IDENTIFICATION

PRODUCT CODE: MAINDEC-12-D3GA-D

PRODUCT NAME: PDP-12 TAPE CONTROL TEST
(PART 2 OF 2)

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MAINTAINER: DIAGNOSTICS GROUP

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1.   ABSTRACT

The tape control diagnostics Part 2 is designed to test

all Controller Logic not tested by Part 1. Specifically

this includes, Inter-Processor Signals, Tape Control

States and Instruction, Tape States, Tape Trap and the

Transfer of Data between the Computer and the Tape

Controller via the Data break facilities. It should be

noted that Part 1 of this diagnostic should have been

successfully run prior to running Part 2, because Part 2

assumes that the logic associated with Part 1 is functioning

normally.

2.   REQUIREMENTS

2.1   Equipment

    1) A Standard Basic PDP-12

    2) A TC-12, PDP-12 Linc Tape Controller

    3) At least 1 Linc-Tape Transport

    4) An ASR-33 Teletype or Equivalent

2.2   Storage

This program is designed to run in Memory Field $\emptyset$ only and it

occupies virtually all of Field $\emptyset$ not occupied by the Binary

and Rim Loaders.

2.3   Preliminary Programs

All PDP-8 and 12 mode basic instruction diagnostics and

exercisers must have been successfully run prior to running

the program.

3.   LOADING PROCEDURE

3.1   Method

This program must be loaded with the binary loader. If you
are unfamiliar with the proper binary loading procedures refer
to Appendix A of this document, otherwise procede with the
following:

A)   Set the teletype reader switch to FREE.

B)   Open the teletype reader and insert the program tape so
     that the arrows on the tape are visible to and pointing
     toward the operator.

C)   Close the reader and set the reader switch to START.

D)   Set the teletype front panel switch to START.

E)   Set the left switches to 7777.

F)   Set the right switches to 4000.

G)   Set the mode switch to 8 mode.

H)   Depress I/O preset.

I)   Depress start LS.

J)   When the program tape has been read in the ACCUMULATOR
     must be 0000, if it is not, a read-in error has occurred
     and one might try reloading the binary loader.
     See Appendix A.

K)   Remove the program tape from the reader.

4.   STARTING PROCEDURES

This preliminary set up procedure is critical and any omission
will result in an error.

A) Set one and only one of the Linc-tape transport number thumbwheels to $\emptyset$ - on some transports the $\emptyset$ position is actually represented by 8.

B) Set all other transports, if available, to all different numbers i.e. no two transports have the same unit nu' ..

C) No TRANSPORT may se to unit 1 as this number is us.. generate a non-select signal.

D) Set the WRITE ENABLE switch on every transport to the disabled condition.

E) Set all transport switches to OFF.

F) Remove any Linc-tapes currently on the transport.

G) Set the left switches to $\emptyset 2\emptyset\emptyset$.

H) Set the right switches to $\emptyset\emptyset\emptyset\emptyset$.

NOTE: Setting the right switches to configurations other than $\emptyset\emptyset\emptyset\emptyset$ will cause the computer to scope loop, halt on error, and perform other options. These options are discussed later.

I) Set the MODE switch to 8 mode.

J) Depress I/O preset.

K) Depress START LS.

The program is running.

4.1   Control Switch Settings

A set of 6 optional mode switches consisting of right switches 0-6 has been included for the convenience of the test engineer, they are:

TAPE MARK SWITCH DOWN No!

    SR00 = 1 suppress error halts

    SR01 = 1 suppress type outs ring bell on error

    SR02 = 1 scope loop on a failing test

    SR03 = 1 scope loop on a non-failing test

    SR04 = 1 unit does not have extended tape fields (unused in
           part 2)
    SR05 = 1 suppress the bell
    SR06 = 1 suppress the pass counter.

The switches have an order of precedence associated with
them. For example, if the option switches were set so as to cause
a typeout and an error halt, it is obvious that the typeout
must precede the halt. Right switch 00 if set to a one will
prevent the computer from halting when an error is detected.
Depending on the condition of the other switches, we may:

    1) go on to the next test after typing out a message

    2) stay in the same test.

Right switch 01, if set to a one, will prevent the computer
from typing anything out and instead causes a bell to ring
at every detected error. The purpose of this is merely to
inform the operator that an error has occurred and nothing more.

Right switch 02, if set to a one, will prevent the computer
from exiting the current failing test.

Using switches 00, 01, 02 several use full combinations of
error analysis present themselves:

SR0	SR1	SR2	Explanation
0	0	0	Type error data and halt
0	1	0	Ring bell and halt
1	0	0	Continuous typing of data with no halt
1	1	0	Ring bell at every failure
1	0	1	Continuous typing of data in current test

In general, an error halt is useful for scoping status of the machine immediately following an error.

Right switch 03, if set to a one, will cause the program to remain in the current test, so long as no failures occur.

Right switch 04, if set to a one, will cause the program not to test the extended tape field register. (4K System)

Right switch 05, if set to a one, will inhibit the bell from ringing. Under normal operation the program will ring the bell about once every 1 and 1/2 minutes.

5.   MESSAGE FORMAT

1)   The message format is designed to yeild the maximum possible information with the minimum amount of typing. To that end the following format has been selected as the best of both worlds; i.e., amount of information vs. the amount of typing.

Example:

LTR   AC   RWB   (VIA TB) Failed

AC   RWB

ØØØ1   ØØØØ

ØØØ2   ØØØØ

LTR 2)   The first item typed, in this case LTR, refers to the logic page on which the logic which is being tested is drawn.   In this case the message tells us that the logic under test is located in the (LTR) Linc Tape Register logic.

It should be understood that the trouble is associated
with the Linc tape register logic but not necessarily on
the page referenced. For example, on this test the data
transfered may not have gotten from the computer to the
tape control or it may not have been read back properly.
Both of these problems would cause a typeout such as this,
indicating a bad register, when in fact, the trouble was
in getting data to or from a register.

AC RWB 3) The second items typed AC RWB indicate that the
two registers involved, the AC, referring to the computer
AC, and the RWB, referring to the tape control read write
buffer, are involved in the test.

(VIA TB) 4) The third item, enclosed in brackets, is a modifier.
In this example, the program is capable of loading the RWB
in one of three (3) ways, from the tape transport, from
the AC serially via a maintenance gate, and from the AC
via the TB. Obviously three different trouble shooting
techniques are required depending on which of the three
data paths are bad. The modifier is this case points out
which one of three data paths failed.

FAILED 5) The word "failed" is typed to be sure the operator
understands that this message indicates trouble and is not
interpreted as a status report.

AC RWB 6) The two registers whose data are shown are named on
the second line of the typeout to ensure that the operator
is aware that the data type out is AC and RWB and not the
TB. Usually the registers involved do not have their names
typed out unless there is a possibility of confusion.

0001 0000 7) The numerical data type outs also in a
          special format.

When more than one number is typed the first number is always
the source number. In this typeout the 0001 is the number
in the AC after the contents of the RWB were read back into
the AC. An engineer must always refer to this document and
locate the exact type in order to properly interpret any
message or data typeout.

6.   MONITORS

This program contains two monitors, and error monitor and a
non-error monitor. The error monitor handles scope looping
on errors, message typeouts, and determines what data shall
be used in a failing test. The non-error monitor is an
extremely simple subroutine whose only function is to allow
a test to loop continuously even when no error exists.
The following example will be used to illustrate a typical
coding sequence, involving the comparing of a true number
with the actual results of an operation.

1)	TESTX, TAD	REGB	/Fetch Received data
2)	CIA		/Negate
3)	TAD	REGA	/Subtract from sent number
4)	SNA	CLA	/Were they equal
5)	JMS	I NERROR	/AC was zero, they were equal
6)	JMS	I ERROR	/Sent Data Received data unequal
7)	GOOF		/Message TAG
8)	HLT		/Error HALT
9)	SKP CIA		/EXIT
10)	TESTX		/Scope Loop Pointer

The numbers shown in the left margin are for reference purposes
only and are not part of the coding.

The first three lines performed in order (1) fetch the
resultant of the test from "REGB". This could have been any
memory register or any hardware register which can be read
under computer control. The test data is converted to twos'
complement form (2) and subtracted from the correct results
(3) The test of the data (i.e. were they equal) takes place on
line (4) and based on this test we go either to the non-error
(NERROR) subroutine or if the ACCUMULATOR is not zero the
error (ERROR) monitor. It should be obvious that any
decision making instruction can be used to ascertain which
monitor we hand control too.

Lines (5), (6), are the actual monitor calling instructions.
Line (7) (GOOF) is the address of the first memory location
of the error message which will be typed out in case of a
failure. Line (8) is an error halt. If an error should
occur and the switches are set so as to allow an error
halt this address will be the one at which it will halt.

Line (9) is an exit. If an error halt occurs, pressing continue
will cause the computer to execute the skip and exit to the
next test.

Line (1∅) contains the address at which this test is begun again.
For example, after completing one pass thru this test routine
the monitors will execute an effective Jump Indirect the
contents of line (1∅) and redo this test routine.

6.1   Non Error Monitor

The non error monitor has two functions. The first is to
increment "REGA". "REGA" is a common tally register used to
count 4096 passes thru a test and to notify the non-err
monitor via an "ISZ" loop when the required number of p
have been performed and thereby causing an exit. The second
function is to examine RSW 03 and if set, inhibit exiting to
the next test.

In some tests, particularly those associated with time delays,
or mechanical delays it becomes prohibitive to make
4096 passes thru a test. To circumvent this it is possible
to preset "REGA" to "7777" so as to only make a single pass
thru a test, or any number of passes from 1 through 4096.

6.2   Error Monitor

The error monitor is the major monitor responsible for all
modes of communicating errors to the operator. The usage of
switch inputs has been completely discussed under part 4.1
control switch settings and will not be discussed here. Several
salient features of the error monitor are as follows. The first
"scope loop on failing test" (SR02=1), is designed to cause
the monitor to inhibit incrementation of "REGA", and to inhibit
the advance of the random number generator. An example of its
use might be in testing any of the 12 bit registers. Assume
that bit 00 can never be set to a one because of some as yet
unknown hardware error. This malfunction will become known the
first time the number 4000 is loaded into it because the read
back will show 0000 - normally the next number to tried will be
4001, 4002 etc. with each being typed out and each causing

different data to be transferred. To facilitate scope testing
of this problem, we must eliminate type outs and prevent the
data from changing. This is easily accomplished as explained
under switch settings.

An error message is always formatted such that all of the non
numeric characters are typed out first followed by the numerics.
The contents of some memory register, other than those selected
by the programmer, may be of interest to the field engineer.
For example, in a random data transfer test it is impossible
to determine the number of successful data transfers, because
only the errors are typed out. Lets presume that the engineer
wishes to type out the pass counter i.e. "REGA" memory address
ØØØ4. It is necessary to modify the message type out string
as follows:

	BEFORE			AFTER	
GOOF,	ØØØ1	ØØØ1	GOOF,	ØØØ1	ØØØ1
	Ø2Ø3	Ø2Ø3		Ø2Ø3	Ø2Ø3
	EXITA	7777		EXITA	7777
	REGB	ØØØ5		REGB	ØØØ5
	REGC	ØØØ6		REGC	ØØØ6
	EXIT	ØØØØ		REGA	ØØØ4
				EXIT	ØØØØ

The following shows the before and after type out.

ABC 7351 735Ø   ABC 6773 6253 ØØ37

The type out on the right shows the contents of the pass counter
and will indicate if all random numbers failed or if only some
of them failed. It is absolutely necessary to restore the

toggled in modifications to the message type out in order

to prevent erroneous type outs in other messages.

7.   MAINTENANCE INSTRUCTION SET

MNEMONIC	CODE	MODE	OPERATION
LMR	6151	PDP-8	Load maintenance register

AC

Ø	TO MAINT INST REG	
1	TO MAINT INST REG	
2	TO MAINT INST REG	
3	TO MAINT INST REG	
4	CLEAR TAPE DONE FLOP	
5	SKIP ON TAPE DONE	
6	GENERATE A SIMULATED TT0, TT1, TT2, PULSES	
7	GENERATE A SIMULATED TT3, TT4, PULSES	
8	SIMULATE MARK INPUT	
9	SIMULATE DATA 1 INPUT	
10	SIMULATE DATA 2 INPUT	
11	SIMULATE DATA 3 INPUT	

Bits Ø,1,2,3

The contents of ACCUMULATOR bits Ø, 1, 2, 3, are loaded as a

command into the maintenance instruction register. The command

will be executed if and only if the XFR IOT (6154) is generated;

the function of these commands are discussed later.

Bit 4

Executing the LMR command with 'AC bit 4 set will unconditionally

clear the tape done flag.

Bit 5

Executing the LMR command with AC bit 5 set will cause the computer to skip the next instruction in sequence if the tape done flip-flop were set.

Example: CLA CLL   /Clear AC, L   ·

                 TAD KØ1ØØ   /Set Bit 5

                 LMR   /IOT 6151

                 HLT   /Tape done was zero

                 HLT   /Tape done was one

It should be noted that these commands are not designed to be microprogrammed; for example, setting both Bit 4 and 5 and executing LMR in an attempt to SKIP and clear on the tape done flag is unwise.

Bit 6

Executing the LMR command with AC bit 6 set will generate in order the timing pulses TTØ, TT1, TT2 regardless of the state of the tape control logic.

Bit 7

Executing the instruction LMR with bit 7 set will generate in order TT3 and TT4. It should be noted that to generate an entire timing stream consisting of pulses TTØ, TT1, TT2, TT3, and TT4, it is necessary to generate TTØ, TT1, and TT2 first followed by a second command to generate TT3 and TT4.

Bit 8

Is used to simulate an input to the mark window, see bits 9, 1Ø, 11 below.

Bits 9, 1Ø, 11

Executing the instruction LMR with data in AC bits 9, 1Ø, 11 will simulate reading data of the data heads into the Read-write buffer. This feature is useful in testing the tape control without a transport.

TRC 6152	PDP-8	Tape Register Clock

AC	
Ø	Generate tape preset
1	Shift RWB once left with no end around carry
2	Transfer TB to RWB
3	Add TB and TAC place the results in TAC
4	Ø Tape word flip flop
5	Set Forward
6	Set unit 1
7	Set Backward
8	Set write sync flip flop
9	Set 8 mode tape motion
1Ø	Select 8 tape mode
11	AC11 LTP8 Write if AC1Ø is set

The tape register control command TRC (6152) in conjunction with selected bits in the AC can perform a number of direct non-conditional operations. Several of the commands are useful primarily for logic testing the rest although they are tested, are used in normal machine operation.

Bit 0:

Executing the command tape register control TMR (6152) in
conjunction with AC bit 0 set to a one generates the internal
signal tape preset. Tape preset, in general, sets all control
flops to a null state, which may be either a one or a zero.

Bit 1:

TMR in conjunction with AC bit 1 will cause the Read-write
buffer (RWB) to be shifted once to the left, observing it from
the computer accumulator, or once up on the logic drawings.
Data shifted out of RWB is lost and a logic 0 is shifted into
the low order bit.

Bit 2:

TMR in conjunction with AC Bit 2 will cause the contents of the
TB to be copied into the RWB. The previous contents of the RWB
are lost, the TB remains unchanged. It should be noted that the
only path by which the RWB may be loaded in parallel is via
the TB register.

Bit 3:

AC bit 3 causes the contents of the TB register to be added to
the contents of the TAC register, with the resultant being
retained in the TAC.

Example:

BEFORE	AFTER
TB = 7321	TB =7321
TAC = 0412	TAC = 773

Bit 4:

Clear the tape word flip flop. This bit generates an unconditional clear.

Bit 5:

Set forward. The direction flip flop is set to a one unconditionally. This command is useful for diagnostics.

Bit 6:

Set unit 1. When executed this command will select tape transport unit 1. It should be noted that this command can only select unit 1, if the extended transport select register (part of extended operations register bits 10, 11) are set to a zero. If the extended transport select register is not zero, the appropriate odd numbered unit is selected.

Bit 7:

Set Backward. The direction flip flop is set to zero unconditionally. This command is useful for diagnostics.

Bit 8:

Set write sync. This command unconditionally sets the write sync flip flop.

Bit 9:

Set 8 tape motion is used with the TC12-F option. This options allows the reading and writing of tapes written in PDP-8 Linc tape format.

Bit 10:

Set 8 write selects 8 tape mode.

Bit 11:

Set LTP8 write, AC bit 11 is provided as a data input to the 8 tape write flip-flop. If AC bit 10 is set, the bit is clocked into the flop.

XFR   6154   PDP-8   Transfer

Maintenance register

ØØ	AC to TB
Ø1	AC to TBN
1Ø	AC to TAC
11	AC to TMA
2Ø	TMA setup to AC
21	TBN to AC
3Ø	TB to AC
31	RWB to AC
4Ø	Mark window to AC
41	States to AC
5Ø	Units and motion to AC
51	Tape instruction register to AC
6Ø	Misc status 1 to AC
61	Misc status 2 to AC
7Ø	TMA to AC
71	Unused, returns all zeros to AC

In general all data transfers into the AC using maintenance commands are 1's transfers, that is, they do not clear the AC prior to inserting data. All data transfers from the AC into tape control register are jam transfers. Any data which was in a tape control register is lost.

00 AC to TB

The current contents of the AC are transferred into the TB
(Tape Buffer). The AC data is unaffected the previous
contents of the TB are lost.

01 AC to TBN

The current contents of the AC are transferred into the TBN
(Tape Block Number). The AC is unaffected, the previous
contents of the TBN are lost.

10 AC to TAC

The current contents of the AC are transferred into the TAC
(Tape Accumulator). The AC is unaffected, the previous contents
of the TAC are lost.

11 AC to TMA

The contents of the AC are transferred into the TMA (Tape
Memory Address). The AC is unaffected the previous contents
of the TMA are lost.

20 TMA setup to AC

The contents of the TMA setup register is "ORED" into the AC.
The contents of the TMA setup register is unaffected.

21 TBN to AC

The contents of the TBN register is "ORED" into the AC.
The contents of the TBN are unaffected.

30 TB to AC

The contents of the TB register is "ORED" into the AC. The
contents of the TB is unaffected.

31 RWB to AC

The contents of the RWB (Read write buffer) is "ORED" into
the AC. The contents of the RWB are unaffected.

4Ø Mark Window to AC

The contents of the tape mark window and its associated

mark decoding gates are "ORED" into the AC. The contents

of the Mark window register is unaffected. The data format

is as follows:

AC

ØØ	Window shade
Ø1	Window ØØ
Ø2	Window Ø1
Ø3	Window Ø2
Ø4	Window Ø3
Ø5	End Zone mark
Ø6	Check mark
Ø7	Guard mark
Ø8	Data mark
Ø9	Final mark
1Ø	Block mark
11	Intermediate zone mark

41 States to AC

The contents of several flops and the levels of several

gates are "ORED" into the AC. Reading the data does not

affect its state. The data format is shown below:

AC

ØØ	TAC = 7777
Ø1	IDLE Mode = 1
Ø2	Search mode = 1
Ø3	Block Mode = 1
Ø4	Check word mode = 1
Ø5	Turn around mode = 1
Ø6	Write flop = 1
Ø7	Write cycle flop = 1
Ø8	Acip delay not timed out
Ø9	Tape timing OK
1Ø	Timing OK gate set
11	Tape fail delay

5Ø Units + MTN to AC

The data concerning transport selection, motion, direction, unit select, and write enable is "ORED" into the AC.

AC

ØØ	UNIT Ø	Selected
Ø1	UNIT 1	Selected
Ø2	UNIT 2	Selected
Ø3	UNIT 3	Selected
Ø4	UNIT 4	Selected
Ø5	UNIT 5	Selected

Ø6	UNIT 6	Selected
Ø7	UNIT 7	Selected
Ø8	MOTION FLOP	(1)
Ø9	DIRECTION FLOP	(1)
1Ø	UNIT SELECT	
11	WRITE ENABLE	

Bit 1Ø Unit Select

This bit indicates that one and only one unit is selected at a time.

51 TINST to AC

The contents of the tape instructions register decoder, the I bit and the group register are transferred to the AC. The contents of these datum are unaffected; however, the previous contents of the AC are lost.

AC

ØØ	RDC
Ø1	RCG
Ø2	RDE
Ø3	MTB
Ø4	WRC
Ø5	WRE
Ø6	WRI
Ø7	CHK
Ø8	I BIT
Ø9	GPØ (1)
1Ø	GP 1 (1)
11	GP 2 (1)

6∅ Misc Status 1 to AC

This command transfers the status of several important levels
to the AC. The format is shown below:

AC

∅∅   PHASE GATE

∅1   PROGRESS FLOP (1)

∅2   LC ∅∅ (1) Line Counter

∅3   LC ∅1 (1) Line Counter

∅4   MARK CHANNEL WRITE

∅5   DATA CHANNEL 1

∅6   DATA CHANNEL 2

∅7   DATA CHANNEL 3

∅8   GP CNT = GP FLOP

∅9   GP CNT ∅ (1)

1∅   GP CNT 1 (1)

11   GP CNT 2 (1)

61 Misc Status 2 to AC

Bit ∅ of the AC is set to a one if the LTP8 tape select
flip-flop is set.

7∅   TMA to AC

The contents of the TMA register is transferred to the AC. The
contents of the TMA are unchanged, the original contents of the
AC is lost.

71 Unused

General Information

This program will test the PDP-12 tape control logic on a
gate by gate basis. This was made possible by including a
16 instruction maintenance register in the basic desing.
The linc tape maintenance register (LTMR) facilitates
examination of all major registers and the majority of status
bits, control levels etc., associated with the tape control.
It is usually possible to isolate the fault to no more than
one or two modules by analizing the diagnostic type out and
referring to the appropriate logic diagram.

This program is written in several major and minor sections
designed to point to a failure on an appropriate page in the
logic drawings. The four major sections in order are:
1) Test out, in so far as possible, the maintenance logic. This
includes the maintenance mode flop, maintenance instruction
register, tape preset and the tape buffer to computer accumulator
(TB to AC) data read back portion. This group of tests are a
necessary preliminary diagnosis in order to be reasonably
certain that the following tests fail because of logic failures
and not because of failures in the maintenance instruction register
2) Test out the 12 bit registers TAC, TB, TMA, TMA setup, RWB
and TBN. Two tests are performed on each register; the first
test is a binary up count sequence; the second a random number
sequence. The binary sequence ascertains that all flops can be
both set to a one and set to a zero. In addition it also proves
mutual independence of the data paths i.e. the flops can move
independently of one another and the input and output data paths

are not shorted in any way. The random number test causes
each bit of the registers to toggle at a relatively high speed,
in contrast to the binary sequence wherein only the low order
bits toggle at high speed. A second useful effect or the
random number sequence is that it leaves the tested register
in a random state, a technique sometimes useful for discovering
grossly illogical wiring errors.

3) Test all minor registers; i.e., registers with less than
12 bits. These include unit select registers, mark window,
extended _____ions register, etc. In this series of tests an
attempt is made to diagnose all flops and all sequenceable
flops such as the major state generator. In most cases random
number tests are not performed due to the fact that an unknown
state in any control flop might have an adverse affect on the
succeeding tests.

4) Test all gates using as many as possible input combinations.
For example, AND gates are first tested with all inputs true to
determine if the gate will function. Next each individual input
is set false in turn to see if each input is expressed in the
output. OR gates are tested by allowing at least one input and
maybe more to become true and monitoring the output for a true
condition. This is followed by setting all inputs to false
monitoring the output for false, followed by setting each
input in turn to true and checking the output.

A significant number of gates in the tape control can not be directly tested tape state logic TC12-∅-LTS, for example. These untestable gates are evaluated indirectly by logical deduction; i.e., all testable inputs to these gates are tested as inputs to other gates. An example:

Block mark (BM) is a functional input to the LTS logic. As previously stated it is extremely difficult to prove that a correct (BM) appears at the LTS logic, however, it is each to prove that a correct (BM) signal itself is functional, that other gates using the (BM) signal function, and that the (BM) signal is not shorted, either to logical low or logical high. The technique used to circumvent the apparent difficulty in testing multilevel logic is as follows:

a) Attempt to set all inputs to a group of logic to a state which will cause a true output at some software observable point.

b) Attempt to disqualify the output by causing one input at a time to change to a state which will cause the output to become flase.

c) In many cases a gate will be qualified or disqualified, as the case may be for a specific period of time regardless of what the diagnostic program does. An example of this is any gate whose inputs are a function of tape delays.

The following four (4) error messages are associated with tests
of the: TAPE DONE FLOP

LIP TAPE DONE FAILED TO SET

The LIP TAPE DONE M216 C31 flip-flop failed to set.
The tape done flop is set by toggling the progress
flop from a 1 to a $\emptyset$. This test is accomplished by
setting progress via MTP Setup, clearing progress via
MTB, BM, ACIP-NOT and TP2, and testing the TAPE DONE
flop via the TAPE SKIP Maintenance Instruction.

LIP MTP SETUP FAILED TO CLEAR TAPE DONE

The signal, MTP SETUP, failed to clear the Tape done
flop. The tape done flip-flop was set as discussed
above, and cleared via direct clear input, by MTP
SETUP. The results are checked via the TAPE SKIP
Maintenance Instruction.

LIP TAPE PRESET FAILED TO CLEAR TAPE DONE

The signal,TAPE PRESET, failed to clear the tape done
flop. The tape done flip-flop was set as discussed above,
and cleared via direct clear input, by TAPE PRESET. The
results are checked via the TAPE SKIP Maintenance Instruction.

LIP CLEAR TAPE DONE FAILED

The signal, CLEAR TAPE DONE, failed to clear the tape done
flop. The tape done flip-flop was set as discussed above,
and cleared via direct clear input, by CLEAR TAPE DONE. The
results are check via the TAPE SKIP Maintenance Instruction.

The following three (3) messages are associated with the Linc mode command STD, STD i and Tape interrupt.

LIP STD FAILED TAPE DONE = 1

The Linc mode command STD (Ø416) failed to SKIP or STD i (Ø436) skipped in error when the TAPE DONE flop was on a 1.

LIP STD FAILED TAPE DONE = Ø

The Linc mode command STD (Ø436) failed to skip when the TAPE DONE flop was on a Ø.

LIP TAPE INTERRUPT FAILED INT ENB = 1

The tape processor failed to cause a tape interrupt. The TAPE DONE flop and the INTERRUPT ENABLE flop in the extended operations register were both set to a 1.

The following eight (8) messages are associated with tests of the PROGRESS and IN-PROGRESS flops. Specifically whether MTP SETUP sets the flops and that the clock input gating will zero the flops.

LIP MTP SETUP FAILED TO SET IN-PROGRESS

    A non-paused tape instruction was executed to set the
    IN-PROGRESS M216, D19 flop. The resulting state of the
    flop is checked by reading it back into the AC, bit $\emptyset$1
    via a Misc status 1 to AC Maintenance Instruction.

LIP TAPE PRESET FAILED TO $\emptyset$ IN-PROGRESS

    The IN-PROGRESS flop was set via a non-paused tape instruction
    then cleared via a TPAE PRESET. The resulting state of the
    flop is check by reading it back into the AC, bit $\emptyset$1 via a
    Misc status 1 to AC Maintenance Instruction.

LIP LCS (MTB * BM * SEARCH) FAILED TO $\emptyset$ IN-PROGRESS

    The IN-PROGRESS flop was set via a non-paused MTB tape
    instruction. The Mark window was loaded to BM (16) and a
    simulated TP1 pulse was generated to set search mode. The
    transition from IDLE mode to SEARCH mode.

LIP M115 C25 PIN S2 FAILED TO $\emptyset$ IN-PROGRESS

    The IN-PROGRESS flop was set by a MTP SETUP and an attempt
    was made to clear it via END INST signal which is generated
    by gate M115, C25, PINS N2, P2, R2 and S2.

LIP END INST FAILED TO Ø PROGRESS

 The progress flop was set by a MTP SETUP and an attempt was

 made to clear it via END inst signal generated as discussed

 in the previous type out.

LIP CHK OK FAILED TO Ø PROGRESS

 The progress flop was set by a MTP SETUP and an attempt was

 made to clear it via CHK OK generated by M119 C22 PIN P2.

 The resulting state of the progress flop is detected by

 examining the TAPE DONE flop to see if the transition

 of progress to a zero did in fact set TAPE DONE.

LIP M113, C16, H1 WRITE CYCLE (Ø) FAILED TO Ø IN PROGRESS

 This test as in the previous test ascertains if the signal

 LIP CHK OK can in fact Ø the in progress flip-flop. In this

 case the input to gate M113 C16 PIN J1 is disabled i.e. LIN

 TINR 9 (1) and LCS write cycle (Ø) PIN H1 is true.

LIP STW FAILED TAPE WORD = 1

 The tape word flip-flop is tested by the Linc command STW

 (457) and STW I (477). The tape done flop is kept in the

 one state during this test.

LIP STW FAILED TAPE WORD = Ø

 The tape word flip-flop is tested by the LINC command STW

 (457) and STW I (477). The tape done flop is kept in the

 zero state during this test.

LIP TAPE WORD TOGGLES FAILED

The Tape Word flop failed to toggle as the result of the action of line counters LCØ1, LCØØ on the clock and data inputs.

LIP DATA BREAK FAILED

Ø176   ØØØØ ØØØØ

The DATA BREAK facility has failed. The first number typed is the address in memory which was referenced by the tape control this is always address Ø176. It was necessary to use a fixed address rather than all addresses because almost any error in data break will wipe out the controlling program. The second number typed is the data which was transferred from the tape control to the computer. The last number is the actual number received.

LCX MARK FLOP

ØØØØ ØØØØ

An attempt was made to set the mark flip-flop. The first number typed indicates the data sent to the extended operations register this number is either ØØØØ or Ø2ØØ. The second number typed indicates the status of the mark flop as read back from the extended operations register this number also is either ØØØØ or Ø2ØØ. This error may also indicate that the operator failed to set the mark key.

LCX MARK FLOP TAPE PRESET FAILED

ØØØØ

       The mark flip-flop was set. An attempt was made to clear it
       via a tape preset pulse.

LIN TAC=7777, DIR = REV FAILED

       The program attempted to set the tape control major state
       generator to the Blcok state. In order to go from Idle to
       search to block, it is necessary for the TAC register to
       equal 7777 and the direction to be forward. In this
       case we have purposely set the direction flop to a reverse
       condition so that the major state generator should be inhibited
       from going from search to block.

LIN TAC = ØØØØ DIR = FWD FAILED

       Same as the previous test except that we are testing to see
       if TAC not equal to 7777 will inhibit going to the Block
       state.

LIT MARK CLOCK FAILED TO GENERATE TP3

       An attempt was made to see if the mark clock can generate
       computer timing. The LCØ1 Line counter is on a zero, the mark
       window is set ot a Block mark, and sufficient time is allowed
       for the mark clock to generate TP3, TP4 to set LCØ1. This test
       will fail if the mark key is not set.

LCS IDLE SEARCH FAILED

    An attempt was made to change the major state generator

    transfer from idle to search.

LCS SEARCH BLOCK FAILED

    The major state generator is initially set to Idle. A

    routine is executed to set the generator first to search

    then to block. The primary test is from search to block,

    because the Idle to search has already been tested.

LCS SEARCH TURN AROUND FAILED

    An attempt was made to go from the Idle to the search, to

    the turn around major state.

LCS TURN AROUND IDLE FAILED

    The major state generator was set to the turn around state

    as in the previous test. An attempt to go from turn around

    to IDLE was made. The gate M115 A32 PIN H2 was used to

    generate the timing to cause the transition to the IDLE

    state.

LCS BLOCK CHK WRD FAILED

    The major state generator was set to block mode in a manner

    similar to the search Block Test previously discussed and

    attempt was made to go from Block to CHK WRD Mode.

LCS CHK WRD IDLE FAILED

> The major state generator was set to CHK WRD mode and
>
> attempt was made to Idle mode via gate M16Ø, B29, PIN
>
> V2.

LCS SEARCH IDLE (MTB+I) FAILED

> The major state generator was set to search mode with the
>
> (I) bit set. This test tries to set idle mode using LIN I
>
> (1) and LCS MTP END at gate M16Ø, B29 PINS V1, U2 and V2.

LRL; LRE; EN TAC, EN TB, OR LOAD TAC

> This type out indicates an error in the function TB+TAC
>
> to TAC. The adders and this function have previously been
>
> tested using the maintenance logic in tape control test PART 1.
>
> We can therefore presume that the trouble only occurs when
>
> the controller performs under its own control. The four (4)
>
> names typed out indicate the suspected logic. The three (3)
>
> numbers typed out indicate in order the contents of the TB,
>
> TAC and TAC after the addition has been performed.

LTS PHASE GATE FAILED

> Each of the two gates which generate the PHASE signal are
>
> tested individually first with both inputs false then with
>
> each input set true in turn. The two inputs consist of CHK WRD
>
> and LCØ2.

LWN MARK WRITE GATE FAILED

The mark write test is similar in principle to the phase
gate test above.

LTR DATA CHANNEL RWB Ø, 4, 8 FAILED

421Ø Ø16Ø

The Data channel output from the RWB was tested and failed.
Bits Ø, 4, 8 of the RWB are alternately set to all ones
then all zeros. The first number typed out shows bits Ø, 4, 8,
set to ones. The second number shows them as they are read
back via the data channel on bits 5, 6, 7.

LTT MARK CLOCK FAILED TO GENERATE TPØ

The timing logic is tested to ascertain if the mark clock
can generate TPØ, TP1, TP2. The results are detected by
determining if TP2 will set the GP=GPC flip-flop.

LTS LINE COUNTER FAILED TO COUNT

ØØØØ

The 3 Line counter flops were set to all ones an attempt was
made to ripple a carry thru it i.e. set is to all zeros. The
number printed in bits Ø2, Ø3 indicate the value of LCØØ,
and LCØ1.

LMU TURN AROUND BM FAILED TO Ø MOTION

The motion flip-flop was set via a Linc tape instruction.
The major state generator was set to turn around the window
to block mark and time pulses Ø, 1, 2 were used to try to clear
the motion flop.

LMU TAPE PRESET FAILED TO Ø MOTION

> The motion flip-flop was set as discussed above. An attempt
> was made to clear it by generating a tape preset.

LMU CLR PROGRESS FAILED TO Ø MOTION

> The tape flop was set an attempt was made to clear it using
> CLR progress. CLR is made up of MTB, I (Ø) and BM

LRR TP3 FAILED TO SHIFT RWB

ØØØØ ØØØØ

> The RWB was set to the value of the first number typed. A
> TP3 pulse was used to shift RWB. The second number is
> the resulting value of the RWB. It should be noted that the
> shift logic i.e. the logic which handles the data which is
> being shifted has previously been tested. So a failure will
> be indicated by no shifting rather than bad data.

LRL EN WRITE LD RWB FAILED TO SHIFT RWB

ØØØØ ØØØØ

> A test of the RWB shift logic has failed. The two numbers
> indicate the before and after contents of the RWB.

LRL TB+TAC=TAC FAILED

ØØØØ ØØØØ ØØØØ ØØØØ

> The add function of the Tape processor is tested. The numbers
> typed are in order TAC, TB RESULTANT and the resultant as
> computed by the central processor.

LRL LOAD TAC FAILED TP3, SEARCH

ØØØØ

The TAC register was set to 7777. The major state generator
was set to search. TP3 was used to try to clear TAC ie.
generate. LOAD TAC with no data on the BUSS. The number
typed out indicates taht data which was left in the TAC
after the transfer.

LCS WRITE CYCLE FLOP TEST FAILED

The write cycle flop was both set and cleared with the result
read back and tested after each change.

LTS TIMING OK GATE FAILED

The timing OK gate failed to indicate that all machine
timing was OK after the program had set all inputs to the
timing OK gate to true.

TMA failed to increment during tape break

was   is

A tape break was executed; at the completion of the break cycle, the
TMA was not equal to the previous address plus one.

TC12-Part 2 Pass--(PASS)

The octal number indicates the number of completed passes executed
since the last "Start 2Ø".

```
 1
 2                    /PDP-12 TAPE CONTROL TEST PART II, MAINDEC 12-D3GA-L
 3                    /COPYRIGHT 1970, DIGITAL EQUIPMENT CORP., MAYNARD, MASS.
 4                    /
 5                    /AUTHOR: JAMES KELLY
 6                    /
 7                    /THIS PROGRAM, OPERATING IN BOTH 8 AND LINC MODE,
 8                    /IS DESIGNED TO COMPLETE CHECKOUT OF THE PDP-12
 9                    /TAPE CONTROL LOGIC.  TAPE CONTROL TEST PART I
10                    /MUST RUN SUCCESSFULLY PRIOR TO EXECUTION OF PART II
11                    /THIS PORTION.
12                    /
13                    /SPECIAL INSTRUCTIONS:
14                    / 1.  REMOVE LINCTAPES FROM ALL DRIVES
15                    / 2.  SET TRANSPORT THUMBWHEELS TO "OFF LINE"
16                    / 3.  SET TRANSPORT SELECT SWITCHES TO "OFF"
17                    / 4.  DEPRESS AND HOLD THE MARK KEY
18                    / 5.  I/O PRESET TO 8 MODE
19                    / 6.  DEPRESS START 20,
20                    /
21                    /THE TEST IS CONTROLLED BY A MONITOR RESIDENT
22                    /IN PAGE 24.  OPTIONAL SETTINGS ARE AVAILABLE
23                    /FOR MODIFICATION OF ERROR CONTROL.
24                    /
25                    /SWITCH SETTINGS:  (NORMALLY 0000)
26                    /
27                    /RSW00=1, INHIBIT ERROR HALT.
28                    /RSW01=1, INHIBIT ERROR TYPEOUT.
29                    /RSW02=1, SCOPE LOOP ON ERROR.
30                    /RSW03=1, SCOPE LOOP ON NONERROR.
31                    /RSW05=1, INHIBIT BELL.
32                    /RSW06=1, INHIBIT PASS COUNTER TYPEOUT.
33                    /
34                    /AT THE COMPLETION OF A PASS, THE CONTENTS
35                    /OF THE PASS COUNTER WILL BE TYPED OUT,
36                    /
37                    /
```

```
38
39              0001         *1
40      0001    5402                     JMP I    RETURN
41      0002    0000         RETURN,  0000
42      0003    4000         K4000,   4000
43      0004    3400         K3400,   3400
44      0005    0250         K0250,   0250
45      0006    7400         K7400,   7400
46      0007    0017         K0017,   0017
47
48                           /COMMAND IDENTIFICATION
49                           /
50              6141         LINC=6141
51              0000         EXIT=0000
52              7777         EXITA=7777
53              0002         PDP=0002
54              6151         LMR=6151
55              6152         TRC=6152
56              6154         XFR=6154
57              0416         STD=0416
58              0017         COM=0017
59              0001         AXO=0001
60              0457         STW=0457
61              0003         TAC=0003
62                                       .
63              0011         CLR=0011
64              0021         XOA=0021
65              0004         ESF=0004
```

```
66
67            0010     *10
68    0010    0000     PINT,    0000
69            0020     *20
70    0020    7300              CLA CLL        /START 20
71    0021    3065              DCA     PASS
72    0022    5423              JMP I   .+1
73    0023    0177              0177               /THIS LOCATION MAY POINT TO ANY TEST
74    0024    0000     LSTERR,  0000               /THE OPERATOR DESIRES
75    0025    0000     TPEPRE,  0000
76    0026    7330              CLA CLL CML RAR
77    0027    6152              TRC            TAPE PRESET
78    0030    7200              CLA
79    0031    5425              JMP I   TPEPRE
80    0032    3134     MAINT1,  MAINTS
81    0033    0016     K0016,   0016
82    0034    3144     LOADR,   LOADS
83    0035    0040     K0040,   0040
84    0036    5000     NERROR,  NERROS
85    0037    5021     ERROR,   ERRORS
86    0040    0002     K0002,   0002
87    0041    0160     K0160,   0160
88    0042    4210     K4210,   4210
89    0043    5000     K5000,   5000
90    0044    3040     K3040,   3040
91    0045    5216     RAN,     RANDOM
92    0046    0000     REGE,    0000
93    0047    7000     K7000,   7000
94    0050    7030     K7030,   7030
95    0051    7777     K7777,   7777
96    0052    3334     M4444,   -4444
97    0053    4140     K4140,   4140
98    0054    7770     K7770,   7770
99    0055    0100     K0100,   0100
100   0056    0200     K0200,   0200
101   0057    0150     K0150,   0150
102   0060    0450     PNTA,    LOCA
103   0061    3027     PNTB,    WRCFLB
104   0062    1302     PNTC,    LOCC
105   0063    3133     PNTJ,    LOCJ
106   0064    5054     OUTPAS,  ASCII
107   0065    0000     PASS,    0000
108   0066    2000     K2000,   2000
109   0067    6040     K6040,   6040
110   0070    6000     K6000,   6000
111   0071    1000     K1000,   1000
112   0072    0400     K0400,   0400
113   0073    0077     K0077,   0077
114   0074    7740     M40,     -40
```

```
115
116    0075   0240    K240,    240
117    0076   7774    K7774,   7774
118    0077   1026    K1026,   1026
119    0100   0215    K0215,   0215
120    0101   0212    K0212,   0212
121    0102   0177    K0177,   0177
122    0103   5200    BELLA,   BELL
123    0104   0207    K0207,   0207
124    0105   5210    TYPE,    TYPOUT
125    0106   0000    SPACE,   0000
126    0107   0050    K0050,   0050
127    0110   0020    K0020,   0020
128    0111   7773    K7773,   7773
129    0112   0010    K0010,   0010
130    0113   0000    TEMPB,   0000
131    0114   0000    REGD,    0000
132    0115   0000    REGA,    0000
133    0116   0000    REGB,    0000
134    0117   0000    REGC,    0000
135    0120   0000    REGF,    0000
136    0121   0376    LIA004,  LIB004
137    0122   4440    K4440,   4440
138    0123   3700    K3700,   3700
139    0124   7400    M0400,   -0400
140    0125   7000    M1000,   -1000
141
142    0126   0000    DELAY,   0000
143    0127   1162             TAD     K7737         /GET TALLY
144    0130   3025             DCA     TPEPRE        /SET TALLY
145    0131   3024             DCA     LSTERR        /0 LAST ERROR
146    0132   2024             ISZ     LSTERR        /WAIT
147    0133   5132             JMP     .-1
148    0134   2025             ISZ     TPEPRE        /WAIT
149    0135   5133             JMP     .-2
150    0136   5526             JMP I   DELAY         /WAIT FOR ACIP TO TIME OUT
151    0137   0177    K177,    177
```

```
152              0140        *140
153     0140  7777                   7777
154     0141  0002                   PDP              /P MODE
155     0142  5543                   JMP I    .+1     /EXIT
156     0143  3105                   LOCTRP
157     0144  0050        C0050,     0050
158     0145  1400        K1400,     1400
159     0146  0013        K0013,     0013
160     0147  3000        K3000,     3000
161     0150  7700        M0100,     -0100
162     0151  6000        M2000,     -2000
163     0152  7600        M0200,     -0200
164     0153  0011        K0011,     0011
165     0154  3440        K3440,     3440
166     0155  6020        K6020,     6020
167     0156  0007        K0007,     0007
168     0157  7040        K7040,     7040
169     0160  0012        K0012,     0012
170     0161  3020        K3020,     3020
171     0162  7737        K7737,     7737
172     0163  0003        K0003,     0003
173     0164  3420        K3420,     3420
174     0165  3427        K3427,     3427
175     0166  0001        RNA,       0001
176     0167  0000        RNB,       0000
177     0170  0176        C0176,     0176
178     0171  7356        K7356,     7356
179     0172  2224        LWA104, LWB104
```

```
180
181           0176        *176
182
183   0176   7777     LOC176,  7777                     /TEST ADDRESS FOR DATA BREAKS
184   0177   4434              JMS I    LOADR           /SET REVERSE
185   0200   4503              JMS I    BELLA           /RING BELL
186   0201   4126              JMS      DELAY           /WAIT FOR ACIP
187                    /
188                    /TC12-0-LIP INTERPROCESSOR SIGNALS
189                    /SKIP ON TAPE DONE TEST M115 C29 PIN U1 PULSES TO LOW
190                    /THE NEXT 17 TESTS DIAGNOSE THE TAPE DONE LOGIC
191                    /
192
193   0202   4025     LIP000,  JMS     TPEPRE          /0>PROGRESS, 0>TAPE DONE
194   0203   1071              TAD      K1000           /GET AC > TAC
195   0204   6151              LMR                      /LOAD MAINT REG
196   0205   7330              CLA CLL CML RAR          /SET AC00
197   0206   6154              XFR                      /SET TAC00
198   0207   4432              JMS I    MAINT1          /SET MAINT MODE
199   0210   6141              LINC                     /L MODE
200   0211   0713              0713                     /MTB
201   0212   7000              7000                     /NO PAUSE FAILED TO SET.
202   0213   0002              POP                      /P MODE SET PROGRESS
203   0214   1033              TAD      K0016           /GET 0M
204   0215   4434              JMS I    LOADR           /SET MARK WINDOW TO BLOCK MARK
205   0216   1035              TAD      K0040           /GENERATE TP2
206   0217   6151              LMR                      /TP2
207   0220   7104              RAL CLL                  /SET AC BIT 05
208   0221   6151              LMR                      /TRY TO SKIP
209   0222   7610              SKP CLA                  /INVERT SENSE OF SKIP
210   0223   4436              JMS I    NERROR          /IT SKIPPED GOOD
211   0224   4437              JMS I    ERROR           /NO GOOD
212   0225   6006              LIM000                   /MESSAGE TAG
213   0226   7402              HLT                      /ERROR HALT
214   0227   7610              SKP CLA                  /EXIT
215   0230   0202              LIP000                   /SCOPE LOOP
```

```
216
217
218                     /                /DOES MTP SETUP CLEAR TAPE DONE M113,B16,L1,M1,N1
219                     /
220      0231   4025    LIP001, JMS      TPEPRE          /0>PROGRESS, 0>TAPE DONE
221      0232   1071            TAD      K1000           /GET AC > TAC
222      0233   6151            LMR                      /LOAD MAINT REG
223      0234   7330            CLA CML CLL RAR          /SET AC00 (1)
224      0235   6154            XFR                      /SET TAC00
225      0236   4432            JMS I    MAINT1          /SET MAINT MODE
226      0237   6141            LINC                     /L MODE
227      0240   0713            0713                     /MTB
228      0241   7000            7000                     /WASTED MEMORY
229      0242   0002            PDP                      /P MODE
230      0243   1033            TAD      K0016           /GET BM
231      0244   4434            JMS I    LOADR           /SET MARK WINDOW TO BLOCK
232      0245   1035            TAD      K0040           /GENERATE TP2
233      0246   6151            LMR                      /LOAD MAINTENANCE REGISTER
234      0247   7300            CLA CLL                  /CLEAR AC,L
235      0250   6141            LINC                     /L MODE
236      0251   0703            0703                     /DOES MTP SETUP 0 TAPE DONE
237      0252   7000            7000                     /TAPE AREA
238      0253   0002            PDP                      /P MODE
239      0254   1035            TAD      K0100           /SET AC05
240      0255   6151            LMR                      /SKIP ON ERROR
241      0256   4436            JMS I    NERROR          /TEST OKAY
242      0257   4437            JMS I    ERROR           /TEST FAILED
243      0260   5233            LIM001                   /MESSAGE TAG
244      0261   7402            HLT                      /ERROR HALT
245      0262   7610            SKP CLA                  /EXIT
246      0263   0231            LIP001                   /SCOPE LOOP
```

```
247
248                     /
249                     /DOES TAPE PRESET CLEAR TAPE DONE M113,B16,M1,N1
250                     /
251     0264  4025   LIP002,  JMS     TPEPRE      /0>PROGRESS, 0>TAPE DONE
252     0265  1071            TAD     K1000       /GET AC > TAC
253     0266  6151            LMR                 /LOAD MAINT REG
254     0267  7330            CLA CML CLL RAR     /SET AC00 (1)
255     0270  6154            XFR                 /SET TAC00
256     0271  4432            JMS I   MAINT1      /SET MAINT MODE
257     0272  6141            LINC                /L MODE
258     0273  0713            0713                /MTB
259     0274  7000            7000                /WASTED MEMORY
260     0275  0002            PDP                 /P MODE
261     0276  1033            TAD     K0016       /GET 8M
262     0277  4434            JMS I   LOADR       /SET MARK WINDOW TO BLOCK
263     0300  1035            TAD     K0040       /GENERATE TP2
264     0301  6151            LMR                 /LOAD MAINTENANCE REGISTER
265     0302  4025            JMS     TPEPRE      /DOES TAPE PRESET 0 TAPE DONE
266     0303  1055            TAD     K0100       /SET AC05
267     0304  6151            LMR                 /SKIP ON TAPE DONE
268     0305  4436            JMS I   NERROR      /TEST OKAY
269     0306  4437            JMS I   ERROR       /TEST FAILED
270     0307  5261            LIM002              /MESSAGE TAG
271     0310  7402            HLT                 /ERROR HALT
272     0311  7610            SKP CLA             /EXIT
273     0312  0264            LIP002              /SCOPE LOOP
```

```
274
275                             /
276                             /DOES LMR=AC05 CLEAR TAPE DONE
277                             /
278     0313    4025    LIP003, JMS         TPEPRE          /0>PROGRESS, 0>TAPE DONE
279     0314    1071            TAD         K1000           /GET AC > TAC
280     0315    6151            LMR                         /LOAD MAINT REG
281     0316    7330            CLA CML CLL RAR             /SET AC00 (1)
282     0317    6154            XFR                         /SET TAC00
283     0320    4432            JMS I       MAINT1          /SET MAINT MODE
284     0321    6141            LINC                        /L MODE
285     0322    0713            0713                        /MTB
286     0323    7000            7000                        /WASTED MEMORY
287     0324    0002            PDP                         /P MODE
288     0325    1033            TAD         K0016           /SET BM
289     0326    4434            JMS I       LOADR           /SET MARK WINDOW TO BLOCK MARK
290     0327    1035            TAD         K0040           /SET TP2
291     0330    6151            LMR                         /GENERATE TP2
292     0331    7300            CLA CLL                     /CLEAR AC,L
293     0332    1056            TAD         K0200           /0>TAPE DONE
294     0333    6151            LMR                         /ZERO TAPE DONE
295     0334    7110            RAR CLL                     /SET AC05
296     0335    6151            LMR                         /SKID ON TAPE DONE
297     0336    4436            JMS I       NERROR          /TEST OKAY
298     0337    4437            JMS I       ERROR           /TEST FAILED
299     0340    5307            LIP003                      /MESSAGE TAG
300     0341    7402            HLT                         /ERROR HALT
301     0342    7510            SKP CLA                     /EXIT
302     0343    0313            LIP003                      /SCOPE LOOP
```

```
303
304                     /DOES STD AND STD+20 WORK TAPE DONE = 1 PROGRESS = 1
305                     /
306     0344   4025    LIP004,  JMS      TPEPRE          /GENERATE TAPE PRESET
307     0345   1071             TAD      K1000           /GET AC > TAC
308     0346   6151             LMR                      /LOAD MAINT REG
309     0347   7330             CLA CLL CML RAR          /SET AC00
310     0350   6154             XFR                      /SET TAC00(0)
311     0351   4432             JMS I    MAINT1          /SET NO PAUSE
312     0352   6141             LINC                     /L MODE
313     0353   0713             0713                     /MTB
314     0354   7000             7000                     /WASTED MEMORY
315     0355   0002             PDP                      /P MODE
316     0356   6151             LMR                      /GENERATE TP2
317     0357   7300             CLA CLL                  /CLEAR AC,L
318     0360   6141             LINC                     /GO TO LINC MODE
319     0361   0416             STD                      /SKIP ON TAPE MODE
320     0362   0017             COM                      /SET AC TO CLEAR LATER
321     0363   0017             COM                      /SET OR CLEAR
322     0364   0002             PDP                      /GO TO 8 MODE
323     0365   7640             SZA CLA                  /TEST IF=7777 IT SKIPPED
324     0366   5521             JMP I    LIA004          /STD FAILED
325     0367   6141             LINC                     /GO TO LINC MODE
326     0370   0436             STD 20                   /STD+20
327     0371   0017             COM                      /SET AC TO CLEAR LATER
328     0372   0017             COM                      /SET OR CLEAR
329     0373   0002             PDP                      /GO TO 8 MODE
330     0374   7640             SZA CLA                  /TEST FOR ALL 0000
331     0375   4436             JMS I    NERROR          /ALL 0000 NO ERROR
332     0376   4437    LIB004,  JMS I    ERROR           /TROUBLE
333     0377   5326             LIM004                   /MESSAGE ID
334     0400   7402             HLT                      /ERROR HALT
335     0401   7610             SKP CLA                  /EXIT
336     0402   0344             LIP004                   /SCOPE MODE
```

```
337
338
339                             /DOES STD AND STD+20 FUNCTION TAPE DONE = 0 PROGRESS = 0
340                             /
341     0403    4025    LIP005, JMS        TPEPRE          /0>TAPE DONE
342     0404    6141            LINC                       /GO TO LINC MODE
343     0405    0416            STD                        /STD SHOULD NOT SKIP
344     0406    0017            COM                        /IT DIDN'T SO SET THE AC
345     0407    0017            COM                        /CLEAR AC IF IT DIDN'T SKIP
346     0410    0002            PDP                        /GO TO 8 MODE
347     0411    7650            SNA CLA                    /TEST FOR ALL ZEROS
348     0412    5222            JMP        LIB005          /STD FAILED
349     0413    6141            LINC                       /GO TO LINC MODE
350     0414    0436            STD 2                      /STD SHOULD SKIP
351     0415    0017            COM                        /SET AC TO 7777
352     0416    0017            COM                        /CLEAR IF NO SKIP
353     0417    0002            PDP                        /GO TO 8 MODE
354     0420    7650            SNA CLA                    /TEST FOR ALL ZEROS
355     0421    4436            JMS I      NERROR          /NO ERROR
356     0422    4437    LIB005, JMS I      ERROR           /ERROR
357     0423    5345            LIM005                     /MESSAGE ID
358     0424    7402            HLT                        /ERROR HALT
359     0425    7610            SKP CLA                    /SCOPE LOOP
360     0426    0403            LIP005                     /ERROR HALT
361
362                             /
363                             /DOES LIP TAPE INTERRUPT FUNCTION M113,C16,L2,M2,N2
364                             /
365     0427    1060    LIP006, TAD        PNTA            /GET INTERRUPT RETURN
366     0430    3002            DCA        RETURN          /SET UP INTERRUPT RETURN
367     0431    1057            TAD        K0150           /SET MAINT, TAPE INT, NO PAUSE
368     0432    3107            DCA        K0050           /RESET MAINT
369     0433    4432            JMS I      MAINT1          /SET MAINT
370     0434    6141            LINC                       /L MODE
371     0435    0713            0713                       /MTB
372     0436    7000            7000                       /WASTE SPACE
373     0437    0002            PDP                        /P MODE
374     0440    1033            TAD        K0016           /GET BM
375     0441    4434            JMS I      LOADR           /SET MARK WINDOW TO BLOCK MARK
376     0442    1035            TAD        K0040           /GET TP2
377     0443    6151            LMR                        /GENERATE TP2
378     0444    6001            ION                        /TURN ON INTERRUPT
379     0445    7000            NOP                        /WASTE TIME
380     0446    6002            IOF                        /TURN OFF INTERRUPT
381     0447    7610            SKP CLA                    /SKIP TO ERROR IF NO INT
382     0450    4436    LOCA,   JMS I      NERROR          /TEST OKAY
383     0451    4437            JMS I      ERROR           /TEST FAILED
384     0452    5364            LIM006                     /MESSAGE TAG
385     0453    7402            HLT                        /ERROR HALT
386     0454    7610            SKP CLA                    /EXIT
387     0455    0427            LIP006                     /SCOPE LOOP
388     0456    1144            TAD        C0050           /GET 0050
389     0457    3107            DCA        K0050           /RESET
```

```
390
391                           /
392                           /DOES MTP SETUP SET THE IN PROGRESS FLOP M216,D19
393                           /
394     0460    4025    LIP007, JMS     TPEPRE          /0 PROGRESS
395     0461    4432            JMS I   MAINT1          /SET NO PAUSE
396     0462    6141            LINC                    /L MODE
397     0463    0710            0710                    /TAPE COMMAND
398     0464    7000            7000                    /WASTE
399     0465    0002            PDP                     /P MODE
400     0466    1070            TAD     K6000           /GET MISC STATUS 1 TO AC
401     0467    6151            LMR                     /LOAD MAINTENANCE REGISTER
402     0470    7300            CLA CLL                 /CLEAR AC,L
403     0471    6154            XFR                     /READ STATUS
404     0472    0066            AND     K2000           /SAVE IN PROGRESS BIT
405     0473    7640            SZA CLA                 /WAS IT SET
406     0474    4436            JMS I   NERROR          /TEST OKAY
407     0475    4437            JMS I   ERROR           /TEST FAILED
408     0476    5410            LIM007                  /ERROR MESSAGE
409     0477    7402            HLT                     /ERROR HALT
410     0500    7610            SKP CLA                 /EXIT
411     0501    0460            LIP007                  /SCOPE LOOP
412                           /
413                           /DOES TAPE PRESET ZERO IN PROGRESS FLOP M216,C19
414                           /
415     0502    4432    LIP008, JMS I   MAINT1          /SET NO PAUSE
416     0503    6141            LINC                    /L MODE
417     0504    0710            0710                    /TAPE COMMAND
418     0505    7000            7000                    /WASTE
419     0506    0002            PDP                     /P MODE
420     0507    4025            JMS     TPEPRE          /TRY TO CLEAR IN PROGRESS
421     0510    1070            TAD     K6000           /GET MISC STATUS 1 TO AC
422     0511    6151            LMR                     /LOAD MAINT REGISTER
423     0512    7300            CLA CLL                 /CLEAR AC,L
424     0513    6154            XFR                     /READ STATUS
425     0514    0066            AND     K2000           /SAVE IN PROGRESS BIT
426     0515    7650            SNA CLA                 /DID IT CLEAR
427     0516    4436            JMS I   NERROR          /TEST OKAY
428     0517    4437            JMS I   ERROR           /TEST FAILED
429     0520    5435            LIM008                  /MESSAGE TAG
430     0521    7402            HLT                     /ERROR HALT
431     0522    7610            SKP CLA                 /EXIT
432     0523    0502            LIP008                  /SCOPE LOOP
```

```
433
434
435                    /DOES LCS(MTB*BM*SEARCH) ZERO IN PROGRESS M115 C25 PIN L2,M2
436                    /
437    0524   4025     LIP009, JMS     TPEPRE              /ZERO EVERY THING
438    0525   4432             JMS I   MAINT1              /SET NO PAUSE
439    0526   6141             LINC                        /L MODE
440    0527   0713             0713                        /TAPE COMMAND (MTB)
441    0530   7000             7000                        /WASTE
442    0531   0002             PDP                         /P MODE
443    0532   1033             TAD     K0016               /SET AC TO BLOCK MARK
444    0533   4434             JMS I   LOADR               /SET MARK WINDOW TO BM
445    0534   1067             TAD     K6040               /SET MISC STATUS 1 TO AC AND TP1
446    0535   6151             LMR                         /1>SEARCH, 0> IN PROGRESS
447    0536   7300             CLA CLL                     /CLEAR AC,L
448    0537   6154             XFR                         /READ STATUS
449    0540   0066             AND     K2000               /SAVE IN PROGRESS BIT
450    0541   7650             SNA CLA                     /TEST
451    0542   4436             JMS I   NERROR              /TEST OKAY
452    0543   4437             JMS I   ERROR               /TEST FAILED
453    0544   5464             LIM009                      /MESSAGE TAG
454    0545   7402             HLT                         /ERROR HALT
455    0546   7610             SKP CLA                     /EXIT
456    0547   0524             LIP009                      /SCOPE LOOP
457                    /
458                    /DOES M115 C25 PINS N2,P2,R2,S2 CLEAR IN PROGRESS
459                    /
460    0550   4025     LIP010, JMS     TPEPRE              /ZERO EVERYTHING
461    0551   4432             JMS I   MAINT1              /SET NO PAUSE
462    0552   6141             LINC                        /L MODE
463    0553   0712             0712                        /SET TINR 10 (1)
464    0554   7000             7000                        /WASTE
465    0555   0002             PDP                         /P MODE
466    0556   1033             TAD     K0016               /GET BLOCK MARK
467    0557   4434             JMS I   LOADR               /SET MARK WINDOW TO BM
468    0560   1055             TAD     K0100               /GET SET FWD BIT
469    0561   6152             TRC                         /SET DIRT TO FORWARD
470    0562   7300             CLA CLL                     /CLEAR AC,L
471    0563   1071             TAD     K1000               /GET AC>TAC
472    0564   6151             LMR                         /LOAD MAINT REG
473    0565   7240             CLA CMA                     /SET AC=7777
474    0566   6154             XFR                         /SET TAC
475    0567   7300             CLA CLL                     /CLEAR AC,L
476    0570   1035             TAD     K0040               /GET TP0,1,2
477    0571   6151             LMR                         /1>BLOCK
478    0572   7110             RAR CLL                     /SET AC = 0020
479    0573   6151             LMR                         /SET LC01 SO WE CAN DECODE CM
480    0574   7300             CLA CLL                     /CLEAR AC,L
481    0575   4434             JMS I   LOADR               /CLOSE WINDOW
482    0576   1035             TAD     K0040               /SET TP0,1,2
483    0577   6151             LMR                         /GEN TP0,1,2
```

```
484
485    0600    7201        CLA IAC                 /SET CM
486    0601    4434        JMS I    LOADR          /SET MARK WINDOW TO CM
487    0602    1035        TAD      K0040          /GET TP0,1,2
488    0603    6151        LMR                     /1>CHKWRD
489    0604    1070        TAD      K5000          /ADD MISC STATUS 1 TO AC
490    0605    6151        LMR                     /GENERATE TP0,1,2 0>IN PROGRESS
491    0606    7300        CLA CLL                 /CLEAR AC,L
492    0607    6154        XFR                     /READ DATA
493    0610    0066        AND      K2000          /SAVE IN PROGRESS BIT
494    0611    7650        SNA CLA                 /TEST
495    0612    4436        JMS I    NERROR         /TEST OKAY
496    0613    4437        JMS I    ERROR          /TEST FAILED
497    0614    5516        LIM010                  /MESSAGE TAG
498    0615    7402        HLT                     /ERROR HALT
499    0616    7610        SKP CLA                 /EXIT
500    0617    0550        LIP010                  /SCOPE LOOP
```

```
501
502                     /
503                     /DOES LIP PROGRESS FLOP GET ZEROED BY TAPE PRESET
504                     /IF THIS TEST FAILS THE COMPUTER WILL HANG UP WITH
505                     /NO TYPE OUT DUE TO TAPE PAUSE
506                     /
507     0620    4432    LIP011, JMS I    MAINT1          /SET NO PAUSE
508     0621    6141            LINC                     /L MODE
509     0622    0700            0700                     /TAPE INSTRUCTION 1 SET PROGRESS
510     0623    7000            7000                     /WASTE
511     0624    0002            PDP                      /P MODE
512     0625    4025            JMS      TPEPRE          /0>PAUSE, 0>PROGRESS
513     0626    2115            ISZ      REGA            /DONE YET
514     0627    5220            JMP      LIP011          /REDO
```

```
515
516                          /
517                          /DOES M115 C25 PINS N2,P2,R2,S2 ZERO PROGRESS FLOP
518                          /
519     0630   4025   LIP012, JMS        TPEPRE            /0>TAPE DONE
520     0631   4432           JMS I      MAINT1            /SET NO PAUSE
521     0632   6141           LINC                         /L MODE
522     0633   0712           0712                         /SET TINR 10(1)
523     0634   7000           7000                         /WASTE
524     0635   0002           PDP                          /P MODE
525     0636   1033           TAD        K0016             /GET BLOCK MARK
526     0637   4434           JMS I      LOADR             /SET MARK WINDOW TO BM
527     0640   1055           TAD        K0100             /GET SET FWD BIT
528     0641   6152           TRC                          /SET DIR FWD
529     0642   7300           CLA CLL                      /CLEAR AC,L
530     0643   1071           TAD        K1000             /GET AC>TAC
531     0644   6151           LMR                          /LOAD MAINT REG
532     0645   7240           CLA CMA                      /SET AC=7777
533     0646   6154           XFR                          /SET TAC
534     0647   7300           CLA CLL                      /CLEAR AC,L
535     0650   1035           TAD        K0040             /GET TP0,1,2
536     0651   6151           LMR                          /1>BLOCK
537     0652   7110           RAR CLL                      /SET AC = 0020
538     0653   6151           LMR                          /SET LC01
539     0654   7300           CLA CLL                      /CLEAR AC,L
540     0655   4434           JMS I      LOADR             /CLOSE WINDOW
541     0656   1035           TAD        K0040             /SET TP0,1,2
542     0657   6151           LMR                          /GEN TP0,1,2
543     0660   7201           CLA IAC                      /SET CH
544     0661   4434           JMS I      LOADR             /SET MARK WINDOW TO BM
545     0662   1035           TAD        K0040             /GET TP0,1,2
546     0663   6151           LMR                          /1>CHDWRK
547     0664   6151           LMR                          /0>PROGRESS
548     0665   7300           CLA CLL                      /CLEAR AC,L
549     0666   1055           TAD        K0100             /SET AC05
550     0667   6151           LMR                          /SKIP ON TAPE DONE (1)
551     0670   7610           SKP CLA                      /REVERSE
552     0671   4436           JMS I      NERROR            /TEST OKAY
553     0672   4437           JMS I      ERROR             /TEST FAILED
554     0673   6025           LIM012                       /MESSAGE TAG
555     0674   7402           HLT                          /ERROR HALT
556     0675   7610           SKP CLA                      /EXIT
557     0676   0630           LIP012                       /SCOPE LOOP
```

```
558
559                         /TAPE 2
560                         /
561                         /DOES M119,C22,F1,H1,J1,K1,K2,L2,M2,N2,P2, CLEAR THE IN PROGRESS FLOP
562                         /
563     0677   4025    LIP013, JMS      TPEPRE          /0 EVERYTHING
564     0700   4432         JMS I    MAINT1          /SET NO PAUSE
565     0701   6141         LINC                     /L MODE
566     0702   0712         0712                     /TAPE SET WRITE CYCLE
567     0703   7000         7000                     /WASTE
568     0704   0002         POP                      /P MODE LIN TINR 09 (0)
569     0705   1035         TAD      K0040           /SET FOR TP2
570     0706   6151         LMR                      /GP EQ GPC (1)
571     0707   7300         CLA CLL                  /CLEAR AC,L
572     0710   1071         TAD      K1000           /GET AC>TAC
573     0711   6151         LMR                      /LOAD MAINT REGISTER
574     0712   7240         CLA CMA                  /SET AC
575     0713   6154         XFR                      /SET TAC
576     0714   7300         CLA CLL                  /CLEAR AC, L
577     0715   1033         TAD      K0016           /GET 8M
578     0716   4434         JMS I    LOADR           /LOAD WINDOW
579     0717   1055         TAD      K0100           /SET FWD
580     0720   6152         TRC                      /SET FORWARD
581     0721   7300         CLA CLL                  /CLEAR AC,L
582     0722   1035         TAD      K0040           /SET TP0,1,2
583     0723   6151         LMR                      /SET BLOCK STATE
584     0724   7110         RAR CLL                  /SET AC = 0020
585     0725   6151         LMR                      /SET LC01
586     0726   7300         CLA CLL                  /CLEAR AC,2
587     0727   4434         JMS I    LOADR           /SET WINDOW SHUT
588     0730   1035         TAD      K0040           /SET TP0,1,2
589     0731   6151         LMR                      /GEN TP0,1,2
590     0732   7301         CLL CLA IAC              /SET AC
591     0733   4434         JMS I    LOADR           /SET CM
592     0734   1035         TAD      K0040           /SET TP0,1,2
593     0735   6151         LMR                      /1> CHK WRD
594     0736   7300         CLA CLL                  /CLEAR AC,L
595     0737   1071         TAD      K1000           /GET AC>TAC
596     0740   6151         LMR                      /LOAD MAINT REG
597     0741   7240         CLA CMA                  /SET AC
598     0742   6154         XFR                      /SET TAC
599     0743   7300         CLA CLL                  /CLEAR AC,L
600     0744   1110         TAD      K0020           /GET TP3
601     0745   6151         LMR                      /0 IN PROGRESS
602     0746   7300         CLA CLL                  /CLEAR AC,L
603     0747   1070         TAD      K6000           /GET MISC STATUS 1 TO AC
604     0750   6151         LMR                      /LOAD MAINT REG
605     0751   7300         CLA CLL                  /CLEAR AC,L
606     0752   6154         XFR                      /READ DATA
607     0753   0066         AND      K2000           /SAVE IN PROGRESS
608     0754   7650         SNA CLA                  /TEST
609     0755   4436         JMS I    NERROR          /TEST OKAY
610     0756   4437         JMS I    ERROR           /TEST FAILED
611     0757   5544         LIM013                   /MESSAGE TAG
612     0760   7402         HLT                      /ERROR HALT
```

```
613    0761  7610            SKP CLA                  /EXIT
614    0762  0677            LIP013                   /SCOPE LOOP
```

```
615                    /
616                    /DOES M119,C22 PIN P2 CLEAR PROGRESS FLOP
617                    /
618    0763  4025   LIP015, JMS      TPEPRE          /0>EVERYTHING
619    0764  4432           JMS I    MAINT1          /SET NO PAUSE
620    0765  6141           LINC                     /L MODE
621    0766  0712           0712                     /TAPE
622    0767  7000           7000                     /WASTED MEMORY SPACE
623    0770  0002           PDP                      /P MODE LIN TINR 09 (0)
624    0771  1071           TAD      K 000           /GET AC>TAC
625    0772  6151           LMR                      /LOAD MAINT REG
626    0773  7240           CLA CMA                  /SET AC=7777
627    0774  6154           XFR                      /SET TAC=7777
628    0775  7300           CLA CLL                  /CLEAR AC,L
629    0776  1033           TAD      K0016           /GET BM
630    0777  4434           JMS I    LOADR           /LOAD WINDOW
631    1000  1055           TAD      K0100           /SET FWD
632    1001  6152           TRC                      /SET FORWARD
633    1002  7300           CLA CLL                  /CLEAR AC,L
634    1003  1035           TAD      K0040           /SET TP0,T,2
635    1004  6151           LMR                      /SET BLOCK STATE
636    1005  7104           CLL RAL                  /SET TP3
637    1006  6151           LMR                      /GENERATE TP3
638    1007  7300           CLA CLL                  /CLEAR AC,L
639    1010  4434           JMS I    LOADR           /CLEAR MARK WINDOW
640    1011  1035           TAD      K0040           /SET FOR TP0, 1, 2
641    1012  6151           LMR                      /GENERATE TP0, 1, 2
642    1013  7301           CLL CLA IAC              /SET AC=1
643    1014  4434           JMS I    LOADR           /SET CM
644    1015  1035           TAD      K0040           /SET TP0,1,2
645    1016  6151           LMR                      /1>CHK WRD
646    1017  7300           CLA CLL                  /CLEAR AC,2
647    1020  1071           TAD      K1000           /GET TAC>AC
648    1021  6151           LMR                      /LOAD MAINT REG
649    1022  7240           CLA CMA                  /SET AC=7777
650    1023  6154           XFR                      /SET TAC
651    1024  7300           CLA CLL                  /CLEAR AC,L
652    1025  1110           TAD      K0020           /GET TP0
653    1026  6151           LMR                      /0>PROGRESS
654    1027  7300           CLA CLL                  /CLEAR AC,L
655    1030  1055           TAD      K0100           /SET AC05
656    1031  6151           LMR                      /SKIP ON TAPE DONE
657    1032  7610           SKP CLA
658    1033  4436           JMS I    NERROR          /TEST OKAY
659    1034  4437           JMS I    ERROR           /TEST FAILED
660    1035  5567           LIM015                   /MESSAGE TAG
661    1036  7402           HLT                      /ERROR HALT
662    1037  7610           SKP CLA                  /EXIT
663    1040  0763           LIP015                   /SCOPE LOOP
```

```
664                          /
665                          /DOES M113 C16,PINS H1,J1,K1 WRITE CYCLE (0) CLEAR IN PROGRESS
666                          /
667    1041    4025    LIP017, JMS        TPEPRE          /0>EVERYTHING
668    1042    4432             JMS I     MAINT1          /SET NO PAUSE
669    1043    6141             LINC                      /L MODE
670    1044    0716             0716                      /SET TINR 09 (1)
671    1045    7000             7000                      /WASTED MEMORY
672    1046    0002             PDP                       /SET WRITE CYCLE
673    1047    1033             TAD       K0016           /GET BM
674    1050    4434             JMS I     LOADR           /SET WINDOW TO BM
675    1051    1071             TAD       K1000           /GET AC>TAC
676    1052    6151             LMR                       /LOAD MAINT REG
677    1053    7240             CLA CMA                   /SET AC=7777
678    1054    6154             XFR                       /SET TAC=7777
679    1055    7300             CLA CLL                   /CLEAR AC,L
680    1056    1056             TAD       K0200           /GET DIRECTION BIT
681    1057    6152             TRC                       /SET DIRECTION FORWARD
682    1060    7300             CLA CLL                   /CLEAR AC,L
683    1061    1035             TAD       K0040           /SET UP FOR TP0,TP1,TP2
684    1062    6151             LMR                       /1>SEARCH, 1>BLOCK
685    1063    7344             CLA CMA CLL RAL           /SET AC=7776=CM
686    1064    4434             JMS I     LOADR           /SET MARK WINDOW TO BLOCK MARK
687    1065    1035             TAD       K0040           /SET UP FOR TP2
688    1066    6151             LMR                       /1>CHK WRD
689    1067    6151             LMR                       /0>WRITE CYCLE
690    1070    7201             CLA IAC                   /SET RWD BM
691    1071    4434             JMS I     LOADR           /SET MARK WINDOW
692    1072    1035             TAD       K0040           /SET UP FOR TP0,1,2
693    1073    7344             CLA CLL CMA RAL           /SET AC=7776=CM
694    1074    4434             JMS I     LOADR           /SET MARK WINDOW TO CM
695    1075    1035             TAD       K0040           /SET FOR TP0,TP1,TP2
696    1076    6151             LMR                       /SET 1>CHK-WRD
697    1077    7110             CLL RAR                   /SET AC=0020
698    1100    6151             LMR                       /GEN TP3,TP4
699    1101    7300             CLA CLL                   /CLEAR AC,L
700    1102    1070             TAD       K6000           /GET MISC STATUS I TO AC
701    1103    6151             LMR                       /LOAD MAINT REG
702    1104    7300             CLA CLL                   /CLEAR AC,L
703    1105    6154             XFR                       /READ DATA
704    1106    0066             AND K2000                 /SAVE IN PROGRESS FLOP
705    1107    7640             SZA CLA                   /TEST
706    1110    4436             JMS I     NERROR          /TEST OKAY
707    1111    4437             JMS I     ERROR           /TEST FAILED
708    1112    5611             LIM017                    /MESSAGE TAG
709    1113    7402             HLT                       /ERROR HALT
710    1114    7610             SKP CLA                   /EXIT
711    1115    1041             LIP017                    /SCOPE LOOP
```

```
712                         /
713                         /DOES CLEAR TAPE WORD AND STW WORK
714                         /
715     1116    4025    LIP018,  JMS      TPEPRE          /GENERATE TAPE PRESET
716     1117    6141             LINC                     /GO TO LINC MODE
717     1120    0457             STW                      /SKIP ON TAPE WORD
718     1121    0017             COM                      /SET AC TO CLEAR LATER
719     1122    0017             COM                      /SET OR CLEAR
720     1123    0002             PDP                      /GO TO 8 MODE
721     1124    7650             SNA CLA                  /TEST IF=7777 IT SKIPPED
722     1125    7040             CMA                      /ERROR AC=0000
723     1126    6141             LINC                     /GO TO LINC MODE
724     1127    0477             STW 20                   /STW +20
725     1130    0017             COM                      /SET AC TO CLEAR LATER
726     1131    0017             COM                      /SET OR CLEAR
727     1132    0002             PDP                      /GO TO 8 MODE
728     1133    7650             SNA CLA                  /TEST FOR ALL 0000
729     1134    4436             JMS I    NERROR          /ALL 0000 NO ERROR
730     1135    4437             JMS I    ERROR           /TROUBLE
731     1136    5647             LIM018                   /MESSAGE ID
732     1137    7402             HLT                      /ERROR HALT
733     1140    7610             SKP CLA                  /EXIT
734     1141    1116             LIP018                   /SCOPE MODE
```

```
735
736
737                           /
                              /DOES TAPE WORD FUNCTION
738                           /
739     1142    1056   LIP019, TAD       K0200           /SET AC04(1)
740     1143    6152           TRC                       /GENERATE CLEAR TAPE WORD
741     1144    4432           JMS I     MAINT1          /SET NO PAUSE
742     1145    6141           LINC                      /TO LMODE
743     1146    0710           0710
744     1147    7000           7000                      /RDC U
745     1150    0457           STW                       /STW SHOULD NOT SKIP
746     1151    0017           COM                       /IT DIDN'T SO SET THE AC
747     1152    0017           COM                       /CLEAR AC IF IT DIDN'T SKIP
748     1153    0002           PDP                       /GO TO 8 MODE
749     1154    7640           SZA CLA                   /TEST FOR ALL ZEROS
750     1155    7040           CMA                       /ERROR AC=7777
751     1156    6141           LINC                      /GO TO LINC MODE
752     1157    0477           STW 20                    /STW SHOULD SKIP
753     1160    0017           COM                       /SET AC TO 7777
754     1161    0017           COM                       /CLEAR IF NO SKIP
755     1162    0002           PDP                       /GO TO 8 MODE
756     1163    7640           SZA CLA                   /TEST FOR ALL ZEROS
757     1164    4436           JMS I     NERROR          /NO ERROR
758     1165    4437           JMS I     ERROR           /ERROR
759     1166    5666           --LIM019                  /MESSAGE TAG
760     1167    7402           HLT                       /ERROR HALT
761     1170    7610           SKP CLA                   /SCOPE LOOP
762     1171    1142           LIP019                    /ERROR HALT
763
```

```
764
765                         /
766                         /DOES LC00 AND LC01 CONTROL TAPE WORD
767                         /
768     1172    4025    LIP022, JMS      TPEPRE          /SET TAPE WORD
769     1173    1033            TAD      K0016           /GET BLOCK MARK
770     1174    4434            JMS I    LOADR           /SET MARK WINDOW TO BM
771     1175    1110            TAD      K0020           /GET TP3,TP4 TO SET LINE COUNTERS
772     1176    6151            LMR                      /SET BOTH LINE COUNTERS
773     1177    7104            CLL RAL                  /SET UP FOR TP0
774     1200    6151            LMR                      /GENERATE TP0,TP1,TP2
775     1201    7110            CLL RAR                  /SET UP FOR TP3
776     1202    6151            LMR                      /THIS CLEARS TAPE WORD
777     1203    7300            CLA CLL                  /CLEAR AC,L
778     1204    6141            LINC                     /L MODE
779     1205    0457            STW                      /SKIP ON TAPE WORD
780     1206    0017            COM                      /SET IT
781     1207    0017            COM                      /CLEAR IT
782     1210    0002            PDP                      /P MODE
783     1211    7650            SNA CLA                  /TEST RESULTS
784     1212    4436            JMS I    NERROR          /TEST OKAY
785     1213    4437            JMS I    ERROR           /TEST FAILED
786     1214    5705            LIM022                   /MESSAGE TAG
787     1215    7402            HLT                      /ERROR HALT
788     1216    7610            SKP CLA                  /EXIT
789     1217    1172            LIP022                   /SCOPE LOOP
```

```
790                              /
791                              /DOES TAPE BREAK FUNCTION WITH (DM)
792                              /
793    1220    4025    LIP024,  JMS         TPEPRE          /0 EVERYTHING
794    1221    4432             JMS  I      MAINT1          /SET NO PAUSE
795    1222    1145             TAD         K1400           /GET AC TO TMA
796    1223    6151             LMR                         /LOAD MAINT REG
797    1224    7300             CLA CLL                     /CLEAR AC,L
798    1225    1170             TAD         C0176           /FETCH THE TEST ADDRESS
799    1226    3116             DCA         REGB            /STORE FOR TYPING
800    1227    1116             TAD         REGB            /FETCH IT
801    1230    6154             XFR                         /SET TEST ADDRESS IN TMA
802    1231    6141             LINC                        /L MODE
803    1232    0710             0710                        /SET TINR 09 (0)
804    1233    7000             7000                        /WASTE MEMORY
805    1234    0002             PDP                         /P MODE
806    1235    7300             CLA CLL                     /CLEAR AC,L
807    1236    1115             TAD         REGA            /FETCH DATA TO BE XFERED
808    1237    3117             DCA         REGC            /STORE IT
809    1240    1071             TAD         K1000           /GET AC TO TAC
810    1241    6151             LMR                         /LOAD MAINT REG
811    1242    7240             CLA CMA                     /SET AC=7777
812    1243    6154             XFR                         /SET TAC
813    1244    7300             CLA CLL                     /CLEAR AC,L
814    1245    1033             TAD         K0016           /GET BM
815    1246    4434             JMS  I      LOADR           /SET BLOCK MARK
816    1247    1055             TAD         K0100           /GET FWD
817    1250    6152             TRC                         /SET FWD
818    1251    7300             CLA CLL                     /CLEAR AC,L
819    1252    1035             TAD         K0040           /GET TP0,1,2
820    1253    6151             LMR                         /GEN TP0,1,2 SET BLOCK MODE
821    1254    7300             CLA CLL                     /CLEAR
822    1255    1117             TAD         REGC            /GET DATA
823    1256    1040             TAD         K0002           /ADD TWO FOR CORRECTION
824    1257    6154             XFR                         /AC>TB
825    1260    7300             CLA CLL                     /CLEAR
```

```
826
827    1261    1153            TAD    K0011       /GET DM
828    1262    4434            JMS I  LOADR       /LOAD WINDOW
829    1263    1035            TAD    K0040       /GET TP0,1,2
830    1264    6151            LMR                /GO TO TAPE BREAK
831    1265    7300            CLA CLL            /CLEAR AC,L
832    1266    1176            TAD    LOC176      /GET CELL 0176
833    1267    3114            DCA    REGD        /STORE FOR TYPING
834    1270    1114            TAD    REGD        /FETCH IT
835    1271    7041            CIA                /NEGATE
836    1272    1117            TAD    REGC        /SUBTRACT DATA SOURCE
837    1273    7650            SNA CLA            /TEST
838    1274    5462            JMP I  PNTC        /TEST OKAY, NOW CHECK THAT TMA INCREMENTED (.+6)
839    1275    4437            JMS I  ERROR       /TEST FAILED
840    1276    5725            LIM023             /MESSAGE TAG
841    1277    7402            HLT                /ERROR HALT
842    1300    7610            SKP CLA            /EXIT
843    1301    1220            LIP024             /SCOPE LOOP
844    1302    1047    LOCC,   TAD    K7000       /GET COMMAND "TMA TO AC"
845    1303    6151            LMR                /LOAD IT
846    1304    7300            CLA CLL
847    1305    6154            XFR                /GET TMA
848    1306    3117            DCA    REGC        /SAVE FOR TYPING
849    1307    1137            TAD    K177        /GET WHAT IT SHOULD BE
850    1310    7041            CIA                /NEGATE
851    1311    1117            TAD    REGC        /SUBTRACT WHAT IT IS
852    1312    7650            SNA CLA            /EQUAL?
853    1313    4436            JMS I  NERROR      /YES
854    1314    4437            JMS I  ERROR       /NO
855    1315    6752            TMATB              /MESSAGE TAG
856    1316    7402            HLT                /ERROR HALT
857    1317    7610            SKP CLA            /EXIT
858    1320    1220            LIP024             /SCOPE LOOP; ISZ LOOP
```

```
859
860                           /
861                           /TC12-0-LCX TAPE EXTENDED OPERATIONS (MARK FLOP)
862                           /
863    1321   4025    LCX000, JMS      TPEPRE              /0 EVERYTHING
864    1322   1115            TAD      REGA                /GET A TEST NUMBER
865    1323   0056            AND      K0200               /SAVE MARK BIT
866    1324   3116            DCA      REGB                /STORE TEST BIT
867    1325   1116            TAD      REGB                /FETCH BIT
868    1326   6141            LINC                         /L MODE
869    1327   0001            AXO                          /LOAD MARK BIT
870    1330   0011            CLR                          /CLEAR AC.L
871    1331   0021            XOA                          /READ EXTENDED OPS REGISTER
872    1332   0002            PDP                          /P MODE
873    1333   0056            AND      K0200
874    1334   3117            DCA      REGC                /STORE FOR TESTING
875    1335   1117            TAD      REGC                /FETCH RETURNED DATA
876    1336   7041            CIA                          /NEGATE
877    1337   1116            TAD      REGB                /SUBTRACT DATA SOURCE
878    1340   7650            SNA CLA                      /TEST RESULTS
879    1341   4436            JMS I    NERROR              /TEST OKAY
880    1342   4437            JMS I    ERROR               /TEST FAILED
881    1343   5746            LCM000                       /MESSAGE TAG
882    1344   7402            HLT                          /ERROR HALT
883    1345   7610            SKP      CLA                 /EXIT
884    1346   1321            LCX000                       /SCOPE LOOP
885                           /
886                           /DOES TAPE PRESET ZERO THE MARK FLOP
887                           /
888    1347   1056    LCX001, TAD      K0200               /GET AC05
889    1350   6141            LINC                         /L MODE
890    1351   0001            AXO                          /SET MARK FLOP
891    1352   0002            PDP                          /P MODE
892    1353   4025            JMS      TPEPRE              /GENERATE TAPE PRESET
893    1354   6141            LINC                         /L MODE
894    1355   0021            XOA                          /READ EXTENDED OPS REGISTER
895    1356   0002            PDP                          /P MODE
896    1357   0056            AND      K0200               /SAVE MARK BIT
897    1360   7650            SNA CLA                      /TEST
898    1361   4436            JMS I    NERROR              /TEST OKAY
899    1362   4437            JMS I    ERROR               /TEST FAILED
900    1363   5762            LCM001                       /MESSAGE TAG
901    1364   7402            HLT                          /ERROR HALT
902    1365   7610            SKP CLA                      /EXIT
903    1366   1347            LCX001                       /SCOPE LOOP
```

```
904
905                      /
906                      /TC12-0-LIN M113,826, PINS P1,R1,S1(TAC=7777=FWD)
907                      /
908                      /
909                      /DOES THE GATE RESPOND TO FALSE INPUTS (TAC=7777 AND DIRECTION=REVERSE
910                      /
911     1367    4025     LIN001, JMS      TPEPRE              /CLEAR THE WORLD
912     1370    4432             JMS I    MAINT1              /SET NO PAUSE
913     1371    6141             LINC                         /L MODE
914     1372    0700             0700                         /SET MTB, NOT
915     1373    7000             7000                         /WASTE
916     1374    0002             PDP                          /P MODE
917     1375    1033             TAD      K0016               /GET BLOCK MARK
918     1376    4434             JMS I    LOADR               /SET WINDOW TO BLOCK MARK
919     1377    1071             TAD      K1000               /GET AC TO TAC
920     1400    6151             LMR                          /LOAD MAINT REG
921     1401    7240             CLA CMA                      /SET AC=7777
922     1402    6154             XFR                          /SET TAC=0000 7777,NOT
923     1403    0122             AND      K4440               /STATES TO AC AND GENERATE TPK,T 1,TP2
924     1404    6151             LMR                          /LOAD MAINT REG TRY TO SET BLOCK
925     1405    7300             CLA CLL                      /CLEAR AC,L
926     1406    6154             XFR                          /READ MAJOR STATES
927     1407    0123             AND      K3700               /SAVE MAJOR STATES
928     1410    3116             DCA      REGB                /STORE DATA
929     1411    1116             TAD      REGB                /FETCH DATA
930     1412    1125             TAD      M1000               /SUBTRACT SEARCH MODE
931     1413    7650             SNA CLA                      /TEST
932     1414    4436             JMS I    NERROR              /TEST OKAY
933     1415    4437             JMS I    ERROR               /TEST FAILED
934     1416    6047             LINMX1                       /MESSAGE TAG
935     1417    7402             HLT                          /ERROR HALT
936     1420    7610             SKP CLA                      /EXIT
937     1421    1367             LIN001                       /SCOPE LOOP
938                      /
939                      /DOES THE GATE RESPOND TO (TAC=0000 AND DIRECTION=FORWARD)
940                      /
941     1422    4025     LIN002, JMS      TPEPRE              /CLEAR THE WORLD
942     1423    4432             JMS I    MAINT1              /SET NO PAUSE
943     1424    6141             LINC                         /L MODE
944     1425    0700             0700                         /SET MTB-NOT
945     1426    7000             7000                         /WASTE
946     1427    0002             PDP                          /P MODE
947     1430    1033             TAD      K0016               /GET BM
948     1431    4434             JMS I    LOADR               /SET MARK WINDOW TO BM
949     1432    1071             TAD      K1000               /GET AC>TAC
950     1433    6151             LMR                          /LOAD MAINT REGISTER
951     1434    7300             CLA CLL                      /CLEAR AC,L
```

```
952
953     1435  6154        XFR                     /SET TAC = 7777
954     1436  1055        TAD       K0100         /GET FWD BIT
955     1437  6152        TRC                     /SET FORWARD
956     1440  7300        CLA CLL                 /CLEAR AC,L
957     1441  1122        TAD       K4440         /TRY TO SET BLOCK MODE
958     1442  6151        LMR                     /GENERATE TIMING
959     1443  7300        CLA CLL                 /CLEAR AC,L
960     1444  6154        XFR                     /READ DATA
961     1445  0123        AND       K3700         /SAVE SIGNIFICANT DATA
962     1446  3116        DCA       REGB          /STORE DATA
963     1447  1116        TAD       REGB          /FETCH DATA
964     1450  1125        TAD       M1000         /SUBTRACT SEARCH MODE
965     1451  7650        SNA CLA                 /TEST
966     1452  4436        JMS I     NERROR        /TEST OKAY
967     1453  4437        JMS I     ERROR         /TEST BAD
968     1454  6066        LINMX2                  /MESSAGE TAG
969     1455  7402        HLT                     /ERROR HALT
970     1456  7610        SKP CLA                 /EXIT
971     1457  1422        LIN002                  /SCOPE LOOP
```

```
972
973                     /
974                     /DOES M121 B25 V2,R2,S2 GENERATE TP3,TP4.
975                     /
976     1460    4025    LTT004, JMS     TPEPRE          /0>EVERYTHING
977     1461    1033            TAD     K0016           /SET BM
978     1462    4434            JMS I   LOADR           /SET MARK WINDOW TO BLOCK MARK
979     1463    1005            TAD     K0250           /SET MARK, NO PAUSE, MAINT
980     1464    6141            LINC                    /L MODE
981     1465    0001            AXO                     /SET AOX
982     1466    0002            PDP                     /P MODE
983     1467    1110            TAD     K0020           /SET TP3,TP4
984     1470    6151            LMR                     /LOAD MAINT REG 1SET LC01,LC00
985     1471    7104            RAL CLL                 /SET TP0,TP1,TP2
986     1472    7300            CLA CLL                 /CLEAR AC,L
987     1473    1070            TAD     K6000           /GET MISC 1 TO AC
988     1474    6151            LMR                     /LOAD MAINT MODE
989     1475    7300            CLA CLL                 /CLEAR AC,L
990     1476    6154            XFR                     /READ STATUS
991     1477    0072            AND     K0400           /SAVE LC01
992     1500    7650            SNA CLA
993     1501    5305            JMP     .+4
994     1502    2120            ISZ     REGF            /WAIT
995     1503    5275            JMP     .-6
996     1504    7610            SKP CLA
997     1505    4436            JMS I   NERROR          /TEST OKAY
998     1506    4437            JMS I   ERROR           /TEST FAILED
999     1507    6105            LTM004                  /MESSAGE TAG
1000    1510    7402            HLT                     /ERROR HALT
1001    1511    7610            SKP CLA                 /EXIT
1002    1512    1460            LTT004                  /SCOPE LOOP
```

```
1003
1004                          /TAPE 3
1005                          /TC12-0-LCS TAPE CONT STATES + INST
1006                          /
1007                          /CAN WE GO IDLE TO SEARCH
1008                          /
1009     1513   4025    LCS000, JMS      TPEPRE          /0 MAJOR STATE GENERATOR
1010     1514   4432            JMS I    MAINT1          /SET NO PAUSE
1011     1515   6141            LINC                     /L MODE
1012     1516   0700            0700                     /TAPE COMMAND USED TO SET -
1013     1517   7000            7000                     /IN PROGRESS
1014     1520   0002            PDP                      /P MODE
1015     1521   1122            TAD      K4440           /GENERATE TP1 AND SET STATES TO AC
1016     1522   6151            LMR                      /THIS SHOULD SET SEARCH
1017     1523   7300            CLA CLL                  /CLEAR AC,L
1018     1524   6154            XFR                      /TRANSFER STATES TO AC
1019     1525   0123            AND      K3700           /SAVE STATES
1020     1526   3116            DCA      REGB            /STORE FOR TYPING
1021     1527   1116            TAD      REGB            /FETCH IT
1022     1530   1125            TAD      M1000           /SUBTRACT SEARCH MODE
1023     1531   7650            SNA CLA                  /WERE WE IN IDLE MODE
1024     1532   4436            JMS I    NERROR          /TEST OKAY
1025     1533   4437            JMS I    ERROR           /TEST FAILED
1026     1534   6131            LCMX00                   /MESSAGE TAG
1027     1535   7402            HLT                      /ERROR HALT
1028     1536   7610            SKP CLA                  /EXIT
1029     1537   1513            LCS000                   /SCOPE LOOP
```

```
1030
1031                      /
1032                      /DOES SEARCH TO BLOCK WORK
1033                      /
1034     1540    4025     LCS001,  JMS        TPEPRE          /0 MAJOR STATE GENERATOR
1035     1541    4432              JMS I      MAINT1          /SET NO PAUSE
1036     1542    6141              LINC                       /L MODE
1037     1543    0700              0700                       /MTB.NOT
1038     1544    7000              7000
1039     1545    0002              PDP                        /P MODE
1040     1546    1033              TAD        K0016
1041     1547    4434              JMS I      LOADR
1042     1550    1055              TAD        K0100           /GET FORWARD BIT
1043     1551    6152              TRC                        /SET FWD
1044     1552    7300              CLA CLL                    /CLEAR AC,L
1045     1553    1071              TAD        K1000           /GET AC TO TAC
1046     1554    6151              LMR                        /SET MAINT IR TO AC TO TAC
1047     1555    7240              CLA CMA                    /SET AC=7777
1048     1556    6154              XFR                        /SET TAC=7777
1049     1557    7300              CLA CLL                    /CLEAR AC,L
1050     1560    1122              TAD        K4440           /SET STATES TO AC GENERATE TP1,TP2
1051     1561    6151              LMR                        /LOAD MAINT AND GENERATE TP0,TP1,TP2
1052     1562    7300              CLA CLL                    /CLEAR AC,L
1053     1563    6154              XFR                        /READ STATUS
1054     1564    3116              DCA        REGB            /STORE FOR TYPING
1055     1565    1116              TAD        REGB            /FETCH IT
1056     1566    0123              AND        K3700           /SAVE MAJOR STATES
1057     1567    1124              TAD        M0400           /SUBTRACT BLOCK MODE
1058     1570    7650              SNA CLA                    /TEST
1059     1571    4436              JMS I      NERROR          /TEST OKAY
1060     1572    4437              JMS I      ERROR           /TEST FAILED
1061     1573    6147              LCMX01                     /MESSAGE TAG
1062     1574    7402              HLT                        /ERROR HALT
1063     1575    7610              SKP CLA                    /EXIT
1064     1576    1540              LCS001                     /SCOPE LOOP
```

```
1065
1066                        /
1067                        /DOES SEARCH TO TURN AROUND FUNCTION
1068                        /
1069    1577    4025    LCS002, JMS         TPEPRE          /0 MAJOR STATE GENERATOR
1070    1600    4432            JMS I       MAINT1          /SET NO PAUSE
1071    1601    6141            LINC                        /L MODE
1072    1602    0703            0703                        /MTB
1073    1603    7000            7000
1074    1604    0002            PDP                         /P MODE
1075    1605    1033            TAD         K0016           /GET BM
1076    1606    4434            JMS I       LOADR           /LOAD WINDOW
1077    1607    1071            TAD         K1000           /GET AC TO TAC
1078    1610    6155            LMR XFR                     /SET TAC=7777,NOT
1079    1611    7300            CLA CLL                     /CLEAR AC,L
1080    1612    1122            TAD         K4440           /SET STATES TO AC GENERATE TP1,TP2
1081    1613    6151            LMR                         /SET COMMAND AND GENERATE TIMING
1082    1614    7300            CLA CLL                     /CLEAR AC,L
1083    1615    6154            XFR                         /TRANSFER
1084    1616    0123            AND         K3700           /SAVE MAJOR STATES
1085    1617    3116            DCA         REGB            /STORE FOR TYPING
1086    1620    1116            TAD         REGB            /FETCH FOR TYPING
1087    1621    1150            TAD         M0100           /SUBTRACT TURN AROUND
1088    1622    7650            SNA CLA                     /TEST
1089    1623    4436            JMS I       NERROR          /TEST OKAY
1090    1624    4437            JMS I       ERROR           /TEST
1091    1625    6165            LCM002                      /MESSAGE TAG
1092    1626    7402            HLT                         /ERROR HALT
1093    1627    7610            SKP CLA                     /EXIT
1094    1630    1577            LCS002                      /SCOPE LOOP
```

```
1095
1096                    /
1097                    /DOES TURN AROUND TO IDLE WORK
1098                    /
1099    1631   4025     LCS003, JMS        TPEPRE          /0 MAJOR STATE GENERATOR
1100    1632   4432             JMS I      MAINT1          /SET NO PAUSE
1101    1633   6141             LINC                       /L MODE
1102    1634   0703             0703                       /SET MTB
1103    1635   7000             7000                       /SETS IN PROGRESS
1104    1636   0002             PDP                        /P MODE
1105    1637   1033             TAD        K3016           /GET BM
1106    1640   4434             JMS I      LOADR           /SET WINDOW TO BLOCK MARK
1107    1641   1122             TAD        K4440           /IDLE TO SEARCH TO TURN AROUND
1108    1642   6151             LMR                        /GENERATE TP1,TP2 TO SET TURN AROUND
1109    1643   6151             LMR                        /TRY TO GO TO IDLE
1110    1644   7300             CLA CLL                    /CLEAR AC, LINK
1111    1645   6154             XFR                        /READ STATUS
1112    1646   0123             AND        K3700           /SAVE MAJOR STATES
1113    1647   3116             DCA        REGB            /STORE FOR TYPING
1114    1650   1116             TAD        REGB            /FETCH
1115    1651   1151             TAD        M2000           /SUBTRACT IDLE MODE
1116    1652   7650             SNA CLA                    /TEST
1117    1653   4436             JMS I      NERROR          /TEST OKAY
1118    1654   4437             JMS I      ERROR           /TEST FAILED
1119    1655   6206             LCM003                     /MESSAGE TAG
1120    1656   7402             HLT                        /ERROR HALT
1121    1657   7610             SKP CLA                    /EXIT
1122    1660   1631             LCS003                     /SCOPE LOOP
```

```
1123
1124                        /
1125                        /DOES BLOCK TO CHK WRD WORK
1126                        /
1127    1661    4025    LCS004,  JMS        TPEPRE       /0 MAJOR STATE GENERATOR
1128    1662    4432             JMS I      MAINT1       /SET NO PAUSE
1129    1663    6141             LINC                    /L MODE
1130    1664    0760             0700                    /MTB,NOT
1131    1665    7000             7000                    /SET IN PROGRESS
1132    1666    0002             PDP                     /P MODE
1133    1667    1033             TAD        K0016        /GET BM
1134    1670    4434             JMS I      LOADR        /SET BLOCK MARK
1135    1671    1055             TAD        K0100        /SET FWD BIT
1136    1672    6152             TRC                     /SET FORWARD
1137    1673    7300             CLA CLL                 /CLEAR AC,L
1138    1674    1071             TAD        K1000        /GET AC TO TAC COMMAND
1139    1675    6151             LMR                     /LOAD MAINT REG
1140    1676    7240             CLA CMA                 /SET AC=7777
1141    1677    6154             XFR                     /SET TAC=7777
1142    1700    7300             CLA CLL                 /CLEAR AC,L
1143    1701    1122             TAD        K4440        /GENERATE TP2,TP1,TP0
1144    1702    6151             LMR                     /AND SET STATES TO AC SETS BLOCK WORD
1145    1703    7300             CLA CLL                 /CLEAR AC,L
1146    1704    4434             JMS I      LOADR        /SET WIND,
1147    1705    1035             TAD        K0040        /GET TP0
1148    1706    6151             LMR
1149    1707    7201             CLA IAC                 /SET CM
1150    1710    4434             JMS I      LOADR        /SET WINDOW TO CHECK MARK
1151    1711    1122             TAD        K4440        /SET UP FOR TP2
1152    1712    6151             LMR                     /LOAD MAINT REG
1153    1713    7300             CLA CLL                 /CLEAR AC,L
1154    1714    6154             XFR                     /READ STATUS
1155    1715    0123             AND        K3700        /SAVE MAJOR STATES
1156    1716    3116             DCA        REGB         /STORE FOR TYPING
1157    1717    1116             TAD        REGB         /FETCH IT
1158    1720    1152             TAD        M0200        /SUBTRACT CHECK WORD
1159    1721    7650             SNA CLA                 /TEST
1160    1722    4436             JMS I      NERROR       /TEST OKAY
1161    1723    4437             JMS I      ERROR        /TEST FAILED
1162    1724    6226             LCM004                  /MESSAGE TAG
1163    1725    7402             HLT                     /ERROR HALT
1164    1726    7610             SKP CLA                 /EXIT
1165    1727    1661             LCS004                  /SCOPE LOOP
```

```
1166
1167                         /
1168                         /DOES CHK WRD TO IDLE WORK
1169                         /
1170    1730  4025    LCS005,  JMS        TPEPRE       /0 MAJOR STATE GENERATOR
1171    1731  4432             JMS I      MAINT1       /SET NO PAUSE
1172    1732  6141             LINC                    /L MODE
1173    1733  0700             0700                    /MTB,NOT
1174    1734  7000             7000                    /SET IN PROGRESS
1175    1735  0002             PDP                     /P MODE
1176    1736  1033             TAD        K0016        /SET BM
1177    1737  4434             JMS I      LOADR        /SET MARK WINDOW TO BLOCK MARK
1178    1740  1055             TAD        K0100        /SET FWD BIT
1179    1741  6152             TRC                     /SET FORWARD
1180    1742  7300             CLA CLL                 /CLEAR AC,L
1181    1743  1071             TAD        K1000        /GET AC TO TAC COMMAND
1182    1744  6151             LMR                     /LOAD MAINT REG
1183    1745  7240             CLA CMA                 /SET AC=7777
1184    1746  6154             XFR                     /SET TAC
1185    1747  7300             CLA CLL                 /CLEAR AC,L
1186    1750  1122             TAD        K4440        /GEN TP1,TP2
1187    1751  6151             LMR                     /SET BLOCK MODE
1188    1752  7300             CLA CLL                 /CLEAR AC,L
1189    1753  4434             JMS I      LOADR        /SET WIND,
1190    1754  1035             TAD        K0040        /GET TP0
1191    1755  6151             LMR
1192    1756  7301             CLA CLL IAC             /GET CM
1193    1757  4434             JMS I      LOADR        /SET CHECK WORD
1194    1760  1122             TAD        K4440        /GET TP2 TO SET CHK-WRD
1195    1761  6151             LMR                     /SET CHECK WORD
1196    1762  6151             LMR                     /DOES CM*CHK WRD AND PROGRESS (1) SET IDLE
1197    1763  7300             CLA CLL                 /CLEAR AC,L
1198    1764  6154             XFR                     /READ STATUS
1199    1765  0123             AND        K3700
1200    1766  3116             DCA        REGB         /STORE FOR TYPING
1201    1767  1116             TAD        REGB         /FETCH FOR TESTING
1202    1770  1151             TAD        M2000        /SUBTRACT IDLE MODE
1203    1771  7650             SNA CLA                 /TEST
1204    1772  4436             JMS I      NERROR       /TEST OKAY
1205    1773  4437             JMS I      ERROR        /TEST FAILED
1206    1774  6245             LCM005                  /MESSAGE TAG
1207    1775  7402             HLT                     /ERROR HALT
1208    1776  7610             SKP CLA                 /EXIT
1209    1777  1730             LCS005                  /SCOPE LOOP
```

```
1210
1211                          /
1212                          /DOES MTB*I SET IDLE FROM SEARCH
1213                          /
1214    2000    4025    LCS006, JMS      TPEPRE              /0 EVERYTHING
1215    2001    4432            JMS I    MAINT1              /SET NO PAUSE
1216    2002    6141            LINC                         /L MODE
1217    2003    0723            0723                         /MTB I
1218    2004    7000            7000                         /SET IN PROGRESS
1219    2005    0002            PDP                          /P MODE
1220    2006    1033            TAD      K0016               /GET BM
1221    2007    4434            JMS I    LOADR               /SET BLOCK MARK
1222    2010    1122            TAD      K4440               /GENERATE TP1, TP2
1223    2011    6151            LMR                          /GO TO SEARCH MODE THEN BACK TO IDLE
1224    2012    7300            CLA CLL                      /CLEAR AC, L
1225    2013    6154            XFR                          /READ STATUS
1226    2014    0123            AND      K3700               /SAVE STATES
1227    2015    3116            DCA      REGB                /STORE IT FOR TYPING
1228    2016    1116            TAD      REGB                /FETCH IT
1229    2017    1151            TAD      M2000               /SUBTRACT IDLE MODE
1230    2020    7650            SNA CLA                      /TEST
1231    2021    4436            JMS I    NERROR              /TEST OKAY
1232    2022    4437            JMS I    ERROR               /TEST FAILED
1233    2023    6261            LCM006                       /MESSAGE TAG
1234    2024    7402            HLT                          /ERROR HALT
1235    2025    7610            SKP CLA                      /EXIT
1236    2026    2000            LCS006                       /SCOPE LOOP
```

```
1237
1238                          /
1239                          /DOES (DM) FUNCTION USE (TB + TAC TO   TAC)
1240                          /
1241    2027    4025    LWNORM, JMS         TPEPRE        /0 > EVERYTHING
1242    2030    4432            JMS I       MAINT1        /SET MAINT
1243    2031    6141            LINC                      /L MODE
1244    2032    0707            0707
1245    2033    0000            0000
1246    2034    0002            PDP                       /P MODE
1247    2035    1115            TAD         REGA          /FETCH TEST NUMBER
1248    2036    6154            XFR                       /SET TB TO TEST NUMBER
1249    2037    7300            CLA CL                    /CLEAR AC,L
1250    2040    1071            TAD         K1000         /GET AC TO TAC
1251    2041    6151            LMR                       /LOAD MAINT REG
1252    2042    7240            CLA CMA                   /SET AC=7777
1253    2043    6154            XFR                       /SET TAC REGISTER
1254    2044    0033            AND         K0016         /SET AC = TO BLOCK MARK
1255    2045    4434            JMS I       LOADR         /SET REVERSE AND LOAD WINDOW
1256    2046    1055            TAD         K0100         /GET FWD BIT
1257    2047    6152            TRC                       /SET DIRECTION FORWARD
1258    2050    7300            CLA CLL                   /CLEAR AC,L
1259    2051    1035            TAD         K0040         /SET UP FOR TP0,1,2
1260    2052    6151            LMR                       /GO TO BLOCK MODE
1261    2053    7300            CLA CLL                   /CLEAR AC, L
1262    2054    1153            TAD         K0011         /GET DM
1263    2055    4434            JMS I       LOADR         /LOAD
1264    2056    1035            TAD         K0040         /GET TP0
1265    2057    6151            LMR
1266    2060    4025            JMS         TPEPRE        /0 PROGRAMS
1267    2061    6141            LINC                      /L MODE
1268    2062    0003            TAC                       /READ TAC
1269    2063    0002            PDP                       /P MODE
1270    2064    1163            TAD         K0003         /ADD THREE (SEE WRITE UP)
1271    2065    3116            DCA         REGB          /STORE FOR TYPING
1272    2066    1116            TAD         REGB          /FETCH
1273    2067    7041            CIA                       /NEGATE
1274    2070    1115            TAD         REGA          /SUBTRACT DATA SOURCE
1275    2071    7650            SNA CLA                   /TEST
1276    2072    4436            JMS I       NERROR        /TEST OKAY
1277    2073    4437            JMS I       ERROR         /TEST FAILED
1278    2074    6303            LWM101                    /MESSAGE TAG
1279    2075    7402            HLT                       /ERROR HALT
1280    2076    7610            SKP CLA                   /EXIT
1281    2077    2027            LWNORM                    /SCOPE LOOP
```

```
1282
1283                        /
1284                        /DOES MARK WRITE FUNCTION FIRST TEST IS FOR PHASE ON TC12-3-LTS
1285                        /
1286      2100   4025  LWN102, JMS      TPEPRE          /0 EVERYTHING 0 CHKWRD
1287      2101   4432          JMS I    MAINT1
1288      2102   1067          TAD      K6040           /SET UP FOR TP0
1289      2103   6151          LMR                      /SET LC02 (1)
1290      2104   7300          CLA CLL                  /CLEAR AC,L
1291      2105   6154          XFR                      /READ STATUS
1292      2106   7700          SMA CLA                  /IS IT SET
1293      2107   5357          JMP      LWB102          /NO ERROR
1294      2110   1155          TAD      K6020           /SET UP TP ZERO LC02
1295      2111   6151          LMR                      /0>LC02
1296      2112   7300          CLA CLL                  /CLEAR AC,L
1297      2113   6154          XFR                      /READ STATUS
1298      2114   7710          SPA CLA                  /IS PHASE NOT SET
1299      2115   5357          JMP      LWB102          /FAILED
1300      2116   6141          LINC
1301      2117   0700          0700
1302      2120   0000          0000
1303      2121   0002          PDP
1304      2122   1033          TAD      K0016           /GET BM
1305      2123   4434          JMS I    LOADR           /SET BLOCK MARK
1306      2124   1071          TAD      K1000           /GET AC>TAC
1307      2125   6151          LMR                      /LOAD MAINT REG
1308      2126   7240          CLA CMA                  /SET AC=7777
1309      2127   6154          XFR                      /SET TAC 7777
1310      2130   0055          AND      K0100           /SAVE FWD BIT
1311      2131   6152          TRC                      /SET FORWARD
1312      2132   7300          CLA CLL                  /CLEAR AC,L
1313      2133   1035          TAD      K0040           /SET UP FOR TP0
1314      2134   6151          LMR                      /1 BLOCK MODE
1315      2135   7300          CLA CLL                  /CLEAR AC, L
1316      2136   4434          JMS I    LOADR           /CLEAR WINDOW
1317      2137   1035          TAD      K0040           /GEN TP0, 1, 2
1318      2140   6151          LMR                      /SET LC01
1319      2141   7201          CLA IAC                  /SET CM
1320      2142   4434          JMS I    LOADR           /SET WINDOW TO CHECK MARK
1321      2143   1067          TAD      K6040           /SET TO GO TO CHKWRD
1322      2144   6151          LMR                      /GO TO CHKWRD 1 LC02
1323      2145   7300          CLA CLL                  /CLEAR AC,L
1324      2146   6154          XFR                      /READ STATUS
1325      2147   7710          SPA CLA                  /DID PHASE COME UP IN ERROR
1326      2150   5357          JMP      LWB102          /ERROR
1327      2151   1155          TAD      K6020           /SET FOR TP3
1328      2152   6151          LMR                      /0 LC02
1329      2153   7300          CLA CLL                  /CLEAR AC,L
1330      2154   6154          XFR                      /READ STATUS
1331      2155   7710          SPA CLA                  /IS IT SET
1332      2156   4436          JMS I    WERROR          /TEST OKAY
1333      2157   4437  LWB102, JMS I    ERROR           /TEST FAILED
1334      2160   6333          LWM102                   /MESSAGE TAG
1335        1    7402          HLT                      /ERROR HALT
1336        2    7610          SKP CLA                  /EXIT
```

   1337   2163 2100   LWN102   /SCOPE LOOP

```
1338
1339                        /
1340                        /TEST MARK WRITE
1341                        /
1342   2164   4025   LWN104, JMS     TPEPRE      /Z > EVERYTHING & TO IDLE MODE
1343   2165   1033           TAD     K0016       /SET WIND 00 (1)
1344   2166   4434           JMS I   LOADR       /SET WINDOW BIT 00
1345   2167   1067           TAD     K6040       /GET STATUS TO AC
1346   2170   6151           LMR                 /LOAD MAINT REG
1347   2171   7300           CLA CLL             /CLEAR AC,L
1348   2172   6154           XFR                 /READ MARK WRITE
1349   2173   0056           AND     K0200       /SAVE MARK WRITE
1350   2174   7640           SZA CLA             /DID IT SET
1351   2175   5572           JMP I   LWA104      /NOPE ERROR
1352   2176   1155           TAD     K6020       /GEN TP3
1353   2177   6151           LMR                 /LOAD MAINT REG
1354   2200   7300           CLA CLL             /CLEAR AC,L
1355   2201   6154           XFR                 /READ STATUS
1356   2202   0056           AND     K0200       /SAVE MARK WRITE
1357   2203   7650           SNA CLA             /DID IT STAY ZERO
1358   2204   5572           JMP I   LWA104      /NOPE ERROR
1359   2205   4434           JMS I   LOADR       /0 WIND
1360   2206   1067           TAD     K6040       /TRY TO GET OUTPUT FROM WIND00-PHASE
1361   2207   6151           LMR                 /LOAD MAINT REG
1362   2210   7300           CLA CLL             /CLEAR AC,L
1363   2211   6154           XFR                 /READ STATUS
1364   2212   0056           AND     K0200       /SAVE MARK WRITE
1365   2213   7650           SNA CLA             /TEST IT
1366   2214   5572           JMP I   LWA104      /ERROR
1367   2215   1155           TAD     K6020       /RESET LC02 (1)
1368   2216   6151           LMR                 /LOAD MAINT REG
1369   2217   7300           CLA CLL             /CLEAR AC,L
1370   2220   6154           XFR                 /READ STATUS
1371   2221   0056           AND     K0200       /SAVE MARK WRITE
1372   2222   7650           SNA CLA             /TEST
1373   2223   4436           JMS I   NERROR      /TEST OKAY
1374   2224   4437   LWB104, JMS I   ERROR       /TEST BAD
1375   2225   6347           LWM104              /MESSAGE TAG
1376   2226   7402           HLT                 /ERROR HALT
1377   2227   7610           SKP CLA             /EXIT
1378   2230   2164           LWN104              /SCOPE LOOP
```

```
1379                          /
1380                          /LTS TC12-0-LTS
1381                          /
1382                          /
1383                          /DOES DATA CHANNEL RWB 0,4,8 WORK
1384                          /
1385      2231   4025   LTR000, JMS      TPEPRE         /0 EVERYTHING
1386      2232   1042           TAD      K4210          /GET RWB 0,4,8
1387      2233   3116           DCA      REGB           /STORE FOR TYPING
1388      2234   6151           LMR                     /SET MAINT REG TO AC > TB
1389      2235   1116           TAD      REGB           /FETCH TEST DATA
1390      2236   6154           XFR                     /SET TB
1391      2237   7300           CLA CLL                 /CLEAR AC,L
1392      2240   1071           TAD      K1000          /GET TB > RWB
1393      2241   6152           TRC                     /SET RWB
1394      2242   7300           CLA CLL                 /CLEAR AC,L
1395      2243   1070           TAD      K6000          /GET MISC STATUS 1 TO AC
1396      2244   6151           LMR                     /SET DATA CHANNEL TO AC
1397      2245   7300           CLA CLL                 /CLEAR AC,L
1398      2246   6154           XFR                     /READ
1399      2247   4041           AND      K0160          /SAVE IT
1400      2250   3117           DCA      REGC           /STORE IT
1401      2251   1117           TAD      REGC           /FETCH IT
1402      2252   7640           SZA CLA                 /TEST
1403      2253   5274           JMP      LTB000         /BLUNDER
1404      2254   3116           DCA      REGB           /TRY TESTING WITH ZERO DATA
1405      2255   6155           LMR XFR                 /SET MAINT REG TO AC > TB
1406      2256   1071           TAD      K1000          /GET TB > RWB
1407      2257   6152           TRC                     /SET RWB
1408      2260   7300           CLA CLL                 /CLEAR AC,L
1409      2261   1070           TAD      K6000          /GET MISC STATUS 1 TO AC
1410      2262   6151           LMR                     /SET DATA CHANNEL TO AC
1411      2263   7300           CLA CLL                 /CLEAR AC,L
1412      2264   6154           XFR                     /READ DATA
1413      2265   0041           AND      K0160          /SAVE DATA CHANNEL BITS
1414      2266   3117           DCA      REGC           /STORE FOR TYPING
1415      2267   1117           TAD      REGC           /FETCH
1416      2270   7041           CIA                     /NEGATE
1417      2271   1041           TAD      K0160          /SUBTRACT DATA
1418      2272   7650           SNA CLA                 /TEST RESULTS
1419      2273   4436           JMS I    NERROR         /TEST OKAY
1420      2274   4437   LTB000, JMS I    ERROR          /TEST FAILED
1421      2275   6366           LMM000                  /MESSAGE TAG
1422      2276   7402           HLT                     /ERROR HALT
1423      2277   7610           SKP CLA                 /EXIT
1424      2300   2231           LTR000                  /SCOPE LOOP
```

```
1425
1426                      /
1427                      /DOES THE MARK CLOCK GENERATE TIMING
1428                      /
1429   2301   4025    LXA000,  JMS      TPEPRE      /0 TC01, TC02 AND MARK FLOP 0, GP EQ
1430   2302   1056             TAD      K0200       /GET MARK BIT
1431   2303   6141             LINC                 /L MODE
1432   2304   0001             AXO                  /SET MARK FLOP
1433   2305   0011             CLR                  /CLEAR AC
1434   2306   0001             AXO                  /CLEAR MARK FLOP
1435   2307   0002             PDP                  /P MODE
1436   2310   1070             TAD      K6000       /GET MISC 1 TO AC
1437   2311   6151             LMR                  /LOAD MAINT REG
1438   2312   7300             CLA CLL              /CLEAR AC,L
1439   2313   6154             XFR                  /READ DATA
1440   2314   0112             AND      K0010       /SAVE EQUAL BIT
1441   2315   7640             SZA CLA              /TEST IT
1442   2316   4436             JMS I    NERROR      /TEST OKAY
1443   2317   4437             JMS I    ERROR       /TEST FAILED
1444   2320   6414             LTM000               /MESSAGE TAG
1445   2321   7402             HLT                  /ERROR HALT
1446   2322   7610             SKP CLA              /EXIT
1447   2323   2301             LXA000               /SCOPE LOOP
```

```
1448                        /
1449                        /DOES LC00,01,02 COUNT NORMALLY
1450                        /
1451    2324    4025    LTS101,  JMS        TPEPRE          /0 > EVERYTHING
1452    2325    1033             TAD        K0016           /SET BLOCK MARK
1453    2326    4434             JMS I      LOADR           /SET MARK WINDOW TO REVERSE
1454    2327    1110             TAD        K0020           /SET UP FOR TP4
1455    2330    6151             LMR                        /SET LC01,00 TO ONES
1456    2331    7104             CLL RAL                    /SET AC FOR TP0
1457    2332    6151             LMR                        /SET LC02 (1)
1458    2333    7110             CLL RAR                    /SET AC FOR TP1
1459    2334    6151             LMR                        /LOAD MAINT REG
1460    2335    7300             CLA CLL                    /CLEAR AC,L
1461    2336    1070             TAD        K6000           /SET UP FOR MISC 1
1462    2337    6151             LMR                        /LOAD MAINT REG
1463    2340    7300             CLA CLL                    /CLEAR AC,L
1464    2341    6154             XFR                        /READ DATA
1465    2342    0145             AND        K1400           /SAVE LINE COUNTER
1466    2343    3116             DCA        REGB            /STORE FOR TYPING
1467    2344    1116             TAD        REGB            /FETCH IT
1468    2345    7650             SNA CLA                    /TEST
1469    2346    4436             JMS I      NERROR          /TEST OKAY
1470    2347    4437             JMS I      ERROR           /TEST FAILED
1471    2350    6440             LTM101                     /MESSAGE TAG
1472    2351    7402             HLT                        /ERROR HALT
1473    2352    7610             SKP CLA                    /EXIT
1474    2353    2324             LTS101                     /SCOPE LOOP
```

```
1475
1476                              /TAPE 4
1477                              /
1478                              /
1479                              /
1480                              /TC12 - 0 - LMU MOTION FLOP TESTS
1481                              /
1482    2354    4025     MOTST1,  JMS       TPEPRE           /0 EVERYTHING
1483    2355    4432              JMS I     MAINT1           /SET NO PAUSE AND MAINT FLOP
1484    2356    6141              LINC                       /L MODE
1485    2357    0703              0703                       /MOVE TOWARD BLOCK
1486    2360    7000              7000                       /
1487    2361    0002              PDP                        /P MODE
1488    2362    1033              TAD       K0016            /GET BLOCK MARK
1489    2363    4434              JMS I     LOADR            /SET MARK WINDOW TO BLOCK MARK
1490    2364    1035              TAD       K0040            /SET BIT FOR TP0,TP1,TP2
1491    2365    6151              LMR                        /LOAD MAINT REGISTER SET TURN AROUND
1492    2366    1043              TAD       K5000            /ADD UNITS + MTN TO AC
1493    2367    6151              LMR                        /TRY TO ZERO MOTION
1494    2370    7300              CLA CLL                    /CLEAR AC,LINK
1495    2371    6154              XFR                        /READ DATA
1496    2372    0112              AND       K0010            /SAVE MOTION FLOP
1497    2373    7650              SNA CLA                    /TEST
1498    2374    4436              JMS I     NERROR           /TEST OKAY
1499    2375    4437              JMS I     ERROR            /TEST FAILED
1500    2376    6464              MOTT1M                     /MESSAGE TAG
1501    2377    7402              HLT                        /ERROR HALT
1502    2400    7610              SKP CLA                    /EXIT
1503    2401    2354              MOTST1                     /SCOPE LOOP
1504                              /
1505                              /DOES TAPE PRESET 0 > THE MOTION FLOP
1506                              /
1507    2402    4025     MOTST2,  JMS       TPEPRE           /0 > EVERYTHING
1508    2403    4432              JMS I     MAINT1           /SET MAINT AND NO PAUSE
1509    2404    6141              LINC                       /L MODE
1510    2405    0700              0700                       /SET MOTION FLOP
1511    2406    7000              7000                       /
1512    2407    0002              PDP                        /P MODE
1513    2410    4025              JMS       TPEPRE           /ATTEMPT TO ZERO MOTION FLOP
1514    2411    1043              TAD       K5000            /GET MTN TO AC
1515    2412    6151              LMR                        /LOAD MAINT REGISTER
1516    2413    7300              CLA CLL                    /CLEAR AC,L
1517    2414    6154              XFR                        /READ DATA
1518    2415    0112              AND       K0010            /SAVE MOTION FLOP
1519    2416    7650              SNA CLA                    /TEST
1520    2417    4436              JMS I     NERROR           /TEST OKAY
1521    2420    4437              JMS I     ERROR            /TEST FAILED
1522    2421    6507              MOTT2M                     /MESSAGE TAG
1523    2422    7402              HLT                        /ERROR HALT
1524    2423    7610              SKP CLA                    /EXIT
1525    2424    2402              MOTST2                     /SCOPE LOOP
```

```
1526
1527                      /
1528                      /DOES CLR PROGRESS 0 THE MOTION FLOP
1529                      /
1530    2425    4025      MOTST3, JMS       TPEPRE            /0 > EVERYTHING
1531    2426    7240              CLA CMA                     /SET AC=7777
1532    2427    3115              OCA       REGA              /SET MONITOR TO 1 CYCLE
1533    2430    3116              DCA       REGB              /0 TIMING
1534    2431    1071              TAD       K1000             /GET AC>TAC
1535    2432    6151              LMR                         /LOAD MAINT REG
1536    2433    7330              CLA CML CLL RAR             /SET AC00
1537    2434    6154              XFR                         /SET TAC=4000
1538    2435    4432              JMS I     MAINT1            /SET NO PAUSE MAINT
1539    2436    6141              LINC                        /L MODE
1540    2437    0703              0703                        /MTB
1541    2440    0000              0000                        /
1542    2441    0002              PDP                         /P MODE
1543    2442    1033              TAD       K0016             /GET BM
1544    2443    4434              JMS I     LOADR             /LOAD MARK WINDOW
1545    2444    1035              TAD       K0040             /GEN TP0,TP1,TP2
1546    2445    6151              LMR                         /LOAD MAINT REG
1547    2446    7300              CLA CLL                     /CLEAR AC,L
1548    2447    1043              TAD       K5000             /GET MTN TO AC
1549    2450    6151              LMR                         /LOAD MAINT REG
1550    2451    7300              CLA CLL                     /CLEAR AC,L
1551    2452    6154              XFR                         /READ DATA
1552    2453    0112              AND       K0010             /SAVE MOTION BIT
1553    2454    7650              SNA CLA                     /TEST
1554    2455    5261              JMP       .+4               /OKAY
1555    2456    2116              ISZ       REGB              /DONE YET
1556    2457    5244              JMP       .-13              /WAIT
1557    2460    7610              SKP CLA                     /ERROR
1558    2461    4436              JMS I     NERROR            /TEST OKAY
1559    2462    4437              JMS I     ERROR             /TEST FAILED
1560    2463    6532              MOTT3M                      /MESSAGE TAG
1561    2464    7402              HLT
1562    2465    7610              SKP CLA
1563    2466    2425              MOTST3
```

```
1564
1565
1566                     /DOES M113 B24 PINS D2,E2,F2 SHIFT RWB
1567                     /
1568    2467   4025    REG004,  JMS       TPEPRE        /0>EVERYTHING
1569    2470   4432             JMS I     MAINT1        /SET MAINT MODE
1570    2471   7240             CLA CMA                 /FETCH A TEST NUMBER
1571    2472   6154             XFR                     /SET TB TO (7777)
1572    2473   7300             CLA CLL                 /CLEAR AC, L
1573    2474   1071             TAD       K1000         /SET BIT 2, TB TO RWB
1574    2475   6152             TRC                     /SET RWB=TB=7777,
1575    2476   7300             CLA CLL                 /CLEAR AC, L
1576    2477   1165             TAD       K3427         /SET FOR TP3 AND READ RWB
1577    2500   6151             LMR                     /SHIFT RWB
1578    2501   7300             CLA CLL                 /CLEAR AC, L
1579    2502   6154             XFR                     /READ RWB
1580    2503   3116             DCA       REGB          /STORE
1581    2504   7240             CLA CMA                 /FETCH TEST DATA
1582    2505   0171             AND       K7356         /SHIFTED?  OR MASKED?
1583    2506   3117             DCA       REGC          /STORE FOR TYPING
1584    2507   1117             TAD       REGC          /FETCH
1585    2510   7041             CIA                     /NEGATE
1586    2511   1116             TAD       REGB          /SUBTRACT
1587    2512   7650             SNA CLA                 /TEST
1588    2513   4436             JMS I     NERROR
1589    2514   4437             JMS I     ERROR
1590    2515   6556             REGM04
1591    2516   7402             HLT
1592    2517   7610             SKP CLA
1593    2520   2467             REG004
1594
```

```
1595
1596                     /
1597                     /DOES WRITE SHIFT RWB FUNCTION
1598                     /
1599    2521    4025     REG006,  JMS         TPEPRE       /0> EVERYTHING
1600    2522    4432              JMS I       MAINT1       /SET MAINT AND NO PAUSE
1601    2523    7300              CLA CLL                  /CLEAR AC,L
1602    2524    1115              TAD         REGA         /FETCH DATA SOURCE
1603    2525    7104              CLL RAL                  /SHIFT IT
1604    2526    3116              DCA         REGB         /STORE SIMULATION
1605    2527    6141              LINC                     /L MODE
1606    2530    0700              0700                     /SET IN PROGRESS
1607    2531    0000              0000
1608    2532    0002              PDP                      /P MODE
1609    2533    1112              TAD         K0010        /GET WRITE SYNC BIT
1610    2534    6152              TRC                      /SET WRITE SYNC
1611    2535    7300              CLA CLL
1612    2536    1033              TAD         K0016        /GET BM
1613    2537    4434              JMS I       LOADR        /SET WINDOW TO BLOCK MARK
1614    2540    1071              TAD         K1000        /SET AC> TAC
1615    2541    6151              LMR                      /LOAD MAINT IR
1616    2542    7240              CLA CMA                  /SET AC=7777
1617    2543    6154              XFR                      /SET TAC
1618    2544    0055              AND         K0100        /GET FWD BIT
1619    2545    6152              TRC                      /SET FWD BIT
1620    2546    7300              CLA CLL                  /CLEAR AC, L
1621    2547    1035              TAD         K0040        /SET UP FOR TP0,1,2
1622    2550    6151              LMR                      /1 TO BLOCK MODE
1623    2551    7300              CLA CLL                  /CLEAR AC, L
1624    2552    1112              TAD         K0010        /SET AC08
1625    2553    6152              TRC                      /SET WRITE SYNC
1626    2554    7300              CLA CLL                  /CLEAR AC,L
1627    2555    1110              TAD         K0020        /SET UP FOR TP3
1628    2556    6151              LMR                      /SET WRITE
1629    2557    7300              CLA CLL                  /CLEAR AC, L
1630    2560    1115              TAD         REGA         /GET DATA
1631    2561    6154              XFR                      /SET TB
1632    2562    7300              CLA CLL                  /CLEAR AC, L
1633    2563    1071              TAD         K1000        /GET TB TO RWB
1634    2564    6152              TRC                      /SHIFT RWB
1635    2565    7300              CLA CLL                  /CLEAR AC, L
1636    2566    1154              TAD         K3440        /PERFORM SHIFT RWB
1637    2567    6151              LMR                      /SET RWB TO AC
1638    2570    7300              CLA CLL                  /CLEAR AC, L
1639    2571    6154              XFR                      /READ RWB
1640    2572    3117              DCA         REGC         /STORE DATA
1641    2573    1115              TAD         REGA         /FETCH DATA
1642    2574    7041              CIA                      /NEGATE
1643    2575    1117              TAD         REGC         /SUBTRACT DATA,
1644    2576    7650              SNA CLA                  /TEST
1645    2577    4436              JMS I       NERROR       /TEST OKAY
1646    2600    4437              JMS I       ERROR        /TEST FAILED
1647    2601    4601              REGM06                   /MESSAGE
1648    2602    7402              HLT                      /ERROR HALT
1649    2603    7610              SKP CLA                  /EXIT
```

     1650   2604 2521   REG006   /SCOPE LOOP

```
1651                                    /DOES M115 B27 GENERATE LOAD TAC TAC+TB TO TAC
1652    2605    4025    REG009, JMS      TPEPRE        /0>EVERYTHING
1653    2606    4432            JMS I    MAINT1        /SET MAINT AND NO PAUSE
1654    2607    6141            LINC                   /L MODE.
1655    2610    0707            0707                   /SET IN PROGRESS
1656    2611    0000            0000                   /
1657    2612    0002            PDP                    /P MODE
1658    2613    1033            TAD      K0016         /GET BM
1659    2614    4434            JMS I    LOADR         /SET WINDOW TO BLOCK MARK
1660    2615    1071            TAD      K1000         /GET AC>TAC
1661    2616    6151            LMR                    /LOAD MAINT IR
1662    2617    7240            CLA CMA                /SET AC=7777
1663    2620    6154            XFR                    /SET TAC=7777
1664    2621    0055            AND      K0100         /SET FWD BIT
1665    2622    6152            TRC                    /SET DIRECTION TO FORWARD
1666    2623    7300            CLA CLL                /CLEAR AC,L
1667    2624    1035            TAD      K0040         /SET TP0,TP1,TP2
1668    2625    6151            LMR                    /LOAD MAINT REG 1>BLOCK
1669    2626    4445            JMS I    RAN           /GENERATE A RANDOM NUMBER
1670    2627    3116            DCA      REGB          /STORE IT
1671    2630    1071            TAD      K1000         /GET AC>TAC
1672    2631    6151            LMR                    /SET MAINT REG TO AC>TAC
1673    2632    7300            CLA CLL                /CLEAR AC,L
1674    2633    1116            TAD      REGB          /FETCH RANDOM DATA
1675    2634    6154            XFR                    /SET UP TAC REGISTER
1676    2635    7300            CLA CLL                /CLEAR AC,L
1677    2636    6151            LMR                    /SET UP AC>TB
1678    2637    4445            JMS I    RAN           /FETCH A NUMBER
1679    2640    7040            CMA                    /INVERT IT
1680    2641    6154            XFR                    /SET TB
1681    2642    3117            DCA      REGC          /STORE IT
1682    2643    1116            TAD      REGB          /ADD B
1683    2644    1117            TAD      REGC          /ADD C SIMULATE THE ADDITION
1684    2645    3114            DCA      REGD          /STORE SIMULATED ADDITION
1685    2646    1153            TAD      K0011         /GET DM
1686    2647    4434            JMS I    LOADR         /SET MARK WINDOW TO DATA MARK
1687    2650    1035            TAD      K0040         /GENERATE TP0
1688    2651    6151            LMR                    /TB+TAC TO TAC
1689    2652    4025            JMS      TPEPRE        /0 PROGRESS
1690    2653    6141            LINC                   /L MODE
1691    2654    0003            TAC                    /READ TAC
1692    2655    0002            PDP                    /P MODE
1693    2656    1040            TAD      K0002         /ADD TWO FOR CORRECTION.
1694    2657    3046            DCA      REGE          /STORE IT
1695    2660    1046            TAD      REGE          /FETCH IT
1696    2661    7041            CIA                    /NEGATE
1697    2662    1114            TAD      REGD          /SUBTRACT DATA SOURCE
1698    2663    7650            SNA CLA                /TEST
1699    2664    4436            JMS I    NERROR        /TEST OKAY
1700    2665    4437            JMS I    ERROR         /TEST FAILED
1701    2666    6633            REGM09                 /MESSAGE TAG
1702    2667    7402            HLT                    /ERROR HALT
1703    2670    7610            SKP CLA                /EXIT
1704    2671    2605            REG009                 /SCOPE LOOP
```

```
1705
1706                              /
1707                              /DOES M121, B25 PINS F1, H1, L1 GENERATE LOAD TAC
1708                              /
1709    2672    4025    REG012,  JMS      TPEPRE            /0>EVERYTHING
1710    2673    4432             JMS I    MAINT1            /SET MAINT AND NO PAUSE
1711    2674    6141             LINC                       /L MODE
1712    2675    0700             0700                       /SET IN PROGRESS
1713    2676    0000             0000
1714    2677    0002             PDP                        /P MODE
1715    2700    4434             JMS I    LOADR             /WIPE OUT WINDOW
1716    2701    1035             TAD      K0040             /GEN TP0,TP1,TP2
1717    2702    6151             LMR                        /LOAD MAINT REG 1>SEARCH
1718    2703    7300             CLA CLL                    /CLEAR AC,L
1719    2704    1071             TAD      K1000             /SET AC>TAC
1720    2705    6151             LMR                        /LOAD MAINT REG
1721    2706    7240             CLA CMA                    /SET AC=7777
1722    2707    6154             XFR                        /SET TAC=7777
1723    2710    0110             AND      K0020             /SET UP FOR TP3, TP4
1724    2711    6151             LMR                        /CLEAR TAC
1725    2712    7300             CLA CLL                    /CLEAR AC,L
1726    2713    6141             LINC                       /L MODE
1727    2714    0003             TAC                        /READ TAC
1728    2715    0002             PDP                        /P MODE
1729    2716    3116             DCA      REGB              /STORE FOR TYPING
1730    2717    1116             TAD      REGB              /FETCH IT
1731    2720    7650             SNA CLA                    /TEST
1732    2721    4436             JMS I    NERROR            /TEST OKAY
1733    2722    4437             JMS I    ERROR             /TEST FAILED
1734    2723    6652             REGM12                     /MESSAGE TAG
1735    2724    7402             HLT                        /ERROR HALT
1736    2725    7610             SKP CLA                    /EXIT
1737    2726    2672             REG012                     /SCOPE LOOP
1738                              /
1739                              /TEST WRITE CYCLE FLOP
1740                              /
1741    2727    4025    WRCFLP,  JMS      TPEPRE            /0> EVERYTHING
1742    2730    4432             JMS I    MAINT1            /SET MAINT AND NO PAUSE
1743    2731    6141             LINC                       /L MODE
1744    2732    0700             0700                       /SET WRITE CYCLE
1745    2733    7000             7000                       /WASTED MEMORY
1746    2734    0002             PDP                        /P MODE
1747    2735    1122             TAD      K4440             /GET ENABLE STATES TO AC SET GP EQ GFC
1748    2736    6151             LMR                        /LOAD MAINT REGISTER
1749    2737    7300             CLA CLL                    /CLEAR AC,L
1750    2740    6154             XFR                        /READ STATUS
1751    2741    0110             AND      K0020             /SAVE WRITE CYCLE FLOP
1752    2742    7650             SNA CLA                    /WAS IT SET
1753    2743    5461             JMP I    PNTB              /TROUBLE (GO TO WRCFLB)
1754    2744    1071             TAD      K1000             /GET AC> TAC
1755    2745    6151             LMR                        /LOAD MAINT REG
1756    2746    7240             CLA CMA                    /SET AC=7777
1757    2747    6154             XFR                        /SET TAC=7777
1758    2750    0033             AND      K0016             /SET BM
1759    2751    4434             JMS I    LOADR             /SET WINDOW TO BLOCK MARK
```

17600   2752 1055   TAD   K0100   /SET PWD BIT

```
1761    2753    6152              TRC                      /SET FORWARD FLOP
1762    2754    7300              CLA CLL                  /CLEAR AC,L
1763    2755    1035              TAD       K0040          /GENERATE TP0, TP1, TP2 1> SEARCH
1764    2756    6151              LMR                      /1> BLOCK MODE
1765    2757    7300              CLA CLL                  /CLEAR AC,L
1766    2760    4434              JMS I     LOADR          /0> WINDOW
1767    2761    1035              TAD       K0040          /GENERATE TP0
1768    2762    6151              LMR                      /TP0, TP1, TP2
1769    2763    7301              CLA CLL IAC              /SET CM
1770    2764    4434              JMS I     LOADR          /SET MARK WINDOW TO CM
1771    2765    1122              TAD       K4440          /GENERATE TP0, 1, 2
1772    2766    6151              LMR                      /SET CHK WRD
1773    2767    6151              LMR                      /0> WRITE CYCLE
1774    2770    7300              CLA CLL                  /CLEAR AC,L
1775    2771    6154              XFR                      /READ STATUS
1776    2772    0110              AND       K0020          /SAVE WRITE CYCLE
1777    2773    7640              SZA CLA                  /WAS IT ZEROED
1778    2774    5461              JMP I     PNTB           /TROUBLE (GO TO WRCFLB)
1779    2775    1033              TAD       K0016          /WILL WRITE CYCLE STAY ZEROED
1780    2776    4434              JMS I     LOADR          /SET WINDOW TO BM
1781    2777    1055              TAD       K0100          /SET FORWARD BIT
1782    3000    6152              TRC                      /SET FORWARD FLOP
1783    3001    7300              CLA CLL                  /CLEAR AC,L
1784    3002    1035              TAD       K0040          /GENERATE TP0, 1, 2 1> SEARCH
1785    3003    6151              LMR                      /LOAD MAINT REG
1786    3004    7300              CLA CLL                  /CLEAR AC,L
1787    3005    1071              TAD       K1000          /GET AC> TAC
1788    3006    6151              LMR                      /LOAD MAINT REG
1789    3007    7240              CLA CMA                  /SET AC=7777
1790    3010    6154              XFR                      /SET TAC
1791    3011    7300              CLA CLL                  /CLEAR AC,L
1792    3012    4434              JMS I     LOADR          /0> WINDOW
1793    3013    1035              TAD       K0040          /GENERATE TP0
1794    3014    6151              LMR                      /TP0, 1, 2
1795    3015    7301              CLA CLL IAC              /SET CM
1796    3016    4434              JMS I     LOADR          /SET MARK WINDOW TO CM
1797    3017    1122              TAD       K4440          /GENERATE TP0, 1, 2
1798    3020    6151              LMR                      /SET CHK WRD
1799    3021    6151              LMR                      /KEEP WRITE CYCLE 0
1800    3022    7300              CLA CLL                  /CLEAR AC,L
1801    3023    6154              XFR                      /READ STATUS
1802    3024    0110              AND       K0020          /SAVE WRITE CYCLE
1803    3025    7650              SNA CLA                  /DID IT SET IN ERROR
1804    3026    4436              JMS I     NERROR         /NO TROUBLE
1805    3027    4437    WRCFLB,   JMS I     ERROR          /TROUBLE
1806    3030    6712              WRCM                     /MESSAGE
1807    3031    7402              HLT                      /ERROR HALT
1808    3032    7611              SKP CLA                  /EXIT
1809    3033    2727    WRCFLP                             /SCOPE LOOP
```

```
1810                        /
1811                        /TEST TIMING OKAY GATE
1812                        /
1813    3034    1033    TTOK1,  TAD     K0016           /GET BM
1814    3035    4434            JMS I   LOADR           /SET WINDOW
1815    3036    4025            JMS     TPEPRE          /0> MAINT, 0> MARK
1816    3037    1112            TAD     K0010           /SET NO PAUSE MODE
1817    3040    6141            LINC                    /L MODE
1818    3041    0001            AXO                     /SET NO PAUSE
1819    3042    0700            0700                    /SET MOTION
1820    3043    7000            7000
1821    3044    0002            PDP                     /P MODE
1822    3045    7240            CLA CMA                 /SET AC=7777
1823    3046    3115            DCA     REGA            /SET MONITOR TO DO ONE CYCLE.
1824    3047    3116            DCA     REGB            /0> TIMING REGISTER
1825    3050    1054            TAD     K7770
1826    3051    3117            DCA     REGC
1827    3052    1053            TAD     K4140           /GEN TIMING FOR TTOK
1828    3053    6151            LMR                     /LOAD MAINT REG
1829    3054    7300            CLA CLL                 /CLEAR AC,L
1830    3055    6154            XFR                     /READ
1831    3056    0040            AND     K0002           /SAVE TTOK
1832    3057    7640            SZA CLA                 /TEST
1833    3060    5266            JMP     .+6             /TEST OKAY
1834    3061    2116            ISZ     REGB            /WAIT
1835    3062    5252            JMP     .-10            /WAIT
1836    3063    2117            ISZ     REGC            /WAIT SOME MORE
1837    3064    5262            JMP     .-2             /WAIT
1838    3065    7610            SKP CLA                 /INVENT SKIP
1839    3066    4436            JMS I   NERROR          /TEST OKAY
1840    3067    4437            JMS I   ERROR           /TEST FAILED
1841    3070    6734            TTOKM                   /MESSAGE TAG
1842    3071    7402            HLT                     /ERROR HALT
1843    3072    7610            SKP CLA                 /EXIT
1844    3073    3034            TTOK1                   /SCOPE LOOP
1845                        /
1846                        /TAPE TRAP TEST
1847                        /
1848    3074    7300    TPTRAP, CLA CLL                 /0> AC,L
1849    3075    3140            DCA     140             /0 TRAP LOCATION
1850    3076    1145            TAD     K1400           /SET INST AND TAPE TRAP
1851    3077    6141            LINC                    /L MODE
1852    3100    0004            ESF                     /SET SPECIAL FUNCTION
1853    3101    0700            0700                    /TRY AND TRAP THIS
1854    3102    7000            7000
1855    3103    0002            PDP                     /P MODE
1856    3104    5314            JMP     TPTRBD          /NO TRAP, BLUNDER.
1857    3105    7300    LOCTRP, CLA CLL                 /RETURN HERE FROM TRAP.
1858    3106    6141            LINC                    /L MODE
1859    3107    0004            ESF                     /3 SPEC FUN
1860    3110    0002            PDP                     /P MODE
1861    3111    1140            TAD     140             /FETCH PROGRAM COUNTER,
1862    3112    7640            SZA CLA                 /WAS IT SET
1863    3113    4436            JMS I   NERROR          /TEST OKAY
1864    3114    4437    TPTRBD, JMS I   ERROR           /TEST FAILED
```

```
1865    3115   7012              TRAPM                    /MESSAGE TAG
1866    3116   7402              HLT                      /ERROR HALT
1867    3117   7610              SKP CLA                  /EXIT
1868    3120   3074              TPTRAP                   /SCOPE LOOP
1869                   /
1870                   /GRAND FINAL END
1871                   /
1872    3121   4025              JMS     TPEPRE           /0 EVERYTHING
1873    3122   2065              ISZ     PASS
1874    3123   7000              NOP
1875    3124   7604              LAS
1876    3125   0035              AND     K0040
1877    3126   7640              SZA CLA
1878    3127   5177              JMP     177              /START OVER
1879    3130   1063              TAD     PNTJ
1880    3131   3437              DCA I   ERROR
1881    3132   5464              JMP I   OUTPAS
1882    3133   6676      LOCJ,   PASSM
```

```
1883
1884    3134   0000      MAINTS,  0000                         /RETURN ADDRESS STORAGE
1885    3135   7200               CLA                          /CLEAR AC, L
1886    3136   1107               TAD      K0050               /SET MAINT, NO PAUSE
1887    3137   6141               LINC                         /L MODE
1888    3140   0001               AXO                          /LOAD EXTENDED ORS
1889    3141   0002               PDP                          /P MODE
1890    3142   7200               CLA                          /CLEAR AC, L
1891    3143   5734               JMP I    MAINTS              /EXIT
1892
1893    3144   0000      LOADS,   0000                         /RETURN ADDRESS STORAGE
1894    3145   7110               RAR CLL                      /WORD TO BE LOADED IS MOVED RIGHT ONE BIT
1895    3146   3113               DCA      TEMPB               /STORE IT
1896    3147   1110               TAD      K0020               /GET REV BIT
1897    3150   6152               TRC                          /SET REVERSE
1898    3151   7200               CLA                          /CLEAR AC, L
1899    3152   4432               JMS I    MAINT1              /SET MAINTENANCE BIT
1900    3153   1111               TAD      K7773               /SET AC=7773
1901    3154   3334               DCA      MAINTS              /SET TALLY TO MINUS 5
1902    3155   1113      DOMORE,  TAD      TEMPB               /GET STORED DATA
1903    3156   0112               AND      K0010               /SAVE CURRENT DATA BIT
1904    3157   3025               DCA      TPEPRE              /STORE IT
1905    3160   1025               TAD      TPEPRE              /FETCH IT
1906    3161   7040               CMA                          /INVERT IT
1907    3162   0110               AND      K0020               /AND IN COMMAND BIT
1908    3163   1025               TAD      TPEPRE              /ADD IN LOADING BIT
1909    3164   6151               LMR                          /SEND IT
1910    3165   7200               CLA                          /CLEAR AC
1911    3166   1113               TAD      TEMPB               /MOVE NEXT MOST SIGNIFICANT
1912    3167   7004               RAL                          /DATA BIT INTO LINK
1913    3170   3113               DCA      TEMPB               /STORE IT BACK
1914    3171   2334               ISZ      MAINTS              /DONE YET
1915    3172   5355               JMP      DOMORE              /NOT DONE YET
1916    3173   5744               JMP I    LOADS               /EXIT
```

```
1917
1918          5000    *5000
1919                  /
1920                  /NON ERROR MONITOR DETERMINES IF OPERATOR WANTS TO LOOP ON NON FAILING TEST
1921   5000   0000    NERROS, 0                   /RETURN ADDRESS
1922   5001   4432            JMS I   MAINT1       /SET MAINTENANCE FLAG
1923   5002   7307            CLA CLL IAC RTL      /SET AC = 4
1924   5003   1200            TAD     NERROS       /GET RETURN ADDRESS
1925   5004   3200            DCA     NERROS       /UPDATE RETURN ADDRESS
1926   5005   1600            TAD I   NERROS       /GET SCOPE LOOP ADDRESS
1927   5006   3221            DCA     ERRORS       /STORE IT
1928   5007   2115            ISZ     REGA         /UPDATE DATA
1929   5010   5621            JMP I   ERRORS       /EXIT
1930   5011   7604            LAS                  /READ SWITCHES
1931   5012   0072            AND     K0400        /SAVE SR3
1932   5013   7640            SZA CLA              /TEST AND CLEAR
1933   5014   5621            JMP I   ERRORS       /LOOPING
1934   5015   7040            CMA                  /SET AC=-1
1935   5016   1200            TAD     NERROS       /ADD NERROS
1936   5017   3200            DCA     NERROS       /STORE IN NERROS
1937   5020   5600            JMP I   NERROS       /JUMP INDIRECT LOOP
1938                  /
1939                  /ERROR PROCESSOR, SCOPE LOOP, HALT, PRINT
1940   5021   0000    ERRORS, 0                   /RETURN ADDRESS STORAGE
1941   5022   7604            LAS                  /READ SWITCHES
1942   5023   7004            RAL                  /MOVE SR1 INTO AC20
1943   5024   7700            SMA CLA              /IS IT SET
1944   5025   5254            JMP     ASCII        /NO TYPE A MESSAGE
1945   5026   4503            JMS I   BELLA        /RING THE BELL
1946   5027   1221    ASCRXT, TAD     ERRORS       /GET CURRENT ERROR ADDRESS
1947   5030   7041            CIA                  /INVERT IT
1948   5031   3024            DCA     LSTERR       /STORE IN LAST ERROR
1949   5032   2221            ISZ     ERRORS       /YES INDEX ESCAPE
1950   5033   7604            LAS                  /READ SWITCHES
1951   5034   7700            SMA CLA              /IS SR0 SET
1952   5035   5621            JMP I   ERRORS       /NO JUMP TO ERROR HALT
1953   5036   2221            ISZ     ERRORS       /YES INDEX ESCAPE TO JUMP OUT
1954   5037   2221            ISZ     ERRORS       /INDEX ERRORS TO SCOPE MODE
1955   5040   1621            TAD I   ERRORS       /GET SXOPE ADDRESS
1956   5041   3200            DCA     NERROS       /STORE IN TYPE
1957   5042   7604            LAS                  /READ SWITCHES
1958   5043   7006            RTL                  /MOVE SR42 TO AC0
1959   5044   7710            SPA CLA              /IS SCOPE MODE SELECTED
1960   5045   5600            JMP I   NERROS       /YES CONTINUE IN SCOPE LOOP
1961   5046   2115            ISZ     REGA         /UPDATE DATA
1962   5047   5600            JMP I   NERROS       /TEST WITH NEW DATA
1963   5050   7040            CMA                  /NO SET AC=7777
1964   5051   1221            TAD     ERRORS       /SUBTRACT ONE FROM ERRORS
1965   5052   3221            DCA     ERRORS       /STORE SELECTED ADDRESS
1966   5053   5621            JMP I   ERRORS       /EXIT TO NEXT TEST
```

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1967
1968    5054    7240    ASCII,   CLA CMA              /SET C(AC)=-1
1969    5055    1621             TAD I   ERRORS       /GET MESSAGE ADDRESS STORAGE
1970    5056    3010             DCA     PINT         /STORE IT IN AUTO INDEX REGISTER
1971    5057    1221             TAD     ERRORS       /GET RETURN ADDRESS
1972    5060    1024             TAD     LSTERR       /SUBTRACT LAST ERROR ADDRESS
1973    5061    7650             SNA CLA              /TEST
1974    5062    5366             JMP     DATYP        /SAME GO TYPE DATA
1975    5063    1410             TAD I   PINT         /GET FIRST CHARACTER
1976    5064    3200             DCA     NERROS       /SAVE IT
1977    5065    1200             TAD     NERROS       /GET IT
1978    5066    7450             SNA                  /TEST IT
1979    5067    5227             JMP     ASCRXT       /NUMBER=EXIT
1980    5070    7040             CMA                  /INVERT IT
1981    5071    7450             SNA                  /NUMBER=EXITA
1982    5072    5320             JMP     DATUM        /TYPE OUT DATA ROUTINE
1983    5073    7040             CMA                  /CHANGE IT BACK
1984    5074    7112             RTR CLL              /SWAP AC TO THE RIGHT
1985    5075    7012             RTR                  /MOVE
1986    5076    7012             RTR                  /MOVE
1987    5077    4303             JMS     TYPECH       /TYPE IT
1988    5100    1200             TAD     NERROS       /GET IT AGAIN
1989    5101    4303             JMS     TYPECH       /TYPE IT
1990    5102    5263             JMP     ASCII+7      /MUST BE MORE WORDS THAT NEED TYPING
1991    5103    0000    TYPECH,  0
1992    5104    0073             AND     K0077        /SAVE SIGNIFICANT PART
1993    5105    3106             DCA     SPACE        /STORE WORD
1994    5106    1106             TAD     SPACE        /FETCH IT
1995    5107    7650             SNA CLA              /TEST FOR 00 CRLF CODE
1996    5110    4357             JMS     CRLF         /YES IT WAS
1997    5111    1106             TAD     SPACE        /NO TYPE IT
1998    5112    1074             TAD     M40          /SUBTRACT 40
1999    5113    7510             SPA                  /TEST POLARITY
2000    5114    1055             TAD     K0100        /ADD 340
2001    5115    1075             TAD     K240         /ADD 240
2002    5116    4505             JMS I   TYPE         /TYPE
2003    5117    5703             JMP I   TYPECH       /EXIT
2004
2005    5120    1410    DATUM,   TAD I   PINT         /GET ADDRESS OF REGISTER
2006    5121    3200             DCA     NERROS       /STORE IN TEMP
2007    5122    1200             TAD     NERROS       /GET TEMP
2008    5123    7650             SNA CLA              /TEST FOR EXIT
2009    5124    5227             JMP     ASCRXT       /EQUALS 0000 EXIT
2010    5125    1200             TAD     NERROS
2011    5126    1052             TAD     M4444
2012    5127    7650             SNA CLA              /$$?
2013    5130    5177             JMP     177
2014    5131    1600             TAD I   NERROS       /GET DATA
2015    5132    4336             JMS     OCTYP        /TYPE IT
2016    5133    1075             TAD     K240         /SPACE
2017    5134    4505             JMS I   TYPE         /TYPE IT
2018    5135    5320             JMP     DATUM        /TYPE NUMERIC DATA
2019    5136    0000    OCTYP,   0                    /RETURN ADDRESS STORAGE
2020    5137    3303             DCA     TYPECH       /STORE DATA TO BE PRINTED
2021    5140    1076             TAD     K7774        /SET UP TALLY
```

```
2022     5141  3106               DCA     SPACE              /SET IT
```

```
2023
2024                    /TAPE 5
2025                    /
2026    5142  1077      HERE,   TAD     K1026           /GET FLAG NUMBER
2027    5143  3357      REDO,   DCA     CRLF            /STORE
2028    5144  1303              TAD     TYPECH
2029    5145  7004              RAL
2030    5146  3303              DCA     TYPECH
2031    5147  1357              TAD     CRLF
2032    5150  7004              RAL
2033    5151  7420              SNL
2034    5152  5343              JMP     REDO
2035    5153  4505              JMS I   TYPE
2036    5154  2106              ISZ     SPACE
2037    5155  5342              JMP     HERE
2038    5156  5736              JMP I   OCTYP           /EXIT
2039    5157  0000      CRLF,   0                       /RETURN ADDRESS STORAGE
2040    5160  1100              TAD     K0215           /GET CR
2041    5161  4505              JMS I   TYPE            /TYPE IT
2042    5162  1101              TAD     K0212           /GET LF
2043    5163  4505              JMS I   TYPE            /TYPE IT
2044    5164  1102              TAD     K0177           /SET TO RUBOUT
2045    5165  5757              JMP I   CRLF            /EXIT
2046    5166  1410      DATYP,  TAD I   PINT            /GET A TERM OFF OF TYPE LIST
2047    5167  7450              SNA                     /END OF LIST?
2048    5170  5227              JMP     ASCRXT          /YES EXIT
2049    5171  7040              CMA                     /INVERT
2050    5172  7640              SZA CLA                 /BEGINNING OF DATA
2051    5173  5366              JMP     DATYP           /NO
2052    5174  4357              JMS     CRLF            /YES OK RETURN THE TTY CARRIAGE AND LINE FEED
2053    5175  7300              CLA CLL                 /CLEAR AC AND LINK
2054    5176  5320              JMP     DATUM           /GO TYPE THE DATA
```

```
2055
2056              5200      *5200
2057     5200  0000   BELL,     0000
2058     5201  7604             LAS                      /READ SWITCHES
2059     5202  0055             AND     K0100            /SAVE SR05
2060     5203  7640             SZA CLA                  /IS BELL SUPPRESS SET
2061     5204  5600             JMP I   BELL             /YES EXIT
2062     5205  1104             TAD     K0207            /GET BELL
2063     5206  4505             JMS I   TYPE             /TYPE IT
2064     5207  5600             JMP I   BELL             /EXIT
2065     5210  0000   TYPOUT,   0000
2066     5211  6046             6046
2067     5212  6041             6041
2068     5213  5212             JMP     .-1
2069     5214  7200             CLA
2070     5215  5610             JMP I   TYPOUT
2071
2072     5216  0000   RANDOM,   0000
2073     5217  1166             TAD     RNA
2074     5220  1167             TAD     RNB
2075     5221  3166             DCA     RNA
2076     5222  7004             RAL
2077     5223  1166             TAD     RNA
2078     5224  1167             TAD     RNB
2079     5225  3167             DCA     RNB
2080     5226  7004             RAL
2081     5227  1166             TAD     RNA
2082     5230  3166             DCA     RNA
2083     5231  1167             TAD     RNB
2084     5232  5616             JMP I   RANDOM
2085     5233  0014   LIM001,   0014           /LIP MTP SETUP FAILED TO CLEAR TAPE DONE
2086     5234  1120             1120
2087     5235  4015             4015
2088     5236  2420             2420
2089     5237  4023             4023
2090     5240  0524             0524
2091     5241  2520             2520
2092     5242  4006             4006
2093     5243  0111             0111
2094     5244  1405             1405
2095     5245  0440             0440
2096     5246  2417             2417
2097     5247  4003             4003
2098     5250  1405             1405
2099     5251  0122             0122
2100     5252  4024             4024
2101     5253  0120             0120
2102     5254  0540             0540
2103     5255  0417             0417
2104     5256  1605             1605
2105     5257  4000             4000
2106     5260  0000             EXIT
```

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2107
2108    5261    0014    LIM002,  0014          /LIP TAPE PRESET FAILED TO CLEAR TAPE DONE
2109    5262    1120             1120
2110    5263    4024             4024
2111    5264    0120             0120
2112    5265    0540             0540
2113    5266    2022             2022
2114    5267    0523             0523
2115    5270    0524             0524
2116    5271    4006             4006
2117    5272    0111             0111
2118    5273    1405             1405
2119    5274    0440             0440
2120    5275    2417             2417
2121    5276    0314             0314
2122    5277    0501             0501
2123    5300    2240             2240
2124    5301    2401             2401
2125    5302    2005             2005
2126    5303    4004             4004
2127    5304    1716             1716
2128    5305    0500             0500
2129    5306    0000             EXIT
2130    5307    0014    LIM003,  0014          /LIP CLEAR TAPE DONE FAILED
2131    5310    1120             1120
2132    5311    4003             4003
2133    5312    1405             1405
2134    5313    0122             0122
2135    5314    4024             4024
2136    5315    0120             0120
2137    5316    0540             0540
2138    5317    0417             0417
2139    5320    1605             1605
2140    5321    4006             4006
2141    5322    0111             0111
2142    5323    1405             1405
2143    5324    0400             0400
2144    5325    0000             EXIT
```

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2145
2146    5326    0014    LIM004, 0014                    /LIP STD FAILED TAPE DONE#1
2147    5327    1120            1120
2148    5330    4023            4023
2149    5331    2404            2404
2150    5332    4006            4006
2151    5333    0111            0111
2152    5334    1405            1405
2153    5335    0440            0440
2154    5336    2401            2401
2155    5337    2005            2005
2156    5340    4004            4004
2157    5341    1716            1716
2158    5342    0575            0575
2159    5343    6100            6100
2160    5344    0000            EXIT
2161    5345    0014    LIM005, 0014                    /LIP STD FAILED TAPE DONE#0
2162    5346    1120            1120
2163    5347    4023            4023
2164    5350    2404            2404
2165    5351    4006            4006
2166    5352    0111            0111
2167    5353    1405            1405
2168    5354    0440            0440
2169    5355    2401            2401
2170    5356    2005            2005
2171    5357    4004            4004
2172    5360    1716            1716
2173    5361    0575            0575
2174    5362    6000            6000
2175    5363    0000            EXIT
```

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2176
2177     5364   0014      LIM006,  0014              /LIP TAPE INTERRUPT FAILED INT ENB=1
2178     5365   1120               1120
2179     5366   4024               4024
2180     5367   0120               0120
2181     5370   0540               0540
2182     5371   1116               1116
2183     5372   2405               2405
2184     5373   2222               2222
2185     5374   2520               2520
2186     5375   2440               2440
2187     5376   0601               0601
2188     5377   1114               1114
2189     5400   0504               0504
2190     5401   4011               4011
2191     5402   1624               1624
2192     5403   4005               4005
2193     5404   1602               1602
2194     5405   7561               7561
2195     5406   4000               4000
2196     5407   0000               EXIT
2197     5410   0014      LIM007,  0014              /LIP MTP SETUP FAILED TO SET IN-PROGRESS
2198     5411   1120               1120
2199     5412   4015               4015
2200     5413   2420               2420
2201     5414   4023               4023
2202     5415   0524               0524
2203     5416   2520               2520
2204     5417   4006               4006
2205     5420   0111               0111
2206     5421   1405               1405
2207     5422   0424               0424
2208     5423   1740               1740
2209     5424   2305               2305
2210     5425   2440               2440
2211     5426   1116               1116
2212     5427   5520               5520
2213     5430   2217               2217
2214     5431   0722               0722
2215     5432   0523               0523
2216     5433   2300               2300
2217     5434   0000               EXIT
```

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2218
2219    5435    0014    LIM008,  0014                        /LIP TAPE PRESET FAILED TO ZERO IN PROGRESS
2220    5436    1120             1120
2221    5437    4024             4024
2222    5440    0120             0120
2223    5441    0540             0540
2224    5442    2022             2022
2225    5443    0523             0523
2226    5444    0524             0524
2227    5445    4006             4006
2228    5446    0111             0111
2229    5447    1405             1405
2230    5450    0440             0440
2231    5451    2417             2417
2232    5452    4032             4032
2233    5453    0522             0522
2234    5454    1740             1740
2235    5455    1116             1116
2236    5456    4020             4020
2237    5457    2217             2217
2238    5460    0722             0722
2239    5461    0523             0523
2240    5462    2300             2300
2241    5463    0000             EXIT
2242    5464    0014    LIM009,  0014                        /LIP (LCS(MTB*BM*SEARCH) FAILED TO ZERO IN PROGRESS
2243    5465    1120             1120
2244    5466    4050             4050
2245    5467    1403             1403
2246    5470    2350             2350
2247    5471    1524             1524
2248    5472    0252             0252
2249    5473    0215             0215
2250    5474    5223             5223
2251    5475    0501             0501
2252    5476    2203             2203
2253    5477    1051             1051
2254    5500    4006             4006
2255    5501    0111             0111
2256    5502    1405             1405
2257    5503    0440             0440
2258    5504    2417             2417
2259    5505    4060             4060
2260    5506    4011             4011
2261    5507    1640             1640
2262    5510    2022             2022
2263    5511    1707             1707
2264    5512    2205             2205
2265    5513    2323             2323
2266    5514    4000             4000
2267    5515    0000             EXIT
```

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2268
2269    5516  0014    LIM010,  0014                    /LIP M115 C25 PIN S2 FAILED TO 0 IN PROGRESS
2270    5517  1120              1120
2271    5520  4015              4015
2272    5521  6161              6161
2273    5522  6540              6540
2274    5523  0362              0362
2275    5524  6540              6540
2276    5525  2011              2011
2277    5526  1640              1640
2278    5527  2362              2362
2279    5530  4006              4006
2280    5531  0111              0111
2281    5532  1405              1405
2282    5533  0440              0440
2283    5534  2417              2417
2284    5535  4060              4060
2285    5536  2022              2022
2286    5537  1707              1707
2287    5540  2205              2205
2288    5541  2323              2323
2289    5542  4000              4000
2290    5543  0000              EXIT
```

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2291
2292      5544  0014      LIM013, 0014              /LIP CHK OK FAILED TO B IN PROGRESS
2293      5545  1120              1120
2294      5546  4003              4003
2295      5547  1013              1013
2296      5550  4017              4017
2297      5551  1340              1340
2298      5552  0601              0601
2299      5553  1114              1114
2300      5554  0504              0504
2301      5555  4024              4024
2302      5556  1740              1740
2303      5557  6040              6040
2304      5560  1116              1116
2305      5561  4020              4020
2306      5562  2217              2217
2307      5563  0722              0722
2308      5564  0523              0523
2309      5565  2300              2300
2310      5566  0000              EXIT
2311      5567  0014      LIM015, 0014              /LIP CHK OK FAILED TO 0 PROGRESS
2312      5570  1120              1120
2313      5571  4003              4003
2314      5572  1013              1013
2315      5573  4017              4017
2316      5574  1340              1340
2317      5575  0601              0601
2318      5576  1114              1114
2319      5577  0504              0504
2320      5600  4024              4024
2321      5601  1740              1740
2322      5602  6040              6040
2323      5603  2022              2022
2324      5604  1707              1707
2325      5605  2205              2205
2326      5606  2323              2323
2327      5607  4000              4000
2328      5610  0000              EXIT
```

```
2329
2330    5611   0014    LIM017, 0014                      /LIP M113,C16,H1 WRITE CYCLE (0) FAILED TO 0 IN PROGRESS
2331    5612   1120            1120
2332    5613   4015            4015
2333    5614   6161            6161
2334    5615   6340            6340
2335    5616   0361            0361
2336    5617   6640            6640
2337    5620   1061            1061
2338    5621   4027            4027
2339    5622   2211            2211
2340    5623   2405            2405
2341    5624   4003            4003
2342    5625   3103            3103
2343    5626   1405            1405
2344    5627   4050            4050
2345    5630   6051            6051
2346    5631   4006            4006
2347    5632   0111            0111
2348    5633   1405            1405
2349    5634   0440            0440
2350    5635   2417            2417
2351    5636   4060            4060
2352    5637   4011            4011
2353    5640   1640            1640
2354    5641   2022            2022
2355    5642   1707            1707
2356    5643   2205            2205
2357    5644   2323            2323
2358    5645   4000            4000
2359    5646   0000            EXIT
2360    5647   0014    LIM018, 0014                      /LIP STW FAILED TAPE WORD =1
2361    5650   1120            1120
2362    5651   4023            4023
2363    5652   2427            2427
2364    5653   4006            4006
2365    5654   0111            0111
2366    5655   1405            1405
2367    5656   0440            0440
2368    5657   2401            2401
2369    5660   2005            2005
2370    5661   4027            4027
2371    5662   1722            1722
2372    5663   0475            0475
2373    5664   6100            6100
2374    5665   0000            EXIT
2375    5666   0014    LIM019, 0014                      /LIP STW FAILED TAPE WORD =2
2376    5667   1120            1120
2377    5670   4023            4023
2378    5671   2427            2427
2379    5672   4006            4006
2380    5673   0111            0111
2381    5674   1405            1405
2382    5675   0440            0440
2383    5676   2401            2401
```

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2384     5677  2005              2005
2385     5700  4027              4027
2386     5701  1722              1722
2387     5702  0475              0475
2388     5703  6000              6000
2389     5704  0000              EXIT
```

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 2390
 2391   5705   0014     LIM022, 0014                           /LIP TAPE WORD TOGGLES FAILED
 2392   5706   1120             1120
 2393   5707   4024             4024
 2394   5710   0120             0120
 2395   5711   0540             0540
 2396   5712   2717             2717
 2397   5713   2204             2204
 2398   5714   4024             4024
 2399   5715   1707             1707
 2400   5716   0714             0714
 2401   5717   0523             0523
 2402   5720   4006             4006
 2403   5721   0111             0111
 2404   5722   1405             1405
 2405   5723   0400             0400
 2406   5724   0000             EXIT
 2407
 2408   5725   0014     LIM023, 0014                           /LIP DATA BREAK FAILED
 2409   5726   1120             1120                           /0000 0000 0000
 2410   5727   4004             4004
 2411   5730   0124             0124
 2412   5731   0140             0140
 2413   5732   0222             0222
 2414   5733   0501             0501
 2415   5734   1340             1340
 2416   5735   0601             0601
 2417   5736   1114             1114
 2418   5737   0504             0504
 2419   5740   4000             4000
 2420   5741   7777             EXITA
 2421   5742   0116             REGB
 2422   5743   0117             REGC
 2423   5744   0114             REGD
 2424   5745   0000             EXIT
 2425
 2426   5746   0014     LCM000, 0014                           /LCX MARK FLOP
 2427   5747   0330             0330                           /0000 0000
 2428   5750   4015             4015
 2429   5751   0122             0122
 2430   5752   1340             1340
 2431   5753   0614             0614
 2432   5754   1720             1720
 2433   5755   4000             4000
 2434   5756   7777             EXITA
 2435   5757   0116             REGB
 2436   5760   0117             REGC
 2437   5761   0000             EXIT
 2438   5762   0014     LCM001, 0014                           /LCX MARK FLOP TAPE PRESET FAILED
 2439   5763   0330             0330                           /0000
 2440   5764   4015             4015
 2441   5765   0122             0122
 2442   5766   1340             1340
 2443   5767   0614             0614
 2444   5770   1720             1720
```

```
2445     5771  4024               4024
2446     5772  0120               0120
2447     5773  0540               0540
2448     5774  2022               2022
2449     5775  0523               0523
2450     5776  0524               0524
2451     5777  4006               4006
2452     6000  0111               0111
2453     6001  1405               1405
2454     6002  0400               0400
2455     6003  7777               EXITA
2456     6004  0116               REGB
2457     6005  0000               EXIT
2458     6006  0014     LIM000,   0014     /LIP TAPE DONE FAILED TO SET
2459     6007  1120               1120
2460     6010  4024               4024
2461     6011  0120               0120
2462     6012  0540               0540
2463     6013  0417               0417
2464     6014  1605               1605
2465     6015  4006               4006
2466     6016  0111               0111
2467     6017  1405               1405
2468     6020  0440               0440
2469     6021  2417               2417
2470     6022  4023               4023
2471     6023  0524               0524
2472     6024  0000               EXIT
```

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2473
2474      6025   0014      LIM012,  0014              /LIP END INST FAILED TO 0 PROGRESS
2475      6026   1120               1120
2476      6027   4005               4005
2477      6030   1604               1604
2478      6031   4011               4011
2479      6032   1623               1623
2480      6033   2440               2440
2481      6034   0601               0601
2482      6035   1114               1114
2483      6036   0504               0504
2484      6037   4024               4024
2485      6040   1740               1740
2486      6041   6040               6040
2487      6042   2022               2022
2488      6043   1707               1707
2489      6044   2205               2205
2490      6045   2323               2323
2491      6046   0000               EXIT
2492      6047   0014      LINMX1,  0014              /LIN TAC=7777 DIR=REV FAILED
2493      6050   1116               1116
2494      6051   4024               4024
2495      6052   0103               0103
2496      6053   7567               7567
2497      6054   6767               6767
2498      6055   6740               6740
2499      6056   0411               0411
2500      6057   2275               2275
2501      6060   2205               2205
2502      6061   2640               2640
2503      6062   0601               0601
2504      6063   1114               1114
2505      6064   0504               0504
2506      6065   0000               EXIT
2507      6066   0014      LINMX2,  0014              /LIN TAC=0000 DIR=FWD FAILED
2508      6067   1116               1116
2509      6070   4024               4024
2510      6071   0103               0103
2511      6072   7560               7560
2512      6073   6060               6060
2513      6074   6040               6040
2514      6075   0411               0411
2515      6076   2275               2275
2516      6077   0627               0627
2517      6100   0440               0440
2518      6101   0601               0601
2519      6102   1114               1114
2520      6103   0504               0504
2521      6104   0000               EXIT
2522      6105   0014      LTM004,  0014              /LIT MARK CLOCK FAILED TO GENERATE TPS
2523      6106   2424               2424
2524      6107   4015               4015
2525      6110   0122               0122
2526      6111   1340               1340
2527      6112   0314               0314
```

```
2528     6113  1703              1703
2529     6114  1340              1340
2530     6115  0601              0601
2531     6116  1114              1114
2532     6117  0504              0504
2533     6120  4024              4024
2534     6121  1740              1740
2535     6122  0705              0705
2536     6123  1605              1605
2537     6124  2201              2201
2538     6125  2405              2405
2539     6126  4024              4024
2540     6127  2063              2063
2541     6130  0000              EXIT
```

```
2542
2543      6131   0014        LCMX00,  0014              /LCS IDLE > SEARCH FAILED
2544      6132   0323                 0323
2545      6133   4011                 4011
2546      6134   0414                 0414
2547      6135   0540                 0540
2548      6136   7640                 7640
2549      6137   2305                 2305
2550      6140   0122                 0122
2551      6141   0310                 0310
2552      6142   4006                 4006
2553      6143   0111                 0111
2554      6144   1405                 1405
2555      6145   0440                 0440
2556      6146   0000                 EXIT
2557      6147   0014        LCMX01,  0014              /LCS SEARCH > BLOCK FAILED
2558      6150   0323                 0323
2559      6151   4023                 4023
2560      6152   0501                 0501
2561      6153   2203                 2203
2562      6154   1040                 1040
2563      6155   7640                 7640
2564      6156   0214                 0214
2565      6157   1703                 1703
2566      6160   1340                 1340
2567      6161   0601                 0601
2568      6162   1114                 1114
2569      6163   0504                 0504
2570      6164   0000                 EXIT
2571      6165   0014        LCM002,  0014              /LCS SEARCH > TURN AROUND FAILED
2572      6166   0323                 0323
2573      6167   4023                 4023
2574      6170   0501                 0501
2575      6171   2203                 2203
2576      6172   1040                 1040
2577      6173   7640                 7640
2578      6174   2425                 2425
2579      6175   2216                 2216
2580      6176   4001                 4001
2581      6177   2217                 2217
2582      6200   2516                 2516
2583      6201   0440                 0440
2584      6202   0601                 0601
2585      6203   1114                 1114
2586      6204   0504                 0504
2587      6205   0000                 EXIT
```

```
2588
2589    6206  0014    LCM003, 0014            /LCS TURN AROUND > IDLE FAILED
2590    6207  0323            0323
2591    6210  4024            4024
2592    6211  2522            2522
2593    6212  1640            1640
2594    6213  0122            0122
2595    6214  1725            1725
2596    6215  1604            1604
2597    6216  4076            4076
2598    6217  4011            4011
2599    6220  0414            0414
2600    6221  0540            0540
2601    6222  0601            0601
2602    6223  1114            1114
2603    6224  0504            0504
2604    6225  0000            EXIT
2605    6226  0014    LCM004, 0014            /LCS BLOCK > CHK WRD FAILED
2606    6227  0323            0323
2607    6230  4002            4002
2608    6231  1417            1417
2609    6232  0313            0313
2610    6233  4076            4076
2611    6234  4003            4003
2612    6235  1013            1013
2613    6236  4027            4027
2614    6237  2204            2204
2615    6240  4006            4006
2616    6241  0111            0111
2617    6242  1405            1405
2618    6243  0440            0440
2619    6244  0000            EXIT
2620    6245  0014    LCM005, 0014            /LCS CHK WRD > IDLE FAILED
2621    6246  0323            0323
2622    6247  4003            4003
2623    6250  1013            1013
2624    6251  4076            4076
2625    6252  4011            4011
2626    6253  0414            0414
2627    6254  0540            0540
2628    6255  0601            0601
2629    6256  1114            1114
2630    6257  0504            0504
2631    6260  0000            EXIT
```

```
2632
2633    6261    0014    LCM006,    0014                    /LCS SEARCH > IDLE (MTB+I) FAILED
2634    6262    0323               0323
2635    6263    4023               4023
2636    6264    0501               0501
2637    6265    2203               2203
2638    6266    1040               1040
2639    6267    7640               7640
2640    6270    1104               1104
2641    6271    1405               1405
2642    6272    4050               4050
2643    6273    1524               1524
2644    6274    0253               0253
2645    6275    1151               1151
2646    6276    4006               4006
2647    6277    0111               0111
2648    6300    1405               1405
2649    6301    0400               0400
2650    6302    0000               EXIT
2651    6303    0014    LWM101,    0014                    /LRL; LRE; EN TAC, EN TB, OR LOAD TAC
2652    6304    2214               2214                    /0000 0000 0000
2653    6305    7340               7340
2654    6306    1422               1422
2655    6307    0573               0573
2656    6310    4005               4005
2657    6311    1640               1640
2658    6312    2401               2401
2659    6313    0354               0354
2660    6314    4005               4005
2661    6315    1640               1640
2662    6316    2402               2402
2663    6317    5440               5440
2664    6320    1722               1722
2665    6321    4014               4014
2666    6322    1701               1701
2667    6323    0440               0440
2668    6324    2401               2401
2669    6325    0300               0300
2670    6326    7777               EXITA
2671    6327    0051               K7777
2672    6330    0115               REGA
2673    6331    0116               REGB
2674    6332    0000               EXIT
```

```
2675
2676    6333    0014    LWM102,  0014              /LTS PHASE GATE FAILED
2677    6334    2423             2423
2678    6335    4020             4020
2679    6336    1001             1001
2680    6337    2305             2305
2681    6340    4007             4007
2682    6341    0124             0124
2683    6342    0540             0540
2684    6343    0601             0601
2685    6344    1114             1114
2686    6345    0504             0504
2687    6346    0000             EXIT
2688    6347    0014    LWM104,  0014              /LWN MARK WRITE GATE FAILED
2689    6350    2716             2716
2690    6351    4015             4015
2691    6352    0122             0122
2692    6353    1340             1340
2693    6354    2722             2722
2694    6355    1124             1124
2695    6356    0540             0540
2696    6357    0701             0701
2697    6360    2405             2405
2698    6361    4006             4006
2699    6362    0111             0111
2700    6363    1405             1405
2701    6364    0400             0400
2702    6365    0000             EXIT
2703    6366    0014    LMM000,  0014              /LTR DATA CHANNEL RWB 2, 4, 8 FAILED
2704    6367    2422             2422                   /4210 0160
2705    6370    4004             4004
2706    6371    0124             0124
2707    6372    0140             0140
2708    6373    0310             0310
2709    6374    0116             0116
2710    6375    1605             1605
2711    6376    1440             1440
2712    6377    2227             2227
2713    6400    0240             0240
2714    6401    6054             6054
2715    6402    6454             6454
2716    6403    7040             7040
2717    6404    0601             0601
2718    6405    1114             1114
2719    6406    0504             0504
2720    6407    4000             4000
2721    6410    7777             EXITA
2722    6411    0116             REGB
2723    6412    0117             REGC
2724    6413    0000             EXIT
2725    6414    0014    LTM000,  0014              /LTT MARK CLOCK FAILED TO GENERATE THE
2726    6415    2424             2424
2727    6416    4015             4015
2728            0122             0122
2729      0     1340             1340
```

```
2730     6421     0314              0314
2731     6422     1703              1703
2732     6423     1340              1340
2733     6424     0601              0601
2734     6425     1114              1114
2735     6426     0504              0504
2736     6427     4024              4024
2737     6430     1740              1740
2738     6431     0705              0705
2739     6432     1605              1605
2740     6433     2201              2201
2741     6434     2405              2405
2742     6435     4024              4024
2743     6436     2060              2060
2744     6437     0000              EXIT
```

```
2745
2746
2747     6440    0014     LTM101,  0014          /LTS LINE COUNTER FAILED TO COUNT
2748     6441    2423              2423          /0000
2749     6442    4014              4014
2750     6443    1116              1116
2751     6444    0540              0540
2752     6445    0317              0317
2753     6446    2516              2516
2754     6447    2405              2405
2755     6450    2240              2240
2756     6451    0601              0601
2757     6452    1114              1114
2758     6453    0504              0504
2759     6454    4024              4024
2760     6455    1740              1740
2761     6456    0317              0317
2762     6457    2516              2516
2763     6460    2400              2400
2764     6461    7777             EXITA
2765     6462    0116             REGB
2766     6463    0000             EXIT
2767     6464    0014     MOTT1M,  0014          /LMU TURN ARND, BM FAILED TO 2 MOTION
2768     6465    1525              1525
2769     6466    4024              4024
2770     6467    2522              2522
2771     6470    1640              1640
2772     6471    0122              0122
2773     6472    1604              1604
2774     6473    5440              5440
2775     6474    0215              0215
2776     6475    4006              4006
2777     6476    0111              0111
2778     6477    1405              1405
2779     6500    0440              0440
2780     6501    2417              2417
2781     6502    4060              4060
2782     6503    1517              1517
2783     6504    2411              2411
2784     6505    1716              1716
2785     6506    0000             EXIT
```

```
2786    6507    0014    MOTT2M,  0014        /LMU TAPE PRESET FAILED TO 0 MOTION
2787    6510    1525             1525
2788    6511    4024             4024
2789    6512    0120             0120
2790    6513    0540             0540
2791    6514    2022             2022
2792    6515    0523             0523
2793    6516    0524             0524
2794    6517    4006             4006
2795    6520    0111             0111
2796    6521    1405             1405
2797    6522    0440             0440
2798    6523    2417             2417
2799    6524    4060             4060
2800    6525    4015             4015
2801    6526    1724             1724
2802    6527    1117             1117
2803    6530    1640             1640
2804    6531    0000             EXIT
2805    6532    0014    MOTT3M,  0014        /LMU CLR PROGRESS FAILED TO 0 MOTION
2806    6533    1525             1525
2807    6534    4003             4003
2808    6535    1422             1422
2809    6536    4020             4020
2810    6537    2217             2217
2811    6540    0722             0722
2812    6541    0523             0523
2813    6542    2340             2340
2814    6543    0601             0601
2815    6544    1114             1114
2816    6545    0504             0504
2817    6546    4024             4024
2818    6547    1740             1740
2819    6550    4060             4060
2820    6551    4015             4015
2821    6552    1724             1724
2822    6553    1117             1117
2823    6554    1640             1640
2824    6555    0000             EXIT
2825    6556    0014    REGM04,  0014        /LRL TP3 FAILED TO SHIFT RWB
2826    6557    2214             2214        /0000 0000
2827    6560    4024             4024
2828    6561    2063             2063
2829    6562    4006             4006
2830    6563    0111             0111
2831    6564    1405             1405
2832    6565    0440             0440
2833    6566    2417             2417
2834    6567    4023             4023
2835    6570    1011             1011
2836    6571    0624             0624
2837    6572    4022             4022
2838    6573    2702             2702
2839    6574    4000             4000
2840    6575    7777             EXITA
```

```
2841      6576   0116              REGB
2842      6577   0117              REGC
2843      6600   0000              EXIT
```

```
2844
2845    6601    0014    REGM06,  0014              /LRL EN WRITE LD RWB FAILED TO SHIFT RWB.
2846    6602    2214             2214              /0000 0000
2847    6603    4005             4005
2848    6604    1640             1640
2849    6605    2722             2722
2850    6606    1124             1124
2851    6607    0540             0540
2852    6610    1404             1404
2853    6611    4022             4022
2854    6612    2702             2702
2855    6613    4006             4006
2856    6614    0111             0111
2857    6615    1405             1405
2858    6616    0440             0440
2859    6617    2417             2417
2860    6620    4023             4023
2861    6621    1011             1011
2862    6622    0624             0624
2863    6623    4000             4000
2864    6624    7777             EXITA
2865    6625    0116             REGB
2866    6626    0117             REGC
2867    6627    0000             EXIT
2868    6630    0014    REGM09,  0014              /LRL TB+TAC=TAC FAILED
2869    6631    2214             2214              /0000 0000 0000 0000
2870    6632    4024             4024
2871    6633    0253             0253
2872    6634    2401             2401
2873    6635    0375             0375
2874    6636    2401             2401
2875    6637    0340             0340
2876    6640    0601             0601
2877    6641    1114             1114
2878    6642    0504             0504
2879    6643    4000             4000
2880    6644    7777             EXITA
2881    6645    0116             REGB
2882    6646    0117             REGC
2883    6647    0114             REGD
2884    6650    0046             REGE
2885    6651    0000             EXIT
2886    6652    0014    REGM12,  0014              /LRL LOAD TAC FAILED TP3, SEARCH
2887    6653    2214             2214              /0000
2888    6654    4014             4014
2889    6655    1701             1701
2890    6656    0440             0440
2891    6657    2401             2401
2892    6660    0340             0340
2893    6661    0601             0601
2894    6662    1114             1114
2895    6663    0504             0504
2896    6664    4024             4024
2897    6665    2063             2063
2898    6666    5440             5440
```

```
2899    6667    2305                    2305
2900    6670    0122                    0122
2901    6671    0310                    0310
2902    6672    4000                    4000
2903    6673    7777                    EXITA
2904    6674    0116                    REGB
2905    6675    0000                    EXIT
2906    6676    0024    PASSM,          0024              /TC12-PART 2 PASS--(PASS)
2907    6677    0361                    0361
2908    6700    6255                    6255
2909    6701    2001                    2001
2910    6702    2224                    2224
2911    6703    4062                    4062
2912    6704    4020                    4020
2913    6705    0123                    0123
2914    6706    2300                    2300
2915    6707    7777                    EXITA
2916    6710    0065                    PASS
2917    6711    4444                    4444              /RETURN TO LOC 177
2918
2919    6712    0014    WRCM,           0014              /LCS WRITE CYCLE FLOP TEST FAILED
2920    6713    0323                    0323
2921    6714    4027                    4027
2922    6715    2211                    2211
2923    6716    2405                    2405
2924    6717    4003                    4003
2925    6720    3103                    3103
2926    6721    1405                    1405
2927    6722    4006                    4006
2928    6723    1417                    1417
2929    6724    2040                    2040
2930    6725    2405                    2405
2931    6726    2324                    2324
2932    6727    4006                    4006
2933    6730    0111                    0111
2934    6731    1405                    1405
2935    6732    0400                    0400
2936    6733    0000                    EXIT
2937    6734    0014    TTOKM,          0014              /LTS TIMING OK GATE FAILED
2938    6735    2423                    2423
2939    6736    4024                    4024
2940    6737    1115                    1115
2941    6740    1116                    1116
2942    6741    0740                    0740
2943    6742    1713                    1713
2944    6743    4007                    4007
2945    6744    0124                    0124
2946    6745    0540                    0540
2947    6746    0601                    0601
2948    6747    1114                    1114
2949    6750    0504                    0504
2950    6751    0000                    EXIT
2951    6752    0014    TMATB,          0014              /LRE TMA FAILED TO INCREMENT DURING TAPE BREAK,
2952    6753    2205                    2205
2953    6754    4024                    4024
```

```
2954    6755   1501            1501        /WAS  IS
2955    6756   4006            4006
2956    6757   0111            0111
2957    6760   1405            1405
2958    6761   0424            0424
2959    6762   1740            1740
2960    6763   1116            1116
2961    6764   0322            0322
2962    6765   0515            0515
2963    6766   0516            0516
2964    6767   2440            2440
2965    6770   0425            0425
2966    6771   2211            2211
2967    6772   1607            1607
2968    6773   4024            4024
2969    6774   0120            0120
2970    6775   0502            0502
2971    6776   2205            2205
2972    6777   0113            0113
2973    7000   5600            5600
2974    7001   2701            2701
2975    7002   2340            2340
2976    7003   4040            4040
2977    7004   1123            1123
2978    7005   4000            4000
2979    7006   7777            EXITA
2980    7007   0170            C0176
2981    7010   0117            REGC
2982    7011   0000            EXIT
2983    7012   0024    TRAPM,  0024        /TAPE TRAP FAILED
2984    7013   2201            2201        /0000
2985    7014   2040            2040
2986    7015   2422            2422
2987    7016   0120            0120
2988    7017   4006            4006
2989    7020   0111            0111
2990    7021   1405            1405
2991    7022   0400            0400
2992    7023   7777            EXITA
2993    7024   0140            0140
2994    7025   0000            EXIT
2995                    S
```

```
0000   01111111  10000000  11111111  11111111  11111111  11111111  11111111  11111111
0100   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11100011

0200   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

0400   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

0600   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

1000   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

1200   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

1400   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1500   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

1600   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1700   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

2000   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2100   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

2200   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2300   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

2400   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2500   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

2600   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2700   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

3000   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3100   11111111  11111111  11111111  11111111  11111111  11111111  11111111  11110000

3200
3300

3400
3500

3600
3700
```

```
4000
4100

4200
4300

4400
4500

4600
4700


5000    11111111    11111111    11111111    11111111    11111111    11111111    11111111    11111111
5100    11111111    11111111    11111111    11111111    11111111    11111111    11111111    11111110

5200    11111111    11111111    11111111    11111111    11111111    11111111    11111111    11111111
5300    11111111    11111111    11111111    11111111    11111111    11111111    11111111    11111111

5400    11111111    11111111    11111111    11111111    11111111    11111111    11111111    11111111
5500    11111111    11111111    11111111    11111111    11111111    11111111    11111111    11111111

5600    11111111    11111111    11111111    11111111    11111111    11111111    11111111    11111111
5700    11111111    11111111    11111111    11111111    11111111    11111111    11111111    11111111


6000    11111111    11111111    11111111    11111111    11111111    11111111    11111111    11111111
6100    11111111    11111111    11111111    11111111    11111111    11111111    11111111    11111111

6200    11111111    11111111    11111111    11111111    11111111    11111111    11111111    11111111
6300    11111111    11111111    11111111    11111111    11111111    11111111    11111111    11111111

6400    11111111    11111111    11111111    11111111    11111111    11111111    11111111    11111111
6500    11111111    11111111    11111111    11111111    11111111    11111111    11111111    11111111

6600    11111111    11111111    11111111    11111111    11111111    11111111    11111111    11111111
6700    11111111    11111111    11111111    11111111    11111111    11111111    11111111    11111111


7000    11111111    11111111    11111100    00000000    00000000    00000000    00000000    00000000
7100    00000000    00000000    00000000    00000000    00000000    00000000    00000000    00000000

7200
7300

7400
7500

7600
7700
```

Symbol	Value	Symbol	Value	Symbol	Value	Symbol	Value
ASCII	5054	K3400	0004	LIM008	5435	LTT004	1560
ASCRXT	5027	K3420	0164	LIM009	5464	LWN104	0172
AXO	....	K3427	0165	LIM010	5516	LWB102	2157
BELL	5200	K3440	0154	LIM012	6025	LWB104	2224
BELLA	0103	K3700	0123	LIM013	5544	LWM101	6303
C0050	0144	K4000	0003	LIM015	5567	LWM102	6333
C0176	0170	K4140	0053	LIM017	5611	LWM104	6347
CLR	0011	K4210	0042	LIM018	5647	LWN102	2120
COM	0017	K4440	0122	LIM019	5666	LWN104	2164
CRLF	5157	K5000	0043	LIM022	5705	LWNORM	2027
DATUM	5120	K6000	0070	LIM023	5725	LXA000	2501
DATYP	5166	K6020	0135	LIN001	1367	M0100	0150
DELAY	0126	K6040	0067	LIN002	1422	M0220	0152
DOMORE	3155	K7000	0047	LINC	6141	M0400	0124
ERROR	0037	K7030	0050	LINMX1	6047	M1000	0125
ERRORS	5021	K7040	0157	LINMX2	6066	M2000	0151
ESF	0004	K7356	0171	LIP000	0202	M40	0074
EXIT	0020	K7400	0006	LIP001	0231	M4444	0052
EXITA	7777	K7737	0162	LIP002	0264	MAINT1	0032
HERE	5142	K7770	0054	LIP003	0313	MAINTS	3134
K0002	0040	K7773	0111	LIP004	0344	MOTST1	2354
K0003	0103	K7774	0076	LIP005	0403	MOTST2	2402
K0007	0156	K7777	0051	LIP006	0427	MOTST3	2425
K0010	0112	LCM000	5746	LIP007	0460	MOTT1M	6464
K0011	0153	LCM001	5762	LIP008	0502	MOTT2M	6507
K0012	0160	LCM002	6165	LIP009	0524	MOTT3M	6532
K0013	0146	LCM003	6206	LIP010	0550	NERROR	0036
K0016	0033	LCM004	6226	LIP011	0620	NERROS	5000
K0017	0007	LCM005	6245	LIP012	0630	OCTYP	5136
K0020	0110	LCM006	6261	LIP013	0677	OUTPAS	0064
K0040	0035	LCMX00	6131	LIP015	0763	PASS	0065
K0050	0107	LCMX01	6147	LIP017	1041	PASSM	6676
K0077	0073	LCS000	1513	LIP018	1116	PDP	0002
K0100	0055	LCS001	1540	LIP019	1142	PINT	0010
K0150	0057	LCS002	1577	LIP022	1172	PNTA	0060
K0160	0041	LCS003	1631	LIP024	1220	PNTB	0061
K0177	0102	LCS004	1661	LMM000	6366	PNTC	0062
K0200	0056	LCS005	1730	LMR	6151	PNTJ	0063
K0207	0104	LCS006	2000	LOADR	0034	RAN	0045
K0212	0101	LCX000	1321	LOADS	3144	RANDOM	5216
K0215	0100	LCX001	1347	LOC170	0176	REDO	5143
K0250	0005	LIA004	0121	LOCA	0450	REG004	2467
K0400	0072	LIB004	0376	LOCC	1302	REG006	2521
K1000	0071	LIB005	0422	LOCJ	3133	REG009	2605
K1026	0077	LIM000	6006	LOCTRP	3105	REG012	2672
K1400	0145	LIM001	5233	LSTERR	0024	REGA	0115
K177	0137	LIM002	5261	LTB000	2274	REGB	0116
K2000	0066	LIM003	5307	LTM000	6414	REGC	0117
K240	0075	LIM004	5326	LTM004	6105	REGD	0114
K3000	0147	LIM005	5345	LTM101	6440	REGE	0046
K3020	0161	LIM006	5364	LTR000	2231	REGF	0120
K3040	0044	LIM007	5410	LTS101	2324	REGM04	6556

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REQH06  6001
REQMED  6630
REQH-2  6652
RETURN  0002
RNA     0166
RNB     0167
SPACE   0106
STD     0416
STH     0457
TAC     0003
TEMPB   0113
THATB   6752
TIMATE  0025
TOTNAP  3074
TOTNBD  3114
TPPM    7012
        6152
TASK1   3034
TTOKM   6734
TYPE    0105
TYPECH  5103
TYPOUT  5210
UNCLLB  3027
   LP   2727
   M    6712
XPA     6154
XOA     0021
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ERRORS DETECTED: 0

LINKS GENERATED: 0

RUN-TIME: 29 SECONDS

?K CORE USED

Symbol														
ASCII	106	1944	1968#	1990										
ASCRXT	1946#	1979	2009	2048										
AXO	59#	869	890	981	1432	1434	1818	1888						
BELL	122	2057#	2061	2064										
BELLA	122#	185	1945											
C0050	157#	388												
C0176	177#	798	2980											
CLR	63#	870	1433											
COM	58#	320	321	327	328	344	345	351	352	718	719	725	726	746
	747	753	754	780	781									
CRLF	1996	2027	2031	2039#	2045	2052								
DATUM	1982	2005#	2018	2054										
DATYP	1974	2046#	2051											
DELAY	142#	150	186											
DOMORE	1902#	1915												
ERROR	85#	211	242	269	298	332	356	383	407	428	452	496	553	610
	659	707	730	758	785	839	854	880	899	933	967	998	1025	1060
	1090	1116	1161	1205	1232	1277	1333	1374	1420	1443	1470	1499	1521	1559
	1589	1646	1700	1733	1805	1840	1864	1880						
ERRORS	85	1927	1929	1933	1940#	1946	1949	1952	1953	1954	1955	1964	1965	1966
	1969	1971												
ESF	65#	1852	1859											
EXIT	51#	2106	2129	2144	2160	2175	2196	2217	2241	2267	2290	2310	2328	2359
	2374	2389	2406	2424	2437	2457	2472	2491	2506	2521	2541	2556	2570	2587
	2604	2619	2631	2650	2674	2687	2702	2724	2744	2766	2785	2804	2824	2843
	2867	2883	2905	2936	2950	2982	2994							
EXITA	52#	2420	2434	2455	2670	2721	2764	2840	2864	2880	2903	2915	2979	2992
HERE	2026#	2037												
K0002	86#	823	1693	1831										
K0003	172#	1270												
K0007	167#													
K0010	129#	1440	1496	1518	1552	1609	1624	1816	1903					
K0011	164#	827	1262	1685										
K0012	169#													
K0013	159#													
K0016	81#	203	230	261	288	374	443	466	525	577	629	673	769	814
	917	947	977	1040	1075	1105	1133	1176	1220	1254	1324	1343	1452	1488
	1543	1612	1658	1758	1779	1813								
K0017	46#													
K0026	127#	600	652	771	983	1454	1627	1723	1751	1776	1802	1896	1907	
K0040	83#	205	232	263	290	376	476	482	487	535	541	545	569	582
	588	592	634	640	644	683	687	692	695	819	829	1147	1190	1259
	1264	1313	1317	1490	1545	1621	1667	1687	1716	1763	1757	1784	1793	1376
K0050	126#	368	389	1886										
K0077	113#	1992												
K0100	99#	239	266	468	527	549	579	631	655	816	954	1242	1135	1178
	1256	1310	1618	1664	1760	1781	2000	2059						
K0150	101#	367												
K0160	87#	1399	1413	1417										
K0177	121#	2044												
K0200	100#	293	680	739	865	875	880	896	1349	1356	1364	1371	1430	
K0207	123#	2062												
K0212	120#	2042												

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K0215    119#   2040
K0210     44#    979
K0400    112#    991   1931
K1000    111#    194    221    252    279    307    471    530    572    595    624    647    675    839
          919    949   1045   1077   1138   1181   1250   1306   1392   1406   1534   1573   ....   ..
         1660   1671   1719   1754   1787
K1226    118#   2026
K1480    158#    795   1465   1850
K177     151#    849
K2000    108#    404    425    449    493    607    704
K???     116#   2001   2016
K3000    160#
K3020    170#
K3040     90#
K3400     43#
K3420    173#
K3427    174#   1576
K3440    165#   1636
K3700    138#    927    964   1019   1056   1084   1112   1155   1199   1226
K4000     42#
K4140     97#   1827
K4210     88#   1386
K4440    137#    923    957   1019   1050   1080   1107   1143   1151   1186   1194   1222   1747   1771
         1797
K????     89#   1492   1514   1548
K????    110#    400    421    489    603    700    987   1395   1409   1436   1461
K6020    166#   1294   1327   1352   1367
K6040    109#    445   1288   1321   1345   1360
K7000     93#    844
K7030     94#
K7040    168#
K7350    170#   1582
K7???     45#
K7737    143    171#
K7770     98#   1825
K7773    128#   1900
K7774    117#   2021
K7777     95#   2671
LCM000   881   2426#
LCM001   900   2438#
LCM002  1091   2571#
LCM003  1119   2599#
LCM004  1162   2605#
LCM005  1206   2620#
LCM006  1233   2633#
LCMX00  1026   2543#
LCMX01  1061   2557#
LCS000  1009#  1029
LCS001  1034#  1064
LCS002  1069#  1094
LCS003  1099#  1122
LCS004  1127#  1165
LCS005  1170#  1209
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LC0006    1214#   1236
LCX000    863#    884
LCX001    888#    903
LIA004    136#    324
LIB004    136     332#
LIB005    348     356#
LIM000    212     2458#
LIM001    243     2085#
LIM002    270     2108#
LIM003    299     2130#
LIM004    333     2146#
LIM005    357     2161#
LIM006    384     2177#
LIM007    408     2197#
LIM008    429     2219#
LIM009    453     2242#
LIM010    497     2269#
LIM012    554     2474#
LIM013    611     2292#
LIM015    660     2311#
LIM017    700     2330#
LIM018    731     2360#
LIM019    759     2375#
LIM022    786     2391#
LIM023    840     2408#
LIN001    911#    937
LIN002    941#    971
LINC      50#     199    226   235   257   284   312   318   325   342   349   370   396   416
          439     462    508   521   565   620   669   716   723   742   751   778   802   868
          889     893    913   943   980   1011  1036  1071  1101  1129  1172  1216  1243  1267
          1300    1431   1484  1509  1539  1605  1654  1690  1711  1726  1743  1817  1851  1858
          1887
LINMX1    934     2498#
LINMX2    968     2507#
LIP000    193#    215
LIP001    220#    246
LIP002    251#    273
LIP003    278#    302
LIP004    306#    336
LIP005    341#    360
LIP006    365#    387
LIP007    394#    411
LIP008    415#    432
LIP009    437#    456
LIP010    460#    500
LIP011    507#    514
LIP012    519#    557
LIP013    563#    614
LIP015    618#    663
LIP017    667#    711
LIP018    715#    734
LIP019    739#    762
LIP022    768#    789
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LIP024	793#	843	858											
LMM000	421	2703#												
LMR	54#	195	206	208	222	233	241	253	254	267	280	291	294	296
	308	316	377	401	422	446	476	477	479	483	488	490	531	536
	538	542	546	547	550	570	573	583	585	589	593	596	601	604
	625	635	637	641	645	648	653	656	676	684	688	689	696	698
	701	772	774	776	796	810	820	830	845	920	924	950	958	984
	988	1016	1046	1051	1078	1081	1108	1109	1139	1144	1148	1152	1182	1187
	1191	1195	1196	1223	1251	1260	1265	1289	1295	1307	1314	1318	1322	1328
	1346	1353	1361	1368	1388	1396	1405	1410	1437	1455	1457	1459	1462	1491
	1493	1515	1535	1546	1549	1577	1615	1622	1628	1637	1661	1668	1672	1677
	1688	1717	1720	1724	1748	1755	1764	1768	1772	1773	1785	1788	1794	1798
	1799	1820	1909											
LOADR	82#	184	204	231	262	289	379	444	467	481	486	526	540	544
	578	587	591	630	639	643	674	686	691	694	770	815	828	918
	948	978	1041	1076	1106	1134	1146	1150	1177	1189	1193	1221	1255	1263
	1305	1316	1320	1344	1359	1453	1489	1544	1613	1659	1686	1715	1759	1766
	1770	1780	1792	1796	1814									
LOADS	82	1893#	1916											
LOC176	183#	832												
LOCA	102	382#												
LOCC	104	844#												
LOCJ	105	1882#												
LOCTRP	156	1857#												
LSTERR	74#	145	146	1948	1972									
LT0000	1403	1420#												
LTM000	1444	2729#												
LTM004	999	2522#												
LTM101	1471	2747#												
LTR000	1385#	1424												
LTS101	1451#	1474												
LTT004	976#	1008												
LWA104	179#	1351	1358	1366										
LWB102	1293	1299	1320	1333#										
LWB104	179	1374#												
LWM101	1278	2651#												
LWM102	1334	2676#												
LWM104	1375	2688#												
LWN102	1286#	1337												
LWN104	1342#	1378												
LWNORM	1241#	1281												
LXA000	1429#	1447												
M0100	161#	1087												
M0200	163#	1158												
M0400	139#	1037												
M1000	140#	930	964	1022										
M2000	162#	1115	1202	1229										
M40	114#	1998												
M4444	96#	2011												
MAINT1	80#	198	225	256	283	311	369	395	415	438	461	507	520	564
	619	668	741	794	912	942	1010	1035	1070	1100	1126	1171	1215	1242
	1287	1483	1508	1538	1569	1600	1655	1710	1742	1899	1922			
MAINTS	80	1884#	1891	1901	1914									

MOTST1	1482#	1503											
MOTST2	1957#	1508											
MOTST3	1558#	1563											
MOTT1M	1560	2767#											
MOTT2M	1562	2786#											
MOTT3M	1560	2805#											
NERROR	84#	210	241	268	297	331	355	382	406	427	451	495	552	529
	658	706	729	757	784	853	879	898	932	966	997	1024	1059	1289
	1117	1168	1204	1231	1276	1332	1373	1419	1442	1469	1498	1520	1558	1588
	1645	1699	1732	1804	1839	1863								
NERROS	84	1921#	1924	1925	1926	1935	1936	1937	1956	1960	1962	1976	1977	1988
	2006	2007	2010	2014										
OCTYP	2015	2019#	2038											
OUTPAS	186#	1881												
PADC	71	107#	1873	2916										
PADSM	1882	2904#												
POP	93#	154	200	229	238	260	287	315	322	329	346	353	373	399
	419	447	460	511	524	568	623	672	720	727	748	755	782	805
	872	884	890	916	946	982	1014	1039	1074	1104	1132	1175	1219	1246
	1269	1304	1435	1487	1512	1542	1608	1657	1692	1714	1728	1746	1821	1855
	1868	1889												
PINT	684	1970	1975	2005	2046									
PNTA	102#	365												
PNTB	1038	1758	1770											
PNTC	1040	854												
PNTJ	185#	1879												
RAM	91#	1667	1675											
RANDOM	91	2072#	2084											
REDO	2027#	2034												
REG004	1568#	1593												
REG006	1599#	1650												
REG009	1652#	1704												
REG012	1799#	1737												
REGA	132#	515	807	864	1247	1274	1532	1602	1630	1641	1823	1928	1961	2672
REGB	133#	799	800	866	867	877	920	929	962	963	1020	1021	1054	1055
	1085	1086	1113	1114	1156	1157	1200	1201	1227	1228	1271	1272	1387	1389
	1404	1466	1467	1533	1555	1580	1586	1604	1670	1674	1682	1729	1730	1824
	1834	2421	2435	2456	2673	2722	2765	2841	2865	2881	2964			
REGC	134#	808	822	836	848	851	874	875	1400	1401	1414	1415	1583	1584
	1640	1643	1681	1683	1826	1836	2422	2436	2723	2842	2866	2882	2981	
REGD	131#	833	834	1684	1697	2423	2883							
REGE	92#	1694	1695	2884										
REGF	135#	994												
REGM04	1590	2825#												
REGM06	1647	2845#												
REGM09	1701	2866#												
REGM12	1734	2886#												
RETURN	40	41#	366											
RNA	175#	2073	2075	2077	2081	2082								
RNB	176#	2074	2076	2079	2083									
SPACE	125#	1993	1994	1997	2022	2036								
STD	57#	319	326	343	350									
STW	60#	717	724	745	752	779								

TAC	61#	1268	1691	1727										
TEMPB	30#	1895	1902	1911	1913									
TMATB	855	2951#												
TPEPRE	75#	79	144	148	193	220	251	265	278	326	341	394	420	437
	460	512	519	563	618	667	715	768	793	863	892	911	941	976
	1009	1034	1069	1099	1127	1170	1214	1241	1266	1280	1342	1366	1429	1451
	1482	1507	1513	1530	1568	1599	1652	1689	1709	1741	1815	1872	1904	1925
	1908													
TPTRAP	1848#	1868												
TPTRBD	1856	1864#												
TRAPM	1865	2983#												
TRC	55#	77	469	528	580	632	681	740	817	955	1043	1136	1179	1257
	1311	1393	1407	1574	1610	1619	1625	1634	1665	1761	1782	1897		
TTOK1	1813#	1844												
TTOKH	1841	2937#												
TYPE	124#	2002	2017	2035	2041	2043	2063							
TYPECH	1987	1989	1991#	2003	2020	2028	2030							
TYPOUT	124	2065#	2070											
WRCFLB	103	1805#												
WRCFLP	1741#	1809												
WRCH	1886	2919#												
XFR	56#	197	224	255	282	310	403	424	448	474	492	533	575	598
	606	627	650	678	703	801	812	824	847	922	926	953	960	990
	1018	1048	1055	1078	1083	1111	1141	1154	1184	1198	1225	1248	1253	1291
	1297	1309	1324	1330	1348	1355	1363	1370	1390	1398	1405	1412	1439	1464
	1495	1517	1537	1551	1571	1579	1617	1631	1639	1663	1675	1680	1722	1750
	1757	1775	1790	1801	1830									
XOA	64#	871	894											