		LAC 12525	
04455	544572		SAD K415	/415253 OR 405253
04456	741000		SKP	
04457	740040	F539	HALT	/ERROR. (12525 OR 02525) NOT /415253 OR 405253
			.EOT	

/PDP-9 BASIC EXERCISER - TAPF 5

/TFST JMS SERIES

/

04460	207714		LAC JSSS	
04461	740200		SZA	
04462	740040	F540	HALT	/ERROR. JMS SERIES FAILED
		/		
04463	744002		CLL!CML	/LINK = 1
04464	104465	JS1	JMS .+1	
04465	740040	E541	HALT	/ERROR. JMS SERIES
04466	104467	JS2	JMS .+1	
04467	740040	F542	HALT	/ERROR. JMS SERIES
04470	104471	JS3	JMS .+1	
04471	740040	F543	HALT	/ERROR. JMS SERIES
04472	707704		LEM	
04473	744000		CLL	
04474	104475	JS4	JMS .+1	
04475	740040	F544	HALT	/ERROR. JMS SERIES
04476	147714	RJMSS	DEM JSSS	/CLEAR ERROR TABLE
04477	204573		LAC KJS1	/TFST JS1, LINK = 1
04500	347554		TAD K400K	
04501	740001		CMA	
04502	344465		TAD JS1+1	
04503	740001		CMA	
04504	740200		SZA	
04505	740040	F545	HALT	/ERROR. JS1+1
04506	204574		LAC KJS2	/TEST JS2, LINN = 1
04507	347554		TAD K400K	
04510	740001		CMA	
04511	344467		TAD JS2+1	
04512	740001		CMA	
04513	740200		SZA	
04514	740040	F546	HALT	/ERROR. JS2+1
04515	204575		LAC KJS3	/TEST JS3, LINK = 1
04516	347554		TAD K400K	
04517	740001		CMA	
04520	344471		TAD JS3+1	
04521	740001		CMA	
04522	740200		SZA	
04523	740040	E547	HALT	/ERROR. JS3+1
04524	204576		LAC KJS4	/TEST JS4, EXT = 0, LINK = 0
04525	740001		CMA	
04526	344475		TAD JS4+1	
04527	740001		CMA	
04530	740200		SZA	
04531	740040	F548	HALT	/ERROR. JS4+1
		/		
04532	447634		ISZ WORK3	/CHECK DONE LOOPING
04533	604221		JMP TSJMS	/LOOP
04534	106102		JMS GENRAN	/GET NO. FOR NEXT LOOP
04535	106126		JMS CKNO	
04536	604577		JMP TSXCT	/TEST XCT
			.EJECT	

/CONSTANTS FOR JMS. MODIFIED WHEN IN HI 4K

04537	604234	RJSM71	JMP RJMS71
04540	111111	RSM71	JMS 11111
04541	010000	K10000	10000
04542	604255	RJSM72	JMP RJMS72
04543	112222	RSM72	JMS 12222
04544	007777	K77	07777
04545	604276	RJSM73	JMP RJMS73
04546	113333	RSM73	JMS 13333
04547	007776	K76	07776
04550	604317	RJSM74	JMP RJMS74
04551	114444	RSM74	JMS 14444
04552	007775	K75	07775
04553	604340	RJSM75	JMP RJMS75
04554	115555	RSM75	JMS 15555
04555	007774	K74	07774
04556	604361	RJSM76	JMP RJMS76
04557	116666	RSM76	JMS 16666
04560	007773	K73	07773
04561	604404	RJSM77	JMP RJMS77
04562	117777	RSM77	JMS 17777
04563	007772	K72	07772
04564	604433	RJSM25	JMP RJMS14
04565	115252	RSM25	JMS 15252
04566	412526	K426	412526
04567	604453	RJSM52	JMP RJMS15
04570	112525	RSM52	JMS 12525
04571	007771	K71	07771
04572	415253	K415	415253
04573	004465	KJS1	JS1+1
04574	004467	KJS2	JS2+1
04575	004471	KJS3	JS3+1
04576	004475	KJS4	JS4+1

/

.EJECT

		/TFST XCT	
		/	
04577	754003	TSXCT	CLA!CMA!CLL!CML
04600	404601		XCT .+1
04601	740000		NOP
04602	740400		SNL
04603	740040	F549	HALT
04604	740001		CMA
04605	740200		SZA
04606	740040	F550	HALT
		/	
		/TEST EXECUTE NOP, AC = 0, LINK = 0	
04607	754000		CLA!CLL
04610	404611		XCT .+1
04611	740000		NOP
04612	741400		SZL
04613	740040	F551	HALT
04614	740200		SZA
04615	740040	F552	HALT
		/	
		/TEST XCT SKP	
04616	407617		XCT KSKP
04617	740040	F553	HALT
04620	750001		CLA!CMA
04621	407620		XCT KCLA
04622	740200		SZA
04623	740040	F554	HALT
		/	
		/TEST XCT LAW	
04624	750000		CLA
04625	407573		XCT K7S
04626	740001		CMA
04627	740200		SZA
04630	740040	F555	HALT
		/TFST XCT ISZ	
04631	750001		CLA!CMA
04632	057777		DAC 17777
04633	405052		XCT XCTISZ
04634	740040	F556	HALT
		/	
		/TFST XCT TAD	
04635	744002		CLL!CML
04636	777777		LAW 17777
04637	057777		DAC 17777
04640	405054		XCT XCTTAD
04641	740200		SZA
04642	740040	F557	HALT
04643	741400		SZL
04644	740040	F558	HALT
			.EJECT

	/AC = ONES, LINK = 0
	/NOP
	/ERROR; XCT NOP; LINK WAS RESET
	/ERROR; XCT NOP; AC NOT ONES
	/AC = 0, LINK = 0
	/ERROR; XCT NOP; LINK WAS SET
	/ERROR; XCT NOP; AC NOT 0
	/SKIP
	/ERROR; XCT SKP FAILED
	/AC = ONES
	/CLA
	/ERROR; XCT CLA FAILED
	/AC = 0
	/LAW = 17777
	/AC = 0
	/ERROR; XCT LAW FAILED
	/AC = ONES
	/ISZ 17777
	/ERROR; XCT ISZ FAILED TO SKP
	/LINK = 1
	/AC = ONES
	/17777=777777
	/TAD K1
	/ERROR; XCT TAD FAILED, AC NOT 0
	/ERROR; XCT TAD FAILED LINK

04645	754003	/TEST XCT RAL, AC = ONES, LINK = 1	
04646	407641	CLA!CMA!CLL!CML	/AC = ONES, LINK = 1
04647	740001	XCT XCTRAL	/RAL
04650	740200	CMA	/AC = 0
04651	740040	SZA	
04652	744400	F559 HALT	/ERROR: XCT RAL FAILED AC DROPPED A HIT
04653	740040	SNL!CLL	
		F560 HALT	/ERROR: XCTRAL FAILED LINK DROPPED
		/	
		/TEST XCT DAC	
04654	207567	LAC K3S	/AC = 333333
04655	405053	XCT XCTDAC	/DAC 17777
04656	347570	TAD K4S	/AC = 777777
04657	740001	CMA	/AC = 0
04660	740200	SZA	
04661	740040	F561 HALT	/ERROR: XCT DAC FAILED, K3S
			/NOT STORED AT 17777
		.EJECT	

```

/TEST XCT JMS
/
04662 207715 LAC XCT11
04663 740200 SZA
04664 740040 F562 HALT

04665 205030 LAC XT11S
04666 047715 DAC XCT11
04667 051111 DAC 11111
04670 205031 LAC XTR11
04671 056666 DAC 16666
04672 205032 LAC XT1R
04673 051112 DAC 11112
04674 611111 JMP 11111
04675 147715 RXCT1 DZM XCT11
04676 211111 LAC 11111
04677 545033 SAD K12
04700 741000 SKP
04701 740040 F563 HALT

04702 207716 LAC XCT12
04703 740200 SZA
04704 740040 F564 HALT

04705 205034 LAC XT12S
04706 047716 DAC XCT12
04707 052222 DAC 12222
04710 205035 LAC XTR12
04711 055555 DAC 15555
04712 205036 LAC XT2R
04713 052223 DAC 12223
04714 612222 JMP 12222
04715 147716 RXCT2 DZM XCT12
04716 212222 LAC 12222
04717 545037 SAD K23
04720 741000 SKP
04721 740040 F565 HALT

04722 207717 LAC XCT13
04723 740200 SZA
04724 740040 F566 HALT

.EJECT

/ERROR, XCT (16666 OR 06666)
/FROM 11111 OR 01111
/XCT (16666 OR 06666)

/OR 01111
/JMS 11111 OR 01111
/OR 06666
/RJMP TO RXCT1
/OR 01112
/OR 01111 AND XCT (16666 OR 06666)
/CLEAR ERROR TABLE
/OR 01111

/ERROR, RJMP ADR, NOT 1112
/OR 01112

/ERROR, XCT (15555 OR 05555)
/FROM 12222 OR 02222
/XCT (15555 OR 05555)

/JMS 12222 OR 02222
/RJMP TO RXCT2

/CLEAR ERROR TABLE

/ERROR, RJMP NOT 12223
/OR 02223

/ERROR, XCT (14444 OR 04444)
/FROM 13333 OR 03333

```

04725	205040	LAC XT13S	/XCT (14444 OR 04444)
04726	047717	DAC XCT13	
04727	053333	DAC 13333	
04730	205041	LAC XTR13	/JMS 13333 OR 03333
04731	054444	DAC 14444	
04732	205042	LAC XT3R	/RJMP TO RXCT3
04733	053334	DAC 13334	
04734	613333	JMP 13333	
04735	147717	DZM XCT13	/CLEAR ERROR TABLE
04736	213333	LAC 13333	
04737	545043	SAD K34	
04740	741000	SKP	
04741	740040	HALT	/ERROR, RJMP NOT 13334 OR 03334
04742	207720	LAC XCT17	
04743	740200	SZA	
04744	740040	HALT	/ERROR, XCT (17776 OR 07776)
			/FROM 07776 OR 17776
			/XCT (17776 OR 07776)
04745	205044	LAC XT17S	
04746	047720	DAC XCT17	/OR 17776
04747	047776	DAC 07776	/JMS 07776 OR 17776
04750	205045	LAC XTR17	/OR 07776
04751	057776	DAC 17776	/RJMP TO RXCT4
04752	205046	LAC XT4R	/OR 17777
04753	047777	DAC 07777	/OR 17776
04754	607776	JMP 07776	/CLEAR ERROR TABLE
04755	147720	DZM XCT17	/FOR 17776
04756	207776	LAC 07776	
04757	544544	SAD K77	
04760	741000	SKP	
04761	740040	HALT	/ERROR, RJMP NOT 07777 OR 17777
04762	207721	LAC XCT125	
04763	740200	SZA	
04764	740040	HALT	/ERROR, XCT (12525 OR 02525)
			/FROM 15252 OR 05252
			/XCT (12525 OR 02525)
			/OR 05252
04765	205047	LAC XCT12S	/JMS 15252 OR 05252
04766	047721	DAC XCT125	/RJMP TO RXCT5
04767	055252	DAC 15252	
04770	205050	LAC XCTR12	
04771	052525	DAC 12525	
04772	205051	LAC XT5R	
04773	055253	DAC 15253	
04774	615252	JMP 15252	
04775	147721	DZM XCT125	/CLEAR ERROR TABLE
04776	215252	LAC 15252	
04777	545435	SAD K15253	
05000	741000	SKP	
05001	740040	HALT	/ERROR, RJMP NOT 15253 OR 05253
		.EJECT	

/TEST XCT SERIES

```

/
05002 754003          CLA!CMA!CLL!CML      /AC = ONES, LINK = 1
05003 405004          XCT .+1; XCT .+1; XCT .+1
05004 405005
05005 405006
05006 405007          XCT .+1; XCT .+1; XCT .+1
05007 405010
05010 405011
05011 405012          XCT .+1; XCT .+1; XCT .+1
05012 405013
05013 405014
05014 405015          XCT .+1
05015 740000          NOP
05016 740001          CMA
05017 740200          SZA
05020 740040          F572 HALT              /ERROR, XCT SERIES FAILED AC NOT ONES
05021 740400          SNL
05022 740040          F573 HALT              /ERROR, LINK CHANGED
05023 447634          ISZ WORK3            /CHECK DONE LOOPING
05024 604577          JMP TSXCT           /LOOP
05025 106102          JMS GENRAN          /GET NO FOR NEXT LOOP
05026 106126          JMS CKNO
05027 605055          JMP TSAUTO          /TEST AUTO-INDEXING

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/XCT CONSTANTS, MODIFIED WHEN IN UPPER 4K

```

/
05030 416666          XT11S XCT 16666
05031 111111          XTR11 JMS 11111
05032 604675          XT1R  JMP RXCT1
05033 011112          K12   11112
05034 415555          XT12S XCT 15555
05035 112222          XTR12 JMS 12222
05036 604715          XT2R  JMP RXCT2
05037 012223          K23   12223
05040 414444          XT13S XCT 14444
05041 113333          XTR13 JMS 13333
05042 604735          XT3R  JMP RXCT3
05043 013334          K34   13334
05044 417776          XT17S XCT 17776
05045 107776          XTR17 JMS 07776
05046 604755          XT4R  JMP RXCT4
05047 412525          XCT12S XCT 12525
05050 115252          XCTR12 JMS 15252
05051 604775          XT5R  JMP RXCT5
05052 457777          XCTISZ ISZ 17777
05053 057777          XCTDAC DAC 17777
05054 347532          XCTTAD TAD K1
                          .EJECT

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```

                                /AUTO-INDEX
                                /
05055      200020      TSAUTO  LAC 20      /TFST AUTO-INDEX 20
05056      047637      DAC AUTNOT /STORE (20) AT AUTNOT
05057      220020      LAC* 20      /FALSE AUTO-INDEX 20
05060      207637      LAC AUTNOT
05061      540020      SAD 20      /COMPARE (AUTNOT) WITH (20)
05062      741000      SKP
05063      740040      E574  HALT      /ERROR; (20) AUTO-INDEXED
05064      040020      DAC 20      /RESTORE (20)
                                /TEST AUTO-INDEX (30)
                                /STORE (30) AT AUTNOT
05065      200030      LAC 30      /FALSE AUTO INDEX 30
05066      047637      DAC AUTNOT
05067      220030      LAC* 30
05070      207637      LAC AUTNOT
05071      540030      SAD 30      /COMPARE (AUTNOT) WITH 830)
05072      741000      SKP
05073      740040      E575  HALT      /ERROR; (30) AUTO-INDEXED
05074      040030      DAC 30      /RESTORE 30
                                /
                                /TFST AUTO-INDEX 50
                                LAC 50
                                DAC AUTNOT
                                LAC* 50
                                LAC AUTNOT
                                SAD 50
                                SKP
                                E576  HALT
                                DAC 50
                                /STORE (50) AT AUTNOT
                                /FALSE AUTO-INDEX 50
                                /COMPARE (AUTNOT) WITH (50)
                                /ERROR; (50) AUTO-INDEXED
                                /RESTORE 50
                                /
                                /TFST AUTO-INDEX 110
                                LAC 110
                                DAC AUTNOT
                                LAC* 110
                                LAC AUTNOT
                                SAD 110
                                SKP
                                E577  HALT
                                DAC 110
                                /STORE (110) AT AUTNOT
                                /FALSE AUTO INDEX 110
                                /COMPARE (AUTNOT) WITH (110)
                                /ERROR; (110) AUTO-INDEXED
                                /RESTORE 110
                                /
                                /TFST AUTO-INDEX 210
                                LAC 210
                                DAC AUTNOT
                                LAC* 210
                                LAC AUTNOT
                                SAD 210
                                SKP
                                E578  HALT
                                DAC 210
                                /STORE (210) AT AUTNOT
                                /FALSE AUTO-INDEX 210
                                /COMPARE (AUTNOT) WITH (210)
                                /ERROR; (210) AUTO-INDEXED
                                /RESTORE 210
                                .EJECT

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05125	200410	/TEST AUTO-INDEX 410	
05126	047637	LAC 410	
05127	220410	DAC AUTNOT	/STORE (410) AT AUTNOT
05130	207637	LAC* 410	/FALSE AUTOINDEX 410
05131	540410	LAC AUTNOT	
05132	741000	SAD 410	/COMPARE (AUTNOT) WITH (410)
05133	740040	SKP	
05134	040410	F579 HALT	/ERROR; (410) AUT-INDEXED
		DAC 410	/RESTORE 410
		/	
05135	201010	/TEST AUTO-INDEX 1010	
05136	047637	LAC 1010	
05137	221010	DAC AUTNOT	/STORE (1010) AT AUTNOT
05140	207637	LAC* 1010	/FALSE AUTO-INDEX 1010
05141	541010	LAC AUTNOT	
05142	741000	SAD 1010	/COMPARE (AUTNOT) WITH (1010)
05143	740040	SKP	
05144	041010	F580 HALT	/ERROR; (1010) AUT-INDEXED
		DAC 1010	/RESTORE 1010
		/	
05145	202010	/TEST AUTO-INDEX 2010	
05146	047637	LAC 2010	
05147	222010	DAC AUTNOT	/STORE (2010) AT AUTNOT
05150	207637	LAC* 2010	/FALSE AUTO INDEX 2010
05151	542010	LAC AUTNOT	
05152	741000	SAD 2010	/COMPARE (AUTNOT) WITH (2010)
05153	740040	SKP	
05154	042010	F581 HALT	/ERROR; (2010) AUTO-INDEXED
		DAC 2010	/RESTORE 2010
		/	
05155	204010	/TEST AUTO-INDEX 4010	
05156	047637	LAC 4010	
05157	224010	DAC AUTNOT	/STORE (4010) AT AUTNOT
05160	207637	LAC* 4010	/FALSE AUTO INDEX 4010
05161	544010	LAC AUTNOT	
05162	741000	SAD 4010	/COMPARE (AUTNOT) WITH (4010)
05163	740040	SKP	
05164	044010	F582 HALT	/ERROR; (4010) AUTO-INDEXED
		DAC 4010	/RESTORE 4010
		/	
05165	447634	IS7 WORK3	/CHECK DONE LOOPING
05166	605055	JMP TSAUTO	/LOOP
05167	106102	JMS GENRAN	/GET NO, FOR NEXT LOOP
05170	106126	JMS CKNO	
		.EJECT	

```

/TFST LAC INDIRECT
/
05171 204544 LACIN LAC K77
05172 057777 DAC 17777 /((17777 OR 07777) = 07777 OR 17777
05173 207627 LAC M400K /377777
05174 047777 DAC 07777 /OR 17777
05175 237777 LAC* 17777 /OR 07777
05176 347554 TAD K400K /AC = 777777
05177 740001 CMA
05200 740200 SZA
05201 740040 F584 HALT /ERROR, LAC* 17777 OR 07777 FAILED
/
05202 204547 LAC K76
05203 056666 DAC 16666 /((16666 OR 06666) = 07776 OR 17776
05204 207626 LAC M400K /737777
05205 047776 DAC 07776
05206 236666 LAC* 16666 /AC = 737777
05207 347553 TAD K400K /AC = 777777
05210 740001 CMA
05211 740200 SZA
05212 740040 F585 HALT /ERROR, LAC* 16666 OR 06666 FAILED
/
05213 204552 LAC K75
05214 055555 DAC 15555 /((15555 OR 05555) = 07775 OR 17775
05215 207625 LAC M400K /AC = 773777
05216 047775 DAC 07775
05217 235555 LAC* 15555 /AC = 773777
05220 347550 TAD K400K /AC = 777777
05221 740001 CMA
05222 740200 SZA
05223 740040 F586 HALT /ERROR, LAC* 15555 OR 05555 FAILED
/
05224 204555 LAC K74
05225 054444 DAC 14444 /((14444 OR 04444) = 07774 OR 17774
05226 207624 LAC M400K /AC = 777377
05227 047774 DAC 07774
05230 234444 LAC* 14444 /AC = 777377
05231 347545 TAD K400K /AC = 777777
05232 740001 CMA
05233 740200 SZA
05234 740040 F587 HALT /ERROR, LAC* 14444 OR 04444 FAILED
/
05235 204560 LAC K73
05236 053333 DAC 13333 /((13333 OR 03333) = 07773 OR 17773
05237 207623 LAC M400K /AC = 777737
05240 047773 DAC 07773
05241 233333 LAC* 13333 /AC = 777737
05242 347543 TAD K400K /AC = 77777
05243 740001 CMA
05244 740200 SZA
05245 740040 F588 HALT /ERROR, LAC* 13333 OR 03333 FAILED
.EJECT

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05246	204563	LAC K72	
05247	052222	DAC 12222	/(12222 OR 02222) = 07772 OR 17772
05250	207622	LAC M4	/AC = 777773
05251	047772	DAC 07772	
05252	232222	LAC* 12222	/AC = 777773
05253	347534	TAD K4	/AC = 777777
05254	740001	CMA	
05255	740200	SZA	
05256	740040	HALT	/ERROR, LAC* 12222 OR 02222 FAILED
		F589	
		/	
05257	204571	LAC K71	
05260	051111	DAC 11111	/(11111 OR 01111) = 07771 OR 17771
05261	207621	LAC M1	/AC = 777776
05262	047771	DAC 07771	
05263	231111	LAC* 11111	/AC = 777776
05264	347532	TAD K1	/AC = 777777
05265	740001	CMA	
05266	740200	SZA	
05267	740040	HALT	/ERROR, LAC* 11111 OR 01111 FAILED
		F590	
		/	
05270	205427	LAC INK52	
05271	055252	DAC 15252	/(15252 OR 05252) = 02525 OR 12525
05272	207606	LAC K121	/AC = 525252
05273	052525	DAC 12525	
05274	235252	LAC* 15252	/AC = 525252
05275	347605	TAD K010	/AC = 777777
05276	740001	CMA	
05277	740200	SZA	
05300	740040	HALT	/ERROR, LAC* 15252 OR 05252 FAILED
		F591	
		/	
05301	447634	ISZ WORK3	/CHECK DONE LOOPING
05302	605171	JMP IACIN	/LOOP
05303	106102	JMS GENRAN	/GFT NO, FOR NEXT LOOP
05304	106126	JMS CKNO	
		.EJECT	

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/TEST XCT JMS INDIRECT
/
05305      744000      XTJMSI      CLL
05306      750000      CLA
05307      547722      SAD JST77
05310      741000      SKP
05311      740040      F592      HALT      /ERROR, JMS DEST'B ERROR
/
05312      206060      LAC K17776      /DIRECT ADDRESS
05313      047777      DAC 07777
05314      205430      LAC JMSI1      /JMS* 07777 OR 17777
05315      047722      DAC JST77      /ERROR TABLE
05316      055252      DAC 15252
05317      205431      LAC RJMI1      /JMP RJSI1
05320      057777      DAC 17777
05321      415252      XCT 15252      /XCT TEST
05322      741000      SKP
05323      147722      RJSI1      DZM JST77
05324      217776      LAC 17776
05325      545432      SAD RJSI1X      /RJSI1X = RJSI1-1
05326      751000      CLA:SKP
05327      740040      F593      HALT      /ERROR (17776 OR 07776) NOT =
/TO RJSI1-1
/
/
/TEST JMS INDIRECT
/
05330      744000      CLL
05331      750000      CLA
05332      547723      SAD JST66
05333      741000      SKP
05334      740040      F594      HALT      /ERROR, JMS DEST'N ERROR
/
05335      206075      LAC K11111      /DIRECT ADR. 11111 OR 01111
05336      056666      DAC 16666      /OR 06666
05337      205433      LAC JST66      /JMS* 16666 OR 06666
05340      047723      DAC JST66
05341      055252      DAC 15252      /JMS* 16666 OR 06666 AT 15252
/OR 05252
/
05342      205434      LAC RJMI2      /JMP RJSI2
05343      051112      DAC 11112 /OR 01112
05344      615252      JMP 15252      /OR 05252
05345      741000      SKP
05346      147723      RJSI2      DZM JST66      /CLEAR ERROR TABLE
05347      211111      LAC 11111
05350      545435      SAD K15253
05351      751000      CLA:SKP
05352      740040      E595      HALT      /ERROR, RJMP ADR. (11111 OR 01111)
/NOT 15253 OR 05253
.EJECT

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0F353	744000		CLL	
0F354	750000		CLA	
0F355	547724		SAD JST55	
0F356	741000		SKP	
0F357	740040	F596	HALT	/ERROR. JMS DEST'N ERROR
0F360	206073		LAC K12222	/DIRECT ADR. 12222 OR 02222
0F361	055555		DAC 15555 /OR 055555	
0F362	205436		LAC JST55	/JMS* 15555 OR 05555
0F363	047724		DAC JST55	
0F364	055252		DAC 15252	/JMS* 15555 OR 05555 AT
				/15252 OR 05252
0F365	205437		LAC RJM13	/JMP RJSI3
0F366	052223		DAC 12223	/OR 02223
0F367	615252		JMP 15252	/OR 05252
0F370	741000		SKP	
0F371	147724	RJSI3	DZM JST55	/CLEAR ERROR TABLE
0F372	212222		LAC 12222	/OR 02222
0F373	545435		SAD K15253	
0F374	751000		CLA:SKP	
0F375	740040	F597	HALT	/ERROR. RJMP ADR. (12222 OR 02222)
				/NOT 15253 OR 05253
0F376	744000		CLL	
0F377	750000		CLA	
0F400	547725		SAD JST44	
0F401	741000		SKP	
0F402	740040	F598	HALT	/ERROR. JMS DEST'N ERROR
		/		
0F403	206071		LAC K13333	/DIRECT ADR. 13333 OR 03333
0F404	054444		DAC 14444	/OR 04444
0F405	205440		LAC JST44	/JMS* 14444 OR 04444
0F406	047725		DAC JST44	
0F407	055252		DAC 15252	/OR 05252
0F410	205441		LAC RJM14	
0F411	053334		DAC 13334	/OR 03334
0F412	615252		JMP 15252	/OR 05252
0F413	741000		SKP	
0F414	147725	RJSI4	DZM JST44	/CLEAR ERROR TABLE
0F415	213333		LAC 13333	/OR 03333
0F416	545435		SAD K15253	
0F417	751000		CLA:SKP	
0F420	740040	F599	HALT	/ERROR. RJMP ADR (13333 OR 03333)
				/NOT 15253 OR 05253
0F421	447634		ISZ WORK3	/CHECK DONE LOOPING
0F422	605305		JMP XTJMSI	/LOOP
0F423	106102		JMS GENRAN	/GFT NO. FOR NFXT LOOP
0F424	106126		JMS CKNO	
0F425	700004		CLOF	
0F426	605442		JMP XTXCT	/TEST XCT INDIRECTS
			.EJECT	

/CONSTANTS FOR LAC*, XCT JMS* MODIFIED
/WHEN IN UPPER 4K

05427	012525	INK52	12525
05430	127777	JMSI1	JMS* 07777
05431	605323	RJMI1	JMP RJSI1
05432	005322	RJSI1X	RJSI1-1
05433	136666	JSI66	JMS* 16666
05434	605346	RJMI2	JMP RJSI2
05435	015253	K15253	15253
05436	135555	JSI55	JMS* 15555
05437	605371	RJMI3	JMP RJSI3
05440	134444	JSI44	JMS* 14444
05441	605414	RJMI4	JMP RJSI4
			.EOT

/PDP-9 BASIC EXERCISER - TAPE 6
/TEST XCT INDIRECT

05442	700002	XTXCT	IOF	/PI OFF FOR XCT* TO USE
				/LOCATION 0
05443	207531		LAC K0	
05444	057777		DAC 17777	/OR 07777
05445	205516		LAC XCTDZM	
05446	040000		DAC 0	/DZM 12525 OR 02525
05447	777777		LAW 17777	
05450	052525		DAC 12525	/((12525 OR 02525) = 777777
05451	437777		XCT* 17777	/OR 07777
05452	212525		LAC 12525	/OR 02525
05453	740200		SZA	
05454	740040	F600	HALT	/ERROR, XCT* A DZM FAILED
				/((12525 OR 02525) NOT 777777

/

/TEST ISZ INDIRECT. PI IS OFF

/

05455	207531		LAC K0	
05456	057777		DAC 17777	/OR 07777
05457	777777		LAW 17777	
05460	040000		DAC 0	/((0) = 777777
05461	477777		ISZ* 17777	
05462	740040	F601	HALT	/ERROR ISZ* FAILED TO SKIP/
			.EJECT	

/TEST XCT* AND* PI IS OFF

05463	207531	LAC K0	
05464	057777	DAC 17777	/OR 07777, INDIRECT ADR FOR XCT*
05465	207532	LAC K1	/DIRECT ADR, FOR AND*
05466	057776	DAC 17776	/OR 07776
05467	205517	LAC ANDI	
05470	040000	DAC 0	/AND* 17776 OR 07776
05471	207603	LAC K2525	
05472	040001	DAC 1	/(1) = 2525
05473	750001	CLA!CMA	/AC = ONES
05474	437777	XCT* 17777	/OR 07777
05475	547603	SAD K2525	
05476	741000	SKP	
05477	740040	HALT	/ERROR, XCT* 17777 OR 07777
			/FOLLOWED BY AND* 17776
			/OR 07776 FAILED
			/CHECK DONE LOOPING
			/LOOP
			/GET NO, FOR NEXT LOOP
			/RESTORE LOC 1
			/PI RACK ON
			/TEST ACS5
			/CLOCK BACK ON
			/TEST INDEX REGISTERS
05500	447634	ISZ WORK3	
05501	605442	JMP XTXCT	
05502	106102	JMS GENRAN	
05503	106126	JMS CKNO	
05504	207617	LAC KSKP	
05505	040001	DAC 1	
05506	750004	LAS	
05507	740010	RAL	
05510	740100	SMA	
05511	700042	ION	
05512	507557	AND K20K	
05513	741200	SNA	
05514	106604	JMS SETCLK	
05515	605520	JMP AUTOIN	
		.EJECT	

F602

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/CONSTANTS FOR PRECEDING LOOPS, MODIFIED WHEN IN UPPER 4K
/
0F516      152525      XCTD#M      D#M 12525
0F517      537776      ANDI      AND# 17776
/
/
/TEST AUTO-INDEX (XOR# 10)
/
0F520      206060      AUTOIN      LAC K17776
0F521      040010      DAC 10      /(10) = 17776 OR 07776
0F522      207565      LAC K1S      /AC = 11111
0F523      057777      DAC 17777      /OR 07777
0F524      260010      XOR# 10
0F525      740200      SZA
0F526      740040      F603      HALT      /ERROR, XOR# 10 FAILED
                                /AC NOT 11111
0F527      200010      LAC 10
0F530      546061      SAD K17777
0F531      741000      SKP
0F532      740040      F604      HALT      /ERROR, (10) NOT INCREMENTED+1
/
0F533      206062      LAC K16665
0F534      040010      DAC 10      /(10) = 16665 OR 06665
0F535      207566      LAC K2S      /AC = 22222
0F536      056666      DAC 16666      /OR 06666
0F537      260010      XOR# 10
0F540      740200      SZA
0F541      740040      F605      HALT      /ERROR, XOR# 10 FAILED
                                /AC NOT 22222
0F542      200010      LAC 10
0F543      546063      SAD K16666
0F544      741000      SKP
0F545      740040      F606      HALT      /ERROR, (10) NOT INCREMENTED+1
/
0F546      206064      LAC K15554
0F547      040010      DAC 10      /(10) = 15554 OR 05554
0F550      207567      LAC K3S      /AC = 333333
0F551      055555      DAC 15555
0F552      260010      XOR# 10
0F553      740200      SZA
0F554      740040      F607      HALT      /ERROR, XOR# 10 FAILED. AC NOT 333333
0F555      200010      LAC 10
0F556      546065      SAD K15555
0F557      741000      SKP
0F560      740040      F608      HALT      /ERROR, (10) NOT INCREMENTED +1
                                .EJECT

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05561	206066		LAC K14443	
05562	040010		DAC 10	/(10) = 14443 OR 04443
05563	207570		LAC K4S	/AC = 444444
05564	054444		DAC 14444	
05565	260010		XOR* 10	
05566	740200		SZA	
05567	740040	F609	HALT	/ERROR, XOR* 10 FAILED AC NOT 444444
05570	200010		LAC 10	
05571	546067		SAD K14444	
05572	741000		SKP	
05573	740040	F610	HALT	/ERROR, (10) NOT INCREMENTED +1
05574	206070		LAC K13332	
05575	040010		DAC 10	/(10) = 13332 OR 03332
05576	207571		LAC K5S	/AC = 55555
05577	053333		DAC 13333	
05600	260010		XOR* 10	
05601	740200		SZA	
05602	740040	F611	HALT	/ERROR, XOR* 10 FAILED AC NOT 555555
05603	200010		LAC 10	
05604	546071		SAD K13333	
05605	741000		SKP	
05606	740040	F612	HALT	/ERROR, (10) NOT INCREMENTED+1
		/		
05607	206072		LAC K12221	
05610	040010		DAC 10	/(10) = 12221 OR 02221
05611	207572		LAC K6S	/AC = 666666
05612	052222		DAC 12222	
05613	260010		XOR* 10	
05614	740200		SZA	
05615	740040	F613	HALT	/ERROR, XOR* 10 FAILED, AC NOT 666666
05616	200010		LAC 10	
05617	546073		SAD K12222	
05620	741000		SKP	
05621	740040	F614	HALT	/ERROR, (10) NOT INCREMENTED+1
05622	206074		LAC K11110	
05623	040010		DAC 10	/(10) = 11110 OR 01110
05624	207573		LAC K7S	/AC = 777777
05625	051111		DAC 11111	
05626	260010		XOR* 10	
05627	740200		SZA	
05630	740040	F615	HALT	/ERROR, XOR* 10 FAILED, AC NOT 777777
05631	200010		LAC 10	
05632	546075		SAD K11111	
05633	741000		SKP	
05634	740040	F616	HALT	/ERROR, (10) NOT INCREMENTED +1
			.EJECT	

		/TFST ISZ* 11		
		/		
0F635	206076		LAC K15252	
0F636	040011		DAC 11	/(11) = 15252 OR 05252
0F637	207573		LAC K7S	
0F640	055253		DAC 15253	/OR 05253
0F641	460011		ISZ* 11	
0F642	740040	F617	HALT	/ERROR, ISZ FAILED TO SKIP
				/AUTO-INDEX 11 FAILED
0F643	215253		LAC 15253	
0F644	740200		SZA	
0F645	740040	F618	HALT	/ERROR, (15253 OR 05253) NOT 0
				/ISZ FAILED
0F646	200011		LAC 11	
0F647	545435		SAD K15253	
0F650	741000		SKP	
0F651	740040	F619	HALT	/ERROR, (11) NOT INCREMENTED+1
		/		
		/AUTON-INDEX JMP* 12,		
		/		
0F652	207726		LAC AUTJMP	
0F653	740200		SZA	
0F654	740040	F620	HALT	/ERROR, JMP* 12 FAILED TO REACH 15253
0F655	207651		LAC JMPAUT	/JMP* 12
0F656	047726		DAC AUTJMP	
0F657	206077		LAC AUTRET	/RJMP TO AUTR
0F660	055253		DAC 15253	
0F661	206076		LAC K15252	
0F662	040012		DAC 12	/(12) = 15252
0F663	620012		JMP* 12	
0F664	741000		SKP	
0F665	147726	AUTR	02M AUTJMP	/CLEAR ERROR TABLE
0F666	200012		LAC 12	
0F667	545435		SAD K15253	
0F670	741000		SKP	
0F671	740040	F621	HALT	/ERROR, (12) NOT INCREMENTED+1
		/		
		/AUTO-INDEX (DAC* 13),		
		/		
0F672	204547		LAC K76	
0F673	040013		DAC 13	/(13) = 07776 OR 17776
0F674	204547		LAC K76	
0F675	047777		DAC 07777	/(07777) = 07776
0F676	207531		LAC K0	
0F677	060013		DAC* 13	
0F700	207777		LAC 07777	
0F701	740200		SZA	
0F702	740040	F622	HALT	/ERROR, (07777) NOT 0. DAC* 13 FAILED
0F703	200013		LAC 13	
0F704	544544		SAD K77	
0F705	741000		SKP	
0F706	740040	F623	HALT	/ERROR (13) NOT INCREMENTED+1
			.EJECT	

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/ AUTO-INDEX (XCT* 14).
/
05707      204571      LAC K71
05710      040014      DAC 14      /(14) = 07771
05711      207642      LAC AUTCMA
05712      047772      DAC 07772      /(07772) = CMA
05713      750001      CLA!CMA
05714      420014      XCT* 14
05715      740200      SZA
05716      740040      F624      HALT      /ERROR. AC NOT 0 (XCT* 14) A CMA
05717      200014      LAC 14
05720      544563      SAD K72
05721      741000      SKP
05722      740040      F625      HALT      /ERROR. (14) NOT INCREMENTED+1
/
/ AUTO-INDEX (TAD* 15).
/
05723      206060      LAC K17776
05724      040015      DAC 15      /(15) = 17776 OR 07776
05725      207532      LAC K1
05726      057777      DAC 17777      /OR 07777
05727      754001      CLL!CLA!CMA
05730      360015      TAD* 15
05731      740200      SZA
05732      740040      F626      HALT      /ERROR. AC NOT 0 (TAD* 15)
05733      740400      SNL
05734      740040      F627      HALT      /ERROR. LINK NOT 1 (TAD* 15)
05735      200015      LAC 15
05736      546061      SAD K17777
05737      741000      SKP
05740      740040      F628      HALT      /ERROR. (15) NOT INCREMENTED+1
05741      217777      LAC 17777
05742      547532      SAD K1
05743      741000      SKP
05744      740040      F629      HALT      /ERROR. (17777 OR 07777) NOT 1
/
/ AUTO-INDEX (SAD* 16).
/
05745      204555      LAC K74
05746      040016      DAC 16      /(16) = 07774
05747      207604      LAC K5252
05750      047775      DAC 07775      /(07775) = 5252
05751      560016      SAD* 16
05752      741000      SKP
05753      740040      F630      HALT      /ERROR. SAD SKIPPED (SAD* 16)
05754      207775      LAC 07775
05755      547604      SAD K5252
05756      741000      SKP
05757      740040      F631      HALT      /ERROR. (07775) NOT 5252
05760      200016      LAC 16
05761      544552      SAD K75
05762      741000      SKP
05763      740040      F632      HALT      /ERROR. (16) NOT INCREMENTED+1
                        .EJECT

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.EJECT

/AUTO-INDEX (XCT* 15),

06034	204560		LAC K73	
06035	040015		DAC 15	/(15) = 07773
06036	207645 4		LAC LAWAUT	
06037	047774		DAC 07774	/(07774) = XCT* 15
06040	207646 5		LAC LAWFUL	
06041	047775		DAC 07775	/(07775) = LAW 17777
06042	750000		CLA	/AC = 0
06043	420015		XCT* 15	
06044	740001		CMA	
06045	740200		SZA	
06046	740040	F640	HALT	/ERROR, AC NOT ONES
				/LAW 1777 DID NOT OCCUR
06047	200015		LAC 15	
06050	544552		SAD K75	
06051	741000		SKP	
06052	740040	F641	HALT	/ERROR, (15) NOT 7775 (XCT* 15)
06053	447634 3		ISZ WORK3	/CHECK DONE LOOPING
06054	605520		JMP AUTOIN	/LOOP
06055	777775		LAW -3	
06056	047634 3		DAC WORK3	
06057	606154		JMP CHKBRO	/BASIC MEMORY CHECKERBOARD
			.EJECT	

(27)

/CONSTANTS FOR AUTO-INDEXING. MODIFIED WHEN IN HI 4K

06060	017776	K17776	17776
06061	017777	K17777	17777
06062	016665	K16665	16665
06063	016666	K16666	16666
06064	015554	K15554	15554
06065	015555	K15555	15555
06066	014443	K14443	14443
06067	014444	K14444	14444
06070	013332	K13332	13332
06071	013333	K13333	13333
06072	012221	K12221	12221
06073	012222	K12222	12222
06074	011110	K11110	11110
06075	011111	K11111	11111
06076	015252	K15252	15252
06077	605665	AUTRET	JMP AUTR
06100	605777	AUTRJM	JMP AUTRE1
06101	005776	AURJMP	AUTRE1-1
			.EJECT

/RANDOM NUMBER GENERATORS

06102	000000	GENRAN	0	
06103	206123		LAC RANDEX	
06104	546124		SAD ENDTL	/CHECK FOR END OF TABLE
06105	741000		SKP	/END
06106	606116		JMP RANTAD-1	/GENERATE RANDOM
06107	206125		LAC TBLTOP	
06110	046123		DAC RANDEX	/RESET INDEX TO FIRST
06111	207655		LAC RANCON	/POSITION MODIFIER
06112	744010		CLL:RAL	/1 LEFT
06113	741400		SZL	/WAS BIT 0 A 1
06114	347532		TAD K1	/YES MAKE 17 A 1
06115	047655		DAC RANCON	/RESTORE MODIFIER
06116	226123		LAC* RANDEX	/GET FIRST CONTROL
06117	347655	RANTAD	TAD RANCON	/ADD MODIFIER
06120	066123		DAC* RANDEX	/NEW CONTROL = RANDOM
06121	446123		ISZ RANDEX	/STEP POINTER
06122	626102		JMP* GENRAN	/EXIT
/				
06123	007666	RANDEX	RANTRL+10	
06124	007666	ENDTRL	RANTRL+10	
06125	007656	TBLTOP	RANTRL	
/				
06126	000000	CKNO	0	
06127	507610		AND K37S	/MAKE 65K OR LESS
06130	740001		CMA	
06131	047634		DAC WQRK3	/LOOP COUNTER
06132	626126		JMP* CKNO	/EXIT
/				
06133	000000	RANGEN	0	
06134	206123		LAC RANDEX	/CHECK FOR TABLE END
06135	546124		SAD ENDTL	
06136	741000		SKP	/END
06137	606147		JMP TADRAN-1	/GENERATE RANDOM
06140	206125		LAC TBLTOP	
06141	046123		DAC RANDEX	/RESET INDEX TO FIRST
06142	207655		LAC RANCON	/POSITION MODIFIER
06143	744010		CLL:RAL	/1 LEFT
06144	741400		SZL	/WAS BIT 0 A 1
06145	347532		TAD K1	/MAKE 17 A 1
06146	047655		DAC RANCON	/RESTORE MODIFIER
06147	226123		LAC* RANDEX	/GET FIRST CONTROL
06150	347655	TADRAN	TAD RANCON	/ADD MODIFIER
06151	066123		DAC* RANDEX	/NEW CONTROL = RANDOM
06152	446123		ISZ RANDEX	/STEP POINTER
06153	626133		JMP* RANGEN	/EXIT
.EJECT				

(7654) - 000 000

(7655) - (7654) = 0

507601

06154 700002
06155 750004
06156 740010
06157 740100
06160 700042
06161 777777
06162 047317
06163 206165
06164 046332
06165 207301
06166 047305
06167 147632
06170 707704

CHKBRD IOF
LAS
RAL
SMA
ION
LAW -1
DAC RITSUP
LAC .+2
DAC NEXPAT
LAC KPAT
DAC MPAT
DEM WORK1
LEM

/CHECK PI INHIBITED
/PI ON

/LOAD CHECKERBOARD
/

06171 106312
06172 207305
06173 047307
06174 777776
06175 047314
06176 777770
06177 047277
06200 777760
06201 047276
06202 207307
06203 047306
06204 207306
06205 744010
06206 047306
06207 751400
06210 740001
06211 067300
06212 207300
06213 546261
06214 606234
06215 447300
06216 447276
06217 606204
06220 447277
06221 606200
06222 207305
06223 744020
06224 740400
06225 606230
06226 447314
06227 606176
06230 207307
06231 740001
06232 047307
06233 606174

LOAD JMS ADJUST
LAC MPAT
DAC PATWD
LAW -2
DAC WC256
LCNTA LAW -10
DAC WC128
LCNTR LAW -20
DAC WC16
LAC PATWD
DAC PATR
WCI OOP LAC PATR
RCL
DAC PATR
SZL:CLA
CMA
DAC* LLREG
LAC LLREG
SAD K17777
JMP READ
ISZ LLREG
ISZ WC16
JMP WCI OOP
ISZ WC128
JMP LCNTR
LAC MPAT
RCR
SNL
JMP .+3
ISZ WC256
JMP LCNTA
LAC PATWD
CMA
DAC PATWD
JMP LOAD+2
EJECT

/-16 DECIMAL

/TEST FOR A 1 OR 0

/STORE WORD

/DONE LOADING?

/YES
/INCR. ADR
/16 WORDS?
/NO

06234	207305	/READ CHECKERBOARD	
06235	047633	READ	LAC MPAT
06236	106312		DAC WORK2
06237	777776		JMS ADJUST
06240	047314	RCNTA	LAW -2
06241	777770		DAC WC256
06242	047277		LAW -10
06243	207633	RCNTR	DAC WC128
06244	047306		LAC WORK2
06245	777760		DAC PATR
06246	047276		LAW -20
06247	777772	RCLOOP	DAC WC16
06250	047242		LAW -6
06251	207306		DAC CRLF
06252	744010		LAC PATR
06253	047306		RCL
06254	751400		DAC PATR
06255	740001		SZL:CLA
06256	047307		CMA
06257	227300		DAC PATWD
06260	740001		LAC* LLREG
06261	067300		CMA
06262	447242		DAC* LLREG
06263	606257		ISZ CRLF
06264	227300		JMP , -4
06265	547307		LAC* LLREG
06266	741000		SAD PATWD
06267	606340		SKP
06270	207300		JMP ERROR
06271	546061	RDRTN	LAC LLREG
06272	606325		SAD K17777
06273	447300		JMP NXTST
06274	447276		ISZ LLREG
06275	606247		ISZ WC16
06276	447277		JMP RCLOOP
06277	606243		ISZ WC128
06300	207305		JMP RCNTR
06301	744020		LAC MPAT
06302	740400		RCR
06303	606306		SNL
06304	447314		JMP , +3
06305	606241		ISZ WC256
06306	207633		JMP RCNTA+2
06307	740001		LAC WORK2
06310	047633		CMA
06311	606237		DAC WORK2
			JMP RCNTA
			.EJECT

/RESTORE PATTERN GEN

/-26 DECIMAL

/SAVE FOR COMPARE

/COMPARE
/OK

/DONE READING?

/YES
/INCR. ADR
/16 WORDS?
/NO,

06312	000000	ADJUST	0	
06313	206313		LAC .	
06314	507556		AND K10K	
06315	740200		SZA	
06316	606322		JMP ULADJ	
06317	207556		LAC K10K	/SA = 010000 FOR PATTERN
06320	047300		DAC LLREG	
06321	626312		JMP* ADJUST	
/				
06322	207545	ULADJ	LAC K400	/SA = 400 FOR PATTERN
06323	047300		DAC LLREG	
06324	626312		JMP* ADJUST	
/				
06325	207632	NXTST	LAC WORK1	
06326	247561		XOR K600K	
06327	741200		SNA	
06330	606363		JMP CKLOOP	
06331	446332		ISZ .+1	
06332	207301	NEXPAT	LAC KPAT	
06333	047305		DAC MPAT	
06334	207632		LAC WORK1	
06335	347560		TAD K200K	
06336	047632		DAC WORK1	
06337	606171		JMP LOAD-1	
			.EJECT	

```

06340 047634 /BASIC MEMORY CHECKERBOARD ERROR ROUTINE.
06341 507317 ERROR DAC WORK3
06342 740200 AND BITSUP
06343 740001 SZA
06344 507317 CMA
06345 741200 AND BITSUP
06346 606270 SNA
06347 207300 JMP RDRTN
06350 740040 F642 LAC LLREG /DISPLAY ADDRESS
06351 207307 LAC PATWD /GOOD DATA
06352 740040 GDATA HLT
06353 207634 LAC WORK3 /BAD DATA
06354 740040 HDATA HLT
06355 750004 LAS /SUPPRESS HERE
06356 740001 CMA
06357 047317 DAC BITSUP
06360 207633 LAC WORK2 /PATTERN CONTROL WORD
06361 740040 PATT HLT
06362 606055 JMP E641+3 /START OVER

/
CKLOOP LAS
RTL
RAL
SPA
JMP CHKBRD /LOOP ON MEMORY TEST
ISZ WORK3 /CHECK DONE LOOPING
JMP CHKBRD /LOOP
IOF
LAS
AND K20K /CHECK ACS 4 FOR
/INHIBIT RELOCATION

SNA
JMP FNTST /RFLOCATE
LAW 207
JMS TLSSF /BELL FOR ONE PASS
LAS
RAL
SPA
JMS PINOT /CHECK FOR PI INHIBITED
JMP SEQUEN /INHIBITED
.EOT /START OVER IN THIS 4K

```

/PDP-9 BASIC EXERCISER - TAPE 7

/

/ROUTINE FOR PROGRAM RELOCATION

/

06406	700002	ENTST	IOF	/PI OFF DURING RELOCATION
06407	770023		LAW -7755	
06410	047313		DAC WDCNT	
06411	206411		LAC .	
06412	507556		AND K10K	
06413	740200		SZA	/SEE IF IN LO OR HI 4K
06414	606510		JMP MVRK	/HI 4K
06415	740001		CMA	
06416	047633		DAC WORK2	/SOURCE ADDRESS
06417	207320		LAC K777	/DEST'N ADR. TO HI 4K
06420	047634		DAC WORK3	
06421	207633	MOVE	LAC WORK2	
06422	047315		DAC MOVES	
06423	207634		LAC WORK3	
06424	047316		DAC MOVED	
06425	447316		ISZ MOVED	
06426	167316		DZM* MOVED	/CLEAR DEST'N TO 0'S
06427	447313		ISZ WDCNT	
06430	606425		JMP .-3	
06431	207634		LAC WORK3	
06432	047316		DAC MOVED	/RESTORE DEST'N S.A.
06433	447315	RFROM	ISZ MOVES	
06434	227315		LAC* MOVES	/SOURCE ADR.
06435	047634		DAC WORK3	/SAVE INSTRUCTION
06436	507562		AND K700K	
06437	247562		XOR K700K	
06440	740200		SZA	/OPERATE INST. IF 0
06441	606515		JMP MRINS	/MEMORY REF
06442	207634		LAC WORK3	
06443	447316	MVRTN	ISZ MOVED	
06444	067316		DAC* MOVED	/STORE IN OPPOSITE 4K
06445	547275		SAD LIMITA	/DONE WITH INST. IF EQUAL
06446	741000		SKP	/MOVE CONSTANT TABLES
06447	606433		JMP RFROM	/MOVE ANOTHER INST.
06450	147634		DZM WORK3	
06451	447315	MVCST	ISZ MOVES	
06452	227315		LAC* MOVES	/SOURCE
06453	447316		ISZ MOVED	
06454	067316		DAC* MOVED	/DEST'N
06455	547275		SAD LIMITA	/DONE MOVING IF EQUAL
06456	741000		SKP	/DONE
06457	606451		JMP MVCST	/MOVE ANOTHER CONSTANT
			.EJECT	

06460 204541
 06461 247556
 06462 054541
 06463 204376
 06464 247556
 06465 054376
 06466 207327
 06467 247556
 06470 057327
 06471 207326
 06472 247556
 06473 057326
 06474 750004
 06475 740010
 06476 741100
 06477 107251

LAC K10000
 XOR K10K
 DAC K10000+10000
 LAC E534+6
 XOR K10K
 DAC E534+6+10000
 LAC TTIN
 XOR K10K
 DAC TTIN+10000
 LAC TTOUT
 XOR K10K
 DAC TTOUT+10000
 LAS
 RAL
 SPA
 JMS PINOT
 .EJECT

/LOWFR

/CHECK FOR INHIBIT PI
 /INHIBITED

06500 206500
06501 507556
06502 740200
06503 741000
06504 627311
06505 760207
06506 107211
06507 627310

RGNAGN LAC .
AND K10K
SZA /SEE WHICH 4K
SKP
JMP* BGNHI /START OVER IN HI 4K
LAW 207 /BELL
JMS TLSSF
JMP* BGNLO /START IN LOW 4K

/
/SETUP TO MOVE TO LOW 4K
/

06510 777777
06511 047634
06512 207320
06513 047315
06514 606423

MVRK LAW 17777 /DEST'N
DAC WORK3
LAC K7777 /SOURCE
DAC MOVES
JMP MOVE+2 /MOVE PROGRAM

/

/ADJUST MEMORY REF. INSTRUCTIONS. DO NOT ADJUST IF
/ADR. PORTION=ANY ADR. FROM 0 TO 21.
/

06515 147313
06516 207634
06517 507320
06520 047633
06521 207313
06522 547542
06523 606530
06524 547633
06525 606442

MRINS DZM WDCNT /ADR. COMPARE WORD
LAC WORK3 /INST. TO BE MODIFIED
AND K7777 /CLEAR BITS 0-5
DAC WORK2 /SAVE
LAC WDCNT
SAD K22 /DONE IF EQUAL TO 22
JMP .+5
SAD WORK2 /COMPARE
JMP MVRTN-1 /ADR. IS SOME REG. FROM 0
/TO 21, MOVE WITHOUT ADJUSTING
/ADR. COUNT+1

06526 447313
06527 606521
06530 207556
06531 247634
06532 606443

ISZ WDCNT
JMP .-6
LAC K10K /10000
XOR WORK3 /ADJUST INST. BY 10000
JMP MVRTN /MOVE

06533 047643
06534 047644
06535 606536

/

SAV3 DAC SAVAC /THESE ARE MODIFIED FOR
SAV5 DAC RJMP /RELOCATION
SAV6 JMP SRVINT
.EJECT

```

/
/SERVICE ALL INTERRUPTS
/
06536 700001 SRVINT CLSF /CHECK FOR PI FROM CLOCK
06537 741000 SKP /SOME OTHER DEVICE
06540 606575 JMP CLKINT
06541 700314 IORS
06542 741100 SPA /STATUS WORD BIT 0 MUST = 0
06543 740040 F643 HALT /ERROR. BIT 0 SET. PI OFF
06544 207631 LAC WORK
06545 740010 RAL
06546 741100 SPA /SEE IF TTY IN USE AT TIME
/OF PI
06547 606636 JMP TTYINT /CONTINUE PRINTING
06550 700314 IORS /I/O STATUS WORD
06551 507322 AND K1400
06552 740200 SZA /CHECK FOR NO TAPE FLAGS
06553 107142 JMS RNFLG /EITHER READER OR PUNCH NO TAPE
06554 700101 RSF /CHECK FOR PI FROM READER
06555 741000 SKP
06556 606776 JMP READA /READ MORE
06557 700201 PSF /CHECK PUNCH PI
06560 606562 JMP RTNIT /SOME OTHER DEVICE
06561 626763 JMP* GOPNCH /PUNCH MORE

/
/SETUP TO RETURN TO INSTRUCTION TEST
/
06562 744000 RTNIT CLL
06563 207644 LAC RJMP /C(0) AT PI
06564 741100 SPA /CHECK LINK
06565 744002 STL /RESTORE LINK
06566 507602 AND K17S
06567 546574 SAD ILINT
06570 740040 F644 HALT /ERROR. PI OCCURRED AFTER LAC SAVAC
/INSTEAD OF JMP * RJMP.
06571 207643 LAC SAVAC /AC AT TIME OF PI
06572 700042 PION ION /PI ON
06573 627644 JMP* RJMP /CONTENTS OF (0) AFTER PI

/
ILINT PION
/
CLKINT LAC 7
SAD K100 /LFT CLOCK CONTINUE FOR 1/2 SEC
SKP
JMP .-3
CLOF
JMS CLKSET /RESET CLOCK TO RANDOM VALUE
JMP RTNIT /RETURN TO INST. TEST
.EJECT

```

/
/SETUP CLOCK VALUES

06604 000000
06605 106102
06606 047313
06607 507324
06610 047313
06611 347325
06612 741100
06613 606605
06614 207313
06615 740001
06616 040007
06617 700044
06620 626604

SETCLK 0
JMS GENRAN
DAC WDCNT
AND K777
DAC WDCNT
TAD M167
SPA
JMP SETCLK+1
LAC WDCNT
CMA
DAC 7
CLON
JMP* SETCLK

/GET A NO. FOR CLOCK
/SAVE
/MAX. TIME = 9 SECS.
/SAVE
/MIN. TIME = 2 SEC.
/POS. = 2 SECS. OR MORE
/NEG = LESS THAN 2 SEC.

/PUT VALUE IN (7)
/CLOCK ON
/EXIT

06621 000000
06622 106133
06623 047313
06624 507324
06625 047313
06626 347325
06627 741100
06630 606622
06631 207313
06632 740001
06633 040007
06634 700044
06635 626621

/
CLKSET 0
JMS RANGEN
DAC WDCNT
AND K777
DAC WDCNT
TAD M167
SPA
JMP CLKSET+1
LAC WDCNT
CMA
DAC 7
CLON
JMP* CLKSET
.EJECT

/GET A NO. FOR CLOCK
/SAVE
/MAX. TIME = 9 SECS.
/SAVE
/MIN. TIME = 2 SECS.
/POS. = 2 SECS. OR MORE
/NEG. = LESS THAN 2 SECS.

/PUT VALUE IN (7)
/CLOCK ON
/EXIT

```

/SFTUP FOR READ, PUNCH, OR PRINT
/
06636 207326 TTYINT LAC TTOUT
06637 546701 SAD ENDOUT /IF EQUAL GO PUNCH AND READ
06640 606657 JMP PREADY
06641 207631 LAC WORK
06642 507531 AND K0
06643 247560 XOR K200K
06644 047631 DAC WORK
06645 700101 RSF
06646 741000 SKP
06647 740040 F645 HALT /ERROR. READ FLAG UP
06650 700201 PSF
06651 741000 SKP
06652 740040 F646 HALT /ERROR. PUNCH FLAG UP
06653 447326 IS? TTOUT /TTOUT = CHAR. BIN POINTER
06654 227326 LAC* TTOUT /GET CHAR. FROM TTY RIN
06655 700406 TLS /PRINT ONE CHARACTER
06656 606562 JMP RTNIT /RETURN TO INST. TEST

/
06657 147631 PREADY D2M WORK
06660 147330 D2M CNTA
06661 147331 D2M CNTB
06662 700402 TCF /CLEAR TTY FLAG
06663 750004 LAS
06664 507544 AND K1K
06665 741200 SNA /TEST ACS 8 A 1
06666 606671 JMP .+3
06667 700104 RSA /SELECT READER
06670 606562 JMP RTNIT /RETURN TO INST. TEST
06671 206763 LAC GOPNCH
06672 741200 SNA /0=1ST TIME THRU
06673 606702 JMP PNSTRT /START SSEQUENCE
06674 700104 RSA /SELECT READER
06675 626763 JMP* GOPNCH /CONTINUE SEQUENCE

/
06676 007360 DATARL TTRUFA-1
06677 007444 ENDBIN TTRUFA+63
06700 007444 OUTTOP TTRUFB-1
06701 007530 ENDOUT TTRUFB+63
.EJECT

```

		/			
		/PUNCH DATA			
		/			
06702	107242	PNSTRT	JMS CRLF	/CR,LF	
06703	700402		TCF	/CLEAR TTY FLAG	
06704	750004		LAS		
06705	507547		AND K3K	/MASK ACS 7 AND 8	
06706	741200		SNA	/IF EITHER IS A 1, DON'T PUNCH	
06707	606712		JMP .+3	/PUNCH DATA	
06710	700202		PCF	/CLEAR PUNCH FLAG, NO MORE	
				/PI'S FROM PUNCH SHOULD OCCUR,	
				/RETURN TO INST, TEST	
06711	606562		JMP RTNIT		
06712	750000		CLA		
06713	700104		RSA	/SELECT READER AND PUNCH	
06714	106763		JMS GOPNCH	/TO INITIATE SEQUENCE	
06715	207334		LAC K300		
06716	047336		DAC STORE		
06717	447336	PNXT	ISZ STORE		
06720	207336		LAC STORE		
06721	106763		JMS GOPNCH	/PUNCH CHAR. IN AC 10-17	
06722	207337		LAC SPCE	/(SPCE)=240	
06723	106763		JMS GOPNCH	/PUNCH SPACE	
06724	207336		LAC STORF		
06725	547340		SAD K332	/DONE WITH ALPHABET IF EQUAL	
06726	741000		SKP		
06727	606717		JMP PNXT	/PUNCH MORE CHARS.	
06730	207332		LAC K257		
06731	047336		DAC STORF		
06732	447336	PNXTA	ISZ STORE		
06733	207336		LAC STORE		
06734	106763		JMS GOPNCH		
06735	207337		LAC SPCE		
06736	106763		JMS GOPNCH		
06737	207336		LAC STORE		
06740	547333		SAD K271		
06741	741000		SKP		
06742	606732		JMP PNXTA		
06743	207341		LAC KCRLF	/(KCRLF)=CR,LF	
06744	047336		DAC STORE		
06745	106763		JMS GOPNCH	/PUNCH CR	
06746	207336		LAC STORF		
06747	107233		JMS ROTAT9	/ROTATE 9 RIGHT	
06750	106763		JMS GOPNCH	/PUNCH LF	
06751	777770		LAW -10		
06752	047336		DAC STORE		
06753	750001		CLA: CMA	/AC = 777777	
06754	700010		700010	/CLEAR AC WITH MB 14	
06755	740200		SZA		
06756	740040	E647	HALT	/ERROR, EVENT TIME 1 DIDN'T	
				/CLEAR AC,	
				/PUNCH 8 FRAMES OF 0'S	
06757	106763		JMS GOPNCH		
06760	447336		ISZ STORE		
06761	606753		JMP .-6		
06762	606715		JMP PNXT-2	/START NEW LINE	

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.EJECT

```

****
06763 000000 GOPNCH 0
06764 700204 PSA
06765 750004 LAS
06766 507550 AND K4K /MASK ACS 6
06767 740200 SZA /IF A 1, DON'T USE CNTA OR CNTR
06770 606562 JMP RTNIT /RETURN TO INST, TEST
06771 447330 ISZ CNTA /CNTA=PUNCH SELECTED
06772 207331 LAC CNTR
06773 740200 SZA /0*WAIT FOR PI
06774 607031 JMP SUR1 /1*SFLECT READER AGAIN
06775 606562 JMP RTNIT /RETURN TO INST, TEST

/READ PUNCHED INFO
/
06776 750004 READA LAS
06777 507547 AND K3K /MASK ACS 7 AND 8
07000 740200 SZA /IF EITHER IS A 1, READ FULL SPEED
07001 607113 JMP READR
07002 750004 LAS
07003 507550 AND K4K /MASK ACS 6
07004 741200 SNA /IF A 1, CLEAR READER FLAG, NO
/MORE PI'S FROM READER
07005 607010 JMP .+3
07006 700112 RRR /CLEAR READER FLAG
07007 606562 JMP RTNIT /RETURN TO INST, TEST AND
/WAIT FOR PUNCH PI
/READ ONE
/0=NO DATA IN READER YET
/SEE IF PUNCH IS SELECTED
/YES, SUBTRACT FROM CNTA
/READER SELECTED
/STORE CHAR. IN TTY BIN

/07010 700112 RRR
/07011 740200 SZA
/07012 607017 JMP ZRONOT
/07013 207330 LAC CNTA
/07014 740200 SZA
/07015 607031 JMP SUR1
/07016 607027 JMP TADD1
/07017 447327 ISZ TTIN
/07020 067327 DAC TTIN
/07021 207327 LAC TTIN
/07022 546677 SAD FNOBIN /CHECK FOR 52 CHARACTERS STORED
/07023 607037 JMP SETTY /DONT. SETUP TO PRINT
/07024 207330 LAC CNTA
/07025 740200 SZA
/07026 607031 JMP .+3

/
07027 447331 TADD1 ISZ CNTR
07030 606562 JMP RTNIT /RETURN TO INST, TEST
07031 777777 SUR1 LAW -1
07032 347330 TAD CNTA /((CNTA)-1
07033 047330 DAC CNTA
07034 147331 DZM CNTR
07035 700104 RSA
07036 606562 JMP RTNIT /RETURN TO INST, TEST

/
,EJECT

```

07037	700201	SETTY	PSF	/WAIT FOR PUNCH
07040	607037		JMP .-1	
07041	700202		PCF	/CLEAR PUNCH FLAG
07042	700402		TCF	/CLEAR TTY FLAG
07043	207312		LAC BREAK	
07044	547537		SAD K12A	
07045	607070		JMP PUN6	
07046	447312		ISZ BREAK	
07047	206676		LAC DATABL	/RESTORE INPUT/OUTPUT POINTERS
07050	047327		DAC TTIN	/READER TO BIN
07051	206700		LAC OUTTOP	
07052	047326		DAC TTOUT	/BIN TO TTY
07053	447327	XFR1	ISZ TTIN	/TRANSFER BUFFER A TO BUFFER B
07054	227327		LAC* TTIN	
07055	447326		ISZ TTOUT	
07056	067326		DAC* TTOUT	
07057	207326		LAC TTOUT	
07060	546701		SAD ENDOUT	/DONE IF EQUAL TO TTRUFB+6;
07061	741000		SKP	
07062	607053		JMP XFR1	/TRANSFER ANOTHER
07063	206676		LAC DATABL	/RESTORE BUFFER POINTERS
07064	047327		DAC TTIN	
07065	206700		LAC OUTTOP	/TTBUFB-1
07066	047326		DAC TTOUT	
07067	606641		JMP TTYINT+3	/BEGIN PRINTING
07070	206763	/		
07071	547112	PUN6	LAC GOPNCH	
07072	741000		SAD K647	/PUNCH 0'S ONLY AT END OF BLOCK
07073	607047		SKP	
07074	147312		JMP XFR1-4	/((GOPNCH) NOT=E647+2
07075	777772		DZM BRFAC	
07076	047336		LAW -6	
07077	777777		DAC STORE	/FRAME COUNTER
07100	700010		LAW -1	/AC=777777
07101	740200		700010	/CLEAR AC WITH BIT 14
07102	740040		SZA	
07103	700204	F648	HALT	/ERROR, MB14 DIDN'T CLEAR AC
07104	700201		PSA	/PUNCH BLANK FRAME
07105	607104		PSF	
07106	447336		JMP .-1	
07107	607077		ISZ STORF	
07110	700202		JMP F648-3	
07111	607047		PCF	/CLEAR PUNCH FLAG
			JMP XFR1-4	/SETUP TO PRINT
07112	006760	/		
		K647	E647+2	
		/		
			.EJECT	

/READB ROUTINE IS USED ONLY WHEN PUNCH IS INHIBITED
/BY ACS 7 OR 8, OR BOTH, READER RUNS AT FULL SPEED.

```

07113 750004
07114 507550
07115 741200
07116 607121
07117 700112
07120 606562
07121 700112
07122 741200
07123 607131
07124 447327
07125 067327
07126 207327
07127 546677
07130 607133
07131 700104
07132 606562

07133 206676
07134 047327
07135 750004
07136 507551
07137 740200
07140 607131
07141 607042

07142 000000
07143 507544
07144 740200
07145 607152
07146 760320
07147 247342
07150 047352
07151 607154
07152 760322
07153 607147

07154 207351
07155 047313
07156 107242
07157 447313
07160 227313
07161 741200
07162 607167
07163 107211
07164 107233
07165 107211
07166 607157
07167 107242
07170 627142

/READR LAS
AND K4K /MASK ACS 6
SNA /IF A 1, DON'T READ
JMP .+3
RRR /CLEAR READER FLAG
JMP RTNIT /RETURN TO INST. TEST
RRR /GET CHAR. FROM BUFFER.
SNA /0 = NO DATA IN READER YET.
JMP SELECT /SELECT READER AGAIN
ISZ TTIN /BUFFER POINTER +1
DAC* TTIN /STORE CHAR. IN TTBUFA
LAC TTIN
SAD FNDBIN /CHECK FOR 52 CHARS. STORED
JMP .+3 /TTBUFA IS FULL
SELECT RSA /SELECT READER
JMP RTNIT /RETURN TO INST. TEST

/
LAC DATABL
DAC TTIN /RESTORE TTBUFA POINTER
LAS
AND K6K /MASK ACS 6 AND 7
SZA /IF EITHER A 1, DON'T PRINT
JMP SELECT /SELECT READER AGAIN
JMP SETTY+3 /SETUP TO PRINT

/
/SERVICE NO TAPE CONDITIONS
/
RNFLG 0
AND K1K /CHECK FOR READER NO TAPE
SZA
JMP .+5 /READER
LAW 320 /PUNCH NO TAPE
XOR K520K
DAC NTFLG+1
JMP OUTFLG /PRINT R OR P NO TAPE
LAW 322 /READER NO TAPE
JMP .-4

/
OUTFLG LAC NTFLG
DAC WDCNT
JMS CRLF /CR,LF
ISZ WDCNT
LAC* WDCNT
SNA
JMP CLRFLG
JMS TLSSF
JMS ROTAT9
JMS TLSSF
JMP OUTFLG+3
CLRFLG JMS CRLF /CR,LF
JMP* RNFLG /RETURN TO SEQUENCE

```

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.EJECT

07171	000000	/PUNCH LEADER	
07172	777440	/	
07173	047313	PNLEDR	0
07174	750000		LAW -340
07175	700204		DAC WDCNT
07176	700201		CLA
07177	607176		PSA
07200	447313		PSF
07201	607175		JMP .-1
07202	627171		ISZ WDCNT
			JMP .-4
			JMP* PNLEDR
07203	000000	/	
07204	777777	PNMARK	0
07205	700204		LAW -1
07206	700201		PSA
07207	607206		PSF
07210	627203		JMP .-1
			JMP* PNMARK
			.EJECT
			/EXIT

```

/PRINT A CHARACTER
/
TLSSF      0
           DAC MOVED
           LAC WORK
           RAL
           SMA
           JMP .+3
           TSF
           JMP .-1
           LAC MOVED
           TLS
           TSF
           JMP .-1
           LAC WORK
           RAL
           SMA
           TCF
           LAC MOVED
           JMP* TLSSF

/ROTATE 9 RIGHT
/
ROTAT9     0
           RTR;      RTR;      RTR
           RTR;      RAR
           JMP*      ROTAT9

/CARRIAGE RETURN, LINEFEED
/
CRLF       0
           LAW 215
           JMS TLSSF
           SAD .+2
           JMP* CRLF
           LAW 212
           JMP CRLF+2
           .EJECT

```

07211 000000
07212 047316
07213 207631
07214 740010
07215 740100
07216 607221
07217 700401
07220 607217
07221 207316
07222 700406
07223 700401
07224 607223
07225 207631
07226 740010
07227 740100
07230 700402
07231 207316
07232 627211

07233 000000
07234 742020
07235 742020
07236 742020
07237 742020
07240 740020
07241 627233

07242 000000
07243 760215
07244 107211
07245 547247
07246 627242
07247 760212
07250 607244

/CHECK TTY FLAG
/WAIT FOR FLAG
/CLEAR TTY IF BIT 1 = 0
/CR
/EXIT
/LF

```

/PRINT "COMPLETE"
/
PINOT 0
LAC WORK4
SAD K12A
SKP
JMP* PINOT
DZM WORK4
DZM WORK4+10000
LAC COMPA
DAC 14
JMS CRLF
LAC* 14
SNA
JMP .+5
JMS TLSSF
JMS ROTAT9
JMS TLSSF
JMP .-6
JMS CRLF
JMP* PINOT

/
COMPA COMP
.EJECT

/PASS COUNTER
/PRINT IF EQUAL TO 10
/START PROGRAM

/PRINT COMPLETE

/DONE PRINTING IF 0
/PRINT 1 CHAR
/PRINT 2ND
/GET NEXT PAIR
/CR, LF

```

07251	000000
07252	207635
07253	547537
07254	741000
07255	627251
07256	147635
07257	157635
07260	207274
07261	040014
07262	107242
07263	220014
07264	741200
07265	607272
07266	107211
07267	107233
07270	107211
07271	607263
07272	107242
07273	627251
07274	007343

/CONSTANT TABLE FOR CHECKERBOARD AND PI
/SERVICE ROUTINES

07275	752525	LIMITA	752525	/OFLIMITER
07276	000000	WC16	0	
07277	000000	WC12H	0	
07300	000000	ILREG	0	
07301	037700	KPAT	037700	
07302	740076		740076	
07303	037701		037701	
07304	740077		740077	
07305	037700	MPAT	037700	
07306	000000	PATN	0	
07307	000000	PATND	0	
07310	000070	RCNLO	SEQUEN	
07311	010070	RCNHI	SEQUEN+10000	
07312	000000	RRFAK	0	
07313	000000	WDCNT	0	
07314	777776	WC256	777776	
07315	000000	MOVES	0	
07316	000000	MOVED	0	
07317	777777	RITSUP	777777	
07320	007777	K7777	7777	
07321	100000	K100K	100000	
07322	001400	K1400	1400	
07323	500000	K500K	500000	
07324	000777	K777	777	
07325	777611	M167	777611	
07326	000000	TTOUT	0	
07327	000000	TTIN	0	
07330	000000	CNTA	0	
07331	000000	CNTH	0	
07332	000257	K257	257	
07333	000271	K271	271	
07334	000300	K300	300	
07335	000301	K301	301	
07336	000000	STORE	0	
07337	000240	SPCE	240	
07340	000332	K332	332	
07341	212215	K0RLF	212215	
07342	520000	K520K	520000	
			.EJECT	

↑↑↑↑

07343 007343
07344 317303
07345 320315
07346 305314
07347 305324
07350 000000

/
/PRINT ROUTINE CONSTANTS
/"COMPLETE"

/
COMP .
317303; 320315; 305314; 305324; 0

07351 007351
07352 000000
07353 317316
07354 324240
07355 320301
07356 240305
07357 207207
07360 000000

/
/R OR P NO TAPE

/
NTFLG .
0
317316; 324240; 320301

240305; 207207
0

07361
07445

/
/TTY BIN

/
TTRUFA .BLOCK 64 /READER BUF = 52 LOCS. (DECIMAL)
/
TTRUFB .BLOCK 64 /TTY BUF = 52 LOCS. (DECIMAL)
.EJECT

/CONSTANT AND ERROR TABLES, NOT MODIFIED WHEN IN HI 4K

07531	000000	K0	0
07532	000001	K1	1
07533	000002	K2	2
07534	000004	K4	4
07535	000010	K10	10
07536	000011	K11	11
07537	000012	K12A	12
07540	000040	K100	40
07541	000020	K20	20
07542	000022	K22	22
07543	000040	K40	40
07544	001000	K1K	1000
07545	000400	K400	400
07546	002000	K2K	2000
07547	003000	K3K	3000
07550	004000	K4K	4000
07551	006000	K6K	6000
07552	000200	K200	200
07553	040000	K40K	40000
07554	400000	K400K	400000
07555	400002	K402K	400002
07556	010000	K10K	10000
07557	020000	K20K	20000
07560	200000	K200K	200000
07561	600000	K600K	600000
07562	700000	K700K	700000
07563	002021	K2021	2021
07564	002120	K2120	2120
07565	111111	K1S	111111
07566	222222	K2S	222222
07567	333333	K3S	333333
07570	444444	K4S	444444
07571	555555	K5S	555555
07572	666666	K6S	666666
07573	777777	K7S	777777
07574	011111	K51S	11111
07575	012222	K12S	12222
07576	013333	K13S	13333
07577	014444	K14S	14444
07600	015555	K15S	15555
07601	016666	K16S	16666
07602	017777	K17S	17777
07603	002525	K2525	2525
07604	005252	K5252	5252
07605	252525	K010	252525
07606	525252	K101	525252
07607	525253	K53	525253
07610	077777	K37S	077777

.EJECT

07611	700042	K7X42	700042
07612	700002	K7XX2	700002
07613	760002	K76X2	760002
07614	100002	K1XX2	100002
07615	604002	K6X42	604002
07616	344002	K344X2	344002
07617	741000	KSKP	SKP
07620	750000	KCLA	CLA
07621	777776	M1	777776
07622	777773	M4	777773
07623	777737	M40	777737
07624	777377	M400	777377
07625	773777	M4K	773777
07626	737777	M40K	737777
07627	377777	M400K	377777
		/	
07630	000000	RJCNT	0
07631	000000	WORK	0
07632	000000	WORK1	0
07633	000000	WORK2	0
07634	000000	WORK3	0
07635	000000	WORK4	0
07636	000000	IIADR	0
07637	000000	AUTNOT	0
07640	000000	TCLK	0
07641	740010	XCTRAL	RAL
07642	740001	AUTCMA	CMA
07643	000000	SAVAC	0
07644	000000	RJMP	0
07645	420015	LAWAUT	XCT* 15
07646	777777	LAWFUL	LAW 17777
07647	120015	JMSAUT	JMS* 15
07650	740040	KHALT	740040
07651	620012	JMPAUT	JMP* 12
07652	200000	SAV4	LAC 0
07653	741400	KS7L	741400
07654	740400	KSNL	740400
07655	123456	RANCON	123456
07656	654321	RANTRL	654321
07657	361416		361416
07660	055363		055363
07661	546060		546060
07662	243035		243035
07663	762572		762572
07664	453237		453237
07665	150214		150214
07666	000000		0
			.EJECT

/ERROR TABLES

07667	000000	JMPRFT	0	/JMP 22
07670	000000	J111	0	/JMP 11111 (E509)
07671	000000	J222	0	/JMP 12222 (F510)
07672	000000	J333	0	/JMP 13333 (E511)
07673	000000	J444	0	/JMP 14444 (F512)
07674	000000	J555	0	/JMP 15555 (E513)
07675	000000	J666	0	/JMP 16666 (F514)
07676	000000	J777	0	/JMP 17777 (E515)
07677	000000	J525	0	/JMP 15252 (F516)
07700	000000	J252	0	/JMP 12525 (E517)
07701	000000	CAL0	0	/CAL FROM 17757 EXT, LINK = 0 (E518)
07702	000000	CAL1	0	/CAL FROM 17757, LINK = 1 (E520)
07703	000000	JSM71	0	/JMS FROM 07777 TO 11111 (E522)
07704	000000	JSM72	0	/JMS FROM 07776 TO 12222 (E524)
07705	000000	JSM73	0	/JMS FROM 07775 TO 13333 (F526)
07706	000000	JSM74	0	/JMS FROM 07774 TO 14444 (F528)
07707	000000	JSM75	0	/JMS FROM 07773 TO 15555 (F530)
07710	000000	JSM76	0	/JMS FROM 07772 TO 16666 (E532)
07711	000000	JSM77	0	/JMS FROM 07771 TO 17777 (E534)
07712	000000	JS252	0	/JMS FROM 12525 TO 15252 (F536)
07713	000000	JS525	0	/JMS FROM 15252 TO 12525 (F538)
07714	000000	JSSS	0	/JMS SERIES TEST (E540)
		/		
07715	000000	XCT11	0	/XCT JMS, FROM 11111 XCT (16666) (E562)
07716	000000	XCT12	0	/XCT JMS, FROM 12222 XCT (15555) (F564)
07717	000000	XCT13	0	/XCT JMS, FROM 13333 XCT (14444) (F566)
07720	000000	XCT17	0	/XCT J.S FROM 07776 XCT (17776) (E568)
07721	000000	XCT125	0	/XCT JMS, FROM 12525 XCT (15252)
		/		
07722	000000	JST77	0	/JMS* 07777 (E592)
07723	000000	JST66	0	/JMS* 16666 (E594)
07724	000000	JST55	0	/JMS* 15555 (E596)
07725	000000	JST44	0	/JMS* 14444 (E598)
07726	000000	AUTJMP	0	/JMP* 12 (AUTO-INDEX) (E620)
07727	000000	AUTJMS	0	/JMS* 17 (AUTO-INDEX) (E633)
07730	752525		752525	
	000000		.END	

ABMATS	02530
ADDAC	01524
ADDAC1	01772
ADEDON	03030
ADJUST	06312
AMRPRT	02571
AMRSUM	03025
AMINSB	02433
AMNSRT	02467
ANDAC	01306
ANDI	05517
ANEG	03017
APLSRT	02454
APLUSB	02417
APOS	03016
AURJMP	06101
AUTCMA	07642
AUTJMP	07726
AUTJMS	07727
AUTNDT	07637
AUTOIN	05520
AUTR	05665
AUTRET	06077
AUTRE1	05777
AUTRJM	06100
BDATA	06354
BEGIN	00022
BGNAGN	06500
BGNHI	07311
BGNLO	07310
BISYU	03036
BITSUP	07317
BITTS1	03055
BITTS2	03070
BMMRT	02543
BMASUM	03024
BMINSA	02425
BMNSAT	02515
BNEG	03021
BPOS	03020
BREAK	07312
CAL0	07701
CAL1	07702
CHKBRD	06154
CKLOOP	06363
CKLP	03011
CKNO	06126
CLKINT	06575
CLKSFT	06621
CLRFIG	07167
CNTA	07330
CNTB	07331
COMP	07343
COMPA	07274
CONCHG	02767

CRLF	07242
DACAC	03341
DATARL	06676
DBRX	00204
DBRXX	00207
DBRXXX	00215
DEMAC	03222
ENDBTN	06677
ENDOUT	06701
ENDTRL	06124
ENTST	06406
ERROR	06340
E1	00002
E113	00644
E114	00671
E115	00705
E116	00721
E140	00747
E141	00775
E142	01012
E143	01027
E162	01033
E163	01037
E164	01043
E165	01047
E166	01053
E167	01057
E168	01063
E169	01067
E170	01072
E206	01103
E207	01106
E208	01111
E209	01114
E210	01117
E211	01121
E212	01125
E213	01130
E214	01133
E215	01136
E216	01141
E217	01144
E218	01146
E219	01153
E220	01155
E221	01162
E222	01164
E223	01171
E224	01173
E225	01200
E226	01202
E24	00140
E25	00144
E258	01212
E259	01214

E26	00150
E260	01220
E261	01222
E262	01226
E263	01230
E264	01234
E265	01236
E266	01243
E267	01245
E268	01252
E269	01254
E27	00154
E270	01261
E271	01263
E272	01270
E273	01301
E274	01311
E275	01315
E276	01321
E277	01326
E278	01342
E279	01344
E28	00164
E280	01354
E281	01361
E282	01366
E283	01372
E284	01405
E285	01415
E286	01417
E287	01424
E288	01426
E289	01433
E29	00170
E290	01435
E291	01443
E292	01445
E293	01451
E294	01453
E295	01457
E296	01461
E297	01467
E298	01471
E299	01477
E30	00174
E300	01501
E301	01511
E302	01517
E303	01531
E304	01533
E305	01541
E306	01543
E307	01551
E308	01553
E309	01561

E31	00200
E310	01563
E311	01571
E312	01573
E313	01601
E314	01603
E315	01611
E316	01613
E317	01621
E318	01623
E319	01631
E32	00227
E320	01633
E321	01642
E322	01644
E323	01653
E324	01655
E325	01664
E326	01666
E327	01675
E328	01677
E329	01706
E33	00232
E330	01710
E331	01717
E332	01721
E333	01730
E334	01732
E335	01741
E336	01743
E337	01752
E338	01754
E339	01763
E34	00236
E340	01765
E347	02000
E348	02002
E349	02011
E35	00241
E350	02013
E351	02022
E352	02024
E353	02033
E354	02035
E355	02044
E356	02046
E357	02055
E358	02057
E359	02066
E36	00245
E360	02070
E361	02077
E362	02101
E363	02110
E364	02112

E365	02121
E366	02123
E367	02132
E368	02134
E369	02143
E37	00250
E370	02145
E371	02154
E372	02156
E373	02165
E374	02167
E375	02176
E376	02200
E377	02207
E378	02211
E379	02220
E38	00254
E380	02222
E381	02231
E382	02233
E383	02242
E384	02244
E385	02253
E386	02255
E387	02264
E388	02266
E389	02275
E39	00257
E390	02277
E391	02306
E392	02310
E393	02316
E394	02320
E395	02326
E396	02330
E397	02336
E398	02340
E399	02353
E4	00262
E400	02355
E401	02461
E402	02465
E403	02474
E404	02500
E405	02507
E406	02513
E407	02535
E408	02541
E409	02550
E41	00265
E410	02554
E411	02563
E412	02567
E413	02576
E414	02602

E415	02610
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:422	02663
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:423	02676
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:424	02702
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IFLCH5	02721
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FLCH7	02764
430	02765
ONCHG	02767
KLP	03011
POS	03016
NFG	03017
POS	03020
NFG	03021
UMNFG	03022
UMPNS	03023
IMASUM	03024
MBSUM	03025
ISKBIT	03026
ASS2	03027
DEFONN	03030
ELSETU	03036
IONNFG	03050
ITTS1	03055
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ITTS2	03070
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ADAC	03120
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CT1R	05036
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CT1R	05042
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CT17S	05044
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CT12S	05047
CT12	05050
CT1R	05051
CT1S2	05052
CTDAG	05053
CTTAD	05054
SAUTO	05055

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GENRAN	06102
RANTAD	06117

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ENDTRL	06124
THLTOP	06125
CKNO	06126
RANGFN	06133
TADRAN	06150
CHKRRD	06154
LOAD	06172
LCNTA	06176
LCNTR	06200
WCLOOP	06204
READ	06234
RCNTA	06237
RCNTR	06243
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RDRTN	06270
ADJUST	06312
ULADJ	06322
NXTST	06325
NEXPAT	06332
ERROR	06340
E642	06350
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BDATA	06354
PATT	06361
CKLOOP	06363
ENTST	06406
MOVE	06421
RFROM	06433
MVRTN	06443
MVOST	06451
BGNAGN	06500
MVRK	06510
MRINS	06515
SAV3	06533
SAV5	06534
SAV6	06535
SRVINT	06536
E643	06543
RTAIT	06562
E644	06570
PION	06572
ILINT	06574
CLKINT	06575
SETCLK	06604
CLKSFT	06621
TTYINT	06636
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E646	06652
PREADY	06657
DATARL	06676
ENDRTN	06677
OUTTOP	06700
ENDOUT	06701
PNSTRT	06702

PNT	06717
PNTA	06732
E647	06756
DOBNCH	06763
READA	06776
ARNDOT	07017
IAPD1	07027
SUP1	07031
SETTY	07037
XER1	07053
PUN6	07070
E648	07102
K647	07112
READR	07113
SELECT	07131
RNPLG	07142
OUTFIG	07154
CLIFIG	07167
PNLEDR	07171
PNMARK	07203
ILSSF	07211
ROTAT9	07233
ORLF	07242
PINOT	07251
CONPA	07274
LIMITA	07275
KC16	07276
KC128	07277
LLREG	07300
KPAT	07301
IPAT	07305
PATR	07306
PATWD	07307
KGNLO	07310
KGNHT	07311
KREAK	07312
KDONT	07313
KCP56	07314
MOVES	07315
MOVED	07316
KITSUP	07317
K7777	07320
K170K	07321
K1400	07322
K570K	07323
K777	07324
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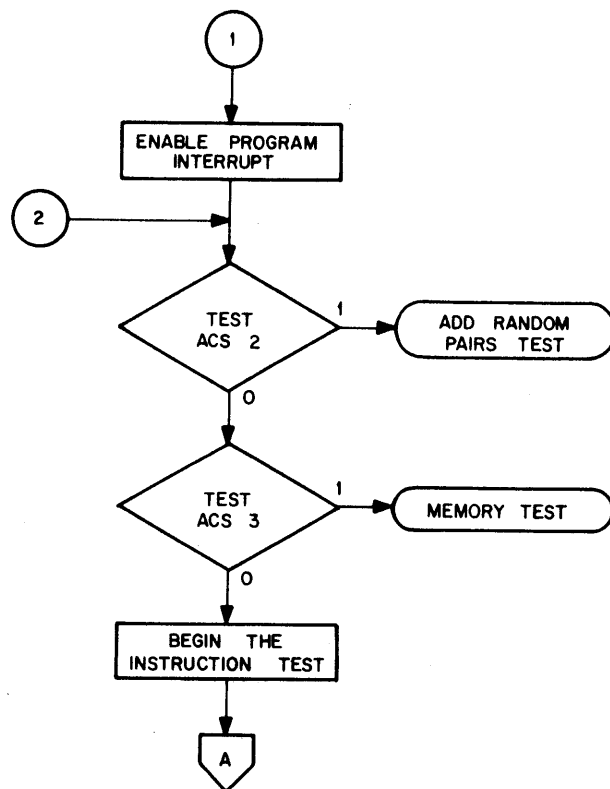
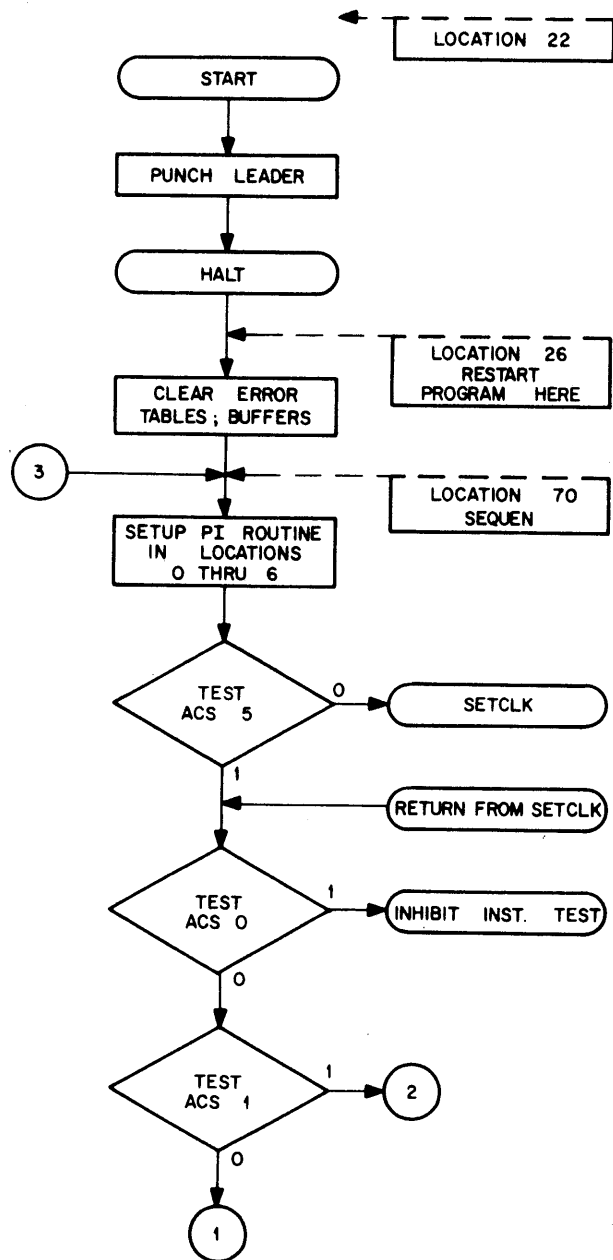
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K0	07531
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K12	07535
K11	07536
K12A	07537
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K42	07543
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K420	07545
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K3K	07547
K4K	07550
K6K	07551
K220	07552
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K720K	07562
K221	07563
K2120	07564
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K5S	07571
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K7S	07573
K51S	07574
K12S	07575
K12S	07576
K14S	07577
K15S	07600
K16S	07601
K17S	07602
K2525	07603
K5252	07604
K010	07605
K121	07606

AS	07607
AS/S	07610
A7X42	07611
A7XX2	07612
A7~X2	07613
A1XX2	07614
A6X42	07615
A3+4X2	07616
ASKP	07617
ACIA	07620
M1	07621
M4	07622
M4~	07623
M4~0	07624
M4~	07625
M4~K	07626
M4~0K	07627
ROJNT	07630
RO~K	07631
RO~K1	07632
RO~K2	07633
RO~K3	07634
RO~K4	07635
IJADR	07636
AUTNOI	07637
ICIK	07640
XCTRAL	07641
AUTCMA	07642
SAVAC	07643
ROJP	07644
LA~AUT	07645
LA~FIL	07646
JMSAUT	07647
~HALT	07650
JMPAUT	07651
SAV4	07652
AS/L	07653
KS~L	07654
PAXCON	07655
PA~TRL	07656
JMPRET	07667
J111	07670
J222	07671
J333	07672
J444	07673
J555	07674
J666	07675
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J252	07700
CAL0	07701
CAL1	07702
JS~71	07703
JS~72	07704
JS~73	07705

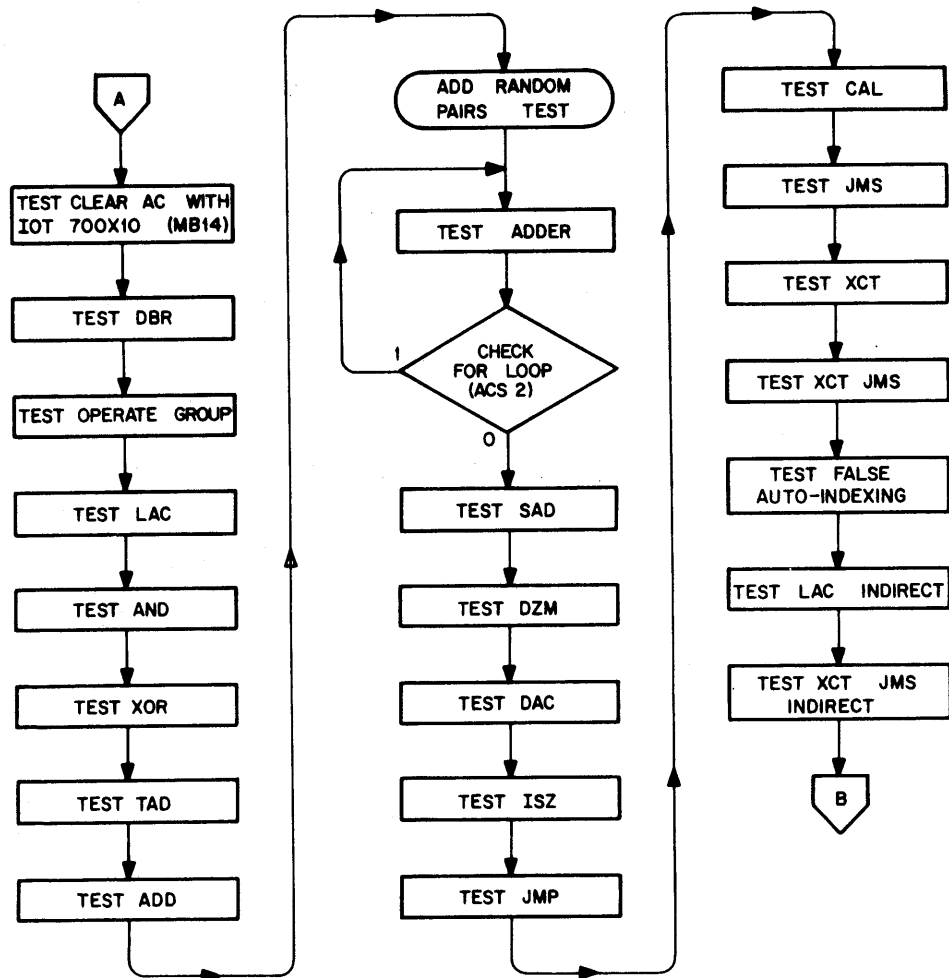
BASEX9 PAGE 159

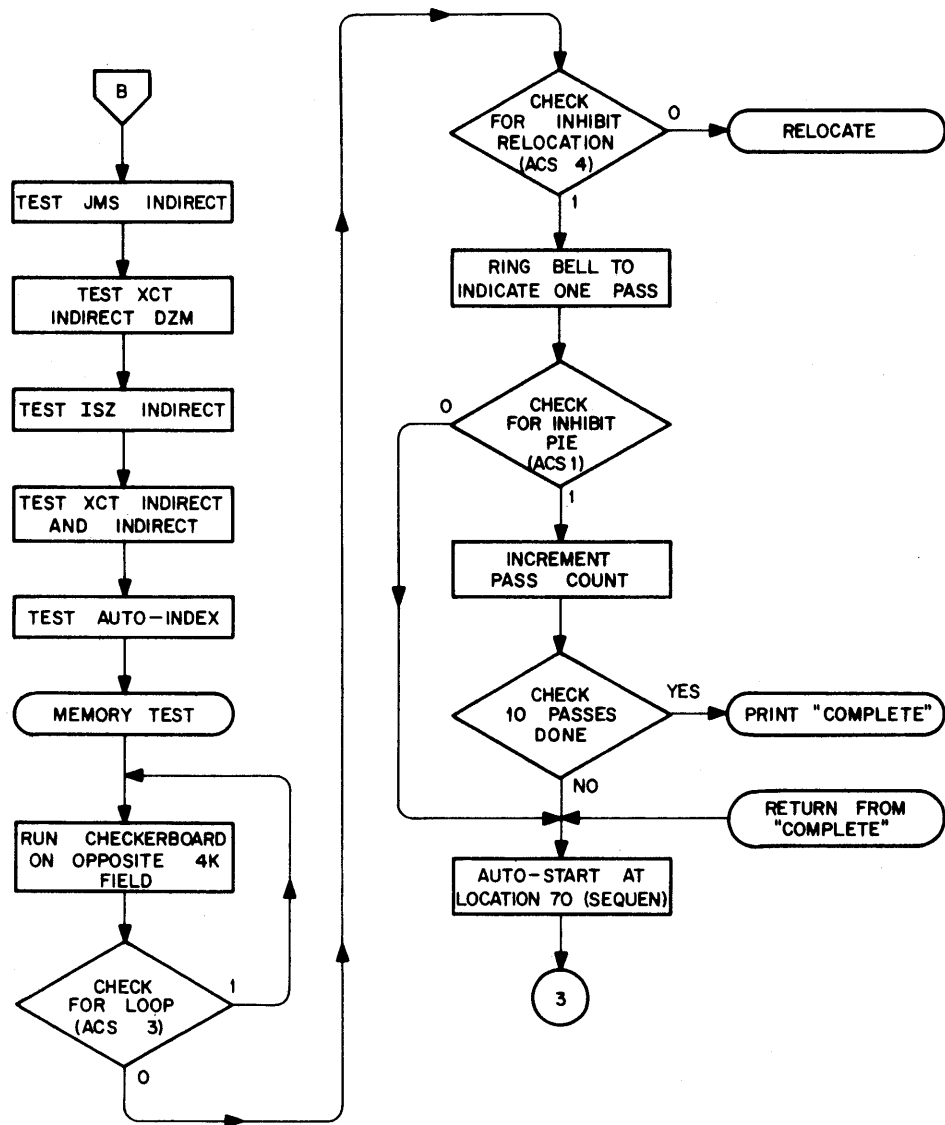
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XCT13	07717
XCT17	07720
XCT125	07721
JST77	07722
JST66	07723
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AUTJMS	07727
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HALT	740040

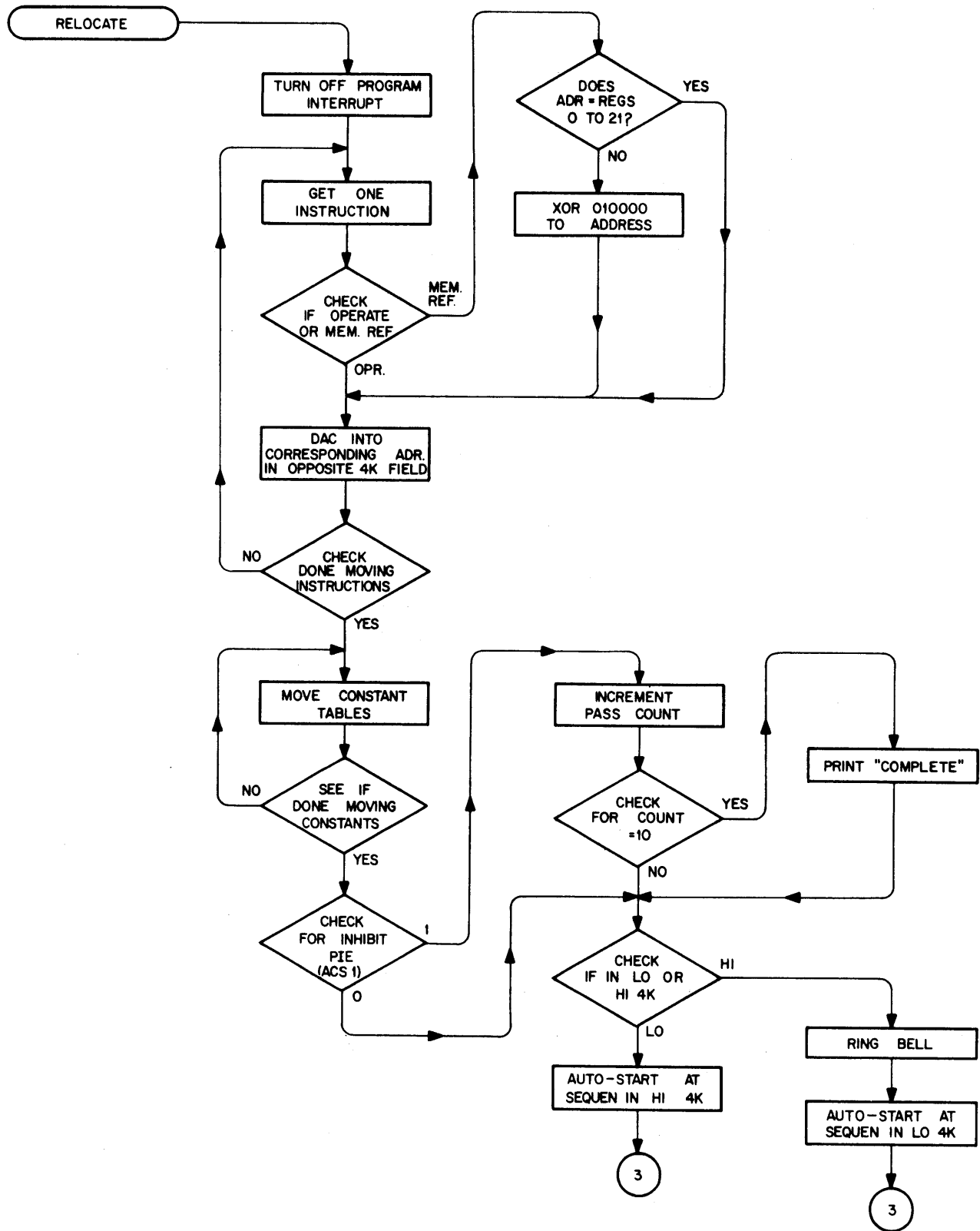
11. FLOW CHARTS



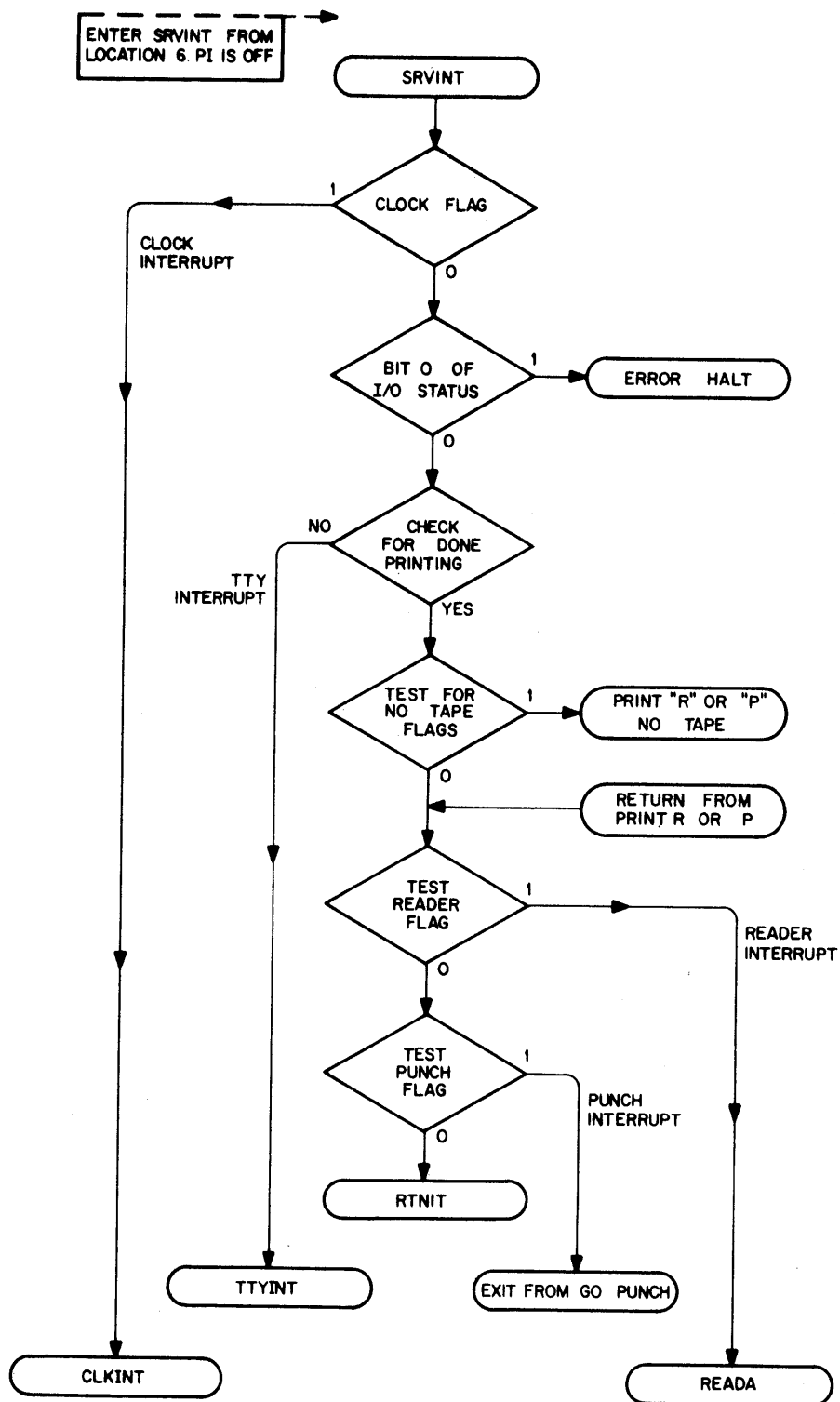
Generalized Flow of PDP-9 Basic Exerciser



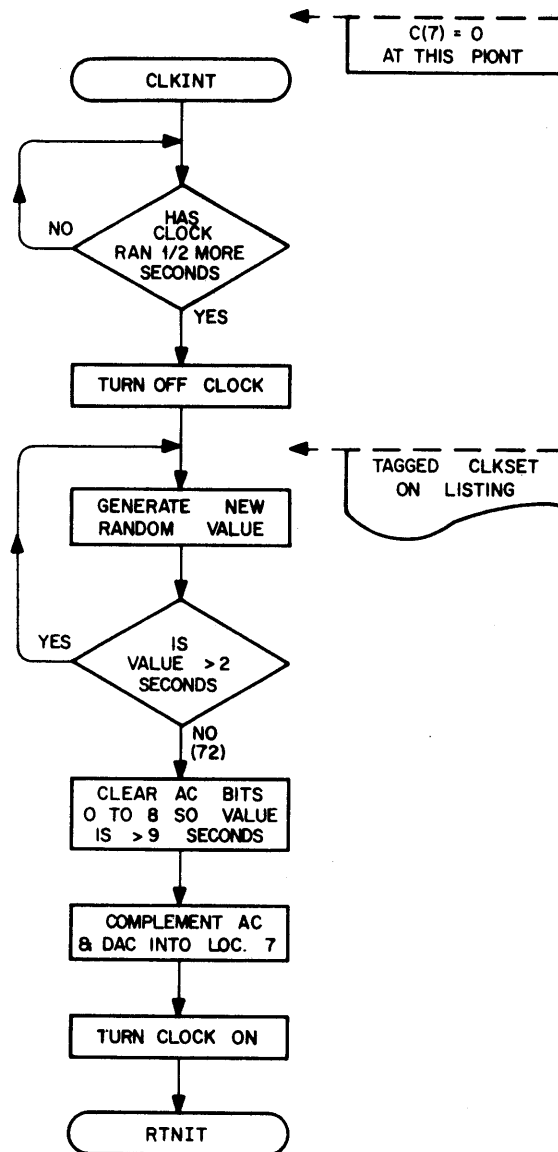




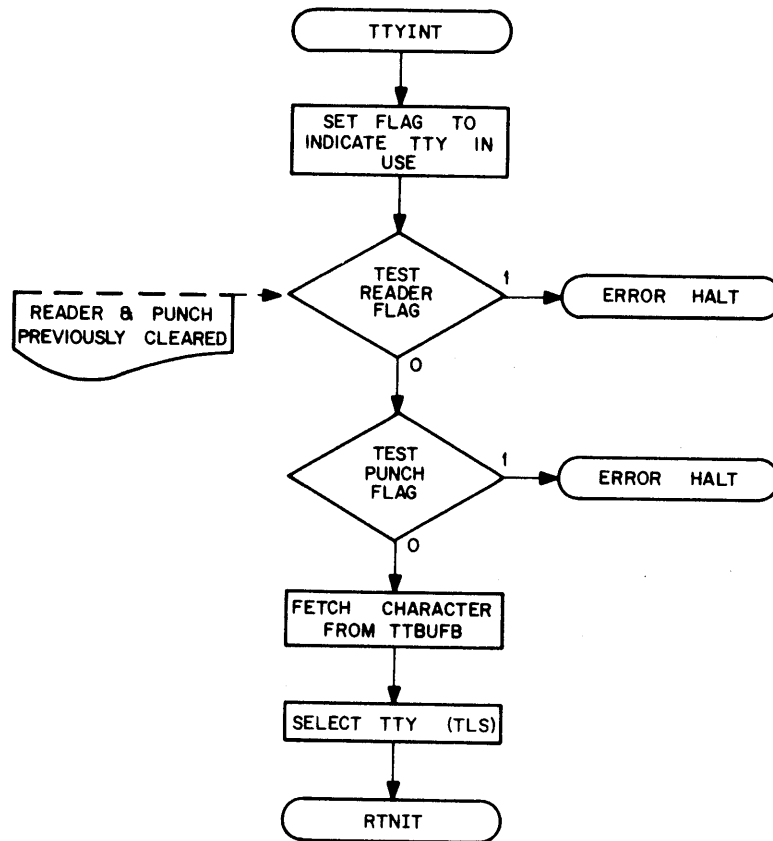
Program Relocation Routine



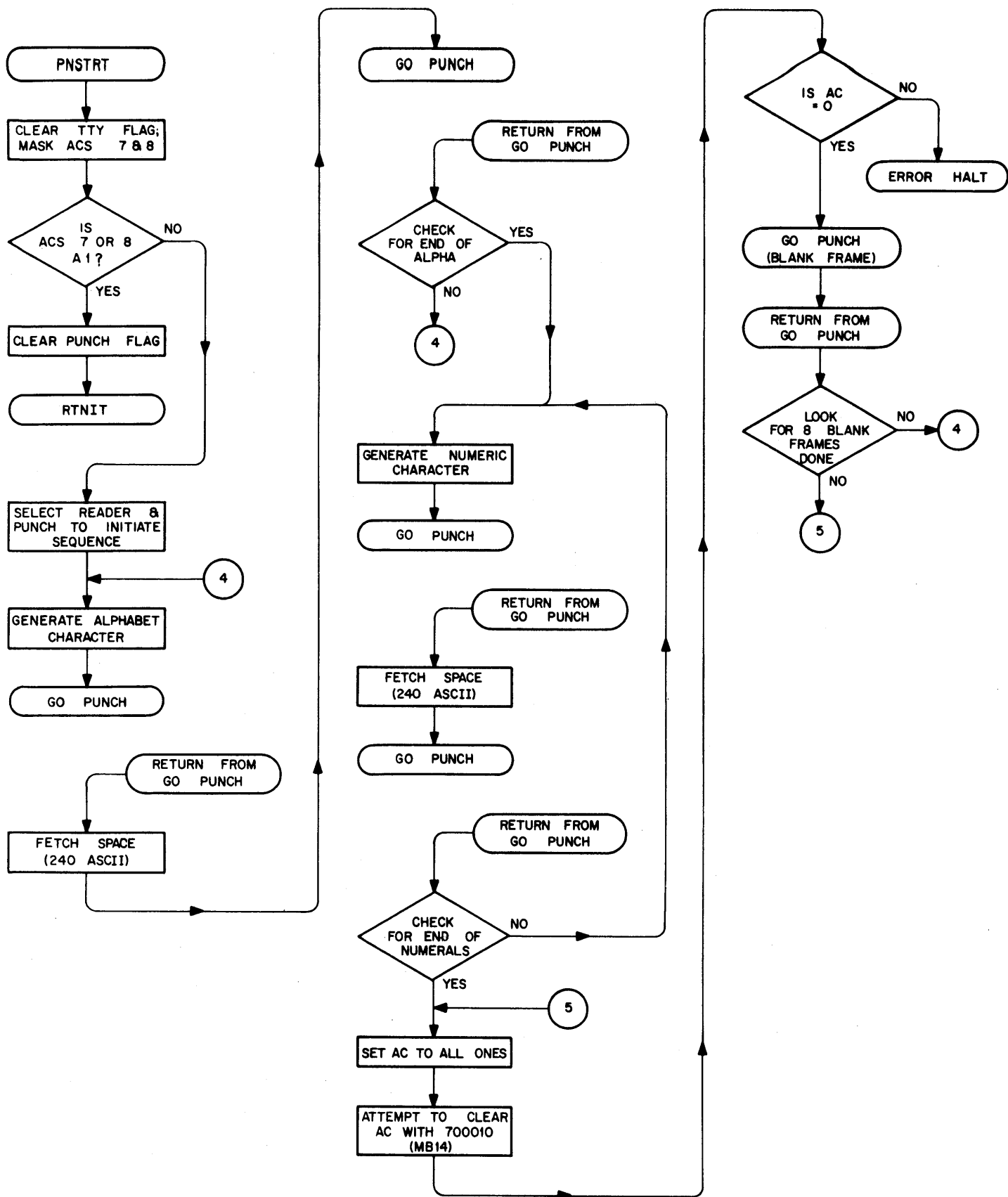
Interrupt Service Routine



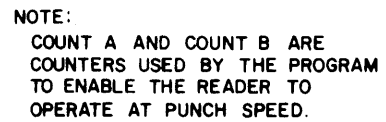
Service Clock Interrupt

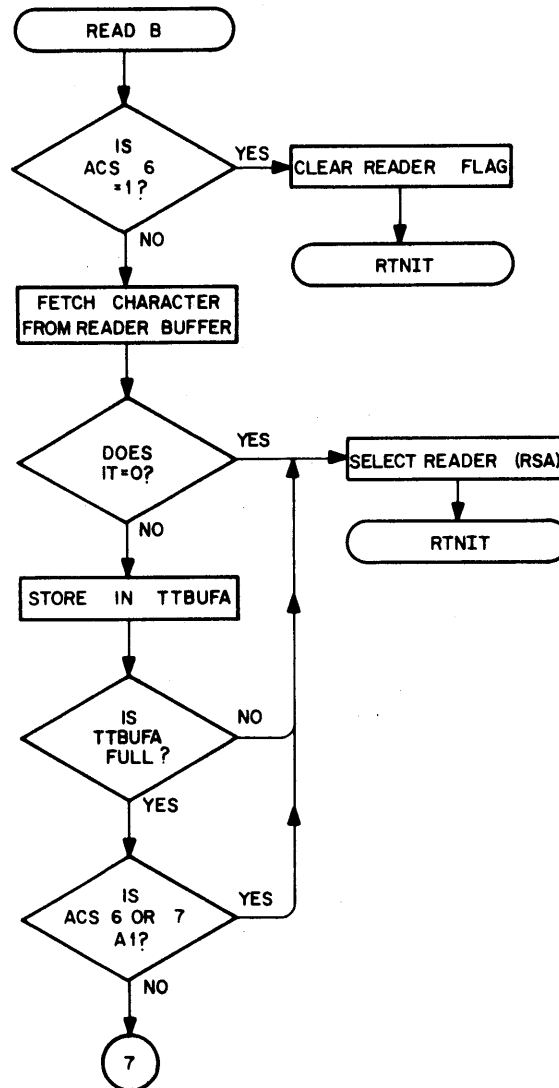


Service TTY Interrupt



Punch Routine





Read full speed ACS 7 A 1

