

**Diagnostic Engineering Publication**

IBM POUGHKEEPSIE  
December 31, 1964

1410/7010

**Subject:** Diagnostic Program T020C - Tape Operations Test  
Sequence Number 201  
Replaces T020B

T020 requires information about system and channel configuration in order to operate properly. The minimum information required, for use at installation time is described on Summary page 003, the last page of T020 documentation.

When running from cards be sure that the Standard System Control Card (T 020 001) is punched in accordance with instructions in the "1410/7010 Introduction", Vol. 1.00.

**Reason for Change:**

A problem existed in the routine to "Test for Erase Forward During Backspace After Write Status" under certain conditions.

1. When the length of tape erased was equal to the length of the record used in the test routine.
2. One pass of the test had been run and the first 1000 records on tape, written by the last routine run, all had labels of the form xxxx 00586#.

The following changes were made to T020B to create T020C: (All pages to which changes were made are dated 12/31/64)

1. The length of the second record written in the subject routine was changed from 586 characters to End of memory - 9400.
2. The tape record label used in all 586 character records (and End of Memory records) was redefined FROM: xxxx 00586# TO: xxxx 00586#.

**Enclosures: 76 Pages**

Card Deck for CARD ONLY SYSTEMS (as punched by UP51)  
8 Cards - Card Loader (1-7) and 1 Core Clear  
183 Cards No. 001 - 183 Data Cards  
1 Card Execute Card

**Distribution:** X 1410 Tape  
X 7010 Tape  
Other

002  
TOZO  
1996

003  
T020  
Page 001

T020C  
TAPE OPERATIONS TEST  
(1410/7010)  
December 31, 1964

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4.00.00.0 TEST DESCRIPTION

.00.1 MODIFICATIONS

See Release Sheet description of changes from last level.

.00.2 DESCRIPTION

T020 tests magnetic tape operation instructions on a 1410 or 7010 Data Processing System. It is a test of electrical rather than mechanical operation.

The test covers three main areas:

- a. CPU channel circuitry, control and data lines to TAU.
- b. Tape Adapter Unit, control and data lines to drives.
- c. Tape Drive Write and Read circuitry.

These areas are by no means independent and are not completely testable separately. The test assumes that the CPU is functioning correctly and can at least decode a tape operation instruction.

Tape Units are tested sequentially, one channel at a time, on all channels. No simultaneous channel operation is performed. Overlap mode is used when the Overlap Feature is present. All tape instructions are then issued in overlap mode.

T020 can serve as a reliability test. Most instructions are used frequently enough to keep them under close surveillance.

The test is organized in building block fashion. Each block or section tests an additional area of tape operation. Each section is composed of one or more routines where each routine tests particular steps in the execution of the tape instruction. Although each routine depends on previously established operations, any routine can be run independently.

After each test routine, a monitor routine, labeled "MONITR", is entered to provide program control and report error conditions.  
(Refer to flow chart Page 013.)

4.00.00.0 TEST DESCRIPTION

.00.2 DESCRIPTION Continued

Almost all tape operations are performed through the use of utility Write, Read and Unit Control Routines. These utility routines generate the particular instruction requested, set up the data field, execute the instruction, test the channel status indicators and test for overlapped and non overlapped operation.

For additional information on the utility Write, Read and Unit Control routines refer to OPERATING HINTS and COMMENTS section 4.00.03.3.

Automatic error correction routines are used if manual intervention does not prohibit their execution. The analysis of the results of each tape operation is made in the test routine initiating the instruction, and failure to meet expected results is recorded.  
(Refer to flow chart, page 015.)

T020 begins immediately on completion of loading. No manual intervention is required. The program types its identity and the identity of each tape unit it is testing as they are selected. Success or failure indications are typed following the tape unit's identity. At completion of the test, an end of job message is typed, and T020 branches to the load program.

.00.3 EQUIPMENT REQUIRED

Any model

1410 or 7010

With

729s Mod II, IV, V, VI and/or 7330s.

Attached through

1414 Mods. 1, 2, or 7.

The Console Printer is the only output device employed.

.00.4 CARD DECK

T020 in card form consists of:

7 Cards	Load Program
1 Card	Core Clear
Program Deck <sup>1</sup>	Program T020
1 Card	Execute card (TADS) (Branch to 2000)

NOTE: Program card #001 is a STANDARD SYSTEM CONTROL CARD. It does not have any control information punched in columns 13 - 44.

.00.5 EC LEVEL OF MACHINE

1414 - 252643 (Permits backspacing into load point)

.00.6 PROGRAM RUN TIME

Approximately 3 minutes per tape drive for 729s.

4.00.01.0 LOADING PROCEDURES

Standard 1410 Diagnostic Loading Procedure is used. Refer to "1410/7010 Introductory Material" for further information.

4.00.02.0 OPERATING PROCEDURE

.02.1 Rewind and set to READY status tape drives to be tested.  
(All READY tape drives from number 1 to number 9 are tested.  
Drive 0 is not tested on any channel.)

Set ASTERISK INSERT switch to ON.

T020 begins immediately on completion of loading. No manual intervention is required.

Tape drives are tested sequentially. Each drive is tested to conclusion before the next one is selected.

All drives to be tested need not be READY when the test is begun. Additional tape units on a channel can be added in ascending sequence.

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1. See Release Sheet for exact number of cards in program deck.

- .02.2 Program operation can be changed at any time using the "Program Alter Routine". TADs are loaded as blanks and TAD locations are only tested for 1.

The TADs used are:

Standard

<u>TADs</u>	<u>ADDR</u>	<u>NOT 1</u>	<u>1</u>
TAD0	01000	Do Not	Bypass Timeout
TAD1	01001	Do Not	Loop on Routine
TAD2	01002	Do Not	Halt on Error
TAD3	01003	Do Not	Repeat Program

Special

TAD4	01004	Do Not	Bypass Overlap Mode
TAD5	01005	Do Not	Halt after 1 I/O Operation
TAD6	01006	Do Not	Rewind Unload
TAD7	01007	Do Not	Perform LRCR Test
TAD8	01008	Do Not	Bypass Status Ind Timeout

T020 is run in overlap mode if the SYSTEM CONTROL CARD indicates the Overlap Feature is present. To change from overlap mode to unoverlap mode or from unoverlap to overlap mode, T020A must be restarted from 2000 after TAD4 is changed.

Setting TAD6 to 1 causes all the tape drives to rewind and unload (instead of just rewinding) after all the drives on a channel are tested.

To run the "LRCR Test" routine, set TAD7 to 1. The routine is run the first time it is encountered after TAD7 is set. It is then bypassed until the next channel is tested. For additional information on running the "LRCR Test" routine, refer to OPERATING HINTS & COMMENTS, section 4.00.03.5.

Setting TAD8 to 1 bypass Status Indicator Error timeouts only.

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1. Longitudinal Redundancy Check Register (LRCR)



4.00.03.0 OPERATING HINTS AND COMMENTS

- .03.1 T020 tests all tape drives and channels that are READY (except drive 0). To bypass a tape drive or channel, RESET the drive to Not READY or turn the TAU to OFF LINE. The same method is used to terminate operations on a drive or channel while the test is in progress. Caution is advised as resetting the drive status may cause the TAU to hang up. Resetting the drive (status) is safest in rewind status or while the console printer is typing. Several successive RESET-START operations may be necessary to "drop" a drive.
- .03.2 Drives are tested sequentially. After each drive is tested the drive number is set in a table, but it is not typed. The table is available for display at locations 00010 to 00019. Locations 00020 to 00024 contain the channels tested. These locations are labeled "RDYTD5" and "CHANOS" respectively.

Much additional and useful information is available in the index registers (X), (locations 00025 to 00099). It is organized in the following manner:

<u>X</u>	<u>ADDR</u>	<u>LABEL</u>	<u>CONTENTS</u>
1	00025	SXR1	Address - Next routine
2	00030	SXR2	Address - Last routine
3	00035	RETURN	Address - Return to test routine
4	00040	DATA	Address - Data field for Write
5	00045	RECLEN	Record length, Write & Read fields
6	00050	BBBBB	B. -Address, Indexed Write & Read
7	00055	XAREOT	B, E, F, G, H address after Write/Read
8	00060	SXR3	Used
9	00065	SXR4	in
10	00070	SXRA	utility
11	00075	SXRB	routines.
12	00080	-----	Not used.
13	00085	TDIND	T. D. number in Ready Table.
14	00090	CHIND	Channel number in Channel Table.
15	00095	CHSTCT	Position in table of channel constants.

The only input-output area is labeled BUFFER and occupies locations 09400 to 09986.

.03.3 Most of the tape operations are performed through the use of Write, Read and Unit Control Routines. Each of the Write, Read and Unit Control Routines has multiple points of entry. The label of the entry to a routine determines the tape operation that is performed in the routine. The labels are the same as the Autocoder mnemonics of the tape instruction to be executed. Specifically, the labels of the points of entry, and therefore the operation performed in the routine are:

RWD, BSP, WTM, SKP	The Unit Control Routine
WT, WTB, WTW, WTBW, WTBEW	The Write Routine
RT, RTB, RTW, RTBW, RTBGW	The Read Routine

(The O is not used to indicate overlap mode)

For example:

1.                    B        WTM

causes a Write Tape Mark instruction (UxUnM) to be set in the Unit Control Routine and executed.

2.                    B        RTBW

causes a Tape Read instruction in odd parity, load mode, (LxBnbbbbR), to be set into the Read Routine and performed.

The Write Routine requires that the branch to it be followed by a constant that is the address of a data field. The constant can be signed or unsigned. The Write Routine moves the data from the address specified to the common input-output area (labeled "BUFFER"). The sign of the data address indicates the size of the output data field in the "BUFFER".

CONSTANT	SIZE OF DATA FIELD
Unsigned	10 Characters
Signed minus (-)	64 Characters
Signed plus (+)	586 Characters

In each case, a group mark-word mark is placed immediately to the right of the last character of the data field in the "BUFFER".

The 586 character records are composed of nine multiples of the 64 character data field addressed and a ten character record label. The record label contains the record number and the record length and is separated from the rest of the data field by a record mark (#). A typical record label is 064900586#. This is record number 649 and is 586 characters long.

The utility Write, Read and Unit Control Routines return control to the test routine from which they were entered after the operation is successfully completed. (Refer to Flow Chart, page 014.)

4.00.03.0 OPERATING HINTS AND COMMENTS Continued

- .03.4 Setting TAD5 to 1 causes a halt after each tape operation. The halt is located at a point where the Read, Write and Unit Control subroutines merge into a common routine. (Refer to flow chart, page 014.) This makes it possible to display the input-output area, indicators, address registers, etc. immediately after the operation is performed. (Preliminary setups can be performed at machine speed.)

NOTE: The halt occurs after each tape operation, Unit Control operations included. Wait for the console READ or WRITE light to be on before displaying the input-output area.

- .03.5 Pressing INQUIRY REQUEST before START on the Read phase of the "LR CR Test" routine causes a STOP after reading the first character. Setting TAD5 to 1 causes a STOP after each of the succeeding read operations. This permits a visual inspection of the TAU's CHECK register, LR CR REG and VRC REG.

- .03.6 In addition to the tests for inquiry requests (BNQs) strategically located in the program, a "BNQ" is placed within the "Program Alter Routine" itself. This permits altering more than one area of the program at one time without returning to a test routine to await the next "BNQ". To accomplish this, hold down INQUIRY REQUEST while pressing INQUIRY RELEASE.

4.00.04.0 PROGRAM STOPS AND RESTARTS

.04.1 STOPS

All programmed stops are under TAD control and occur only on request. <sup>1.</sup>

Setting TAD2 to 1 causes a halt on program detected errors. The halt is located in the "Error Control Routine" and is the only error halt used. It occurs after the error timeout and before any automatic action is taken on the error.

A STOP under control of TAD5 is provided to assist in machine debugging. Its use is explained in OPERATING HINTS & COMMENTS, section 4.00.03.4.

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1. There are two unique STOPS not directly under TAD control. The STOPS are in the "LR CR Test" routine following messages to set density switches. The routine is optional and under TAD control. The STOPS occur only when the "LR CR Test" routine is run.

#### .04.2 PROGRAM RESTARTS

After all STOPS, START causes the test to resume with the next sequential instruction. COMPUTER RESET and START returns the test to the start of the test routine in progress or the last test routine run before resetting. After the test is completed and "EOJ" is typed, COMPUTER RESET and START begins the test again at 2000.

#### 4.00.05.0 TYPEOUTS

##### .05.1 NORMAL OR NON-ERROR TYPEOUTS

T020A Test Identification - typed once at the start of the test.  
It is not retyped.

TU xx Tape Unit Identification - channel and drive number of unit  
being tested. e.g. TU 12 Channel 1, Drive 2.

PASS Pass Complete - typed only on completion of all test rou-  
tines on the selected tape unit. <sup>1.</sup>

##### .05.2 ERROR TYPEOUTS

All typeouts preceded by asterisks are error indication and are  
under TAD control. <sup>2.</sup>

Error typeouts are in four classes.

1. Reporting some Status Indicator set during operation when it  
should not have been (or was not expected.)
2. Reporting a failure to meet some predetermined condition,  
i.e., data fields fail to compare, an expected Status Indi-  
cator not set, address register at end of transfer not  
as expected, etc.
3. A "Not Ready", (1), indication or three successive errors in  
the first two routines (ERROR 01-ERROR 09) causes the testing  
of the drive to be terminated. This action is reported following  
the error typeout.
4. The B-register bit pick up and A-register drop-out test re-  
ports results in summary form. Only non zero totals are  
typed out.

- 
1. Not including "LRCR Test" routine which is optional.
  2. The summary typeouts of Class 4 are not under TAD control.

4.00.05.0 TYPEOUTS (Continued)  
Illustrations and explanations of error typeouts:

1. Status Indicator Set

\* M%B109400W    4    05000  
                  a            b            c

- a. Instruction issued - Write
- b. d-character bit of test and branch instruction used to test indicator -4- Data Check
- c. Starting address of routine in progress.  
To repeat routine ADDRESS SET to this address. 1.

2. Some expected condition not met:

\* ERROR            35            06000  
                  a                    b

- a. Error indication and code number for the condition not met. Refer to the program listing for explanation. (In the listing the error number is the label of a Set Word Mark instruction.)
- b. Starting address of routine.  
To repeat routine ADDRESS SET to this address. 1.

3. Testing of tape drive terminated prematurely:

\* DROPPED

4. The B-register bit pick up and A-register drop out test reports results in the manner:

\*B 0325  
\*C-0980  
\* 1-1000  
  a b c

- a. Indicates bit (1248ABC).
- b. Blank indicates bits picked up; hyphen, (-), indicates bits dropped.
- c. Indicates number of bits picked up or dropped.

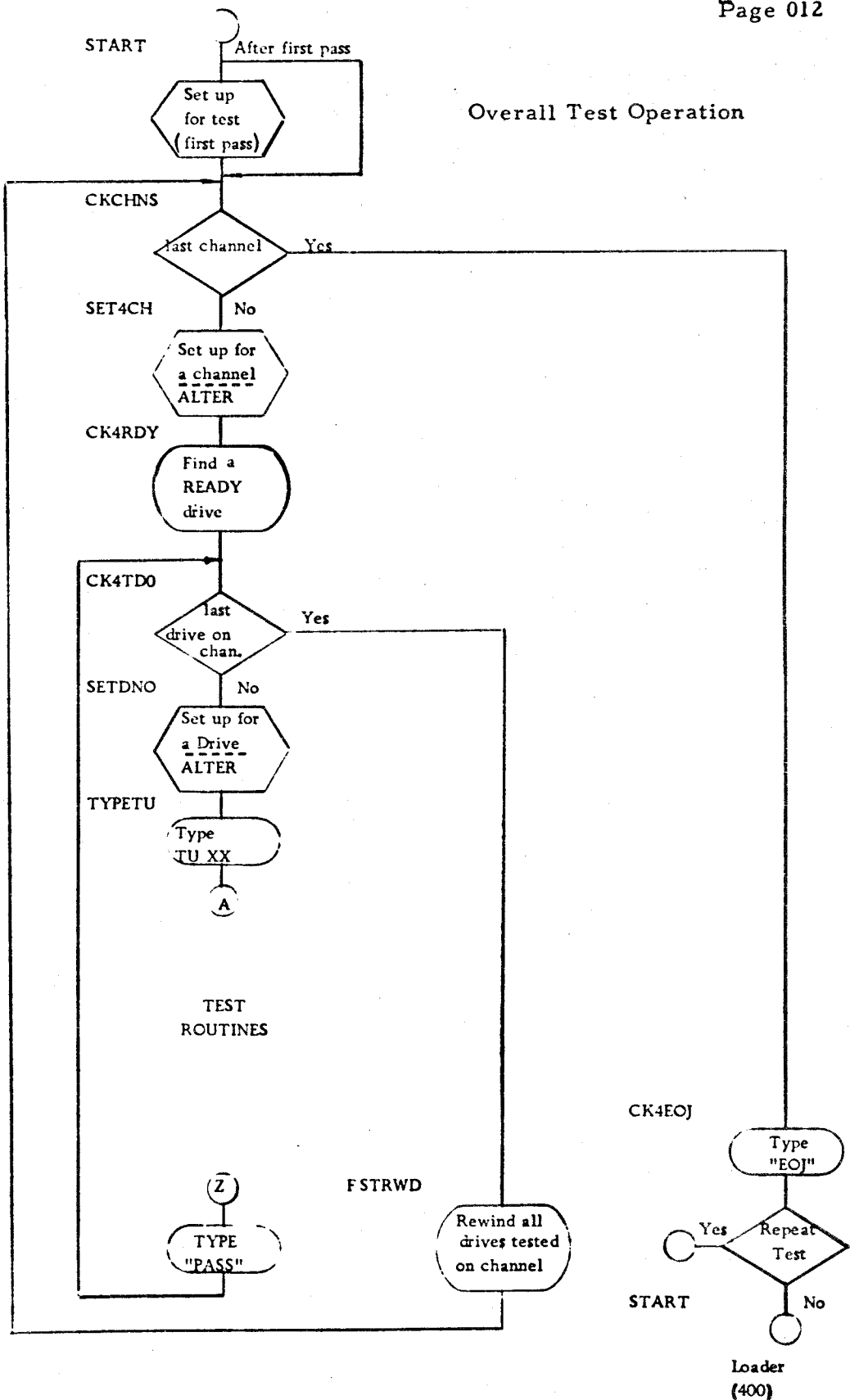
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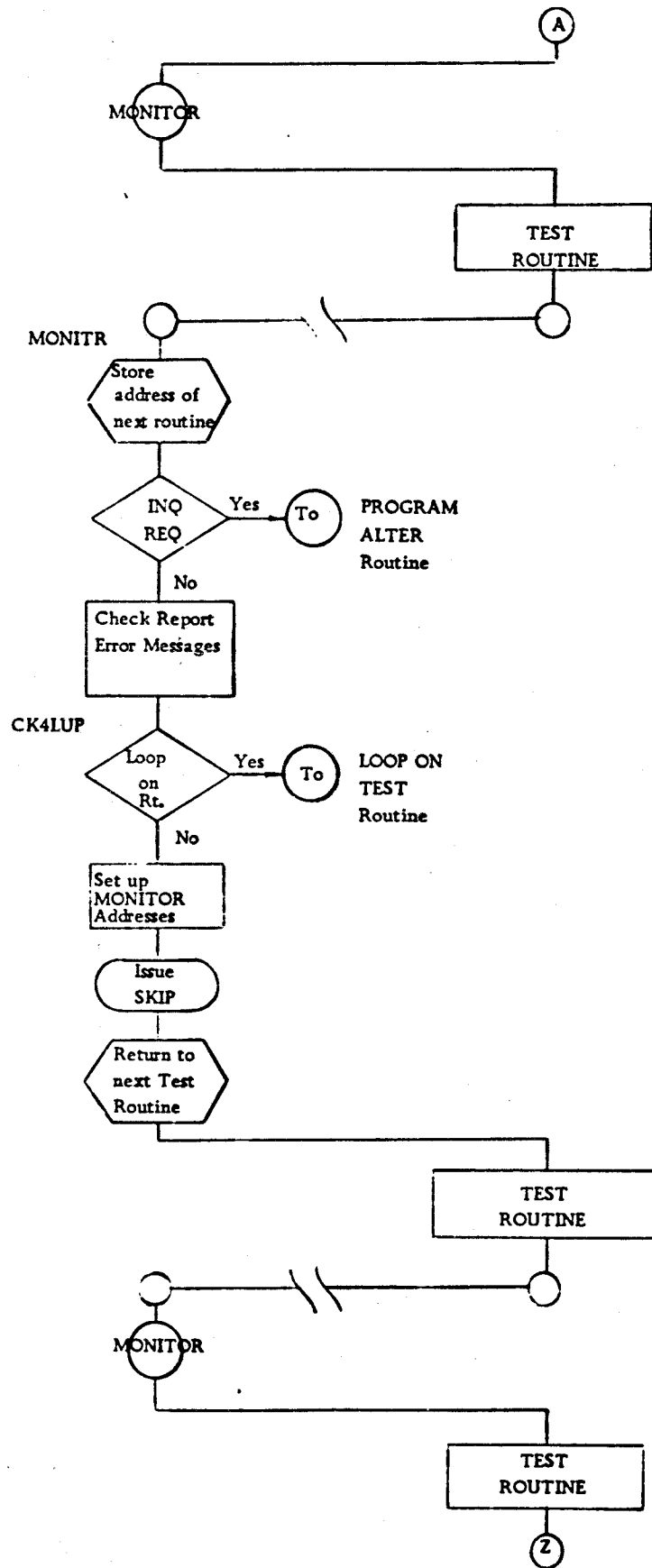
1. RESET-START can be used when TAD2 is set to STOP on error.

TAPE OPERATIONS TEST

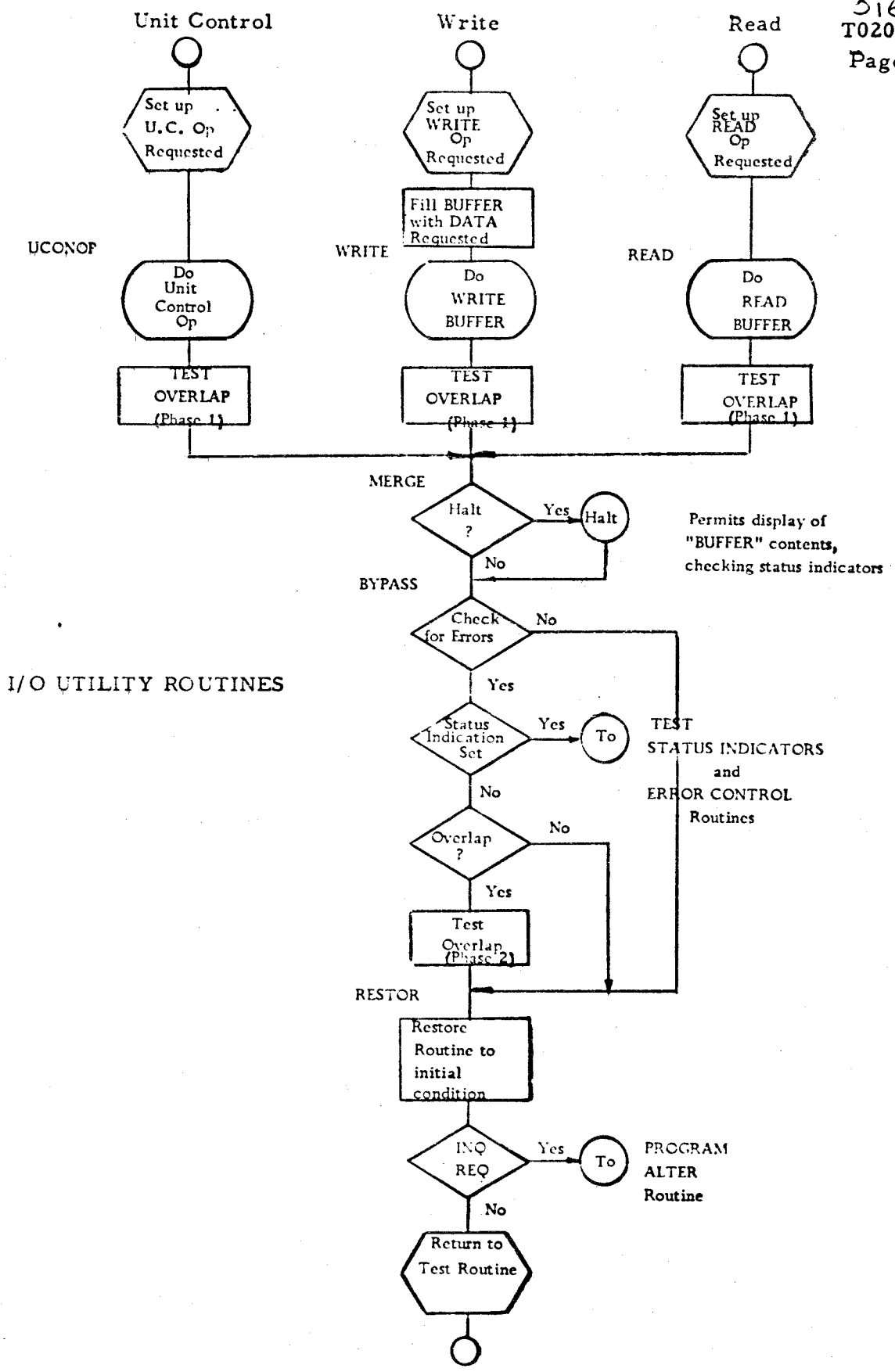
014  
T020  
Page 012

Overall Test Operation

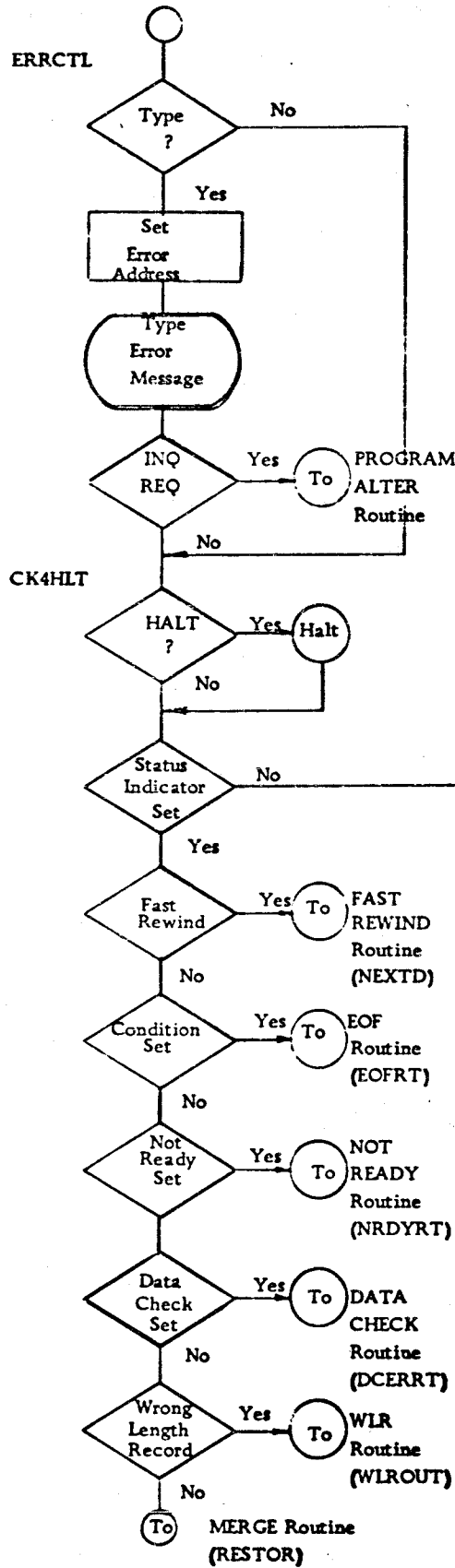




Sequence of Test Routines and common MONITOR Routine







ERROR CONTROL ROUTINE

Entry from Status Indicator Test or Scan for Wms Error Routine.

018  
T020  
page-16

TAPE OPERATIONS TEST

LABEL OPCOD OPERAND

CTL 2  
 LINES 36 MAX. LINES/PAGE 36  
 EQU 400 LOC OF LOAD PROGRAM

\* ASSIGN LABELS TO INDEX REGISTERS AND  
 \* LOCATIONS IN STORAGE

CHSTCT EQU 15,X COUNT FOR CHAN SET UP  
 CHIND EQU 14,X INDICATES CHANNEL NUMBER  
 TOIND EQU 13,X DRIVE NUMBER IN READY TABLE  
 SXRB EQU 11,X UTILITY INDEX REG  
 SXRA EQU 10,X UTILITY INDEX REG  
 SXR4 EQU 9,X UTILITY INDEX REG  
 SXR3 EQU 8,X UTILITY INDEX REG  
 XAKEUT EQU 7,X B/E/F/G/H ADDR AFTER READ/WRITE  
 BBBB EQU 6,X B-ADDR FOR INDEXED READ/WRITE  
 RECLEN EQU 5,X RECORD LENGTH  
 DATA EQU 4,X ADDR OF DATA FIELD  
 RETURN EQU 3,X ADDR OF RETURN TO TEST RT  
 SXR2 EQU 2,X ADDR OF LAST ROUTINE - MONITR  
 SXR1 EQU 1,X ADDR OF NEXT ROUTINE - MONITR

\*\*\*\*\*

ROYTDS EQU 10 TABLE OF READY IDS  
 CHANDS EQU 20 CHANNELS AVAILABLE  
 WKAREA EQU 163 WORK AREA  
 BUFEK EQU 09400 INPUT-OUTPUT AREA  
 BUFEK10 EQU BUFEK10  
 BUFEK74 EQU BUFEK74  
 BUFEK138 EQU BUFEK138  
 BUFEK202 EQU BUFEK202  
 BUFEK266 EQU BUFEK266  
 BUFEK330 EQU BUFEK330  
 BUFEK394 EQU BUFEK394  
 BUFEK458 EQU BUFEK458  
 BUFEK522 EQU BUFEK522  
 BUFRND EQU 09985 LAST CHAR IN BUFEK

LOC OF FIRST CHAR OF  
 A GROUP, IN A RECORD  
 MADE UP OF MULTIPLES  
 OF A GROUP & A LABEL

TAPE OPERATIONS TEST

CT ADDR INSTRUCTION

OPCOD OPERAND

LABEL

LABEL	OPCOD	OPERAND	CT	ADDR	INSTRUCTION
•		***** ORG 01000		01000	
TAD0	DC	2 2	1	01000	
TAD1		2 2	1	01001	
TAD2		2 2	1	01002	
TAD3		2 2	1	01003	
•		***** SPECIAL TADS *****			
TAD4		2 2	1	01004	
TAD5		2 2	1	01005	
TAD6		2 2	1	01006	
TAD7		2 2	1	01007	
TAD8		2 2	1	01008	
GMWM	DCW	2 2	1	01009	
•		*** PROGRAM SET UP IN NOT 1 CONDITION ***			
•		AND WILL ONLY TEST FOR 1			
•		*PROGRAM ALTER ROUTINE			
CONTRL	SBR	CTLXIT65	7	01010	G 01084 B
ENTER	RCP	ADDRESS4	10	01017	M X10 01052 R
	BEX1	ENTER,M	7	01027	R 01017 M
	BNT1	CTLXIT	7	01034	R 01079 B
	BAL	ADDRES	7	01041	R 01048 M
ADDRESS	RCPW	00000	10	01048	L X10 00000 R
	BEX1	ADDRES,M	7	01058	R 01048 M
	BAL	*E1	7	01065	R 01072 M
	BNQ	ENTER	7	01072	J 01017 Q
CTLXIT	B	00000	7	01079	J 00000
•		STAY HERE-ALTER MORE			
		RETURN TO PROGRAM			
		*****			

TAPE OPERATIONS TEST

LABEL      OPCOD    OPERAND

CT    ADDR    INSTRUCTION

CONTROL INFORMATION  
 SEQ# 201    LOK    SYSL ONLY

TEST IDENTIFICATION  
 SUFFIX LEVEL

\*SYSTEM CONTROL CARD  
 INDICATE SYSTEM TYPE

0    1410 STD  
 I    1410 ACC  
 X    7010

INDICATE SYSTEM SIZE

0-10,1-20,3-40    K  
 5-60,7-80,9-100    K

NOT INTERROGATED

1-SYSTEM HAS OVERLAP

NOT INTERROGATED

1-SYSTEM HAS CHAN 2

1-SYSTEM HAS CHAN 3

1-SYSTEM HAS CHAN 4

NOT INTERROGATED

\*\*\*\*\*

\*CONSTANTS,COUNTERS & SWITCHES

ORG    1230  
 DC    a  
 DC    a20101a

DCM    aT020a  
 DC    aCa,G

ORG    1256  
 DC    a a

a a

a a

a a

a a

a a

a a

a a

a a

a#a

ORG    1086

DCW    a00009a

DCW    a00010a

DCW    a00064a

DCW    a00586a

DCW    a09410a

DCW    a09411a

DCW    a09465a

01230

15 01244

5 01249

4 01253

1 01254

01256

1 01256

1 01257

5 01262

1 01263

5 01268

1 01269

1 01270

1 01271

16 01287

1 01288

01086

5 01090

5 01095

5 01100

5 01105

5 01110

5 01115

5 01120

LENGTH OF DATA FIELD

LENGTH OF DATA FIELD

LENGTH OF DATA FIELD

LENGTH OF DATA FIELD

ADDR REG AFTER 10 CHARS

ADDR REG AFTER 11 CHARS

ADDR REG AFTER 64 CHARS

00009

00010

00064

00586

009410

009411

009465

TAPE OPERATIONS TEST

LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
ZERO	EQU	00000			
8PRIME	DCW	ZERO888888	5	01125	00#-0
EDMANI	DCW	09999	5	01130	
WTEADR	DCW	09990	5	01135	
LERROR	DCW	ERROR#	5	01140	
ALLIND	DCW	1248BA	6	01146	
WMERCT	DCW	000	1	01147	
DCCNT	DCW	000	1	01148	
WLRcnt	DCW	000	1	01149	
RECNT1	DCW	0000	4	01153	
RECNT2	DCW	0000	4	01157	
HOLDIT	DCW	00000	5	01162	
HAFDUN	DCW	DRODPC	5	01167	08627
8PUCNT	DCW	00000	5	01172	
COUNT0	EQU	DUMMY-6			
SAVEIT	DCW	0000	4	01176	
TIME1	DCW	06	2	01178	
DLACNT	DCW	000000	6	01184	
DELAY1	DCW	000000	6	01190	
TISW	DCW	0 0	2	01192	
OIPSW	DCW	0 0	2	01194	
	DC	WTFTPC	5	01199	09336
	DCW	WTFTPB	5	01204	09272
	DCW	WTFIPA	5	01209	09208
	DCW	WTFIPB	5	01214	09144
	DCW	WTFIP4	5	01219	09080
	DCW	WTFIP2	5	01224	09016
FREQ1	DCW	WTFIP1	5	01229	08952
	ORG	1289			01289

BASE FOR INDEXD R/W  
INDEXED R/W ADDRESS  
END OF MEMORY ADDRESS  
END OF MEMORY-10  
ALL STATUS IND  
ERROR COUNT  
DATA CHECK COUNTER  
WLR COUNT  
RECORD COUNT  
COUNT TO FIND LABEL  
SAVE ADDRESS  
BIT PICK UP COUNT  
A FIELD OF 4 ZEROS  
SAVE RECORD NUMBER  
LOOP TIME FOR SPACE, 1 SEC ON 7010  
TIME TO TURN ON T.I.  
SWITCH LOCATIONS  
OVERLAP INDICATOR  
TEST PATTERN SEQUENCE  
FOR A WRITE TRIGGER FREQUENCY  
TEST ROUTINE. PATTERNS ARE  
WRITTEN IN ASCENDING SEQUENCE

TAPE OPERATIONS TEST

LABEL OPCODE OPERAND

\* INSTRUCTION ALTERATION ROUTINE  
 \* OP CODES, X-CONTROL FIELDS & D MODS  
 \* ARE ALTERED ACCORDING TO CHAN REQ

LABEL	OPCODE	OPERAND	DESCRIPTION	CT	ADDRS	INSTRUCTION
I-A-R	SBR	SXRA	STORE ADDR OF DATA	7	01289	G 00074 B
	MLNA	4&SXRA, SXRB	SET START ADDR IN XR	12	01296	D 00.4 00079 /
IARSCN	SCNLB	09990, 0&SXRB	SCAN TO B FIELD WM	12	01308	U 09990 00.M0 -
	SBR	SXRB	BAR IS B FIELD WM-1	7	01320	G 00079 B
	C	SXRB, 9&SXRA	CHECK FOR STOP ADDR.	11	01327	C 00079 00.9
	BH	14&SXRA	STOP ADDR. IS HIGHER	7	01338	J 00.J4 U
	MLCS	1&SXRB, *E12	MOVE CHAR TO TEST IT	12	01345	D 00.M1 01368 3
	BCE	IARIOP, IAROPS, 0	I/O OP CODE	12	01357	B 01393 01503 0
	BCE		CHECK CHAR UNDER WM	1	01369	B
	BCE		IS IT ONE IN TABLE	1	01370	B
	BCE	IARCSI	CHAN STATUS IND OP	6	01371	B 01424
	BCE		IF SD GO CHANGE IT	1	01377	B
	BCE		IF NOT KEEP LOOKING	1	01378	B
	BCE			1	01379	B
	BCE	IARJOP	J OP, CK FOR OIP D-CH	6	01380	B 01443
	B	IARSCN	SCAN TO NEXT WM	7	01386	J 01308
IARIOP	MLNS	13&SXRA, 4&SXRB	ALTER X-CTL-FLD, NO. 3	12	01393	D 00.J3 00.M4 1
	MLCS	10&SXRA, 2&SXRB	ALTER X1, CHAN-MODE	12	01405	D 00.J0 00.M2 3
	B	IARSCN	GO	7	01417	J 01308
IARCSI	MLCS	11&SXRA, 1&SXRB	ALTER STATUS IND OP	12	01424	D 00.J1 00.M1 3
	B	IARSCN		7	01436	J 01308
IARJOP	MLCS	7&SXRB, *E12	MOVE D-CH TO TEST IT	12	01443	D 00.M7 01466 3
	BCE	IARBOL, IARDIS, 0	CHECK D-MOD CHAR	12	01455	B 01477 01507 0
	BCE		IS IT ONE	1	01467	B
	BCE		OF D-CHARS USED TO	1	01468	B
	BCE		TEST FOR OL IN PROC	1	01469	B
IARBOL	B	IARSCN		7	01470	J 01308
	MLNS	12&SXRA, 7&SXRB	ALTER BOL D-MOD CHAR	12	01477	D 00.J2 00.M7 1
	B	IARSCN		7	01489	J 01308
IAROPS	DCH	0J13XRULM0	OP CODES SCANNED FOR	8	01503	
IARDIS		043210	D-MODS TO TEST UIP	4	01507	

\* CHANNEL CONSTANTS FOR ALTER ROUTINE-  
 \* CHAN OP CHAR- UNOVERLAP AND OVERLAP,  
 \* CHAN STATUS INDICATOR OP CODE,  
 \* CHAN BRANCH ON OLAP TEST D-MOD CHAR

CHCON	DC	OPRND	OPCOD	CT	ADDR	INSTRUCTION
	DC	00R10		3	01508	CHANNEL 1
	DCW	000		1	01511	OVERLAP
	DC	00X20		3	01514	CHANNEL 2
	DCW	000		1	01515	OVERLAP
	DC	00M30		3	01518	CHANNEL 3
	DCW	000		1	01519	OVERLAP
	DC	00L40		3	01522	CHANNEL 4
	DCW	000		1	01523	OVERLAP
GOPDS	DCW	00EFGH0		4	01524	D MODS FOR G CCCCC X

\*\*\*\*\*

\*SET UP FOR CHANNEL TO BE TESTED

SET4CH	S	CHSTCT	ZERO CH STATUS COUNT	CT	ADDR	INSTRUCTION
	S		ZERO CHAN COUNTER	6	01528	S 00099
CKCHNS	BCE	CK4EOJ,CHAN0ECHIND,	LAST CH ON SYSTEM	1	01534	S
	MRC	CHCON&CHSTCT,CHSTAT	SET CH CONS IN ALTER RT	12	01535	B 06603 00MKO
	BCE	UPSTCT,TAD4,1	UN-OVERLAP OPERATION	12	01547	D 01EM8 01798 #
	MRC	CHCON&3&CHSTCT,CHSTAT	OVERLAPPED OP	12	01559	B 01613 01004 1
	MLCS	CHCON&3&CHSTCT,TESTX1&11	X1 CHAR FOR OL	12	01571	D 01EAL 01798 #
	CW	AREOTO	DONT G CCCCC D YET	12	01583	D 01EAL 07706 3
	MLCS	GOPDS&CHIND,AREOTO&6	SET D MOD CHAR	6	01595	D 07917
UPSTCT	A	FOUR,CHSTCT	UP COUNTER BY 4	12	01601	D 01EK4 07923 3
	MLNS	CHAN0ECHIND,TUIDNO-1	SET CH # IN TAPE UNIT I.D.	11	01613	A 08701 00099
	A	ONE,CHIND	UP 1 FOR NEXT CHAN	12	01624	D 00MKO 01831 1
	MLCS	CHSTAT,CKDRIVE1	SET UP WRITE INSTRUCTION	11	01636	A 08681 00094
	MLCS	CHSTATE1,CKDRIVE10	SET UP D-MOD FOR NOT RDY TEST	12	01647	D 01798 01735 3
	SW	LRCRCK&1	SLT TO RUN LRCR TEST ON 1 DRIVE	12	01659	D 01799 01744 3
				6	01671	, 02906



TAPE OPERATIONS TEST

CT ADDR INSTRUCTION

CHECK FOR READY DRIVES ON A CHANNEL

LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION
CK4RDY	S	RDYDSE9	6	01677	S 00019
	S	ZERO TAPE DRIVE NO	1	01683	S
	S	ZERO TAPE DRIVE CNTR	6	01684	S 00089
	CH	CK4TD0E1	6	01690	0 01708
NEXTDR	A	ONE,ATDNO	11	01696	A 08681 00009
CK4TDO	NOPHM		1	01707	N
	BZ	FSTRWD	7	01708	J 06646 V
	BZ	CKCHNS	7	01715	J 01535 V
	MLNS	ATDNO,UNITNO	12	01722	D 00009 01737 1
	WT	10,BUFER	10	01734	M XUO 09400 W
CKDRIV	BNR1	NEXTDR	7	01744	R 01696 1
	MLNS	UNITNO,TDNO	12	01751	D 01737 01801 1
	MLNS	UNITNO,TUIDNO	12	01763	D 01737 01832 1
	SW	CK4TD0E1	6	01775	0 01708

ALTER INSTRUCTIONS FOR DRIVE SELECTED

LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION
ALTER	B	I-A-R	7	01781	J 01289
	DCW	UPREND	5	01792	08585
		TDNO	5	01797	01801
CHSTAT	DC	0 0	1	01798	
		0 0	1	01799	
	DCW	0 0	1	01800	
TDNO	DCW	000	1	01801	
	BA1	0E1	7	01802	R 01809 M
	RWD	10	5	01809	U XUO R
	BA1	0-11	7	01814	R 01809 M
TUIDNO	B	TYPEIT	7	01821	J 09344
	DCW	0TU 000,G	5	01832	
	B	BEGIN	7	01834	J 02015

CT ADDR INSTRUCTION

MONITOR ROUTINE

MONITR SBR SXR1 RETURN ADDRESS  
 BAI \*E1 RESET I/O INTERLOCK  
 BNQ CONTRL TO PROGRAM CONTROL ROUTINE  
 B CK4WMS CHECK FOR ERRORS  
 NOPWM  
 B UPDATE&I2 BYPASS LOOP CHECK  
 BCE WHICHI,TAD1,1 CHK FOR LOOP ON ROUT  
 B UPDATE BYPASS LOOP CHECK  
 C SXR1,SXR2 COMPARE ROUT ADDR  
 SW LRCRCK&I SET TO LOOP ON LRCR CKS  
 BL O&SXR2 LOOP ON ROUTINE  
 MLNB SXR1,SXR2 SET ADDR FOR LOOP RT  
 CW CK4LUP&I RESTORE LOOP ON RT

7 01841 G 00029 H  
 7 01848 R 01855 M  
 7 01855 J 01010 Q  
 7 01862 J 08076  
 1 01869 N  
 7 01870 J 01932  
 12 01877 B 01896 01001 I  
 7 01889 J 01920  
 11 01896 C 00029 00034  
 6 01907 , 02906  
 7 01913 J 000,0 T  
 12 01920 D 00029 00034 J  
 6 01932 B 01870

6 01938 S 01147  
 7 01944 J 06932

7 01951 J 000\*0  
 1 01958 .

RETURN  
 DEFINE PRECEDING BRANCH LENGTH  
 \*\*\*\*\*

PROGRAM STARTS HERE

ORG 2000

START NOP

B SETUP

B SETACH

BEGIN NOP

1 02000 N  
 7 02001 J 09400  
 7 02008 J 01528  
 1 02015 N

TEST DRIVES SEQUENTIALLY AS THEY ARE FOUND READY  
 DRIVE SHOULD BE AT L.P. OR ON WAY TO L.P.  
 AFTER REWINDING

TAPE OPERATIONS TEST

CT ADDR INSTRUCTION

OPCOD OPERAND

LABEL

\*TEST REWIND OPERATION

RWD AT LP-SPACE FORWARD-RWD TO LP

7	02016	J 01841
7	02023	J 06875
5	02030	U XUI R
6	02035	, 00202
7	02041	R 02054 2
6	02048	□ 00202

TO MONITOR ROUTINE  
 TO REWIND ROUTINE  
 ISSUE REWIND AGAIN  
 BUSY AT LP  
 CHECK FOR BUSY  
 DO NOT LEAVE ERROR SET ON

7	02054	J 01841
5	02061	U XUI A L
7	02066	R 02080 B G
7	02073	R 02061 M
6	02080	□ 02092
5	02086	U XUI R
1	02091	N
7	02092	J 02124
6	02099	, 02092
7	02105	R 02086 2
6	02112	, 00203
6	02118	, 00204
7	02124	R 02144 L B G M
7	02131	R 02086
6	02138	□ 00204
5	02144	U XUI R
7	02149	R 02162 2
6	02156	, 00205

REPORT ERROR  
 SPACE AWAY FROM L.P.  
 BRANCH ON 1/4/8/A/B  
 TRY AGAIN IF BUSY  
 SET SWITCH  
 DRIVE SHOULD BE BUSY  
 SPACING WHEN RWD3 IS  
 ISSUED FIRST TIME  
 RESET RWD3 AFTER  
 1 ST PASS-IF NOT BZY  
 NOW DID NOT SPACE  
 IND SET ON RWD  
 BRANCH ON 1/4/8/A/B  
 TRY AGAIN IF BUSY  
 DO NOT LEAVE ERROR SET ON  
 ISSUE RWD TO CK BUSY  
 BUSY NOW- OK CONTINUE  
 NOT BUSY- NO REWIND

7	02162	J 01841
7	02169	J 06875
5	02176	U XUI R
6	02181	, 00206
7	02187	R 02200 2
6	02194	□ 00206

REWIND AT LOAD POINT  
 AND AGAIN TO CK BUSY  
 WENT BUSY AT LP  
 SHOULD NOT BE BUSY  
 DO NOT LEAVE ERROR SET ON

7	02162	J 01841
7	02169	J 06875
5	02176	U XUI R
6	02181	, 00206
7	02187	R 02200 2
6	02194	□ 00206

\*\*\*\*\*

7	02162	J 01841
7	02169	J 06875
5	02176	U XUI R
6	02181	, 00206
7	02187	R 02200 2
6	02194	□ 00206

\*\*\*\*\*

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
*		*TEST BACKSPACE OPEKATION			
*		BSP AT LP-SPACE FORWARD-BSP TO LP			
BSP1ST	B	MONITR	7	02200	J 01841
BSP2	B	BSP	7	02207	J 06894
ERROR 06	SW	ERR06	5	02214	U XUI B
	BCB1	*E7	6	02219	, 00207
	CW	ERR06	7	02225	R 02238 2
			6	02232	□ 00207
					DO NOT LEAVE ERROR SET ON
BSP3	B	MONITR	7	02238	J 01841
	CU	XUI,A	5	02245	U XUI A
	BEX1	*E8,B	7	02250	R 02264 B L G M
	BAL	*-18	7	02257	R 02245 M
	B	BSP	7	02264	J 06894
	CW	BSPSWG1	6	02271	□ 02283
BSP4	BSP	11	5	02277	U XUI B
BSPSW	NOPWM		1	02282	N
	B	BSPBZY	7	02283	J 02315
	SW	BSPSWG1	6	02290	, 02283
	BCB1	BSP4	7	02296	R 02277 2
ERROR 07	SW	ERR07	6	02303	, 00208
ERROR 08	SW	ERR08	6	02309	, 00209
BSPBZY	BEX1	*E14,B	7	02315	R 02335 B L G M
	BAL	BSP4	7	02322	R 02277 M
	CW	ERR08	6	02329	□ 00209
					DO NOT LEAVE ERROR SET ON
BSP5	B	MONITR	7	02335	J 01841
BSP6	B	BSP	7	02342	J 06894
ERROR 09	SW	ERR09	5	02349	U XUI B
	BCB1	*E7	6	02354	, 00210
	CW	ERR09	7	02360	R 02373 2
			6	02367	□ 00210
					DO NOT LEAVE ERROR SET UN
					*****
*		BACKSPACE MOVES TAPE BACKWARD - STOPS AT LP			

TAPE OPERATIONS TEST

LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
*		*TEST WRITE TAPE MARK OPERATION			
*		WTM-SPACE, TEST FOR TI ON, TURN TI OFF			
	B	MONITR	7	02373	J 01841
	BTI	*E1	7	02380	J 02387 K
	B	WTM	7	02387	J 06913
	B	BSP	7	02394	J 06894
	B	SPACE	7	02401	J 06792
	BW	*E7, TISW	12	02408	V 02426 01192 I
ERROR 10	SW	ERR10	6	02420	, 00211
ERROR 11	SW	ERR11	6	02426	, 00212
	BTI	*E7	7	02432	J 02445 K
	CW	ERR11	6	02439	□ 00212

\*\*\*\*\*

\*TEST SPACE OPERATION  
SHOULD SPACE OVER ONE RECORD ONLY

	B	MONITR	7	02445	J 01841
	B	WT	7	02452	J 07027
DCW		TENGMS	5	02463	08680
B		WTM	7	02464	J 06913
B		BSP	7	02471	J 06894
B		BSP	7	02478	J 06894
B		SPACE	7	02485	J 06792
ERROR 12	SW	*E7, TISW-1	12	02492	V 02510 01191 I
		ERR12	6	02504	, 00213
B		SPACE	7	02510	J 06792
BW		*E7, TISW	12	02517	V 02535 01192 I
ERROR 13	SW	ERR13	6	02529	, 00214

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SPACE MOVES OVER ONLY ONE RECORD

\* TEST ERASE/SKIP OPERATION

LABEL	OPCOD	OPERAND	CT	ADDR	INSTRUCTION
	B	MONITR	7	02535	J 01841
	B	WTM	7	02542	J 06913
	B	WTM	7	02549	J 06913
	B	SKF	7	02556	J 06932
	B	WTM	7	02563	J 06913
	B	BSP	7	02570	J 06894
	B	BSP	7	02577	J 06894
	B	BSP	7	02584	J 06894
	B	SPACE	7	02591	J 06792
ERROR 14	BW	*E7,TISW	12	02598	V 02616 01192 I
	SW	ERR14	6	02610	, 00215
	B	SPACE	7	02616	J 06792
ERROR 15	BW	*E7,TISW	12	02623	V 02641 01192 I
	SW	ERR15	6	02635	, 00216
	MLNA	DLACNT,DELAY1	12	02641	D 01184 01190 /
	A	DELAY1	6	02653	A 01190
	A	DLACNT,DELAY1	11	02659	A 01184 01190
	B	SPACE	7	02670	J 06792
ERROR 16	BW	*E7,TISW	12	02677	V 02695 01192 I
	SW	ERR16	6	02689	, 00217
	C	DELAY1,DLACNT	11	02695	C 01190 01184
	BH	*E7	7	02706	J 02719 U
ERROR 17	BW	ERR17	6	02713	, 00218

\*\*\*\*\*  
SKIP/ERASE WORKS

TAPE OPERATIONS TEST

T020 CT ADDR INSTRUCTION

LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION
*		*TEST STATUS INDICATORS AND ODD PARITY LATCH			
*		READ TM EVEN PARIITY, TEST FOR EOF			
	B	MONITR	7	02719	J 01841
	B	WTM	7	02726	J 06913
	B	BSP	7	02733	J 06894
	SW	BYPASS&1	6	02740	, 07651
	B	RT	7	02746	J 07420
	BEF1	*&7	7	02753	R 02766 8
ERROR 20	SW	ERR20	6	02760	, 00221
	BWL1	*&7	7	02766	R 02779 -
ERROR 21	SW	ERR21	6	02773	, 00222
	BEX1	*&8,X	7	02779	R 02793 X
	B	*&7	7	02786	J 02799
ERROR 22	SW	ERR22	6	02793	, 00223
*		*****			
*		READ TM ODD PARITY, TEST FOR EOF & DC			
*		ALSO 1ST TEST OF ODD RED LATCH			
	B	MONITR	7	02799	J 01841
	SW	AREOTO	6	02806	, 07917
	B	WTM	7	02812	J 06913
	B	BSP	7	02819	J 06894
	SW	BYPASS&1	6	02826	, 07651
	B	RT8	7	02832	J 07438
	BEF1	*&7	7	02839	R 02852 8
ERROR 23	SW	ERR23	6	02846	, 00224
	BWL1	*&7	7	02852	R 02865 -
ERROR 24	SW	ERR24	6	02859	, 00225
	BER1	*&7	7	02865	R 02878 4
ERROR 25	SW	ERR25	6	02872	, 00226
	BEX1	*&8,T	7	02878	R 02892 T
	B	*&7	7	02885	J 02898
ERROR 26	SW	ERR26	6	02892	, 00227
*		*****			

TAPE OPERATIONS TEST

LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
*		*LRCR TEST			
*		WRITE AT 200 BPI - 1 2 4 8 A B C			
LRCRCK	B	MONITR	7	02898	J 01841
	NOPWM		1	02905	N
	BCE	*E8,TAD7,1	12	02906	B 02925 01007 1
	B	NOLRCR	7	02918	J 03185
	CW	LRCRCK&1	6	02925	□ 02906
	B	RWD	7	02931	J 06875
	B	TYPEIT	7	02938	J 09344
	DCW	@SET TO 200 BPI@,G SET DENSITY SWITCH	14	02958	
	H		1	02960	.
	CS	WKAREA	6	02961	/ 00163
	MLCWS	GMHM,WKAREA-62	12	02967	D 01009 00101 7
	SW	AIBIT&1	6	02979	, 09344
	SAR	SXR4	7	02985	G 00069 A
SETNXT	MLCS	0ESXR4,WKAREA-63	12	02992	D 00.40 00100 3
	SAR	SXR4	7	03004	G 00069 A
	B	WTB	7	03011	J 07045
	DCH	-WKAREA	5	03022	00163
	BW	SEINXT,1&SXR4	12	03023	V 02992 00.41 1

DATA TAKEN FROM HERE  
WRITE 1 2 4 8 A B C BITS



TAPE OPERATIONS TEST

1020

CT ADDR INSTRUCTION

OPCOD OPERAND

LABEL

LRCR TEST ROUTINE CONTINUED  
READ AT 556 8PI

LABEL	OPCOD	OPERAND	CT	ADDR	INSTRUCTION
	B	RWD	7	03035	J 06875
	B	TYPEIT	7	03042	J 09344
	DCW	QSET TO 556 8PI,G SET DENSITY SWITCH	14	03062	
	H	SET TADS TO 1 FOR STOP	1	03064	.
	S	RECNT1	6	03065	S 01153
CKALL7	BCE	NOLRCR,RECNT1,7	12	03071	B 03185 01153 7
	SW	BYPASSE1	6	03083	, 07651
	B	RTB	7	03089	J 07438
	A	ONE,RECNT1	11	03096	A 08681 01153
	BER1	*E7	7	03107	R 03120 4
ERROR 90	SW	ERR90	6	03114	, 00291
	BCE	*E8,BUFER,*	12	03120	B 03139 09400 *
	B	*E7	7	03132	J 03145
ERROR 91	SW	ERR91	6	03139	, 00292
	BEX1	*E8,Z	7	03145	R 03159 Z
	B	*E7	7	03152	J 03165
ERROR 92	SW	ERR92	6	03159	, 00293
	SW	CK4LUP&1	6	03165	, 01870
	B	MONITR	7	03171	J 01841
	B	CKALL7	7	03178	J 03071

CHARACTER MUST NOT BE AN \*

BRANCH ON A/8/1

DONT LOOP HERE

\*\*\*\*\*

TAPE OPERATIONS TEST

LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
•		•TEST END OF XFER ON WRITE AND READ			
•		WRITE 10 CHAR RECORD- READ INTO 10 CHAR AREA			
NOLRCR	B	MONITR	7	03185	J 01841
	CW	TENGMS	6	03192	D 08680
	B	WT	7	03198	J 07027
	DCW	TENGMS	5	03209	08680
	C	XAREOT,C09411	11	03210	C 00059 01115
	BE	*E7	7	03221	J 03234 S
ERROR 27	SW	ERR27	6	03228	, 00228
	B	BSP	7	03234	J 06894
	B	RT	7	03241	J 07420
	C	XAREOT,C09411	11	03248	C 00059 01115
	BE	*E7	7	03259	J 03272 S
ERROR 28	SW	ERR28	6	03266	, 00229
•		WRITE 10 CHAR RECORD- READ INTO 9 CHAR AREA			
	B	MONITR	7	03272	J 01841
	CW	TENGMS	6	03279	D 08680
	B	WT	7	03285	J 07027
	DCW	TENGMS	5	03296	08680
	B	BSP	7	03297	J 06894
	MLNA	C00009,RECLEN	12	03304	D 01090 00049 /
	SW	BYPASS&1	6	03316	, 07651
	B	RT	7	03322	J 07420
	C	XAREOT,C09410	11	03329	C 00059 01110
	BE	*E7	7	03340	J 03353 S
ERROR 29	SW	ERR29	6	03347	, 00230
	BHL1	*E7	7	03353	R 03366 -
ERROR 30	SW	ERR30	6	03360	, 00231
	BEX1	*E8,S	7	03366	K 03380 S
	B	*E7	7	03373	J 03386
ERROR 31	SW	ERR31	6	03380	, 00232

TOZO  
CT ADDR INSTRUCTION

TAPE OPERATIONS TEST

LABEL OPCOD OPERAND

WRITE 9 CHAR RECORD-READ INTO 10 CHAR AREA

OPCODE	OPERAND	CT	ADDR	INSTRUCTION
B	MONITR	7	03386	J 01841
SW	TENGMS	6	03393	, 08680
B	WT	7	03399	J 07027
DCW	TENGMS	5	03410	08680
C	XAREOT,C09410	11	03411	C 00059 01110
BE	*E7	7	03422	J 03435 S
SW	ERR32	6	03429	, 00233
B	BSP	7	03435	J 06894
SW	BYPASS&1	6	03442	, 07651
B	RT	7	03448	J 07420
C	XAREOT,C09410	11	03455	C 00059 01110
BE	*E7	7	03466	J 03479 S
SW	ERR33	6	03473	, 00234
BWLI	*E7	7	03479	K 03492 -
SW	ERN34	6	03486	, 00235
BEXI	*E8,5	7	03492	R 03506 5
B	*E7	7	03499	J 03512
SW	ERR35	6	03506	, 00236
CH	TENGMS	6	03512	08680

BE SURE NO WM  
\*\*\*\*\*

TAPE OPERATIONS TEST

LABEL OPCOD OPERAND

\*TEST NORMAL READ & WRITE AT EOM

LABEL	OPCOD	OPERAND	CT	ADDR	INSTRUCTION
B	MONITR		7	03518	J 01841
MLNA	WTEADR,88888	SET ADDR IN X-REG	12	03525	D 01135 00054 /
CS	9&88888	CLEAR TOP 10 LOCS	6	03537	/ 00+.9
MLCS	TENGMS,9&88888	MOVE 10 GMS TO EOM	12	03543	D 08680 00+.9 3
MLCS			1	03555	D
MLCS			1	03556	D
MLCS			1	03557	D
MLCS			1	03558	D
MLCS			1	03559	D
MLCS			1	03560	D
MLCS			1	03561	D
MLCS			1	03562	D
MLCS			1	03563	D
SW	BPRIM&1	SET SW TO MOD WT ADR	6	03564	, 07345
B	WT	WRITE FROM MOD ADDR	7	03570	J 07027
DCW	DUMHY	DUMMY WRITE FIELD	5	03581	08760
C	XAREOT,EOMANI	CHK FOR EOM & 1	11	03582	C 00059 01130
BE	*&7		7	03593	J 03606 S
ERROR 36	SW	ERR36	6	03600	, 00237
B	BSP		7	03606	J 06894
CS	9&88888	CLEAR TOP 10 LOCS	6	03613	/ 00+.9
SW	BPRIM&1	SET SW TO MOD RT ADR	6	03619	, 07562
B	RT	READ INTO MOD ADDR	7	03625	J 07420
C	XAREOT,EOMANI	CHK FOR EOM & 1	11	03632	C 00059 01130
BE	*&7		7	03643	J 03656 S
ERROR 37	SW	ERR37	6	03650	, 00238

TAPE OPERATIONS TEST

CT ADDR INSTRUCTION

OPCOD OPERAND

LABEL

TEST WRONG LENGTH SPECIFICALLY

FORCE WLR BY WRAP A ROUND

LABEL	OPCOD	OPERAND	CT	ADDR	INSTRUCTION
*					
*					
B	MONITR		7	03656	J 01841
MLNA	WTEADR,8888B	SET ADDR IN X-REG	12	03663	D 01135 00054 /
CS	9&8888B	CLEAR TOP 10 LOCS	6	03675	/ 00+0.9
MLCS	TENGMS,9&8888B	MOVE 10 GMS TO EDM	12	03681	D 08680 00+0.9 3
MLCS			1	03693	D
MLCS			1	03694	D
MLCS			1	03695	D
MLCS			1	03696	D
MLCS			1	03697	D
MLCS			1	03698	D
MLCS			1	03699	D
MLCS			1	03700	D
MLCS			1	03701	D
SW	BPRIMR&I	SET SW TO MOD WT ADR	6	03702	, 07345
B	WT	WRITE FROM MOD ADDR	7	03708	J 07027
DCW	DUMMY	DUMMY WRITE FIELD	5	03719	08760
B	BSP		7	03720	J 06894
CS	9&8888B	CLEAR TOP 10 LOCS	6	03727	/ 00+0.9
A	ONE,8888B	FORCE WLR BY RAPARND	11	03733	A 08681 00054
SW	BPRIMR&I	SET SW TO MOD RT ADR	6	03744	, 07562
SW	BYPASSE&I		6	03750	, 07651
B	RT	READ INTO MOD ADDR	7	03756	J 07420
C	XAREUT,EDMANI	CHK FOR EUM & I	11	03763	C 00059 01130
BE	*E7		7	03774	J 03787 S
ERROR 38	SW	ERR38	6	03781	, 00239
	BWLI	*E7	7	03787	R 03800 -
ERROR 39	SW	ERR39	6	03794	, 00240 W
	BEXI	*E8,S	7	03800	R 03814 S
B	*E7		7	03807	J 03820
ERROR 40	SW	ERR40	6	03814	, 00241

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
		FORCE WLR BY FALLING 1 CHAR SHORT			
B	MONITR		7	03820	J 01841
MLNA	WTEADR,08888B	SET ADDR IN X-REG	12	03827	D 01135 00054 /
CS	9E88888B	CLEAR TOP 10 LOCS	6	03839	/ 00#09
MLCS	TENGMS,9E88888B	MOVE 10 CHMS TO EOM	12	03845	D 08680 00#09 3
MLCS			1	03857	D
MLCS			1	03858	D
MLCS			1	03859	D
MLCS			1	03860	D
MLCS			1	03861	D
MLCS			1	03862	D
MLCS			1	03863	D
MLCS			1	03864	D
MLCS			1	03865	D
SW	BPRIMW&1		6	03866	, 07345
B	WT	WRITE FROM MOD ADDR	7	03872	J 07027
DCH	DUMMY	DUMMY WRITE FIELD	5	03883	08760
B	BSP		7	03884	J 06894
CS	9E88888B	CLEAR TOP 10 LOCS	6	03891	/ 00#09
S	ONE,88888B	FORCE WLR ON 1 SHORT	11	03897	S 08681 00054
SW	BPRIMR&1		6	03908	, 07562
SW	BYPASSE&1	CHECKING DONE HERE	6	03914	, 07651
B	RT	READ INTO MOD ADDR	7	03920	J 07420
C	XAREOT,EDMAN1	CHK FOR EOM & 1	11	03927	C 00059 01130
BE	*E7		7	03938	J 03951 S
ERROR 41	SW	ERR41	6	03945	, 00242
	DWLI	*E7	7	03951	R 03964 -
ERROR 42	SW	ERR42	6	03958	, 00243
	BEX1	*E8,S	7	03964	R 03978 S
	B	*E7	7	03971	J 03984
ERROR 43	SW	ERR43	6	03978	, 00244

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TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
*		*TEST WRITE TO-READ TO END OF MEMORY			
	B	MONTR	7	03984	J 01841
	MLNA	WTEADR,88888	12	03991	U 01135 00054 /
	CS	9E88888	6	04003	/ 00+.9
	MLCS	TENCMS,9E88888	12	04009	D 08680 00+.9 3
	MLCS		1	04021	D
	MLCS		1	04022	D
	MLCS		1	04023	D
	MLCS		1	04024	D
	MLCS		1	04025	D
	MLCS		1	04026	D
	MLCS		1	04027	D
	MLCS		1	04028	D
	MLCS		1	04029	D
	SW	4E88888	6	04030	, 00+.4
	SW	BPRIMW61	6	04036	, 07345
	B	WTREW	7	04042	J 07099
	DCW	DUMMY	5	04053	08760
	C	XAREOT,EOMANI	11	04054	C 00059 01130
	BE	*E7	7	04065	J 04078 S
ERROR 45	SW	ERR45	6	04072	, 00246
	B	BSP	7	04078	J 06894
	CS	9E88888	6	04085	/ 00+.9
	MLCWS	GMWM,5E88888	12	04091	D 01009 00+.5 7
	SW	BPRIMR61	6	04103	, 07562
	B	RTBGW	7	04109	J 07492
	C	XAREOT,EOMANI	11	04116	C 06059 01130
	BE	*E7	7	04127	J 04140 S
ERROR 46	SW	ERR46	6	04134	, 00247

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T020  
CT ADDR S INSTRUCTION

TAPE OPERATIONS TEST

LABEL OPCOD OPERAND

\* FIRST TEST OF WRITE-READ DATA LINES  
\* CHECK DATA LINES USED IN TM

LABEL	OPCOD	OPERAND	CT	ADDR	S	INSTRUCTION
NEXTRT	B	MONITR	7	04256	J	01841
	B	WT	7	04263	J	07027
	DCW	TENIS	5	04274		08690
	B	WT	7	04275	J	07027
	DCW	TEN2S	5	04286		08700
	B	BSP	7	04287	J	06894
	B	BSP	7	04294	J	06894
	B	RT	7	04301	J	07420
	C	BUFER9,TEN1S	11	04308	C	09409 08690
	BE	*E7	7	04319	J	04332 S
ERROR 50	SW	ERR50	6	04326		, 00251
	B	RT	7	04332	J	07470
	C	BUFER9,TEN2S	11	04339	C	09409 08700
	BE	*E7	7	04350	J	04363 S
ERROR 51	SW	ERR51	6	04357		, 00252
	B	MONITR	7	04363	J	01841
	B	WT	7	04370	J	07027
	DCW	TEN4S	5	04381		08710
	B	WT	7	04382	J	07027
	DCW	TEN8S	5	04393		08720
	B	BSP	7	04394	J	06894
	B	BSP	7	04401	J	06894
	B	RT	7	04408	J	07420
	C	BUFER9,TEN4S	11	04415	C	09409 08710
	BE	*E7	7	04426	J	04439 S
ERROR 52	SW	ERR52	6	04433		, 00253
	B	RT	7	04439	J	07420
	C	BUFER9,TEN8S	11	04446	C	09409 08720
	BE	*E7	7	04457	J	04470 S
ERROR 53	SW	ERR53	6	04464		, 00254

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CT ADDR INSTRUCTION

OPCOD OPERAND

LABEL

\* WRITE & READ THE COLLATING SEQUENCE  
 \* MOVE & LOAD MODE, EVEN & ODD PARITY

CT	ADDR	INSTRUCTION	OPCOD	OPERAND
7	04470	J 01841	B	MONITR
7	04477	J 07027	B	WT
5	04488	08824	DCW	-COLSEQ
7	04489	J 07045	B	WTB
5	04500	08824	DCW	-COLSEQ
7	04501	J 06894	B	BSP
7	04508	J 06894	B	BSP
7	04515	J 07420	B	RT
11	04522	C 09463 08824	C	BUFER&63,COLSEQ
7	04533	J 04546 /	BU	*&7
6	04540	, 00256	SW	ERR55
12	04546	0 08780 09419 3	MLCS	COLSEQ-44,BUFER&19 RESTORE S/B CHAR
11	04558	C 09463 08824	C	BUFER&63,COLSEQ
7	04569	J 04582 S	BE	*&7
6	04576	, 00257	SW	ERR56
7	04582	J 07438	B	RTB
11	04589	C 09463 08824	C	BUFER&63,COLSEQ
7	04600	J 04613 S	BE	*&7
6	04607	, 00258	SW	ERR57
7	04613	J 01841	B	MONITR
7	04620	J 07081	B	WTBW
5	04631	08824	DCW	-COLSEQ
7	04632	J 06894	B	BSP
7	04639	J 07474	B	RTBW
11	04646	C 09463 08824	C	BUFER&63,COLSEQ
7	04657	J 04670 S	BE	*&7
6	04664	, 00259	SW	ERR58

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TAPE OPERATIONS TEST

TOZO

CT ADDR INSTRUCTION

OPCOD OPERAND

LABEL

WRITE MOVE READ LOAD-CHECK FOR WS-WM

LABEL	OPCOD	OPERAND	CT	ADDR	INSTRUCTION
	B	MONITR	7	04670	J 01841
	B	WTB	7	04677	J 07045
	DCH	-COLSEQ	5	04688	08824
	B	BSP	7	04689	J 06894
	SW	BYPASS&1	6	04696	, 07651
	B	RTHW	7	04702	J 07474
	BWL1	*&7	7	04709	R 04722 -
ERROR 59	SW	ERR59	6	04716	, 00260
	BCE	*&7, BUFER&63,	12	04722	B 04740 09463
ERROR 60	SW	ERR60	6	04734	, 00261
	SW	COLSEQ-46	6	04740	, 08778
	C	BUFER&62, COLSEQ	11	04746	C 09462 08824
	BE	*&7	7	04757	J 04770 S
ERROR 61	SW	ERR61	6	04764	, 00262
	CM	COLSEQ-46	6	04770	0 08778
	C	BUFER&15, COLSEQ-48	11	04776	C 09415 08776
	BE	*&7	7	04787	J 04800 S
ERROR 62	SW	ERR62	6	04794	, 00263

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LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
*		*SET WMS OVER COLLATING SEQUENCE			
*		WRITE MOVE-READ LOAD,-TEST FOR WMS			
*		WRITE LOAD-READ LOAD,-TEST FOR WMS			
B	MONITR		7	04800	J 01841
CS	WKAREA	CLEAR OUT WORK AREA	6	04807	/ 00163
MLCA	COLSEQ,WKAREA	MOVE COL SEQ TO MOD	12	04813	D 08824 00163 I
SW	WKAREA-15,WKAREA-31	SET WMS	11	04825	, 00148 00132
SW	WKAREA-46,WKAREA-47	IN RECORD	11	04836	, 00117 00116
B	WTB		7	04847	J 07045
DCW	-WKAREA	COL SEQ WITH WMS	5	04858	00163
B	WTBW		7	04859	J 07081
DCW	-WKAREA		5	04870	00163
B	BSP		7	04871	J 06894
B	BSP		7	04878	J 06894
B	RTB		7	04885	J 07438
C	BUFER&63,COLSEQ	NO WMS HERE	11	04892	C 09463 08824
BE	*&7		7	04903	J 04916 S
ERROR 63	SW	ERR63	6	04910	, 00264
B	RTBW		7	04916	J 07474
BW	*&7,BUFER&17	CHECK FOR WM	12	04923	V 04941 09417 I
ERROR 64	SW	ERR64	6	04935	, 00265
BW	*&7,BUFER&32	CHECK FOR WM	12	04941	V 04959 09432 I
ERROR 65	SW	ERR65	6	04953	, 00266
BW	*&7,BUFER&48	CHECK FOR WM	12	04959	V 04977 09448 I
ERROR 66	SW	ERR66	6	04971	, 00267
CW	BUFER&17	CLEAR WM	6	04977	H 09417
CW	BUFER&32,BUFER&48	CLEAR WMS	11	04983	H 09432 09448
C	BUFER&63,COLSEQ	COMPARE DATA	11	04994	C 09463 08824
BE	*&7		7	05005	J 05018 S
ERROR 67	SW	ERR67	6	05012	, 00268

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TAPE OPERATIONS TEST

LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
*		*CHECK OPERATION OF 1 ST CHAR. LATCH			
*		READ RECORD 1 ST CHAR TAPE MARK			
	B	MONITR	7	05018	J 01841
	B	WT	7	05025	J 07027
	DCW	CHRITM	5	05036	08730
	B	BSP	7	05037	J 06894
	SW	BYPASS&1	6	05044	, 07651
	B	RT	7	05050	J 07420
	BEF1	*&7	7	05057	R 05070 8
ERROR 70	SW	ERR70	6	05064	, 00271
	BEX1	*&8,M	7	05070	R 05084 M
	B	*&7	7	05077	J 05090
ERROR 71	SW	ERR71	6	05084	, 00272
	C	BUFER&9,CHRITM	11	05090	C 09409 08730
	BE	*&7	7	05101	J 05114 S
ERROR 72	SW	ERR72	6	05108	, 00273
*		READ RECORD 1ST CHAR 7,REST TMS			
	B	MONITR	7	05114	J 01841
	B	WT	7	05121	J 07027
	DCW	SQRUTS	5	05132	08740
	B	BSP	7	05133	J 06894
	SW	BYPASS&1	6	05140	, 07651
	B	RT	7	05146	J 07420
	BEF1	*&8	7	05153	R 05167 8
	B	*&7	7	05160	J 05173
ERROR 73	SW	ERR73	6	05167	, 00274
	BEX1	*&8,M	7	05173	R 05187 M
	B	*&7	7	05180	J 05193
ERROR 74	SW	ERR74	6	05187	, 00275
	C	BUFER&9,SQRUTS	11	05193	C 09409 08740
	BE	*&7	7	05204	J 05217 S
ERROR 75	SW	ERR75	6	05211	, 00276

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TAPE OPERATIONS TEST

CT ADDR INSTRUCTION

OPCOD OPERAND

LABEL	OPCOD	OPERAND	CT	ADDR	INSTRUCTION
•		•TEST FOR ERASE FORWARD DURING			
•		BACKSPACE AFTER WRITE STATUS			
	B	MONITR	7	05217	J 01841
	B	WT	7	05224	J 07027
	DCH	TEN1S	5	05235	08690
C	B	WTBEW	7	05236	J 07099
	DCH	&COLSEQ	5	05247	08824
	B	BSP	7	05248	J 06894
	B	BSP	7	05255	J 06894
	B	WT	7	05262	J 07027
	DCH	TEN2S	5	05273	08700
	B	BSP	7	05274	J 06894
	B	RT	7	05281	J 07420
	C	BUFER&9,TEN2S	11	05288	C 09409 08700
	BE	•&7	7	05299	J 05312 S
ERROR 76	SW	ERR76	6	05306	• 00277
	MLNA	C00586,RECLEN	12	05312	D 01105 00049 /
	SW	BYPASS&1	6	05324	• 07651
	B	RTB	7	05330	J 07438
	C	BUFER&9,LABEL	11	05337	C 09409 09399
	BU	•&7	7	05348	J 05361 /
ERROR 77	SW	ERR77	6	05355	• 00278
•		*****			
•		WT-WTB-BSP RE WT-BSP-RT-RTB			
•		OK 1 ST PORTION OF 2 ND RECORD GONE			

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDRESS	INSTRUCTION
*		*TEST FOR 8-REG BIT PICK UP			
*		AND A-REGISTER DROP OUT			
*		WRITE ODD-READ EVEN- TEST FOR *S			
WTBPUR	B	MONTR	7	05361	J 01841
	B	RWD	7	05368	J 06875
	S	RECNO	6	05375	S 09393
	A	ONE,RECNO	11	05381	A 08681 09393
	B	WTR	7	05392	J 07045
	DCW	8ALTBIT	5	05403	08688
	BCE	WTBPUR,RECNO-3,0	12	05404	B 05381 09390 0
	B	RWD	7	05416	J 06875
	S	BPUCNT	6	05423	S 01172
	CS	WKAREA	6	05429	/ 00163
	SH	WKAREA-63	6	05435	, 00100
	MLCS	CHCON&7,WKAREA	12	05441	D 01515 00163 J
	MLCB	WKAREA,WKAREA-1	12	05453	D 00163 00162 L
	CW	PICKO&E1	6	05465	0 08670
	SAR	SXR3	7	05471	G 00064 A
ZEROIT	S	0&SXR3	6	05478	S 00,00
	SAR	SXR3	7	05484	G 00064 A
	S	TWO,SXR3	11	05491	S 08691 00064
	BW	ZEROIT,1&SXR3	12	05502	V 05478 00,01 1
	S	RECNT1	6	05514	S 01153
RDBPUR	BCE	REPORT,RECNT1-3,1	12	05520	B 06126 01150 1
	SW	BYPASSE&1	6	05532	, 07651
	B	RT	7	05538	J 07420
	A	ONE,RECNT1	11	05545	A 08681 01153
	BEX1	*68,1	7	05556	R 05570 1
	B	CK4AST	7	05563	J 05596
	SW	ERR80	6	05570	, 00281
ERROR 80	SW	CK4LUP&1	6	05576	, 01870
	B	MONTR	7	05582	J 01841
	B	RDBPUR	7	05589	J 05520

TAPE OPERATIONS TEST

CT ADDR INSTRUCTION

OPCOD OPERAND

CHECK BUFR SECTION BY SECTION

LABEL	OPCOD	OPERAND	CT	ADDR	INSTRUCTION
CK4AST	SW	BUFR1, BUFR9	11	05596	, 09410 09922
	MLWB	BUFR9, BUFR8	12	05607	D 09922 09858 M
	SW	BUFRND&1	6	05619	, 09986
	SAR	SXR3	7	05625	G 00064 A
CK4MOR	C	SXR3, C09410	11	05632	C 00064 01110
	BH	ROBPUR	7	05643	J 05520 U
	C	0&SXR3, WKAREA	11	05650	C 00,00 00163
	SAR	SXR3	7	05661	G 00064 A
	BE	CK4MOR	7	05668	J 05632 S

FIND CHARACTERS INVOLVED

LABEL	OPCOD	OPERAND	CT	ADDR	INSTRUCTION
ND0SEC	MLNB	SXR3, HOLDIT	12	05675	D 00064 01162 J
	SW	ALTBIT&1	6	05687	, 08889
	SAR	SXR4	7	05693	G 00069 A
	A	C00064, SXR3	11	05700	A 01100 00064
	C	SXR3, HOLDIT	11	05711	C 00064 01162
	BE	CK4MOR	7	05722	J 05632 S
SCNFLO	SCNLS	0&SXR3, 0&SXR4	12	05729	D 00,00 00,00
	SAR	SXR3	7	05741	G 00064 A
	SBR	SXR4	7	05748	G 00069 B
	BCE	ND0SEC, 1&SXR3, *	12	05755	B 05711 00,01 *
	A	ONE, BPUCNT	11	05767	A 08681 01172
	BCE	TOMANY, BPUCNT-4, 1	12	05778	B 06107 01168 1



TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION
		ANALYZE BITS PICKED UP OR DROPPED			
	CH	HAFWAYE1,PICKUPE1	11	05790	B 05883 05955
	S	ERRCNT	6	05801	S 08670
	SW	PICKDBE1	6	05807	, 08664
	SAR	SXRA	7	05813	G 00074 A
	SH	1ESXR4	6	05820	, 00.#1
	LE	1ESXR4,BITABL	12	05826	T 00.#1 06106 2
	SBR	SXRB	7	05838	G 00079 B
	CW	1ESXR4	6	05845	B 00.#1
	MLCS	0ESXRB,BITCHKI1	12	05851	D 00.M0 05881 3
	SAR	SXRB	7	05863	G 00079 A
	BBE	PICKUP,1ESXR3,	12	05870	H 05954 00.01
	NOPWM		1	05882	N
	BBE	ADDONE,1ESXRB,M	12	05883	H 05962 00.M1 M
	BW	CHKONC,0ESXRB,	12	05895	V 05991 00.M0 1
	S	BITCHK,SXRA	11	05907	S 05870 00074
	C	SXRA,HAFDUN	11	05918	C 00074 01167
	BU	MOVBIT	7	05929	J 05851 /
	SW	HAFWAYE1,PICKUPE1	11	05936	, 05883 05955
	B	CHK4WM	7	05947	J 05895
	NOPWM		1	05954	N
	B	CHK4WM	7	05955	J 05895
	A	ONE,0ESXRA	11	05962	A 08681 00.00
	A	ONE,ERRCNT	11	05973	A 08681 08670
	B	CHK4WM	7	05984	J 05895
	PICKUP				
	ADDONE				

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
CHKONC	B8E	NDOSEC,ERRCNT,1	12	05991	W 05711 08670 1
	BCE	LOSTAC,06SXR3,C	12	06003	B 06033 00.00 C
	A	ONE,PICKDC	11	06015	A 08681 08669
	B	NDOSEC	7	06026	J 05711
LOSTAC	A	ONE,DR0PDC	11	06033	A 08681 08627
	B	NDOSEC	7	06044	J 05711
	DCW	2 C 4 B 12 8 -U2	14	06064	
		2 2 8 -1 4 B 2	14	06078	
		2 1 4 B 2 8 -V2	14	06092	
BITABL	DCW	2 C 12 8 - 4 B 2	14	06106	
TOMANY	SW	ERK81	6	06107	, 00282
	SW	CK4LUP21	6	06113	, 01870
	B	MONIIR	7	06119	J 01841
					DO NOT LOOP HERE
REPORT	SW	PICKDC11	6	06126	, 08670
	SAR	SXR3	7	06132	G 00064 A
NXTOTL	MLCB	06SXR3,BITALY	12	06139	D 00.00 06190 L
	SAR	SXR3	7	06151	G 00064 A
	C	BITALY,COUNT0	11	06158	C 06190 08754
	BE	DONTYP	7	06169	J 06192 S
	B	TYPEIT	7	06176	J 09344
	DCW	2 * 2	2	06184	
BITALY	DCW	2 2,C	6	06190	
DONTYP	BW	NXTOTL,16SXR3	12	06192	V 06139 00.01 1

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TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
•		*WRITE & READ 1000 RECORDS			
•		ALTERNATE BIT PATTERNS			
•		RIPPLE WRITE TRIGGER FREQUENCY TEST			
NXTREC	B	MONITR	7	06204	J 01841
	B	RWD	7	06211	J 06875
	S	RECNO	6	06218	S 09393
	A	ONE,RECNO	11	06224	A 08681 09393
	B	WTB	7	06235	J 07045
	DCH	CALLBIT	5	06246	08888
	BCE	NXTREC,RECNO-2,0	12	06247	B 06224 09391 0
	B	SKP	7	06259	J 06932
RECYCL	SW	FREQ1&1	6	06266	01230
	SAR	SXR4	7	06272	G 00069 A
WTMORE	MLCB	06SXR4,TSTPAT	12	06279	D 00.40 06320 L
	SAR	SXR4	7	06291	G 00069 A
	A	ONE,RECNO	11	06298	A 08681 09393
	B	WTB	7	06309	J 07045
TSTPAT	DCH	CHTFTPL	5	06320	08952
	BW	WTMORE,1&SXR4	12	06321	V 06279 00.41 1
	BCE	RECYCL,RECNO-3,0	12	06333	B 06266 09390 0
RDMORE	B	RWD	7	06345	J 06875
	S	RECNT1	6	06352	S 01153
	BCE	RDDONE,RECNT1-3,1	12	06358	B 06554 01150 1
	MLNB	BUFER&3,SAVEIT	12	06370	D 09403 01176 J
	B	RTH	7	06382	J 07434
	A	ONE,RECNT1	11	06389	A 08681 01153
	C	BUFER&3,RECNT1	11	06400	C 09403 01153
	BE	RDMORE	7	06411	J 06358 S
	C	BUFER&3,SAVEIT	11	06418	C 09403 01176
	BU	CKAHED	7	06429	J 06462 /
ERROR 82	SW	ERR82	6	06436	00283
	SW	CK4LUP&1	6	06442	01870
	B	MONITR	7	06448	J 01841

DO NOT LOOP HERE

TAPE OPERATIONS TEST

LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
	B	RDMORE	7	06455	J 06358
CKAHEd	S	RECNT2	6	06462	S 01157
UPONE	A	ONE,RECNT1	11	06468	A 08681 01153
	A	ONE,RECNT2	11	06479	A 08681 01157
	C	BUFER&3,RECNT1	11	06490	C 09403 01153
	BE	OUTSEQ	7	06501	J 06522 S
	BZ	NOHERE	7	06508	J 06548 V
	B	UPONE	7	06515	J 06468
OUTSEQ	SW	ERR83	6	06522	, 00284
	SW	CK4LUP&1	6	06528	, 01870
	B	MONTR	7	06534	J 01841
	B	RDMORE	7	06541	J 06358
NOHERE	SW	ERR84	6	06548	, 00285
RDDONE	B	MONTR	7	06554	J 01841

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TAPE OPERATIONS TEST

LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
*		END OF PROGRAM PASS ON ONE DRIVE			
*		GO TO CHECK FOR NEXT DRIVE ON CHAN			
CK4EOJ	B	TYPEIT	7	06561	J 09344
	DCW	@PASS@,G	4	06571	
	MLNS	UNITNO,RDYTDSE&TDIND MOVE TO NO TO TABLE	12	06573	D 01737 00M/0 1 <sup>Q</sup>
	A	ONE,TDIND	11	06585	A 08681 00089
	B	NEXTDR	7	06596	J 01696
	B	TYPEIT	7	06603	J 09344
	DCW	@EOJ@,G	3	06612	
	CH	START&I	6	06614	□ 02001
	SAR	SXR2	7	06620	G 00034 A
	BCE	REPEAT,TAD3,1	12	06627	B 02008 01003 1
	B	LOADER	7	06639	J 00400

\*\*\*\*\*

\*REWIND ALL DRIVES USED ON A CHANNEL

LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
FSTRWD	CH	FSTRWD&8	6	06646	□ 06654
	SAR	SXR2	7	06652	G 00034 A
	S	TDIND	6	06659	S 00089
NEXTD	MLNS	RDYTDSE&TDIND,RWDYDSE3	12	06665	D 00M/0 06769 1 <sup>Q</sup>
	BCE	CKCHNS,RDYDSE&TDIND,0	12	06677	B 01535 00M/0 0
	A	ONE,TDIND	11	06689	A 08681 00089
	MLCS	COLSEQ-15,RWDYDSE&4	12	06700	D 08809 06770 3
	BCE	@I3,TAD6,1	12	06712	B 06736 01006 1
	MLCS	COLSEQ-19,RWDYDSE&4	12	06724	D 08805 06770 3
	SW	RWDSW0&1	6	06736	• 08314
	MLCB	WHAT,WHAT-1	12	06742	D 08242 08241 L
	MLCA	RWDYDSE&4,WHAT-6	12	06754	D 06770 08236 T
	RWD	10	5	06766	U XUU R
	BNR1	TSTIND	7	06771	K 07931 1 <sup>Q</sup>
	BA1	@-18	7	06778	R 06766 M
	B	NEXTD	7	06785	J 06665

TAPE OPERATIONS TEST

LABEL OPCOD OPERAND

LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION	T020
*		*SPACE,DELAY AND TEST FOR T.I. ON				
SPACE	SBR	RETURN	7	06792	G 00039 B	
	CU	XU1,A	5	06799	U XU1 A	L
	BEX1	*E8,B	7	06804	R 06818 B	C
	BAL	*-18	7	06811	R 06799 H	
	SW	TISW	6	06818	* 01192	
	CW		1	06824	□	
	S	DLACNT	6	06825	S 01184	
	A	TIMEL,DLACNT	11	06831	A 01178 01184	
	BTI	*E20	7	06842	J 06868 K	
	BCE	*-29,DLACNT-5,0	12	06849	B 06831 01179 0	
	CW	TISW	6	06861	□ 01192	
	SW		1	06867	*	Q
	B	0ERETURN	7	06868	J 000M0	

RETURN TO MAIN LINE  
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TAPE OPERATIONS TEST

LABEL      OPCOD      OPERAND      CT      ADDR      INSTRUCTION

LABEL	OPCOD	OPERAND	CT	ADDR	INSTRUCTION
*		ALTER U.C. INSTRUCTION IN UTILITY			
*		U.C. ROUTINE TO INSTRUCTION REQUESTED			
RWD	SBR	RETURN	7	06875	G 00039 B
	B	UCONRT	7	06882	J 06951
	DCW	@UXUIR@	5	06893	
BSP	SBR	RETURN	7	06894	G 00039 B
	B	UCONRT	7	06901	J 06951
	DCW	@UXUIB@	5	06912	
		NORMAL BACK SPACE			
WTM	SBR	RETURN	7	06913	G 00039 B
	B	UCONRT	7	06920	J 06951
	DCW	@UXUIM@	5	06931	
SKP	SBR	RETURN	7	06932	G 00039 B
	B	UCONRT	7	06939	J 06951
	DCW	@UXUIE@	5	06950	
*		*UNIT CONTROL ROUTINE			
UCONRT	SBR	SXR3	7	06951	G 00064 B
	MLCWB	4&SXR3,UCONOP&4	12	06958	D 00.04 06974 P
UCONOP	BSP	11	5	06970	U XUI B
	MLCB	WHAT,WHAT-1	12	06975	D 08242 08241 L
	MLCA	UCONOP&4,WHAT-6	12	06987	D 06974 08236 T
	B	TST4DL	7	06999	J 07862 L
	BEX1	*E8,B	7	07006	R 07020 B
	BAL	UCONOP	7	07013	R 06970 M
	B	MERGE	7	07020	J 07630

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
•		ALTER WRITE INSTRUCTION IN UTILITY			
•		WRITE ROUTINE TO INSTRUCTION REQUESTED			
WT	SBR	DATA	7	07027	G 00044 B
	B	SETOP	7	07034	J 07142
	DCW	0M%UI0	4	07044	
WTB	SBR	DATA	7	07045	G 00044 B
	B	SETOP	7	07052	J 07142
	DCW	0M%BI0	4	07062	
WTW	SBR	DATA	7	07063	G 00044 B
	B	SETOP	7	07070	J 07142
	DCW	0L%UI0	4	07080	
WTBW	SBR	DATA	7	07081	G 00044 B
	B	SETOP	7	07088	J 07142
	DCW	0L%BI0	4	07098	
WTBEW	SBR	DATA	7	07099	G 00044 B
	MLCS	COLSEQ-12,WRITE09 SET D-MOD TO X	12	07106	D 08812 07372 3
	NOP	OVRLAP ON 7010 ONLY	1	07118	N
WTEOSW	MLCS	CHCON-4ECHSTCT,WTEOP-2 SET FOR UN-OL	12	07119	D 01EM4 07139 3
	B	SETOP	7	07131	J 07142
	DCW	0L%BI0	4	07141	
WTEOP	SBR	DATA	7	07142	G 00064 B
	MLCA	3&SXR3,WRITE03	12	07149	D 00.03 07366 1
	CW	6&DATA	6	07161	D 00+06
	SAR	RETURN	7	07167	G 00039 A



TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION
*		CHECK FOR LABEL, FILL BUFR COMPLETELY			
	S	RECLEN	6	07174	S 00049
	MLNA	C00010,RECLEN	12	07180	D 01095 00049 /
	BZN	SETEND,4&DATA,	12	07192	V 07240 00104 2
	MLNA	C00064,RECLEN	12	07204	D 01100 00049 /
	BZN	SETEND,4&DATA,B	12	07216	V 07240 00104 K
	MLNA	C00586,RECLEN	12	07228	D 01105 00049 /
SETEND	B	CLEAR	7	07240	J 07825
	SW	BUFR,BUFR9	11	07247	, 09400 09922
	MLNA	4&DATA,*66	12	07258	D 00404 07275 /
	MLCWB	00000,BUFR-1&RECLEN	12	07270	D 00000 09179 P
	BZN	ALABEL,4&DATA,6	12	07282	V 07307 00104 B
	CW	BUFR	6	07294	□ 09400
	B	BPRIMW	7	07300	J 07344
ALABEL	MLCWB	BUFR-1&RECLEN,BUFR9-1	12	07307	D 09179 09921 P
C	MLNA	RECLEN,LENGTH	12	07319	D 00049 09398 /
	MLCA	LABEL,BUFR&9	12	07331	D 09399 09409 I
C	NOP		1	07343	N
*		*WRITE ROUTINE			
BPRIMW	NOPWM		1	07344	N
	MLCA	BPRIME,WRITE&8	12	07345	D 01125 07371 I
	CW	BPRIMW&1	6	07357	□ 07345
WRITE	WT	11,BUFR	10	07363	M &U1 09400 W
	SBR	XAREDT	7	07373	G 00057 B
	MLCA	WRITE&9,WHAT-1	12	07380	D 07372 08241 I
	B	TST4OL	7	07392	J 07862 L
	BEX1	*68,B	7	07399	R 07413 B
	BAL	WRITE	7	07406	R 07363 M
	B	MERGE	7	07413	J 07630
*					*****

TAPE OPERATIONS TEST

CT ADDRS INSTRUCTION

OPCOD OPERAND

LABEL

\* ALTER READ INSTRUCTION IN UTILTY  
 \* READ ROUTINE TO INSTRUCTION REQUESTED

RT SBR RETURN COMMON EXIT  
 B READER TO READ ROUTINE  
 DCH @M%UI@

RTB SBR RETURN  
 B READER  
 DCH @M%BI@

RTW SBR RETURN  
 B READER  
 DCH @L%UI@

RTBW SBR RETURN  
 B READER  
 DCH @L%BI@

RTBGW SBR RETURN  
 MLCS COLSEQ-56,READ&9 SET D-MOD TO \$  
 NOP OVRAP ON T010 ONLY

RTGOSH MLCS CHCON-4&CHSTCT,RIEOP-2 UN-OL READ EOM  
 B READER INSTRUCTION REQUEST  
 DCH @L%BI@

\* READ ROUTINE

READER SBR SXR3 STORE ADDR OF OP  
 MLCA 3&SXR3,READ&3 SET DP REQ IN PLACE  
 B CLEAR CLEAR BUFER-SET GMMW AT END

BPRIMR NOPWM  
 MLCA BPRIME,READ&8 SET NEW READ ADDR  
 CW BPRIMR&1 CLEAR SW

7 07420 G 00039 B  
 7 07427 J 07535  
 4 07437

7 07438 G 00039 B  
 7 07445 J 07535  
 4 07455

7 07456 G 00039 B  
 7 07463 J 07535  
 4 07473

7 07474 G 00039 B  
 7 07481 J 07535  
 4 07491

7 07492 G 00039 B  
 12 07499 D 08768 07589 3  
 1 07511 N  
 12 07512 D 01EM4 07532 3

7 07524 J 07535  
 4 07534

7 07535 G 00064 B  
 12 07542 D 00.03 07583 T  
 7 07554 J 07825

1 07561 N  
 12 07562 D 01125 07588 T  
 6 07574 D 07562

TAPE OPERATIONS TEST

LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
READ	RT	11.BUFR	10	07580	M 4U1 09400 H
	SBR	XAREDT	7	07590	G 00059 B
	MLCA	READC9,WHAT-1	12	07597	U 07589 08241 T
	B	TST4DL	7	07609	J 07862 L
	BEX1	*68,B	7	07616	R 07630 B
	BAL	READ	7	07623	R 07580 M

M/L XXN BUFR R U/B  
 B-REG, END OF X-FER  
 SET INST IN ERR MSGE  
 GO SEE ABOUT OVERLAP  
 BRANCH ON I/4/8/A/B  
 TRY AGAIN IF BUSY  
 \*\*\*\*\*

TAPE OPERATIONS TEST

LABEL	OPCOD	OPERAND	CT	ADDR	INSTRUCTION
*		WRITE,READ & U.C. ROUTINES MERGE AND CONTINUE TESTING IN COMMON ROUTINE			
MERGE	BCE	*L8,TAD5,1	12	07630	B 07649 01005 1
	B	*C2	7	07642	J 07650
	H		1	07649	.
BYPASS	NOPWM		1	07650	N
	B	RESTOR	7	07651	J 07762
	CW	RWD5W0E1	6	07658	□ 08314 G
	BAL	TSTIND	7	07664	R 07931 M
	BCE	RESTOR,TAD4,1	12	07671	B 07762 01004 1
	B				
*		TESTING OVERLAP OPERATION - PHASE 2			
*		PHASE 1 DONE IN TST40L ROUTINE			
CKOLAP	BCE	TSTD4M,WHAT-10,U	12	07683	B 07707 08232 U
TESTX1	BCE	CK4OIP,WHAT-9,	12	07695	B 07744 08233
TSTD4M	BCE	CK4OIP,WHAT-6,M	12	07707	B 07744 08236 M
ERROR 99	SW	ERR99	12	07719	V 07762 01193 1
	B	RESTOR	6	07731	, 00300
CK4OIP	BW	RESTOR,OIPSW	7	07737	J 07762
ERROR 98	SW	ERR98	12	07744	V 07762 01194 1
	B		6	07756	, 00299
*		END OF OVERLAP TESTING			
RESTOR	CW	BYPASS&1	6	07762	□ 07651
	S	DCCNT	6	07768	S 01148
	S		1	07774	S
	MLCA	STDWRT,WRITE&9	12	07775	D 07818 07372 1
	MLCA	STDRT,READ&9	12	07787	D 07824 07589 1
	BNQ	CONTRL	7	07799	J 01010 Q
	B	O&RETURN	7	07806	J 000M0
*		*****			
STDWRT	DCW	209400W2	6	07818	
STDRT	DCW	209400R2	6	07824	

TAPE OPERATIONS TEST

CT ADDR INSTRUCTION

LABEL	OPCOD	OPERAND	CT	ADDR	INSTRUCTION
*		*UTILITY SUB-ROUTINES			
*		CLEAR OUT INPUT-OUTPUT AREA			
*		SET GM-WM AT END OF DATA FIELD			
CLEAR	SBR	CLRXT65	7	07825	G 07860 B
	CS	BUFRND61	6	07832	/ 09986
	CS		1	07838	/ 5850
	CS		1	07839	/ 5671
	CS		1	07840	/ 7610
	CS		1	07841	/ 4287
	CS		1	07842	/ 7071
CLRXT	B	00000	12	07843	D 01009 090#0 7
*			7	07855	J 00000
*					
*					
TST40L	SBR	OLTXIT65	7	07862	G 07929 B
	BCE	OLTXIT,TAD4,1	12	07869	B 07924 01004 1
	CW	OIPSW	6	07881	D 01194
	SW		1	07887	.
	BOL1	OIP	7	07888	J 07902 1
	B	OLTXIT	7	07895	J 07924
	SW	OIPSW	6	07902	. 01194
	CW		1	07908	D
	BOL1	*--6	7	07909	J 07909 1
	NOPWM		1	07916	N
AREOTD	SER	XAREOT	7	07917	G 00059 E
OLTXIT	B	00000	7	07924	J 00000

TEST OVERLAP IN PROCESS - PHASE 1

SAVE FOR RETURN  
 DO NOT TEST OVERLAP  
 RESET OLAP TEST SW  
 OIPSW OFF,OIPSW-1,ON  
 BRANCH ON OVERLAP  
 DID NOT BOL  
 SET SW TO IND OLAP  
 OIPSW ON,OIPSW-1 OFF  
 HANG AROUND ON OIP  
 DONT STORE E IIL SET  
 ADDR AT END OF X-FER  
 RETURN

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
•		TEST ALL STATUS INDICATORS			
•					
TSTIND	MLCA	ALLIND,INDSET	12	07931	D 01146 08248 T
	BNR1	*E13 NOT READY	7	07943	R 07962 1
	MLCS	ABLANK,INDSET-5 REMOVE STATUS	12	07950	D 08249 08243 3
	RCN1	*E13 RUSY	7	07962	R 07981 2
	MLCS	ABLANK,INDSET-4 INDICATORS FROM	12	07969	D 08249 08244 3
	BER1	*E13 DATA CHECK	7	07981	R 08000 4
	MLCS	ABLANK,INDSET-3 MESSAGE IF THEY	12	07988	D 08249 08245 3
	BEF1	*E13 CONDITION	7	08000	R 08019 8
	MLCS	ABLANK,INDSET-2 WERE NOT SET	12	08007	D 08249 08246 3
	BWL1	*E13 WLR	7	08019	R 08038 -
	MLCS	ABLANK,INDSET-1 ONLY INDICATORS	12	08026	D 08249 08247 3
	BNT1	*E13 NO XFER	7	08038	R 08057 8
	MLCS	ABLANK,INDSET SET ARE LEFT	12	08045	D 08249 08248 3
	BCE	CK4HLT,TAD8,1 NO STATUS IND TYPEOUT	12	08057	B 08281 0100H 1
	B	ERRCTL TO ERROR CONTROL RT	7	08069	J 08188
•					
•		•CHECK FOR ERROR MESSAGES			
•					
CK4WMS	SW	ERK99E1 SET START OF ERR SCN	6	08076	, 00301
	SAR	SXR3 IN INDEX REGISTER	7	08082	G 00064 A
	CW	LASTW61 END OF TABLE SWITCH	6	08089	□ 08115
SCN4ER	SCNLB	09999,0E5XR3 SCAN ERROR TABLE	12	08095	D 09999 00.00 -
	SBR	SXR3 BAR IS B FIELD WM-1	7	08107	G 00064 B
	NOPWM		1	08114	N
	BCE	NOMDM,1E5XR3,M G END OF ERROR TABLE	12	08115	B 08268 00.01 M
	BCE	CK4LUP,1E5XR3,M G END OF ERROR TABLE	12	08127	B 01869 00.01 M
	SW	LASTW61 CLEAR SWITCH	6	08139	, 08115
	CW	1E5XR3 CLEAR WMS	6	08145	□ 00.01
	MLCB	ABLANK,INDSET BLANK OUT FIELD	12	08151	D 08249 08248 L
	MLCB	ALL OF IT	1	08163	D
	MLNB	SXR3,INDSET-4 SET ERROR NUMBER	12	08164	D 00064 08244 J
	MLCA	LERROR,WHAT-6 SET ERROR IN ERROR MESSAGE	12	08176	D 01140 08236 T

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
ERRCTL	BCE	CK4HLT,TADD,1	12	08188	B 08281 01000 1
	MLNB	SXR2,WHERE	12	08200	D 00034 08254 J
	S	SEVEN,WHERE	11	08212	S 08731 08254
	B	TYPEIT	7	08223	J 09344
	DCN	Q*	7	08236	
WHAT	Q	Q	6	08242	
INSET	Q	Q	6	08248	
ABLANK	Q	Q	1	08249	
WHERE	Q00000Q,G		5	08254	
NOMDWH	BW	SCNER,LASTW61	12	08256	V 08095 08115 1
	CW	LASTW61	6	08268	Q 08115
	BW	CONTRL	7	08274	J 01010 Q
CK4HLT	BCE	HALT,TAD2,1	12	08281	B 08300 01002 1
	B	HALT61	7	08293	J 08301
HALT	H		1	08300	.
RWDSWO	BCE	AHMSET,WHAT-10,E	12	08301	B 08376 08232 E
	NOPWH		1	08313	N
	B	NEXTD	7	08314	J 06665
	BCE	EDFRT,INSET-2,8	12	08321	B 08449 08246 8
	BCE	NRDYRT,INSET-5,1	12	08333	B 08425 08243 1
	BCE	DCERRT,INSET-3,4	12	08345	B 08463 08245 4
	BCE	WLRUT,INSET-1,B	12	08357	B 08493 08247 B
	B	RESTOR	7	08369	J 07762
AHMSET	BCE	CTERNO,INSET-5,0	12	08376	B 08395 08243 0
	B	CK4LUP	7	08388	J 01869
CTERNO	A	ONE,WMERCT	11	08395	A 08681 01147
	BCE	NRDYRT,WMERCT,3	12	08406	B 08425 01147 3
	B	OC5XR2	7	08418	J 000.0

• ERROR CONTROL ROUTINE

LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
•		•ERROR ROUTINES			
•		NOT READY ROUTINE			
•		TYPEIT	7	08425	J 09344
NRDYRT	B	2* DROPPED,G	9	08440	DRIVE DROPPED
•		NEXTDR	7	08442	J 01696
•		END OF FILE ROUTINE - WHILE WRITING			
•		RWD	7	08449	J 06875
EOFRT	B	06SXR2	7	08456	J 000.0
•		DATA CHECK ERROR ROUTINE			
•		ONE,DCCNT	11	08463	A 08681 01148
DCERRT	A	RESTOR,DCCNT,3	12	08474	B 07762 01148 3
•		WHEREZ	7	08486	J 08516
•		WRONG LENGTH RECORD ROUTINE			
•		ONE,WLRCNT	11	08493	A 08681 01149
WLROUT	A	RESTOR,WLRCNT,3	12	08504	B 07762 01149 3
•		BACKSPACE, TRY AGAIN			
•		BRANCH ON 1/4/8/A/B	5	08516	U XUI H
WHERE2	BSP	•68,B	7	08521	R 08535
•		TRY AGAIN IF BUSY	7	08528	R 08516 M
•		ERASE BEFORE REWRITE	5	08535	U XUO E
•		BRANCH ON 1/4/8/A/B	7	08540	R 08554
•		TRY AGAIN IF BUSY	7	08547	R 08535 M
•		IT WAS A WRITE OP	12	08554	B 07363 08241 M
•		IT WAS A READ OP	12	08566	B 07580 08241 R
•		MUST HAVE BEEN A UC	7	08578	J 06970
UPREND	B	UCONOP	1	08585	.
•		H			



TAPE OPERATIONS TEST

LABEL OPCODE OPERAND

TALLEY TABLE FOR BITS DROPPED

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
•	DC	01-0	2	08587	
DROPD1	DC	0 0	4	08591	
DROPD2		02-0	2	08593	
DROPD4		0 0	4	08597	
DROPD8		04-0	2	08599	
DROPDA		0 0	4	08603	
DROPDB		08-0	2	08605	
DROPDC		0 0	4	08609	
		0A-0	2	08611	
		0 0	4	08615	
		0B-0	2	08617	
		0 0	4	08621	
		0C-0	2	08623	
		0 0	4	08627	

TALLEY TABLE FOR BITS PICKED UP

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
•	DC	01 0	2	08629	
PICKD1		0 0	4	08633	
PICKD2		02 0	2	08635	
PICKD4		0 0	4	08639	
PICKD8		04 0	2	08641	
PICKDA		0 0	4	08645	
PICKDB		08 0	2	08647	
PICKDC		0 0	4	08651	
ERRCNT		0A 0	2	08653	
		0 0	4	08657	
		0B 0	2	08659	
		0 0	4	08663	
		0C 0	2	08665	
		0 0	4	08669	
		0 0	1	08670	



TAPE OPERATIONS TEST

T020 INSTRUCTION

LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
	DC	0 0	1	09337	A C BIT
	DCW	0-0	1	09338	A B BIT
	DCW	0B0	1	09339	AN A BIT
	DCW	0B0	1	09340	AN 8 BIT
	DCW	040	1	09341	A 4 BIT
	DCW	020	1	09342	A 2 BIT
AIBIT	DCW	010	1	09343	

• TYPING ROUTINE

TYPEIT	SBR	TYPECL8	STORE ADDRESS OF MESSAGE	CT	ADDRS	INSTRUCTION
TYPE	WCP	00000	TYPE MESSAGE	10	09351	M XTO 00000 W
	SBR	TYPEXT65	STORE ADDRESS FOR RETURN	7	09361	G 09367 B
	BCB1	TYPE		7	09368	K 09351 Z
	BA1	*E1	RESET INTERLOCK	7	09375	R 09382 M
TYPEXT	B	00000	RETURN TO MAIN PROGRAM	7	09382	J 00000
	H		DEFINE PRECEDING BRANCH LENGTH	1	09389	.

RECNO	DCW	00000	RECORD NUMBER	CT	ADDRS	INSTRUCTION
LENGTH C	DC	000000	RECORD LENGTH	5	09398	
LABEL	DC	0+0	LABEL FOR LONG RECS	1	09399	

ORG	9390		RECORD NUMBER	CT	ADDRS	INSTRUCTION
				4	09393	

TAPE OPERATIONS TEST

LABEL	OPCOD	OPERAND	CT	ADDR	INSTRUCTION
•		INITIALIZATION- ONE TIME ONLY			
•		THIS AREA IS ALSO THE BUFFER AREA			
•		IT WILL BE CLEARED OUT WHEN SETUP IS DONE			
SETUP	ORG	9400			
	CS	332	6	09400	/ 00332
	CS		1	09406	/
	CS		1	09407	/
	CS		1	09408	/
	SW	95,20	11	09409	, 00095 00020
	MLWB	95,90	12	09420	D 00095 00090 M
	MRCW	RESET1-6,1	12	09432	D 09694 00001 M
	MRCW		1	09444	D
	MRCW		1	09445	D
	MRCW		1	09446	D
	MLCHS	GMWM,ERRO1-2	12	09447	D 01009 00200 7
	B	TYPEIT	7	09459	J 09344
	C	21020C2,G	5	09470	

CHECK SYSTEMS CARD FOR INFO NEEDED

•					
BCE		NDSYS1,SYSL,	12	09472	B 09704 01256
BBE		HOWBIG,SYSL,-	12	09484	W 09525 01256 -
CW		WTEOSW61,RTGOSW61	11	09496	D 07119 07512
SW		G0210K61	6	09507	, 04249 D
MRCWG		TOTENK,ODEVNI	12	09513	D 09735 10000 L
A		SYSL61,EOMANI-4	11	09525	A 01257 01126
A		ONE,EOMANI	11	09536	A 08681 01130 G
BBE		*67,EOMANI-4,T	12	09547	W 09565 01126 T
S		EOMANI	6	09559	S 01130
A		SYSL61,WIEADR-4	11	09565	A 01257 01131
BCE		*613,SYSL67,1	12	09576	B 09600 01263 1
MLNS		ONE,TAD4	12	09588	D 08681 01004 1
A		ONE,CHANOS	11	09600	A 08681 00020
BCE		*612,SYSL613,	12	09611	B 09634 01269
A		TWO,CHANOS61	11	09623	A 08691 00021
BCE		*613,SYSL614,	12	09634	B 09658 01270

TAPE OPERATIONS TEST

CT ADDR INSTRUCTION

LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION
MLNS		THREE, CHANOS&2	12	09646	D 08744 00022 1
BCE		*612, SYS1&15,	12	09658	B 09681 01271
A		FOUR, CHANOS&3	11	09670	A 08701 00023
CH		START&1	6	09681	□ 02001
B		START	7	09687	J 02000

RESET1 DCW 2J000.0 2  
 2.2  
 2 2  
 2 2

RESET RESTART ADDR  
 7 09700  
 1 09701  
 1 09702  
 1 09703

NOSYS1 B TYPEIT  
 7 09704 J 09344

DCW 2NO SYS CRO2,G  
 10 09720

H SETUP  
 6 09722 . 09400

H  
 1 09728 .

DC 2 2  
 6 09734

ODEVN1 EQU 10000  
 ROUTINE ABOVE 10K FOR 7010

ODEVN2 EQU ODEVN1&105

NO SYSTEM CARD-SEE SUMMARY PAGE 3  
 TRY AGAIN

FILL IN

ROUTINE ABOVE 10K FOR 7010

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION
•		*TEST FOR DATA TRANSFER FROM			
•		ODD STARTING ADDR TO EVEN STOP AND			
•		ODD STARTING ADDR TO ODD STOP ADDR			
TOTENK	B	MONITR	7	09735	J 01841
	MLNA	@09401@,88888	12	09742	D 09999 00054 /
	SW	BPRIMW61	6	09754	, 07345
	B	WT	7	09760	J 07027
	DCH	DIGITS	5	09771	08750
	C	XAREOT,C09411	11	09772	C 00059 01115
	BE	ODEVNIC61	7	09783	J 10061 S
ERROR 85	SW	ERK85	6	09790	, 00286
	B	BSP	7	09796	J 06894
	SW	BPRIMR61	6	09803	, 07562
	D	RT	7	09809	J 07420
	C	XAREOT,C09411	11	09816	C 00059 01115
	BE	ODEVNIC105	7	09827	J 10105 S
ERROR 86	SW	ERK86	6	09834	, 00287
	B	MONITR	7	09840	J 01841
	CS	WKAREA	6	09847	/ 00163
	MLCA	DIGITS-1,WKAREA-55	12	09853	D 08749 00108 T
	MLCWS	GMWM,WKAREA-54	12	09865	D 01009 00109 7
	MLNA	@09401@,88888	12	09877	D 09999 00054 /
	SW	BPRIMW61	6	09889	, 07345
	B	WT	7	09895	J 07027
	DCH	-WKAREA	5	09906	00163
	C	XAREOT,C09410	11	09907	C 00059 01110
	BE	ODEVN2691	7	09918	J 10196 S
ERROR 87	SW	ERK87	6	09925	, 00288
	B	BSP	7	09931	J 06894
	MLNA	C00009,RECLEN	12	09938	D 01090 00049 /
	SW	BPRIMR61	6	09950	, 07562
	B	RT	7	09956	J 07420
	C	XAREOT,C09410	11	09963	C 00059 01110
	BE	ODEVN26147	7	09974	J 10252 S

TAPE OPERATIONS TEST

T020

CT ADDR5 INSTRUCTION

LABEL OPCOD OPERAND

ERROR 88	SM	ERR88	6	09981	00289
	8	NEXTRT G	7	09987	J 04256
	DCH	AM2	1	09994	

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RETURN TO REST OF TEST

	LTORG			09995	
		@094012	5	09999	

ATDNO	END	START
UNITNO	EQU	ROYTDS-1
	EQU	CKDRIV23

