IBM-POUGHKEEPSIE
December 31, 1964

Diagnostic Engineering Publication

1410/7010

Subject: Diagnostic Program TC50C
1410/7010 Diagnostic Tape Control Program

Sequence Number 005
Replaces TC50B

Modification to TC50B to create TC50C:

1. Correct failure to loop on NOT READY pglin AB30, page 46.
2. Correct error that disabled ability to update on 40K and up systems pglin AC70, page 50.
3. Correct problem caused when entering control card information from typewriter and no SYSTEM CARD information entered pglin AD01, page 51.

Enclosures: 102 Pages
192 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
X 7010
Other

TC50

TC50C

1410/7010 DIAGNOSTIC TAPE

CONTROL SYSTEM

12/31/64

CONTENTS OF TC50 WRITEUP AND LISTING

Appendix III Change Cards and Decks - Level Cards

A. Change Card Images

Whenever a program on your master tape is to be patched or deleted, or a new program is to be added to your master tape, a "Change" card image must be created in order to instruct TC50 Update as to what is desired.

Normally, it will not be necessary for these cards to be created in the field, since any program changes supplied by Diagnostic Development will include change card images regardless of whether the changes are supplied via card decks or via card image tape format.

However, the "Change" card images will contain:

Column 1	X	-to indicate a change card
Column 2	N	-If to add a new program
	D	-If to delete an old program
	P	-If to patch a present program
Columns 3-5	Will contain the subject program's sequence number. This must agree with the number within the program.	
Columns 6-75	May contain comments	
Columns 76-80	May contain the subject program's identity.	

B. Sequencing of Change Cards and Decks.

An "XN" change card will be the first card of each new program deck. (A load program may or may not be between the XN card and program deck.)

An "XP" change card will be the first card of each set of card patches to any one program.

An "XD" change card will be used to designate the deletion of any program.

All change cards, and their associated decks, must be placed in ascending numerical sequence according to the sequence numbers in columns 3-5 of the change cards. Due to space limitations, TC50 Update cannot check for correct sequencing.

If your changes are in card image format on tape, TC50 Update will handle them via a tape drive.

If you have an "on line" 1402, 1442 or 7223 card reader and the changes are in card deck form, they may be handled through your reader.

If you have no "on line" reader, and your changes are in card deck form, you must use "off line" card to tape equipment to place your card images on tape with odd parity. These changes may or may not be placed on the same tape, and directly following, any configuration control card images you may be adding to your master tape. The last card image placed on this tape must be followed by a tape mark.

C. Level Cards

Most "changes" or "Updates" distributed to the field from diagnostic engineering will cause a change to the "change level" of your master tape. The first card image of all such updates will be an "L" card. This card indicates to TC50 Update the level that this group of changes will place a diagnostic tape at, and it indicates the oldest level a tape may be at and still be logically updated by these changes. (See section 1.01.05.U0 for further information.) Only "level" cards supplied by diagnostic engineering should ever be used.

The "L" card consists of:

Column 1 - L
Column 2 - Blank
Columns 3-6 Oldest acceptable tape level that can be updated by these changes.
Columns 7- Blank
Columns 8-11 New level of a tape after this update

INTRODUCTION TO THE TC50 DIAGNOSTIC TAPE SYSTEM

The TC50 program is a combination of a tape search program and a tape update program. This writeup is divided into two corresponding sections plus this introduction to the TC50 system.

The prime objectives of the TC50 System are:

1. Assist in "bringing up" a new 1410/7010 system to the point where diagnostics can be run.

2. Provide an initial master tape that may be used to run some diagnostics without requiring the updating of the tape.

3. Provide rapid access to diagnostic programs.

4. Provide the versatility of "machine configuration control cards "without requiring that they be punched for every program on the tape.

5. Provide a simple and fast means of updating 1410/7010 diagnostic tapes.

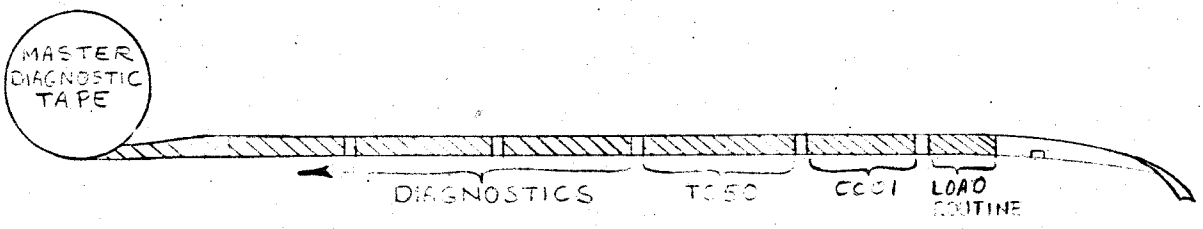
6. Provide for multiple outputs when updating the diagnostic tape.

7. Automatically provide an "Edited" working tape that contains only those programs needed by a particular system, while updating the system's master tape that contains all 1410/7010 diagnostic programs.

8. Provide a means for card/tape systems to obtain card decks directly from their diagnostic tape. (Accomplished through program UP51)

9. Provide a "quick" reliability check of a 1410/7010 machine system.

The Master 1410/7010 diagnostic tape contains programs in "memory dump" form. These "memory dumps" are of program length (not memory length).



The above illustration is to show the contents of a TC50 diagnostic tape. The first record is a short load routine placed there (by TC50) when the tape is created. (This load routine is described in Appendix I of this writeup.) Besides having the function of loading the second record on the tape, the load routine contains some basic tape patterns to assist in diagnosing solid tape read failures.

The second record on the tape is the basic CPU diagnostic CC01. This diagnostic is (automatically) run every time the tape is loaded. All error indications provided by this program are "halts" or "system checks." CC01 also has more extensive tape patterns in it. Upon successful completion, CC01 reads in the third record (TC50), and turns control over to it.

The fourth record, and all succeeding records, are normal diagnostic or utility programs. The last record on the tape is a tape mark.

Updating a TC50 Diagnostic Tape is accomplished through the use of card images. ("Updating" includes creation of a tape, adding or changing the tape's machine configuration control cards, adding programs, deleting programs, and patching programs.) These card images may be provided through a 1402, 1442 or 7223 card reader, or through the use of tape drives.

1.01.00.S TC50 SECTION S (Search Section)

1.01.00.S0 Description

The S, or search section, of TC50 is the program used to locate, load and initiate the running of all diagnostics and other programs contained on the 1410/7010 diagnostic tape.

The search section is designed to make the running of diagnostic programs as fast and easy as possible. The search section cannot be run from cards.

When TC50 is initially loaded, the search section is contained between addresses 01000 and 02000 of core memory. The program is started at address 01972 when initially loaded from tape. It then housekeeps and relocates itself to occupy memory locations 00334 through 00999. The S section is then ready to perform its functions.

At the request of the operator, the S section will initiate a single selected program, a group of selected programs, or all programs on the tape starting at a previously selected program.

TC50 Search also provides an operating option wherein portions of certain programs will be automatically run in a quick mode in order to provide a fast reliability check of a 1410/7010 system. These programs are designated by the diagnostic engineering department. They will automatically include, for all systems, a portion of a CPU reliability program, the addressing tests of applicable memory programs and a complete system test program. It should be noted that this option is a compromise between a thorough and a fast reliability check. The time required to run this complete option will vary according to the system machine configuration. However, for most systems, it should be less than seven minutes.

TC50 Search also provides limited information and closed subroutines for the use of diagnostics on the TC50 tape. It makes available an indicator to allow a diagnostic to know if it is being run from cards or tape. It provides the channel that TC50 Search was loaded from. It has closed subroutines to allow a diagnostic to space or backspace the TC50 source tape.

In order to initiate the running of the TC50 U, or Update, section from the 1410/7010 diagnostic tape, TC50 must be selected for running via the TC50 S section options.

A flow chart of the search section is included in this writeup.

1.01.00.S1 Equipment Required

A 1410 or 7010 machine system with tapes on channel E, F, G or H.

1.01.00.S2 Card Deck (Entire TC50 Program deck)

7	Cards	Load Program
1	Card	Core Clear Card
183	Cards	Program
	(Cards numbered 001 - 180)	
1	Card	Execute Card (Branch to 2000)

1.01.00.S3 Machine E. C. Level

Not Applicable

1.01.00.S4 Pass Length

Variable

1.01.01.S0 Loading Procedures

1. Make a TC50 diagnostic tape ready on tape drive 0 of any channel.

2. If a 7010 load button is being used, and the tape is on channel E:

   Depress the tape load switch

   Otherwise:

   (a) Display memory location 00000.

   (b) Alter to:

RL%B000011$.	For E channel tape
XL⊟B000011$.	For F channel tape
3L?B000011$.	For G channel tape
1L!B000011$.	For H channel tape

3. Set to RUN,, COMPUTER RESET, START

The above procedures will load a very short load routine. This load routine will load CC01. Upon successful completion, CC01 will load and initiate the search section of TC50. Appendix I of this writeup contains a description and listing of the short load routine that is the first record of the TC50 diagnostic tape.

1.01.02.S0 Operating Procedures

Upon initial loading, and upon the completion of any selected option, TC50 Search will type: OPTION?

At this time use the inquiry button to enter one of the following:

1. *Program identity, i.e. "CU01". Designated program will be run in it's entirety.

or 2. *Left portion of a program identity.
All programs having the designated portion of the identity, that are adjacent on the tape, will be run in their entirety. i.e., if "C" were entered, all programs with a "C" identity would be run; if "CU" were entered, all programs with a "CU" identity would be run; if "CU0 " were entered, all programs with a "CU0 " identity would be run; etc.

or 3. Nothing (Just request / release)
All programs on the tape will be run in sequence starting at the point the tape is located when this entry is made.

or 4. $
Entering a dollar sign will select the reliability mode described in section 1.01.0C.S0 of this writeup.

* NOTE: Normally when a program identity or a portion of a program identity is entered, the diagnostic tape is rewound before the search of the tape is started. If a word mark is entered along with the first character of the identity, this rewind will be inhibited.

1.01.03.S0 Operating Hints and Comments

The operation of the search section of TC50 requires very little knowledge of the program. Knowing the various options available should be sufficient.

You should be cautioned that upon the completion of any program on the tape, TC50 Search must necessarily read in the next record to determine if a "multi pass" program is being run. The tape will then be backspaced one record to resume its normal position. However, this destroys the just completed program in core memory. In order to re-run the program, it must be re-selected.

If an invalid entry is made in response to the "OPTION?" request the tape will be completely searched for this invalid entry and, failing to locate it, will re-type "OPTION?"

The search section of TC50 contains no halts and a loop condition will result if a machine malfunction is responsible for an I/O status error condition during the execution of tape forward space, backspace or rewind operations.

When a program identity is entered following the "OPTION?" request, the entered data is read into address 00963.

1.01.04.S0 Program Stops and Restarts

There are no programmed halts in TC50 Search. If a data check is encountered while attempting to read in a program, TC50 will backspace and read repeatedly until the record is read without error, or the program is manually halted.

Program Restart Locations

(a) *00334

Starting at this address will cause OPTION? to be typed. This restart address will simulate the reloading of TC50 Search providing locations 00334 - 00999 have not been disturbed since TC50 Search was last loaded.

(b) * 00400

This is the address all programs must go to when complete. Restarting here will simulate the end of a diagnostic test.

(c) * 02000

This is the starting address of all diagnostic programs.

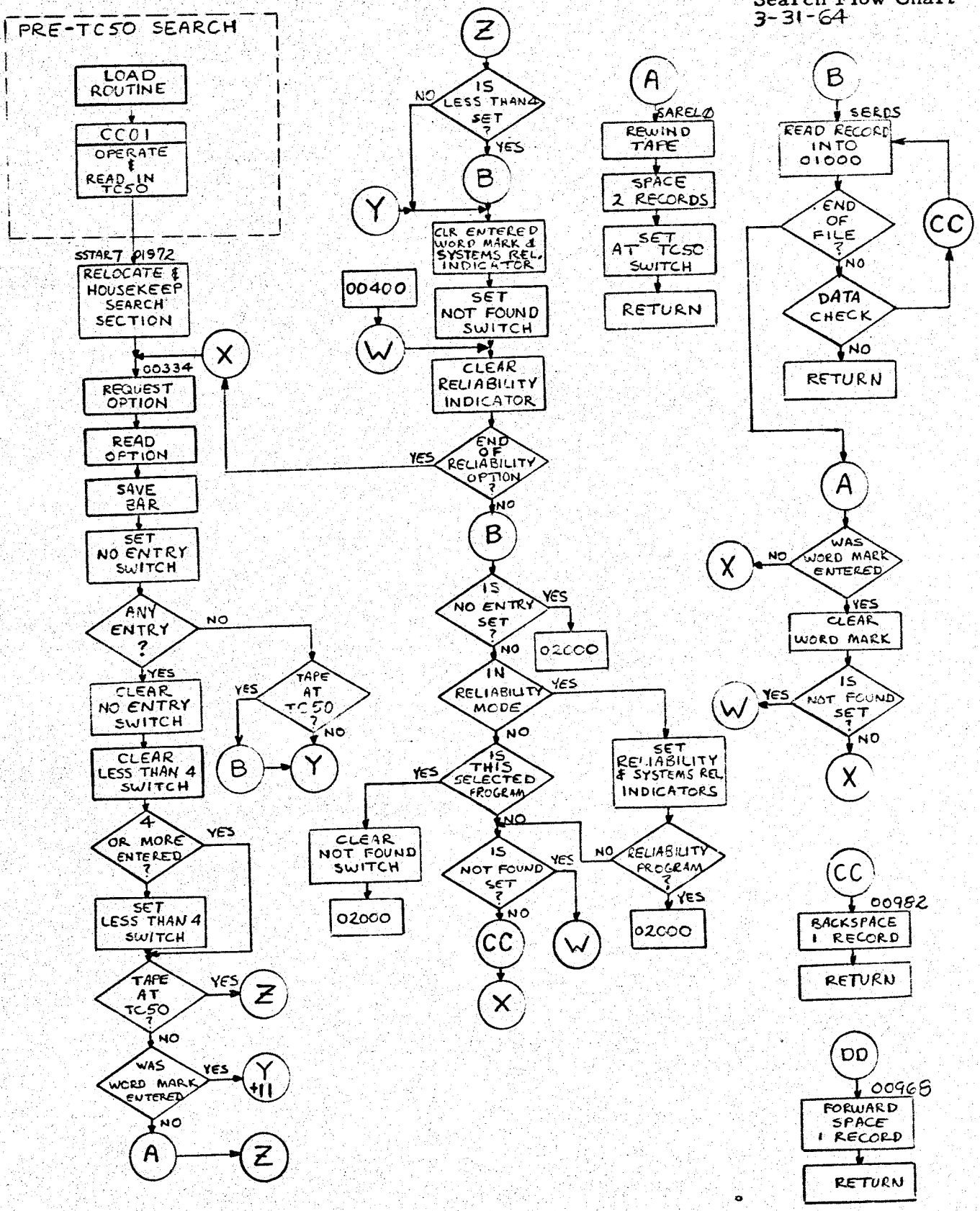
* Note:

These addresses will be different in the case of some memory diagnostics due to the fact that the memory diagnostics must relocate TC50 in order to check the lower portion of core memory.

1.01.05.S0 Typeouts

OPTION?

This is the only typeout provided by TC50 Search. It is a request that an option be selected as explained in section 1.01.02.S0.


PRE-TC50 SEARCH
LOAD ROUTINE
CC01
OPERATE & READ IN TC50
SSTART 01972
RELOCATE & HOUSEKEEP SEARCH SECTION
00334
REQUEST OPTION
READ OPTION
SAVE BAR
SET NO ENTRY SWITCH
ANY ENTRY ?
NO
YES
CLEAR NO ENTRY SWITCH
CLEAR LESS THAN 4 SWITCH
4 OR MORE ENTERED ?
YES
SET LESS THAN 4 SWITCH
TAPE AT TC50 ?
YES
Z
NO
WAS WORD MARK ENTERED
YES
Y +11
NO
A
Z
TAPE AT TC50 ?
YES
NO
B
Y
Z
IS LESS THAN 4 SET ?
NO
YES
B
Y
CLR ENTERED WORD MARK & SYSTEMS REL. INDICATOR
00400
SET NOT FOUND SWITCH
W
CLEAR RELIABILITY INDICATOR
END OF RELIABILITY OPTION ?
YES
X
NO
B
IS NO ENTRY SET ?
YES
02000
NO
IN RELIABILITY MODE
YES
NO
IS THIS SELECTED PROGRAM
YES
CLEAR NOT FOUND SWITCH
02000
NO
IS NOT FOUND SET ?
YES
W
NO
CC
X
SET RELIABILITY & SYSTEMS REL INDICATORS
RELIABILITY PROGRAM ?
NO
YES
02000
A
SAREL0
REWIND TAPE
SPACE 2 RECORDS
SET AT TC50 SWITCH
RETURN
B
SERDS
READ RECORD INTO 01000
END OF FILE ?
CC
NO
DATA CHECK
NO
RETURN
A
X
NO
WAS WORD MARK ENTERED
YES
CLEAR WORD MARK
W
YES
IS NOT FOUND SET ?
NO
X
CC
00982
BACKSPACE 1 RECORD
RETURN
DD
00968
FORWARD SPACE 1 RECORD
RETURN

1.01.00.U TC50 SECTION U (Update Section)

1.01.00.U0 Description (ALSO REFER TO PAGE 034)

The U, or Update, section of TC50 is the program responsible for creating and maintaining all TC50 diagnostic tape systems. The U section is capable of adding, replacing and patching programs on an already existing diagnostic tape. It can create a tape from card image programs. It will selectively place configuration control card images in programs requiring them. The Update section is capable of furnishing an updated master tape output containing all 1410/7010 diagnostics and an updated working tape containing only the programs required by a specific machine configuration. It is capable of performing most of these options during a single run of the program. All outputs of TC50 Update are in a "short memory dump" form. The dumps are created by moving the program to be written to the top of memory, and then performing a WTBEW instruction.

An operation of TC50 Update consists of up to four phases. "Pre-Phase" is the first one to operate. It does all the housekeeping of itself and the other three phases prior to the actual update operation. It occupies the majority of the 9000 memory locations that TC50 is allocated.

Phase 1 (2nd phase) is responsible for combining input card images and input memory dumps. It also stores, into the TC50 program, any new configuration control cards read during pre-phase operation. The output of phase 1 is a tape containing memory length core dumps.

Phase 2 (3rd phase) is responsible for selectively updating the configuration control card images of all programs on the tape (except TC50). Its input consists of short or long memory dumps. Its outputs are from 1 to 20 tapes containing program length (short) memory dumps.

Phase 3 (4th phase) is responsible for producing an edited working tape. It selectively deletes programs not required by a particular machine configuration. Its input is normally a master diagnostic tape of "short" memory dumps. Its output is one tape containing the desired programs in "short" memory dump form.

Phases 1, 2, and 3 occupy only locations 00001 through 00999 while they are operating.

Upon initial loading, pre-phase asks several questions of the operator. The answers are inserted by means of the inquiry request button. Pre-phase then determines, from the answers received, which phases are required for this operation and modifies the program accordingly. Pre-phase also reads any new configuration control cards available, and stores them in lower memory to make them available for phases 1 and 2.

When a straight duplication is being performed (no program changes, no control card changes, and no program editing), Pre-Phase combines phases 1 and 2 to create a single phase duplication program that can provide up to 20 output tapes from a single input tape.

When an "Edit" pass is called for with no program changes and no control card changes, Pre-Phase combines phases 2 and 3 to create a single phase edit program that will provide a single edited output tape from a master input tape.

The memory dump inputs and outputs to TC50 Update may be on any tape selections on any of four channels. TC50 Update is capable of utilizing up to 23 tape drives on a single program run. However, the maximum number of tape drives required for any type of operation is 3. A straight duplication or auto edit run requires only 2 tape drives.

The card image inputs to TC50 Update may be from a card reader (1402, 1442 or 7223) or from any tape drive on any of four channels.

1.01.00.U1 Equipment Required

1410 or 7010 with the following minimum number of I/O devices:

2 tape drives -
Straight duplication or straight edit runs.

3 tape drives -
Any operation requiring only the card image changes pre-written on tape by diagnostic development .

3 tape drives and "off line" card- to-tape equipment-

or

3 tape drives and an "on line" card reader (1402, 1442 or 7223). -
- Any operation.

1.01.00.U2 Card Deck (Entire TC50 Program Deck)

7	Cards	Load Program
1	Card	Core Clear Card
183	Cards	Program

(Cards numbered 001 - 183)

1	Card	Execute Card (Branch to 2000)

1.01.00.U3 Machine E. C. Level

Not Applicable

1.01.00.U4 Pass Length

Variable, but should average less than 5 minutes in the field and should seldom exceed 10 minutes for any operation including creation of a tape.

1.01.01.U0 Loading Procedures

1.01.01.U1 Loading from a card deck:

1. Ready a TC50 card deck in a 1402 or 1442 card reader.
2. If using an E channel reader on a 7010 - Depress the card load switch.

   Otherwise -

   Display and alter memory location 00000 to:

ŘŘL%1100011$.ˇ	For channel 1 reader
ŘŘL⊟1100011$.ˇ	For channel 2 reader

3. Set to RUN, RESET, START.

1.01.01.U2 Loading from a TC50 tape:

1. Load TC50 Search as explained in section 1.01.01.S0.
2. When "OPTION?" is typed, enter "TC50".

1.01.02.U0 Operating Procedures (Creating, modifying or duplicating a TC50 Diagnostic Tape.) ALSO SEE PAGE 034 for illustration

1.01.02.U1 Preparation prior to machine time.

1. If configuration control card information is to be added or modified, prepare the card images as explained in Appendix II of this writeup. (Once a system's Master TC50 Diagnostic Tape contains the proper control card images, they need never be added again unless the system machine configuration is changed or the TC50 Program is replaced.)

2. If any programs are to be patched, added, or deleted, prepare the "change" card images and program deck card images as explained in Appendix III of this writeup.

1.01.02.U2 Machine set up.

1. Ready a TC50 card deck in a 1402 or 1442 reader or ready a TC50 Diagnostic Tape on any tape drive 0.

2. If configuration control cards are to be added or modified, place the new card images in the reader (1402, 1442 or 7223), or on any tape drive. (If limited to 3 tape drives, see NOTE on next page.)

3. If card image patches, additions, or deletions are required, place these card images in the reader (1402, 1442 or 7223) or on any tape drive . (If limited to 3 tape drives, see NOTE on next page.)

4. If a TC50 Diagnostic Tape is being duplicated, modified, or edited, make it ready on any tape drive. (If running from tape, this may or may not be the tape on drive 0 that has already been made ready.)

5. If this operation is other than a straight duplication and is not an "edit" run, make a scratch tape ready on any drive for use as a buffer tape.

6. Make all output tapes ready. (If limited to 3 tape drives, see NOTE below.)

   (a) For any operation other than an "edit" run, this may be from 1 to 20 drives.
   (b) For an "edit" run with no control card changes or program changes, 1 output drive is required.
   (c) For an "edit" run with control card changes or program changes, 2 output drives are required.

NOTE: If limited to 3 tape drives and "control card" and or "change card" image inputs are from tape: Configuration control card images, change card images and one output drive may all utilize the same physical tape drive since none of these are referred to simultaneously by TC50 Update. (In the case of 6. (c) above, the second output tape drive selection entered is the tape drive that may be used for the 3 different purposes.)

7. If using a 7223 reader for control card and/or card image inputs, place a blank card on the back of the input decks.

1.01.02.U3 Operation

1. Load TC50

2. Some of the following questions will be typed by TC50, Use the inquiry request button to enter the correct answers.

   (a) CORE SIZE? 0-10K, 1-20K, 3-40K, ETC. Enter the core memory size of the system being operated on as follows:

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

(b) CONTROL CARD SOURCE?

If no configuration control card changes-
request / release.

If control cards are in a card reader -
Enter "EC" or "FC" for a 1402 or 1442
on E or F channel respectively. ("EZ" or "FZ"
for a 7223 reader.)

If control cards are on a tape drive -
Enter "E" or "F" or "G" or "H" to indicate
channel, followed by a "tape drive selection
digit". i.e. : "E1","E2", "H3", etc.

If control cards are to be entered from the console
printer -
Enter "ET" and see Appendix IV.

(c) DIAGNOSTIC TAPE SOURCE?

If creating a tape from card images -
request / release.

If duplicating, modifying or editing an existing tape-
Enter "E" or"F" or "G" or "H" to indicate channel,
followed by a "tape drive selection digit". i.e.:
"E0, "E1", "G4", etc. (Usually tape drive 0).

(d) CARD IMAGE SOURCE?

If no card image patches, additions or deletions
are being made -
request/release.

If card images are in a card reader -
Enter "EC" or "FC" for a 1402 or 1442
on E or F channel respectively. ("EZ" or"FZ"
for a 7223 reader.)

If card images are on a tape drive -
Enter "E" or "F" or "G" or "H" to indicate
channel, followed by a "tape drive selection
digit". i.e. : "E1", "E2", "F5", etc.

(e) AUTO EDIT? Y/N

If an "edited" working tape is desired, enter "Y" for yes.

If a straight duplication is desired or no "edited" working tape is desired, enter "N" for no.

(f) BUFFER TAPE DRIVE?

Enter "channel letter" and "drive selection digit " of scratch tape to be used as a buffer tape. i.e.: "E1", "E2", "F4", etc.

(g) OUTPUT TAPE DRIVES?

Enter "channel letter" of the first output drive followed by the "drive selection digits" of all output drives on that channel, followed by the "channel letter" of the next channel having output drives, followed by the "drive selection digits" of all output drives on that channel, etc. (Minimum of 1 and maximum of 20 tape drives)

Example: "E569G2H43" entry designates E channel drives 5, 6, and 9 , G channel drive 2 and H channel drives 3 and 4.

(h) 1 OUTPUT TAPES?

Enter a "channel letter" and a "drive selection digit". i.e. : "E2"

(i) 2 OUTPUT TAPES?

Enter a "channel letter" followed by 2 drive selection digits" or a "channel letter" and "drive selection digit" followed by another "channel letter" and "drive selection digit". i.e.: "E27" or "E2F7".

3. After answering one of the output tape questions, the operation will proceed automatically until its completion unless an I/O status indicator is encountered.

4. Input/Output errors:

   (a) If any I/O unit being used should become NOT READY, TC50 Update will loop until the unit is made ready.

   (b) If a DATA CHECK should occur on any read or write operation on any I/O unit, a halt will occur. (This is the only programmed halt in TC50 Update other than the halt at the end of the program.)

      (1) START will attempt a re-read or re-write of the bad data. (If a tape write, a skip operation will preceed the re-write.)

      (2) COMPUTER RESET & START will cause TC50 to attempt to operate without correcting the bad data. CAUTION!

5. Halt with the IAR at 00773 or 00687, program is complete.

1.01.03.U0 Operating Hints and Comments

1. Data Checks and Memory Dump Tapes -
All tape records written by TC50 are in the form of memory dumps. Although depressing START following a "write tape data check" will cause a backspace/skip, due to the length of the records being written, in some cases it could require numerous backspace/skip operations to bypass a bad spot on a tape.

2. Blank Cards and Input Card Images -
TC50 will ignore all blank card image inputs. Therefore blank I. B. M. cards may be used to separate card decks being read by TC50.

3. NEVER use a 10K or 20K system to create, duplicate or update a TC50 Diagnostic Tape that is to be used by a system with a larger memory than 10K or 20K respectively. Programs too large to fit in a 10K or 20K memory are automatically deleted during any type run since they cannot be properly written on tape.

4. If you have a 10K or 20K system, and its memory size is increased, be sure and obtain a new master tape containing all current programs, since your current master tape does not contain any programs larger than your old memory.

5. Load Cards may or may not be on card decks as they are being added to your tape during an update operation. They will be ignored by TC50 Update.

1.01.04.U0 Program Stops, Loops and Restarts

1.01.04.U1 Program Stops

IAR at 00408

A data check occurred on the last I/O operation. The data check indicators are still on.

(a) If tape operation -
- to attempt to correct error by repeating the read or write operation, depress START. A backspace/read or a backspace/skip/write operation will result.

-to attempt to continue without correcting the bad data, COMPUTER RESET and START. CAUTION.

(b) If card reader operation -
-if bad card, correct card, make reader ready and depress START.

-if card reader error, replace card in reader hopper, make reader ready, depress START.

-to attempt to continue without correcting the bad data, COMPUTER RESET and START. CAUTION.

IAR at 00773

Completion of an Update run

IAR at 00687

Completion of an Edit or Update / Edit run.

1.01.04.U2 **Program Loops**

If any tape drive or card reader being used by TC50 Update becomes not ready, TC50 Update will hang in a tight "not ready" loop until the associated I/O device is made ready.

1.01.04.U3 **Program Restarts**

1. If an operator error is made during a TC50 Update operation that causes any kind of loss of control, it is recommended that the TC50 program be reloaded.

2. If further TC50 Update operations are desired after completion of a TC50 Update operation, it is necessary to reload the TC50 program.

3. At the completion of an Edit or Edit/Update run, you may:

   (a) File protect the new edited tape

   (b) Make its drive ready and change its selection to 0.

   (c) COMPUTER RESET, START

   The new edited tape will be placed in operation.

1.01.05.U0 Typeouts

CARD IMAGE ERROR -FIXIT

1. An illegal, unexpected card image was read.

or 2. You indicated the card image source I/O unit incorrectly.

INVALID CARD IMAGE

1. Expected to read at least one configuration control card image, but first card image read was a "change" card,

or 2. An illegal, unexpected card image was read,

or 3. You indicated the configuration control card source I/O unit incorrectly.

As OUTPUT TAPES are being created, TC50 Update will type the sequence numbers and identities of the programs that are being written on the output tapes.

* LEVEL ERR

The changes now being made to your diagnostic tape were not meant to be made to a tape at the change level your present tape is at. Your present tape is either missing some previous changes, or your present tape is already at a level higher (newer) than are the changes you are incorporating.

OLD - XXXX
NEW - XXXX
These typeouts indicate the change level of your old (source) tape, and the new tape(s) you are now creating. The X's should be four digit numeric numbers. (The higher the number, the newer the level.)

Zone bits in the 1000's position of the "old" level indicate that at some prior time, an update was skipped.
Zone bits in the 100's position of the "old" level indicate that at some prior time an update was made to your tape that took it backwards.

Zone bits in the corresponding positions of the "new" level, but missing from the "old" level, indicate you are now making said error. It would be advisable to stop the present operation, and obtain the proper tapes.

All other typeouts are explained in the "Operating Procedures" section 1.01.02.U0.

1.01.06.U0 Restrictions On System Programs

The restrictions below apply to all programs that are to be placed on a TC50 Diagnostic Tape.

1.01.06.U1 Memory Residence Area

All programs, upon initial loading, will occupy no memory locations outside of addresses 01000 through 39999.

1.01.06.U2 Program Starting Address.

All programs will have address 02000 as their initial operating address.

1.01.06.U3 Restricted Memory Areas

No program will, during its operation, alter addresses 00334 through 00999.

1.01.06.U4 Initial Memory Contents

No program can, when initiated, assume any area outside of its residence area to be cleared, or expect it to contain any pre-determined information except as stated in section 1.01.07.U0 of this writeup.

1.01.06.U5 Program Exit Address

All programs, upon completion, will return to address 00400.

1.01.06.U6 Execute Cards

All execute cards included in a program deck (except the final "branch control" card), will assume they are loaded into address 00601 for operation, and, to continue loading, will return to address 00400.

1.01.06.U7 Final Execute Card (Branch Control Card)

The Final Execute Card will normally consist of a branch to 02000. In addition, it will have an "*" punched in the proper column so that upon being read into address 00601 in LOAD mode, the asterisk will occupy address 00672 of core memory.

1.01.06.U8 Core Clear Execute Card

The Core Clear card preceeding card 001 of each deck must conform to the specifications laid out in the 1410/7010 INTRODUCTION.

1.01.06.U9 Required Internal Data

All programs are required to contain, in the designated addresses, the data described in the following paragraphs.

01250-01255

In this area shall be the program's identity followed by a group mark/word mark. i.e., "CU01A‡".

01250 & 01254 may or may not contain word marks.

01251 - 01253 must not contain any word marks

01245-01249

Word Marks

Location 01245 may or may not contain a word mark. However, it may be changed by TC50 Update as the program is placed on the tape.

Locations 01246 - 01249 must not contain any word marks.

Zones

01246 Zone

- If A Bit-Systems Test

01247 Zone

- If B bit - Program belongs to the reliability group.

- If A bit - Program is TC50.

01248 Zone

- If B bit - Program requires System, Channel 1 and Channel 2 configuration control cards and no channel 3 or channel 4 control cards.

- If A bit - Program requires System, Channel 1, Channel 2, Channel 3 and Channel 4 configuration control cards.

01249 Zone

- If B bit - this program is required by all 1410/7010 tape systems. (Program cannot be "auto edited" from tape.)

- If A bit - Program requires System configuration control card and no channel configuration control cards.

Numerics

01245-01247 Numerics

These three locations will contain the program's relative sequence number as assigned by Diagnostic Development.

01248-01249 Numerics

These two locations will contain the "last thousand's" digits of the program. i.e., If the programs last address was 27431, "27" would be placed in 01248-01249. This would cause 01000-27999 to be included in the core dumps of the program.

01215-01244

This area is reserved for the programmer to tell TC50 Update, Phase 3, what systems his program is applicable to. All programs not having a B bit in location 01249, must have some coded information in this area.

How much of the area is required depends on what type systems the program is applicable to. The coding of this area starts at the right (address 01244) and continues to the left in 3 address blocks. The last address of the last block to the left will contain a word mark. Any addresses to the left of that word mark may be used in any manner by the program.

The explanation of the methods of coding this area starts on the next page.

MEMORY SPACE MUST BE ALLOCATED IN YOUR PROGRAM FOR ANY CONFIGURATION CONTROL CARDS REFERRED TO BY THE CONSTANTS IN THIS AREA. Refer to the 1410/7010 Introduction for Control Card space allocation.

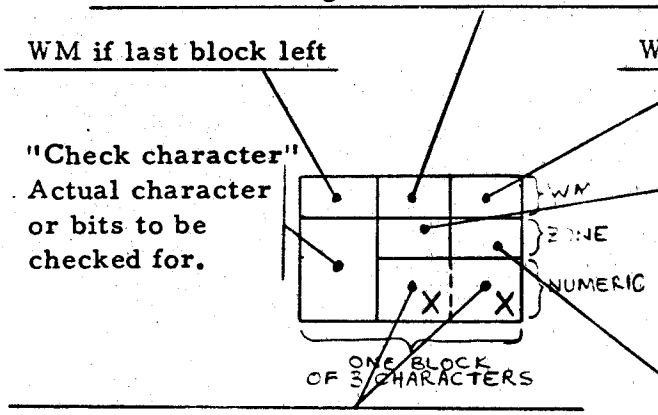
Also, the zone bits in addresses 01248 - 01249 must indicate your program requires these Control Cards.

The figure below is a representation of the coding of an individual block of information.

WM to place ")" between this block's check character and sign and "(" between this block's sign and the next block right.

WM if last block left

WM to cause check with "BBE" instead of "BCE"



$\bar{A}\bar{B}$ Zone = "a." condition
$\bar{A}B$ Zone = "a+" condition
$A\bar{B}$ Zone = "$\bar{a}$." condition
AB Zone = "$\bar{a}$+" condition

$\bar{A}\bar{B}$ Zone and XX>32 = (XX-33) is relative to Chn 1 label
$\bar{A}\bar{B}$ Zone and XX<32 = (XX) is relative to Sys 1 label
$\bar{A}B$ Zone = XX is relative to Chn 2 label
$A\bar{B}$ Zone = XX is relative to Chn 3 label
AB Zone = XX is relative to Chn 4 label

2 digit number specifying position of control card to be checked. For channel one card, add 33 to relative position. (Sys 1 + 0 = 00, Chn 1 + 20 = 53, Chn 2 + 2 = 02, Chn 4 + 55 = 55, etc.)

The methods of using this figure to code a programs "Edit Constants" are explained on the following pages by means of proceeding through an actual example.

We will assume a theoretical program. The assumed theoretical program requires a machine configuration, as follows, in order to properly operate.

The machine must have a memory size of 10K. It must be a 1410 (not a 7010) with a card reader of any kind on channel one,

or

it may be a 7010 with a card reader on Channel 2.

To put this another way:

(10K memory and not 7010 and reader channel 1) or
(7010 and reader channel 2)

This may be coded as a Boolean expression:

$(a \cdot \overline{b} \cdot c) + (d \cdot e)$

Where:
- a = 10K memory
- $\overline{b}$ = not 7010
- c = reader on channel 1
- d = 7010
- e = reader on channel 2
- . = "and" sign
- + = "or sign

In coding this information, these characters, signs and parentheses will be represented in 3 address blocks:

- e. by addresses 01242 - 01244
- d. by addresses 01239 - 01241
- c)+(by addresses 01236 - 01238
- b. by addresses 01233- 01235
- a. by addresses 01230 - 01232

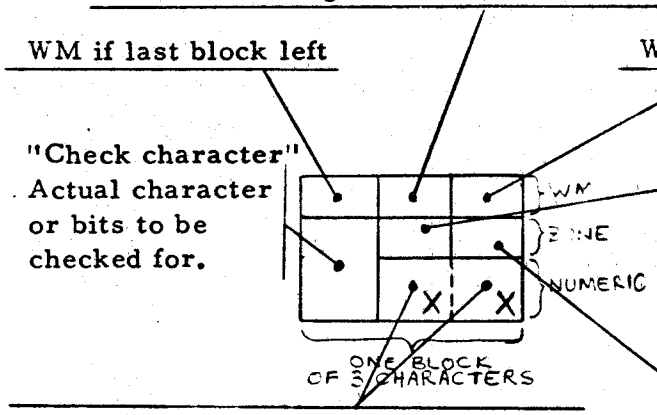
The parentheses on both ends are assumed.

The figure below is a representation of the coding of an individual block of information.

WM to place ")" between this block's check character and sign and "(" between this block's sign and the next block right.

WM if last block left

WM to cause check with "BBE" instead of "BCE"



2 digit number specifying position of control card to be checked. For channel one card, add 33 to relative position. (Sys 1 + 0 = 00, Chn 1 + 20 = 53, Chn 2 + 2 = 02, Chn 4 + 55 = 55, etc.)

$\overline{A}\overline{B}$ Zone = "a." condition
$\overline{A}B$ Zone = "a+" condition
$A\overline{B}$ Zone = "$\overline{a}$." condition
AB Zone = "$\overline{a}$+" condition

$\overline{A}\overline{B}$ Zone and XX>32 = (XX-33) is relative to Chn 1 label
$\overline{A}\overline{B}$ Zone and XX<32 = (XX) is relative to Sys 1 label
$\overline{A}B$ Zone = XX is relative to Chn 2 label
$A\overline{B}$ Zone = XX is relative to Chn 3 label
AB Zone = XX is relative to Chn 4 label

The methods of using this figure to code a programs "Edit Constants" are explained on the following pages by means of proceeding through an actual example.

We will assume a theoretical program. The assumed theoretical program requires a machine configuration, as follows, in order to properly operate.

The machine must have a memory size of 10K. It must be a 1410 (not a 7010) with a card reader of any kind on channel one,

or

it may be a 7010 with a card reader on Channel 2.

To put this another way:

(10K memory and not 7010 and reader channel 1) or
(7010 and reader channel 2)

This may be coded as a Boolean expression:

$(a \cdot \overline{b} \cdot c) + (d \cdot e)$

Where:
- a = 10K memory
- $\overline{b}$ = not 7010
- c = reader on channel 1
- d = 7010
- e = reader on channel 2
- . = "and" sign
- + = "or sign

In coding this information, these characters, signs and parentheses will be represented in 3 address blocks:

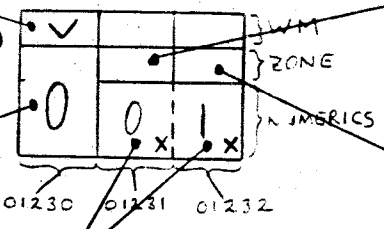
- e. by addresses 01242 - 01244
- d. by addresses 01239 - 01241
- c)+(by addresses 01236 - 01238
- b. by addresses 01233- 01235
- a. by addresses 01230 - 01232

The parentheses on both ends are assumed.

Starting at the left most block (address 01230), and referring to the figure on page 027, the five blocks will be coded as follows:

"WM to indicate this is the last block to the left.

"0" to indicate that TC50 should look for a zero in the control card. (A "0" represents a 10K memory in the system control card.)



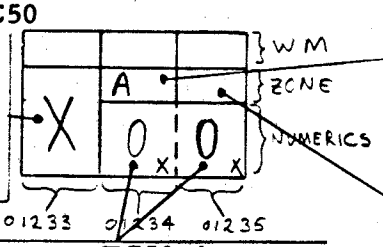
No zone bits to indicate that the Boolean character and sign that this block represents is "a.".

No zone bits to indicate that the control card this block is referring to is either the system control card or the channel one control card. (Memory size is in the system control card.)

"01" to indicate to TC50 that the relative position in the control card to be checked is "card +01". (Memory size is indicated in the first address of the system control card plus one.)

FIRST BLOCK FROM LEFT CODED TO INDICATE A 10K MEMORY IS REQUIRED. "a." in the Boolean expression.

"X" to indicate that TC50 should look for an X in the control card. (An "X" represents a 7010 machine in the system control card.)



"A Bit zone to indicate that the Boolean character and sign that this block represents is "$\bar{a}$.".

No zone bits to indicate that the control card this block is referring to is either the system control card or the channel one control card. (Machine type is the system control card.)

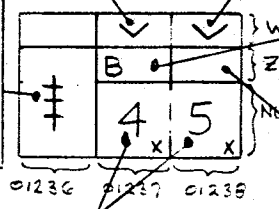
"00" to indicate to TC50 that the relative postion in the control card to be checked is "card + 00". (Machine type is indicated in the first address of the system control card.)

SECOND BLOCK FROM LEFT CODED TO INDICATE THE MACHINE REQUIRED IS NOT A 7010. "$\bar{b}$." in the Boolean expression.

"WM" to cause the Boolean expression to be broken into two terms, at this point, by parentheses.

"WM" to cause TC50 to check the control card character with a "Branch Bit Equal" instruction instead of a "Branch Character Equal" instruction. (Any bit in the reader position indicates a reader is present.)

"‡" to indicate character TC50 should look for in the control card. (A reader is indicated by several different characters in the channel one control card. Therefore, the presence of any bit in the reader position would indicate a reader of some kind is present.)



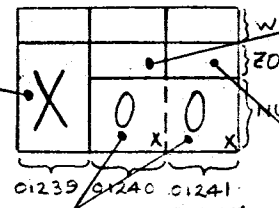
"B Bit" zone to indicate that the Boolean character and sign that this block represents is "a+".

No zone bits to indicate that the control card this block is referring to is either the system control card or the channel one control card. (Channel one reader is indicated in the channel one control card.)

"45" to indicate the relative position in the channel one control card to be checked is channel one card plus 12. (A reader is indicated by a character in the first address plus 12 of the channel one card. "33" must be added to the "12" since this block refers to the channel one control card.)

THIRD BLOCK FROM LEFT CODED TO INDICATE A READER IS REQUIRED ON CHANNEL ONE AND TO INDICATE THAT THIS IS THE END OF THE FIRST TERM OF A TWO TERM BOOLEAN EXPRESSION. "c) + (" in the Boolean expression.

"X" to indicate that TC50 should look for an X in the control card. (An "X" represents a 7010 machine in the system control card.)

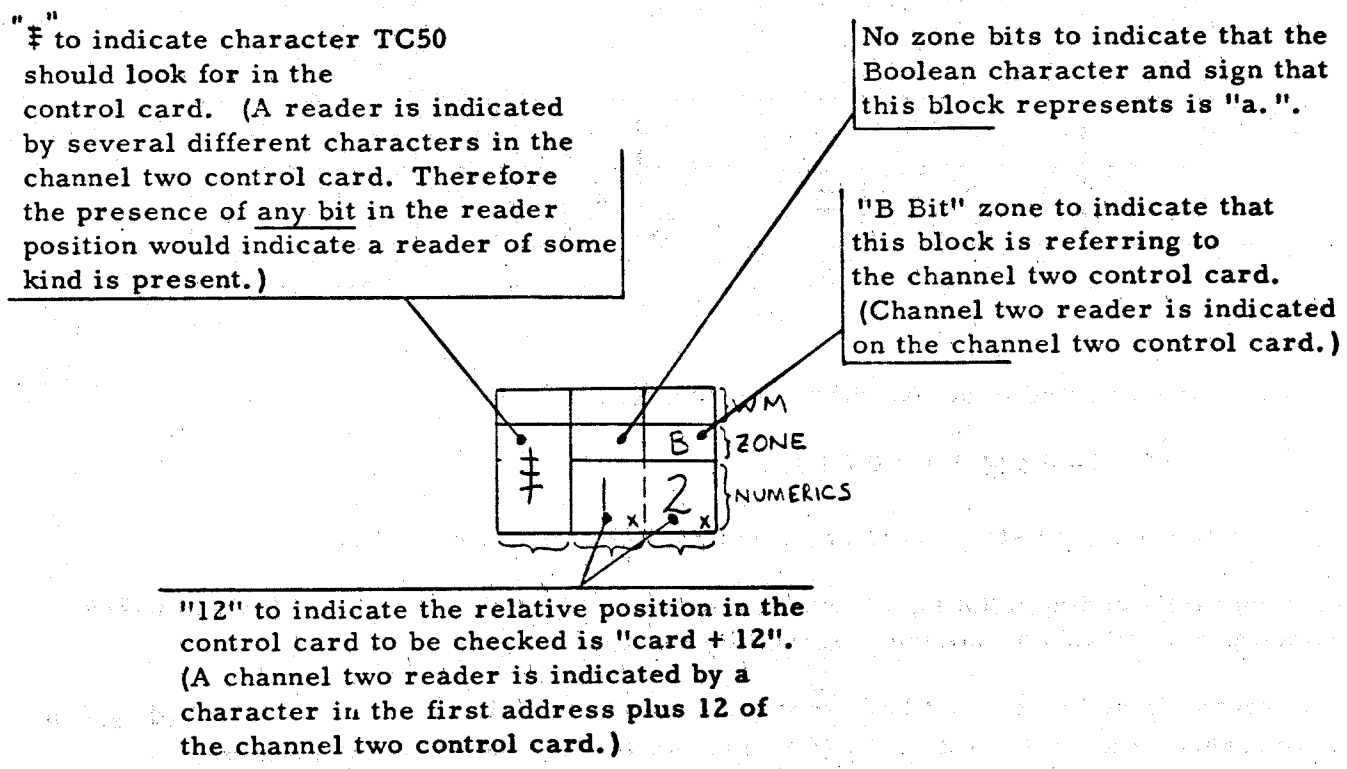


No zone bits to indicate that the Boolean character and sign that this block represents is "a.".

No zone bits to indicate that the control card this block is referring to is either the system control card or the channel one control card. (Machine type is in the system control card.)

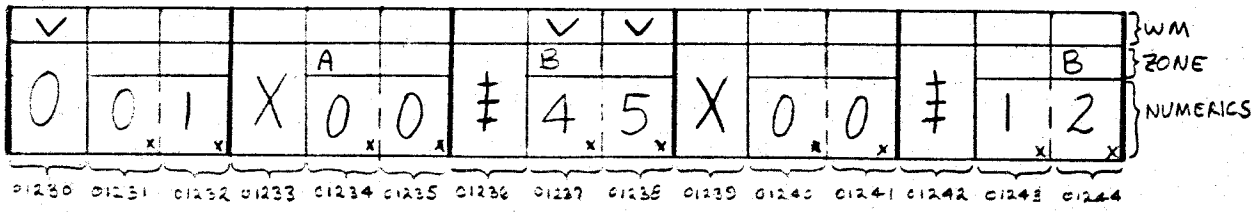
"00" to indicate to TC50 that the relative position in the control card to be checked is, "card +00". (Machine type is indicated in the first address of the system control card.)

FOURTH BLOCK FROM LEFT CODED TO INDICATE A 7010 IS REQUIRED. "d." in the Boolean expression.



FIFTH BLOCK FROM LEFT(LAST BLOCK) CODED TO INDICATE A READER IS REQUIRED ON CHANNEL TWO. "e." in the Boolean expression.

The total coding of the five blocks - -



- - can be converted to actual character coding:

v v v
001 X ‡ 0 ‡ M 5 X 0 0 ‡ 1 K

This data would, as stated earlier, occupy addresses 01230 - 01244.

A program's coding must have a minimum of one block of information (unless 01249 contains a B bit) and a maximum of ten blocks of information.

A program's coding can not have more than two terms. i.e. , (a . $\bar{b}$. c) + (d .e.) is two terms. (a + b + c + d +e) • (f +g +)is two terms. (a + b +) is one term.

Although the sign of the last block to the right is meaningless in the Boolean expression, it must be present as a result of the method of coding. For uniformity, it is normally made the same as the sign of the next to the last block to the right.

1.01.07.U0 Inter-Program Communication

1.01.07.U1 Information available to system programs.

Addresses 00998 - 00999

- 00999 will contain a word mark if a program was loaded from a TC50 tape. 00999 will not contain a word mark if a program was loaded from cards.

- If a word mark is in 00999, the characters in 00998-00999 will be :

% R	if source tape is on channel 1
□ X	if source tape is on channel 2
? 3	if source tape is on channel 3
! 1	if source tape is on channel 4

Address 00997

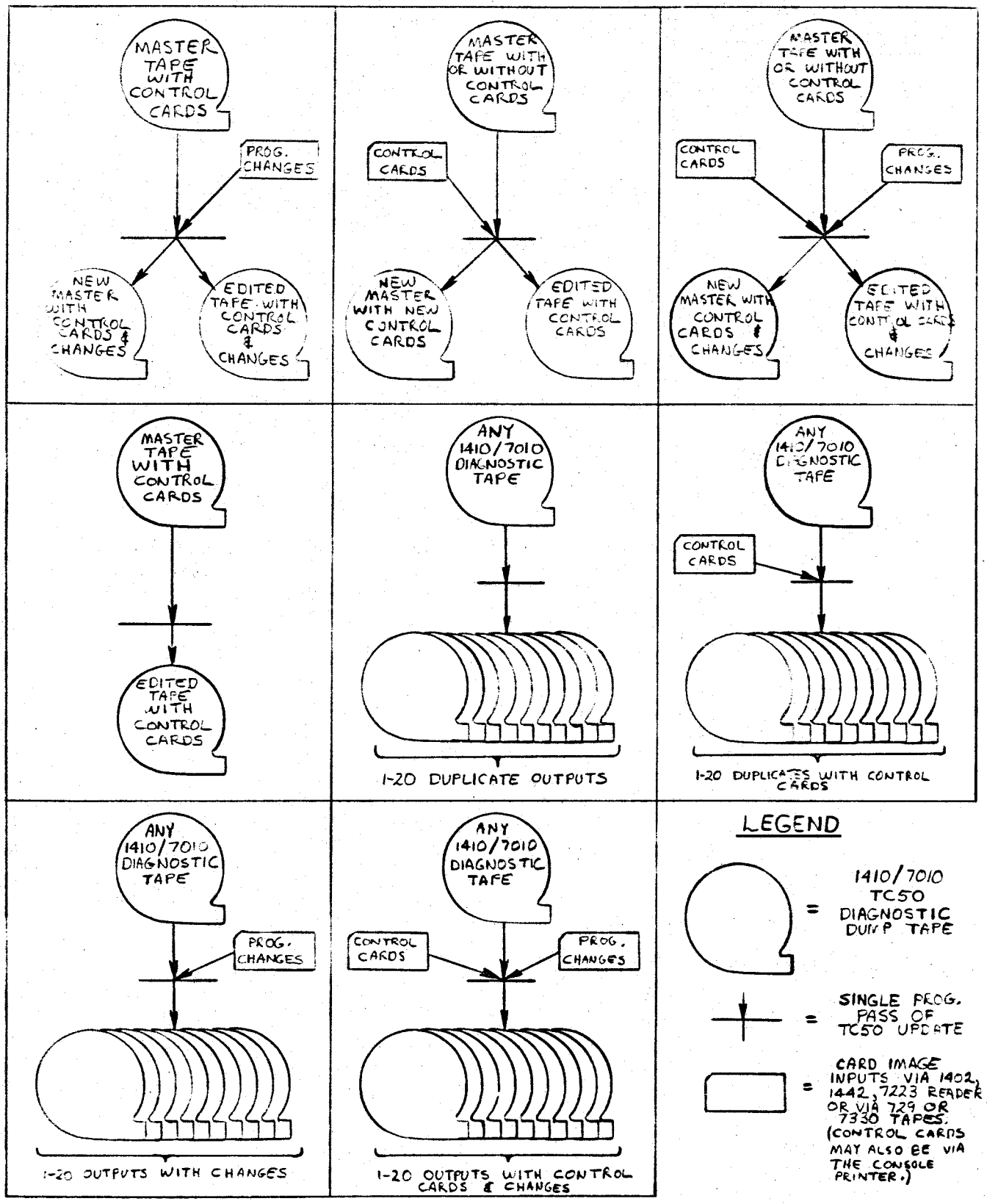
- Will contain a word mark when the "Reliability Option" has been selected for running. Otherwise it will not contain a word mark.

1.01.07.U2 Closed subroutines available to diagnostics. (Only when 00999 contains a word mark)

Branch to 00968
Forward space diagnostic source tape one record.

Branch to 00982
Backspace diagnostic source tape one record.

8 VARIATIONS OF A TC50 UPDATE PROGRAM PASS



Appendix I TC50 Load Routine

Whenever a TC50 Diagnostic Tape is created, duplicated or updated, the first record of the new TC50 Diagnostic Tape is a short load routine. This load routine is automatically created by TC50 Update. The listing below is the actual load routine record that is on all TC50 Diagnostic Tapes. Note that the last portion of the record consists of three type tape patterns to assist in basic tape system debugging. (The first portion of the CC01 record has more extensive tape patterns.)

Address If Load Button	Address Otherwise	Instruction	
00001	00011	W00123000016	Go if Load Button
00013	00023	D000000007	Set Up Tape Read
00025	00035	D000000008	
00037	00047	D000000009	
00049	00059	D000020007	
00061	00071	R00078#	
00068	00078	L%B001000$	Read CC01
00078	00088	R00078	
00085	00095	R00102#	
00092	00102	D0008800332X	Save Channel Info
00104	00114	D0008700331X	
00116	00126	J02000	Go to CC01
00123	00133	R00130#	
00130	00140	L%B001000$	Read CC01

00140	00150	R001303	
00147	00157	R00154‡	
00154	00164	D0014000332X	Save Channel Info
00166	00176	D0013900331X	
00178	00188	J02000b	Go to CC01
00185	00195	:	
00186	00196	12124248488b-b-b-blb	Floating Bits
00207	00217	<mGFm<<mFGm<<m$GF	Floating Not Bits
00228	00238	1248b-b	Word Marks
00235	00245	m m	Word Seperators

Appendix II — Preparation Of Configuration Control Card Images

All tape installations must initially prepare one set of configuration control card images. (Card Only systems refer to 1410/7010 Introduction). You will never have to do this again unless:

(1) Your system machine configuration changes.
or (2) You damage your master tape and must replace it.
or (3) You replace your TC50 program on your master tape.

One complete set of configuration control card images consists of one "system control card image"; and one "channel control card image "for each channel your machine has. i. e.; If you have a one channel system, you need a system control card and a channel one control card. If you have a three channel system, you need a system control card and a channel one control card, and a channel two control card, and a channel three control card. etc.

Most diagnostic programs refer to the information punched in these control cards to determine what equipment is available for use or for checking. The card images you prepare will be placed on your Master TC50 Diagnostic tape in TC50, and in all diagnostics requiring them, by TC50 Update.

This information is also used by TC50 Update during an "Edit " operation.

Determine which configuration control cards your master tape requires, and punch the cards as follows:

Columns 1 - 4

SYS1	for System Control Card
CHN1	for Channel 1 Control Card
CHN2	for Channel 2 Control Card
CHN3	for Channel 3 Control Card
CHN4	for Channel 4 Control Card

Columns 5 - 12
- will be blank for all control cards.

Columns 13 - 69
Punch your machine configuration information as directed in Appendix I of the 1410/7010 Introduction.

Columns 70 - 80
- may be blank or may contain comments as desired.

If you have a card reader (1402, 1442 or 7223), your Configuration Control Cards are ready to be placed on your Master tape.

If you have no card reader on your system, use card to tape equipment to place your control cards on tape with odd parity. Following the control cards on the tape must be either a tape mark, or a "change" card. (Change cards are required only if you are adding, deleting, or patching programs on your master tape. Any required change cards may or may not be on the same tape as the Configuration Control Cards. Change cards are explained in Appendix III of this writeup.)

If you prefer to enter your configuration control card information via the console printer, refer to Appendix IV of this writeup. Whenever possible, control card information should be entered via card images to reduce the possibility of operator error and to save system time.

Appendix III Change Cards and Decks - Level Cards

A. Change Card Images

Whenever a program on your master tape is to be patched or deleted, or a new program is to be added to your master tape, a "Change" card image must be created in order to instruct TC50 Update as to what is desired.

Normally, it will not be necessary for these cards to be created in the field, since any program changes supplied by Diagnostic Development will include change card images regardless of whether the changes are supplied via card decks or via card image tape format.

However, the "Change" card images will contain:

Column 1	X	-to indicate a change card
Column 2	N	-If to add a new program
	D	-If to delete an old program
	P	-If to patch a present program
Columns 3-5	Will contain the subject program's sequence number. This must agree with the number within the program.	
Columns 6-75	May contain comments	
Columns 76-80	May contain the subject program's identity.	

B. Sequencing of Change Cards and Decks.

An "XN" change card will be the first card of each new program deck. (A load program may or may not be between the XN card and program deck.)

An "XP" change card will be the first card of each set of card patches to any one program.

An "XD" change card will be used to designate the deletion of any program.

All change cards, and their associated decks, must be placed in ascending numerical sequence according to the sequence numbers in columns 3-5 of the change cards. Due to space limitations, TC50 Update cannot check for correct sequencing.

If your changes are in card image format on tape, TC50 Update will handle them via a tape drive.

If you have an "on line" 1402, 1442 or 7223 card reader and the changes are in card deck form, they may be handled through your reader.

If you have no "on line" reader, and your changes are in card deck form, you must use "off line" card to tape equipment to place your card images on tape with odd parity. These changes may or may not be placed on the same tape, and directly following, any configuration control card images you may be adding to your master tape. The last card image placed on this tape must be followed by a tape mark.

C. Level Cards

Most "changes" or "Updates" distributed to the field from diagnostic engineering will cause a change to the "change level" of your master tape. The first card image of all such updates will be an "L" card. This card indicates to TC50 Update the level that this group of changes will place a diagnostic tape at, and it indicates the oldest level a tape may be at and still be logically updated by these changes. (See section 1.01.05.U0 for further information.) Only "level" cards supplied by diagnostic engineering should ever be used.

The "L" card consists of:

Column 1 - L
Column 2 - Blank
Columns 3-6 Oldest acceptable tape level that can be updated by these changes.
Columns 4- Blank
Columns 5-8 New level of a tape after this update

Appendix IV Insertion of Control Cards Via the Console Printer.

If it is desired, you may change, or add, configuration control card information via the console printer instead of via card images.

Prior to your scheduled machine time, write on a sheet of paper all information you require in your control cards columns 13-69, as explained in Appendix I of the 1410/7010 Introduction.

After you enter "ET" during the operation of TC50 Update, TC50 will type:

ENTER SYSTEM CARD

At this time, use the inquiry request button to enter your pre-determined system control card information for columns 13-45. (If you do not desire to change the present system control card information that is contained on your master tape, just Request/Release.)

When you depress inquiry release, TC50 will type:

ENTER CHAN 1 CARD

Use the inquiry request button to enter your pre-determined channel 1 control card information for columns 13-69. (If you do not desire to change the present channel 1 control card information that is contained on your master tape, just Request/Release.)

Similar requests may be typed for channel 2, 3 and 4 control card information. They should be treated just as explained for channel 1 above.

Should the program request information for a channel that you do not have on your system, just Request/Release.

026

```
PGLIN    LABEL     OPCOD  OPERAND                                                   CT  ADDRS  INSTRUCTION

AA 1     SCHLOD    EQU    1000           SEARCH LOADING ADDRESS
AA 2     STDIAG    EQU    2000           DIAGNOSTICS RUNNING ADDRESS
AA 3     SBDIAG    EQU    1000           DIAGNOSTICS LOADING ADDRESS
AA 4     SIDENT    EQU    1250           LEFT ADDRESS OF DIAG IDENT
AA 5     RELIA     EQU    1247           RELIABILITY ZONE POSITION
AA 6     FIELD     EQU    1000           LOCATION TO READ PROGRAMS INTO
AA 7     FIELDS    EQU    00997          FIELD ADDRESS -3
AA 8     CAREA     EQU    BPHASE         LOCATION TO READ PHASE 2 INTO
AA 9     PROGSQ    EQU    1247           LOCATION OF PROGRAM SEQUENCE NO.
AA10     TOPTHO    EQU    1249           LOCATION OF TOP THOUSANDS CHARS.
AA11     SYS1      EQU    1256           SYS1 CARD ADDR IN DIAGNOSTIC
AA12     CHN1      EQU    1289           CHN1 CARD ADDR IN DIAGNOSTIC
AA13     CHN2      EQU    1346           CHN2 CARD ADDR IN DIAGNOSTIC
AA14     CHN3      EQU    1403           CHN3 CARD ADDR IN DIAGNOSTIC
AA15     CHN4      EQU    1460           CHN4 CARD ADDR IN DIAGNOSTIC
AA16     PCPU      EQU    2000
AA17     INDEXX    EQU    2,X            3RD INDEX REG FOR PHASE 2 ONLY
AA18     INDEXA    EQU    3,X            IX REG FOR ANYTHING-NOT PH 1
AA19     INDEXB    EQU    4,X            IC ERR RTN AND GENERAL USE
AA20     ****************************************************************
AA21     *SEARCH SECTION OF TAPE CONTROL-THIS SECTION IS RESPONSIBLE FOR
AA22     *FINDING AND LOADING INTO MEMORY THE SELECTED PROGRAMS ON THE
AA23     *DIAGNOSTIC TAPE
AA24               ORG    334                                                           00334
AA25               CEORG  SCHLOD                                            01000       00334
AA26     ****************************************************************
AA27     *ROUTINE TO SELECT A PROGRAM FROM DIAGNOSTIC TAPE.
AA28     *STARTING POINT FOR SEARCH SECTION.
AA29     SSTART    WCP    SOPTN          REQUEST OPTION                     01000 10    00334  M%T000943W
                                                                                                    G
AA30               BA1    *-16                                              01010  7    00344  ROC334M
AA31     SCRPA     RCPW   SELTST         READ OPTION                        01017 10    00351  L%T000963R
AA32               SBR    SPSY           SAVE LAST ADDRESS &1               01027  7    00361  G00399B
                               S                                                                    S
AA33               BEX1   *-23,M         GO ON ANY BUT WLR                  01034  7    00368  R00351M
                                                                                                    G
AA34               BA1    *&1            RESET INTERLOCK                    01041  7    00375  R00382M
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
AA36	**********						
AA37	*WAS ANYTHING ENTERED.						
AA38		SW	SNCENT&1	SET NO ENTRY SWITCH	01048 6	00382	,00598
AA39		B	SARNDB		01054 7	00388	J00407
AA40		ORG	395			00395	
AA41		CCORG	1C61		01061	00395	
AA42	SPSY	CCW	@ @	BAR AFTER RCP	01065 5	00399	
AA43		B	SSWW	ENTRY FROM DIAGNOSTIC	01066 7	00400	J00571
AA44	SARNDB	BCE	SATTC,SPSY,4	GO IF NO ENTRY MADE	01073 12	00407	B00546003994
AA45		CW	SNCENT&1	CLEAR NO ENTRY SWITCH	01085 6	00419	¤00598
AA46	**********						
AA47	*CALCULATE NUMBER OF CHARACTERS ENTERED AND MODIFY ACCORDINGLY.						
AA48		CW	SFCUR&1	CLEAR LESS THAN 4 SWITCH	01091 6	00425	¤00532
AA49	SALLTS	MLCA	SCMPAD,SCOMP&1C	INITIALIZE COMPARE CP	01097 12	00431	D00942006331
AA50		ZA	SRESPL,SRESUL	INITIALIZE SRESUL	01109 11	00443	&0093200927
AA51		S	SPSY,SRESUL	CALCULATE RESULT	01120 11	00454	S0039900927
AA52		BZ	SCKTPC	GO IF 4 OR MORE	01131 7	00465	J00500V
AA53		S	SRESUL,SCOMP&1C	REDUCE	01138 11	00472	S0092700633
AA54		S	SRESUL,SCOMP&5		01149 11	00483	S0092700628
AA55		SW	SFCUR&1	SET LESS THAN 4 SWITCH	01160 6	00494	,00532
AA56	**********						
AA57	*IS TAPE AT TAPE CONTROL RECORD.						
AA58	SCKTPC	BW	SFCUR,SATTC&1	GO IF YES	01166 12	00500	V00531005471
AA59	**********						
AA60	*LOCATE TAPE AT TC50 IF NOT INHIBITED.						
AA61		BW	SVSETR&11,SELTST	GO IF WM ENTERED-RWC INHIBITED	01178 12	00512	V00565009631
AA62		B	SARELO	GO LOCATE TAPE & RETURN	01190 7	00524	J00749
AA63	**********						
AA64	*IF LESS THAN FOUR CHARACTERS ENTERED-LOCATE ONE RECORD PAST TC.						
AA65	SFCUR	NOP			01197 1	00531	N
AA66		B	SBRDS	GO READ RECORD IF LESS THAN FOUR	01198 7	00532	J00795
AA67	SARNDZ	B	SVSETR		01205 7	00539	J00554

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PGLIN   LABEL      CPCOD  OPERANC                                                   CT  ADDRS  INSTRUCTION

AA69    ****************************************************************
AA70    *AT TAPE CCNTRCL SWITCH.
AA71    SATTC      NCPWM                                                    01212  1  00546  N
AA72               B      SBRDS              GO READ A RECORD IF AT TC     01213  7  00547  J00795
AA73    ****************************************************************
AA74    *LCCK FOR SELECTEC PROGRAM
AA75    SVSETR     CW     SELTST,SYSREL      CLR WM ENTERED/CLR SYS REL IND 01220 11 00554  ¤0096300578
AA76               SW     SNCFC&1            SET NOT FOUND SWITCH          01231  6  00565  ,00690
AA77    SSWW       CW     SRELIA             CLEAR RELIABILITY INDICATOR   01237  6  00571  ¤00997
AA78               CCORG  1245                                             01245     00577
AA79               DCW    @0CV@              SEQUENCE IS 005               01247  3  00579
AA80               DC     @0R@               C9 WITH B BIT                 01249  2  00581
AA81    ICENT      CCORG  *                                                01250     00582
AA82           C   DCW    @TC5CC@,G          IDENTITY                      01254  5  00586
AA83    SNWORG     ORG    SSWW&6                                                     00577
AA84    SCDORG     CCORG  *                                                01256     00577
AA85               NCPWM                     GO FOR NEW REQUEST IF COMPLETED 01256  1  00577  N
                                       S                                                              S
AA86    SYSREL     BBE    SSTART,SRESPL,B    GO IF RAN SYS TST IN REL MODE 01257 12  00578  W0033400932B
AA87    SSKPIC     B      SBRDS              GO READ A RECORD              01269  7  00590  J00795
AA88    SNCENT     NCPWM                                                    01276  1  00597  N
AA89               B      STCIAG             GO RUN DIAG.IF NC ENTRY       01277  7  00598  J02000
AA90               BCE    SREPR,SELTST,$     GO IF IN RELIABILITY MODE     01284 12  00605  B00654009635
AA91               SW     SICENT             SET WM IN ICENT               01296  6  00617  ,01250
AA92    SCCMP      C      0,C                SHOULD THIS PRCG.BE RUN       01302 11  00623  C0000000000
AA93               BU     SNCFC              GO IF NO                      01313  7  00634  J00689/
AA94               CW     SNCFC&1            CLEAR NOT FOUND SWITCH        01320  6  00641  ¤00690
AA95               B      STCIAG             GO RUN DIAGNOSTIC             01326  7  00647  J02000
AA96    SREPR      SW     SRELIA,SYSREL      SET REL INDIC/SET SYS REL INDIC 01333 11 00654  ,0099700578
AA97               MLZS   01246,SRESPL       STORE ZONE IN CASE SYSTEMS TEST 01344 12 00665  D01246009322
AA98               BBE    STCIAG,RELIA,-     GO RUN IF RELIABILITY PROG    01356 12  00677  W0200001247-
AA99    SNCFC      NCPWM                     NOT FOUND SWITCH              01368  1  00689  N
AB                 B      SSWW               GO GET ANOTHER IF NOT YET FOND 01369  7  00690  J00571
AB 1               B      SCCENT             BACKSPACE SOURCE TAPE         01376  7  00697  J00982
AB 2               B      SSTART             GO REQUEST A REQUEST          01383  7  00704  J00334
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PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
AB 4	**********						
AB 5	*CLOSED SUBRCUTINE TC BACKSPACE DIAGNOSTIC SCURCE TAPE.ENTER AT						
AB 6	*LCCATION 00982.						
AB 7	SCCRTN *	BSP	10	BACKSPACE TAPE	01390	5	00711 U%U0B
AB 8	*	BAI	*-11		01395	7	00716 R00711M G
AB 9	SCCEXT	B	0	RETURN	01402	7	00723 J00000
AB10	**********						
AB11	*CLOSED SUBRCUTINE TC SKIP A RECCRD CN DIAGNOSTIC SCURCE TAPE.						
AB12	*ENTER AT LCCATION 00968.						
AB13	SCCRTN *	DCW	@U%U0A@	SPACE CNE RECORD	01409	5	00730
AB14	*	BAI	*-11		01414	7	00735 R00730M G
AB15	SCCEXT	B	0	RETURN	01421	7	00742 J00000
AB16	**********						
AB17	* REWIND TAPE AND SKIP TWO RECORDS						
AB18	SARELC	SBR	SAREX&5		01428	7	00749 G00793B
AB19	SARWC *	RWD	10	REWIND SOURCE TAPE	01435	5	00756 U%U0R
AB20	SARBA *	BAI	SARELO	BRANCH ANY	01440	7	00761 R00749M G
AB21		B	SCCENT	SKIP 1 RECCRD	01447	7	00768 J00968
AB22		B	SCCENT	SKIP 1 RECCRD	01454	7	00775 J00968
AB23		SW	SATTC&1		01461	6	00782 ,00547
AB24	SAREX	B	0		01467	7	00788 J00000

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PGLIN   LABEL       OPCCD  OPERANC                             CT  ADDRS  INSTRUCTION

AB26    ***********************************************************
AB27    * READ PRCGRAM INTO LOCATION 1CCC
AB28    SBRDS       SBR    SBREX&5      STORE BAR FCR RETURN       01474  7  00795  G008518
AB29    SBRRC    *  RTBGW  10,SCHLOD    READ TAPE                  01481 10  00802  L%B001000$
AB30    SBRBC    *  BEX1   *-16,3       BRANCH IF BUSY CR NCT READY 01491  7  00812  R008023
AB31    SBRBE    *  BEF1   *&28         GO IF END CF FILE          01498  7  00819  R008538
AB32    SBRERR   *  BER1   SBRERC       GO IF DATA CHK TC TRY AGAIN 01505  7  00826  R009044
                                                                                        G
AB33    SBRBA    *  BA1    *&1          CLEAR I/O INTERLCCK        01512  7  00833  R0084CM
AB34                CW     SAITC&1      CLEAR TC50 SWITCH          01519  6  00840  □00547
AB35    SBREX       B      0            RETURN                     01525  7  00846  J00000
AB36                B      SARELO       BRANCH TO REWINC AND SKIP  01532  7  00853  J00749
AB37                BW     *&8,SELTST   BRANCH IF WM SET           01539 12  00860  V00879009631
AB38                B      SSTART       BRANCH IF NC WM ENTERED    01551  7  00872  J00334
AB39                CW     SELTST       CLEAR ENTERED WCRD MARK    01558  6  00879  □00963
AB40                BW     SSWW,SNOFD&1 BRANCH IF NCT FCUND SW IS SET 01564 12 00885 V00571006901
AB41                B      SSTART       BRANCH IF NCT SET          01576  7  00897  J00334
AB42    SBRERC   *  BSP    10           BACKSPACE DIAGNCSTIC TAPE  01583  5  00904  U%U08
                                                                                        G
AB43    SBRERP   *  BA1    *-11                                    01588  7  00909  R00904M
AB44                B      SBRRC        GO REREAD TAPE             01595  7  00916  J00802
AB45    ***********************************************************
AB46    *SEARCH SECTICN CCNSTANTS AND STCRAGE.
AB47    SRESUL      DCW    @      @     TEMPORARY STORAGE          01606  5  00927
AB48    SRESPL      DCW    SELTST&5                                01611  5  00932  00968
AB49                DCW    SELTST&3                                01616  5  00937  00966
AB50    SCMPAC      DC     SICENT&3                                01621  5  00942  01253
                                  G
AB51     SCPIN      DCW    @OPTIONM@,G                             01622  7  00943
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PGLIN    LABEL    OPCOD  OPERAND                                                        CT  ADDRS  INSTRUCTION

AB53     ****************************************************************
AB54     *ROUTINE ENTRIES AND DATA COMMON FOR ALL DIAGNOSTICS
AB55              ORG    SNWORG&386                                                          00963
AB56              CCORG  SOCORG&386                                           01642          00963
AB57      SELTST  DC     @     @,G            OPTION REQUESTED                01642   4      00963
AB58     SOCENT   SBR    SOCEXT&5             ENTER HERE TO SPACE TAPE        01647   7      00968  G00747B
AB59              B      SOCRTN                                               01654   7      00975  J00730
AB60     SCCENT   SBR    SCCEXT&5             ENTER HERE TO BCKSPCE TAPE      01661   7      00982  G00728B
AB61              B      SCCRTN                                               01668   7      00989  J00711
AB62              DCW    @ @                  SPARE                  00996    01675   1      00996
AB63     SRELIA   DC     @ @                  RELIABILITY INDICATOR 00997     01676   1      00997
AB64     SCHNNL   DCW    @ @                  CHANNEL CHARACTER      00998    01677   1      00998
AB65     SBAOPC   DCW    @ @                  BA OP CODE&TAPE WM     00999    01678   1      00999
                          G
AB66              DCW    @M@                  STOP MOVE OF SEARCH SECTION     01679   1      01000
AB67     SCDORG   CCORG  *                                                    01680          01001
AB68     ****************************************************************
AB69     *RELCCATE SEARCH PORTION OF TAPE CONTROL
AB70              ORG    SCCORG                                                              01680
AB71     SRELSH   CS     00C99                CLEAR INDEX REGISTERS                   6      01680  /00099
AB72              SW     INDEXB-4                                                     6      01686  ,00040
                                                                                                               D
AB73              MRCWG  SCHLOD,SSTART        MOVE SEARCH SECTION                    12      01692  D0100000334L
                                                                                                               D
AB74              MRCWG  SOCORG,SNWCRG                                               12      01704  D0125600577L
AB75              MRCWG                                                               1      01716  D
AB76              MRCWG                                                               1      01717  D
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   PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION

   AB78      **********************************************************************
   AB79      *MODIFY SEARCH SECTION FOR SOURCE CHANNEL.
   AB80                B      PMANYA            GO STORE BA OP            7  01718  J01897
   AB81                DCW    @0C332@             FROM THIS LOCATION      5  01729
   AB82                DCW    SBRERR                TO ALL THESE LOCATIONS  5  01734  00826
   AB83                DCW    SBRERP                                        5  01739  00909
   AB84                DCW    SARBA                                         5  01744  00761
   AB85                DCW    SBRBC                                         5  01749  00812
   AB86                DCW    SBRBA                                         5  01754  00833
   AB87                DCW    SBRBE                                         5  01759  00819
   AB88                DCW    SCCRTN&5                                      5  01764  00716
   AB89                DCW    SDCRTN&5                                      5  01769  00735
   AB90                DCW    SBAOPC                                        5  01774  00999
   AB91                B      PMANYA            GO STORE CHANNEL INDICATOR  7  01775  J01897
   AB92                DCW    @0C323@             FROM THIS LOCATION      5  01786
   AB93                       SCHNNL                TO ALL THESE LOCATIONS  5  01791  00998
   AB94                       SBRERD&1                                      5  01796  00905
   AB95                       SARWD&1                                       5  01801  00757
   AB96                       SBRRD&1                                       5  01806  00803
   AB97                       SCCRTN&1                                      5  01811  00712
   AB98                       SDCRTN&1                                      5  01816  00731
   AB99                B      SSTART                                        7  01817  J00334
   AC        **********************************************************************
   AC 1      *OVERLAY PHASES ONE AND TWO.
   AC 2      PONEPH    MRCWG  CSINGL,BSETUP     MOVE MOST OF PHASE 2       12  01824  D0772700508L
                                                                                        D
   AC 3                MRCWG                                               1  01836  D
   AC 4      **********************************************************************
   AC 5      *MODIFY COMBINED PHASES FOR SINGLE PHASE OPERATION.
   AC 6      PONECC    CW     CCHWTM&1                                      6  01837  @00724
   AC 7                SAR    BBEFDF&5          PHASE 1 TAPE READ BEF OP    7  01843  G00506A
   AC 8                SAR    BPHASE&6          MOD DONE SWITCH BRANCH      7  01850  G00482A
   AC 9                B      PWTLOD            GO RWD-WT LOAD PROG ALL OUTPUTS 7  01857  J08361
   AC10                B      BPHASE                                        7  01864  J00476
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PGLIN   LABEL     CPCCD  OPERAND                     CT  ADDRS  INSTRUCTION

AC12    ***************************************************************
AC13    *CLOSED SUBRCUTINE TO STORE ONE CHARACTER MANY PLACES
AC14    PMLCWS    SBR    INDEXB                       7  01871  G000448
AC15              MLNS   PMANYA,PMANYB&11  ENSURE MLCWS IS PRESENT  12  01878  D01897019401
AC16              B      PMANYC                       7  01890  J01916
AC17    PMANYA    SBR    INDEXB            SET EXIT   7  01897  G000448
AC18              MLNS   PTHREE,PMANYB&11  ENSURE MLCS IS PRESENT  12  01904  D02450019401
AC19    PMANYC    MLCA   9&INDEXB,PMANYB&10  SET MLCS ADDRESSES  12  01916  D00*09019391
AC20              MLCA                                1  01928  D
AC21    PMANYB    MLCS   00000,00000       STORE CHARACTER  12  01929  D00000000003
AC22              A      PMANYD,INDEXB     INCREASE BY 5  11  01941  A01952000044
AC23    PMANYE    BZN    PMANYC,5&INDEXB,            12  01952  V0191600*052
AC24              B      5&INDEXB          EXIT WHEN DONE  7  01964  J00*05
AC25              NCP                      TERMINATE  1  01971  N
AC26    ***************************************************************
AC27    *SEARCH SECTION ENTRY.
AC28              ORG    1972              SET SEARCH ENTRY ADDRESS     01972
AC29              B      SRELSH            GO START SEARCH SECTION  7  01972  J01680
AC30    ***************************************************************
AC31    *SET ENTRY TO CLOSED SUBROUTINE IN PRE-PHASE TO MANIPULATE CONTROL
AC32    *CARDS WHEN UPDATING A TAPE.
AC33    PENTRY    SBR    *&13              SET FOR RETURN  7  01979  G01998
AC34              B      PCARDS            GO MANIPULATE  7  01986  J06420
AC35    PEXITC    B      0                 RETURN TO MASTER TAPE CONTROL  7  01993  J00000
AC36    ***************************************************************
AC37    *TYPE IDENTITY.
AC38    PSTART    WCP    IDENT                       10  02000  M%T001250W
                                                                    G
AC39              BA1    *-16                         7  02010  R02000M
AC40    ***************************************************************
AC41    *RELOCATE FIRST BLOCK INCLUDING PHASE ONE.
                                                                         D
AC42              MRCWG  ONELOC,ONEGO                12  02017  D06696000011
AC43              MRCWG                               1  02029  D
AC44              MRCWG                               1  02030  D
AC45              SW     FIELD-1           TO STOP MOVE UP OF DIAG IN PH2  6  02031  ,00999
AC46              S      IDENT-3           SET SEQUENCE NUMBER TO 000  6  02037  S01247
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PGLIN    LABEL      OPCCD  OPERANC                                           CT  ADDRS  INSTRUCTION

AC48     ***********************************************************************
AC49     * THE CPERATCR WILL NCW INSERT THE NECESSARY INFCRMATICN
AC50     * CCNCERNING MEMCRY SIZE,CONTROL CARDS,SOURCE OF INPLTS
AC51     * AND CUTPUTS
AC52     PTYAZ    B  B      TYP1                                              7  02043  J06087
                                    C
AC53                 CCW    @CCRE SIZEM C-1CK,1-2CK,3-4CK,ETC@,G             32  02081
AC54                 RCP    PSZ                ONE GIGIT                     10  02083  M%I006633R
AC55                 BEX1   *-16,,             GO ANY BUT WLR & DATA CHK      7  02093  R02083,
                                                                                              G
AC56              B  BA1    PTYAZ              GO ANY                         7  02100  R02043M
AC57                 B      PMANYA             GO STORE CCRE SIZE CIGIT       7  02107  J01897
AC58                 CCW    PSZ                                               5  02118  06633
AC59                 CCW    PCRSIZ                                            5  02123  06635
AC60                 CCW    PRELPC&6                                          5  02128  04277
AC61                 CCW    PWTPHC&4                                          5  02133  04294
AC62                 CCW    PCRSZ                                             5  02138  06628
AC63                 A      PCRSIZ&1,PCREL&1   SET MEMCRY SIZE IN INSTRUCTNS 11  02139  AC663608164
AC64                 A      PORSIZ&1,ECREL&1                                 11  02150  A0663609828
AC65              B  MLCA   @B@,BCRCLR&1       SET PH1 FCR 10K               12  02161  D0667600775T
AC66              B  BCE    PNCP&12,PSZ,0      BRANCH IF 1CK SYSTEM          12  02173  B02233066330
AC67              B  MLCA   @,B@,BCRCLR&1      SET PH1 FCR  OK               12  02185  DC667800775T
AC68              B  BCE    PNCP&12,PSZ,1      BRANCH IF 2CK SYSTEM          12  02197  B02233066331
AC69              B  MLCA   @NN@,BCRCLR&1      SET PH1 FOR 40K & UP          12  02209  D0668000775T
AC70     PNCP     C  MLCS   @NN@,BSUBON-7      NOP PH1 BL CP FCR 4CK & UP    12  02221  D06680008303
AC71              B  CCW    @N             @   UNNECESSARY-REMCVE LATER      15  02247
AC72     *        B
AC73                 MLCA   @  @,PCCS&1        BLANK CCNTRCL CARC SOURCE     12  02248  D0668206639T
AC74     PTYA        B      TYP1                                              7  02260  J06087
                                                      C
AC75                 CCW    @CCNTRCL CARD SOURCE M@,G                        21  02287
AC76                 RCP    PCCS-1             READ CCNTROL CARD SCURCE      10  02289  M%I006637R
                                  S                                                               S
AC77                 BEX1   *-16,M                                            7  02299  R02289M
                                                                                                  G
AC78                 BA1    *&1                ANY ERRORS                     7  02306  R02313M
AC79                 BCE    PMCTS,PCCS,        BRANCH IF NC SCLRCE           12  02313  B0294906638
AC80                 BCE    PSYS,PCCS,T        TYPEWRITER SOURCE             12  02325  B02357066638T
AC81                 NCPWM                                                    1  02337  N
AC82                 BCE    1CCCO,PCCS-1,M     FUR MANUFACTURINGS USE        12  02338  B1000C06637M
AC83                 B      PCARC              CARD CR TAPE SCLRCE            7  02350  J04343
```

TC5C UPDATE SECTION PRE-PHASE

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
AC85	PSYS	B	TYP1	TYPEWRITER SOURCE	7	02357	J06C87
AC86		DCW	@ENTER SYSTEM CARD@,G		17	02380	
AC87		B	PMLCWS	GO STORE GM/WMS	7	02382	J01871
AC88		DCW	WMGM		5	02393	00998
AC89		DCW	LOSYS1&32		5	02398	00077
AC90		DCW	LOCHN1&56		5	02403	00134
AC91		DCW	LOCHN2&56		5	02408	00191
AC92		DCW	LOCHN3&56		5	02413	00248
AC93		DCW	LOCHN4&56		5	02418	00305
AC94	**********						
AC95	* ENTER SYSTEM CARD FROM TYPEWRITER						
AC96	PSYR	RCP	LOSYS1	READ SYSTEM CARD	10	02419	M%T000045R
AC97		SER	PSY	STORE BAR	7	02429	G06644B
AC98		BEX1	PSYR,MS	BRANCH ON ANY BUT WLR	7	02436	R02419MS
AC99		BA1	*&1	TURN OFF I/C INTERLOCK	7	02443	R02450MG
AD	PTHREE	C	PSY,PSYSYS	ANY ENTRY	11	02450	C0664406572
AD 1	C	BE	*&12	BRANCH IF NC ENTRY	7	02461	J02479S
AD 2		CW	LOSYS1,LNO	CLEAR WM IF ANY ENTRY	11	02468	¤0004503496
AD 3		B	TYP1		7	02479	JC6087
AD 4		DCW	@ENTER CHAN 1 CARD@,G		17	02502	

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PGLIN   LABEL    OPCOD  OPERAND                                                     CT  ADDRS  INSTRUCTION

AD 6    ************************************************************************
AD 7    * ENTER CHAN 1 CONTROL CARD FROM TYPEWRITER
AD 8    PCHA     RCP    LOCHN1              READ CHAN 1 CARD                        10  02504  M%T000078R
AD 9             SBR    PSY                 STORE BAR                                7  02514  G06644B
                                                                                                      S
AD10             BEXI   PCHA,M              BRANCH ON ANY BUT WLR                    7  02521  R02504M
                             S                                                                        G
AD11             BAI    *&1                 TURN OFF I/O INTERLOCK                   7  02528  R02535M
AD12             C      PSY,PSYONE          ANY ENTRY                               11  02535  C06644065T7
AD13             BE     *&12                BRANCH IF NO ENTRY                       7  02546  J02564S
AD14             CW     LOCHN1,LNO          CLEAR WM IF ANY ENTRY                   11  02553  ¤0007803496
AD15             BW     PCHBW,LOSYS1        BRANCH IF NO SYSTEM CARD ENTRY          12  02564  V02595000451
AD16             BCE    PCHBW,LOSYS1&13,1   BRANCH IF CHAN 2 AVAILABLE              12  02576  B02595000581
AD17             B      PMDTA               BRANCH TO MASTER DUMP SOURCE             7  02588  J02912
AD18    PCHBW    B      TYP1                                                         7  02595  J06087
AD19             DCW    @ENTER CHAN 2 CARD@,G                                       17  02618
AD20    ************************************************************************
AD21    * ENTER CHAN 2 CONTROL CARD FROM TYPEWRITER
AD22    PCHB     RCP    LOCHN2              READ CHAN 2 CARD                        10  02620  M%T000135R
AD23             SBR    PSY                 STORE BAR                                7  02630  G06644B
                                                                                                      S
AD24             BEXI   PCHB,M              BRANCH ON ANY BUT WLR                    7  02637  R02620M
                             S                                                                        G
AD25             BAI    *&1                 BURN OFF I/O INTERLOCK                   7  02644  R02651M
AD26             C      PSY,PSYTWO          ANY ENTRY                               11  02651  C06644065B2
AD27             BE     *&12                GO IF NO ENTRY                           7  02662  J02680S
AD28             CW     LOCHN2,LNO          CLEAR WM IF ANY ENTRY                   11  02669  ¤0013503496
AD29             BW     PCHCW,LOSYS1        BRANCH IF NO SYSTEM CARD ENTRY          12  02680  V02711000451
AD30             BCE    PCHCW,LOSYS1&14,1   BRANCH IF CHAN 3 AVAILABLE              12  02692  B02711000591
AD31             B      PMDTA               BRANCH TO MASTER DUMP SOURCE             7  02704  J02912
AD32    PCHCW    B      TYP1                TYPE                                     7  02711  J06087
AD33             DCW    @ENTER CHAN 3 CARD@,G                                       17  02734
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PGLIN   LABEL    OPCOD  OPERAND                                                              CT  ADDRS  INSTRUCTION

AC35    ****************************************************************************
AD36    * ENTER CHAN 3 CCNTROL CARD FROM TYPEWRITER
AC37    PCHC     RCP    LOCHN3                     READ CHAN 3 CARD                           10  02736  M%T000192R
AC38             SBR    PSY                        STORE BAR                                   7  02746  G06644B
                                 S                                                                              S
AC39             BEX1   PCHC,M                     RANCH ON ANY BUT WLR                        7  02753  R02736M
                                                                                                                G
AD40             BA1    *&1                        TURN OFF I/O INTERLCCK                      7  02760  R02767M
AD41             C      PSY,PSYTHR                 ANY ENTRY                                  11  02767  C0664406587
AC42             BE     *&12                       GO IF NO ENTRY                              7  02778  J02796S
AD43             CW     LOCHN3,LNO                 CLEAR WM IF ANY ENTRY                      11  02785  ¤0019203496
AC44             BW     PCHDW,LOSYS1               BRANCH IF NO SYSTEM CARD ENTRY             12  02796  V02827000451
AD45             BCE    PCHDW,LOSYS1&15,1          BRANCH IF CHAN 4 AVAILABLE                 12  02808  B02827000601
AC46             B      PMCTA                      BRANCH TO MASTER DUMP SOURCE                7  02820  J02912
AD47    PCHDW    B      TYP1                       TYPE                                        7  02827  J06087
AC48             DCW    @ENTER CHAN 4 CARD@,G                                                 17  02850
AD49    ****************************************************************************
AD50    * ENTER CHAN 4 CONTROL CARD FROM TYPEWRITER
AC51    PCHD     RCP    LOCHN4                     READ CHAN 4 CARD                           10  02852  M%T000249R
AC52             SBR    PSY                        STORE BAR                                   7  02862  G06644B
                                 S                                                                              S
AC53             BEX1   PCHD,M                     BRANCH ON ANY BUT WLR                       7  02869  R02852M
                                                                                                                G
AC54             BA1    *&1                        TURN OFF I/C INTERLCCK                      7  02876  R02883M
AC55             C      PSY,PSYFOR                 ANY ENTRY                                  11  02883  C0664406592
AC56             BE     *&12                       GO IF NO ENTRY                              7  02894  J02912S
AC57             CW     LOCHN4,LNO                 CLEAR WM IF ANY ENTRY                      11  02901  ¤0024903496
AC58    PMCTA    B      PMLCWS                     GO RESTORE RECORD MARKS                     7  02912  J01871
AC59             DCW    PWMGMR&1                                                               5  02923  07694
AC60             DCW    LOSYS1&32                                                              5  02928  00077
AC61             DCW    LOCHN1&56                                                              5  02933  00134
AC62             DCW    LOCHN2&56                                                              5  02938  00191
AD63             DCW    LOCHN3&56                                                              5  02943  00248
AD64             DCW    LOCHN4&56                                                              5  02948  00305
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   PGLIN    LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

   AD66     ********************************************************************
   AD67     *ENSURE UNAVAILABLE CHANNELS HAVE BLANK DATA IN CONTROL CARDS.
   AD68     PMCTS     BW     PDIAGS,LOSYS1          GO IF NO SYSTEM CARD ENTERED  12  02949  V03015000451
   AD69               BCE    *&7,LOSYS1&13,1        GO IF CHN2 PRESENT            12  02961  B02979000581
   AD70               CW     LOCHN2                 FORCE BLANK CHN2 IF CHN2 ABSENT  6  02973  ¤00135
   AD71               BCE    *&7,LOSYS1&14,1        GO IF CHN3 PRESENT            12  02979  B02997000591
   AD72               CW     LOCHN3                 FORCE BLANK CHN3 IF CHN3 ABSENT  6  02991  ¤00192
   AD73               BCE    *&7,LOSYS1&15,1        GO IF CHN4 PRESENT            12  02997  B03015000601
   AD74               CW     LOCHN4                 FORCE BLANK CHN4 IF CHN4 ABSENT  6  03009  ¤00249
   AD75     PDIAGS    B      TYP1                                                 7  03015  J06087
   AD76               DCW    @DIAGNOSTIC TAPE SOURCE Q Ma,G                      24  03045
   AD77     ********************************************************************
   AD78     * MODIFY PROGRAM FOR DIAGNOSTIC TAPE SOURCE
   AD79     PMDTR     RCP    PDTS                   READ DUMP TAPE SOURCE        10  03047  M%T006645R
   AD80               SBR    PSY                    STORE BAR                     7  03057  G06644B
   AD81               BCB1   *-23                   BRANCH IF BUSY                7  03064  R030472
   AD82               BEX1   PMDTR,M S                                           7  03071  R03047M S
   AD83               BA1    *&1                    ANY ERRORS                    7  03078  R03085M G
   AD84               S      a1a,PSY                                             11  03085  S0668306644
   AD85               C      PSY,&PDTS              COMPARE ADDRESSES            11  03096  C0664406688
   AD86               BU     PMDXXT                 GO IF ANY ENTRY               7  03107  J03152/
   AD87               SW     BPHASE&1               SET WM IF NO ENTRY            6  03114  ,00477
   AD88               CW     BENDPH&1,BEQUAL&1                                   11  03120  ¤0096300565
   AD89               SAR    BMODDN&6                                             7  03131  G00525A
   AD90               SBR    BCMLOW&5                                             7  03138  G00555B
   AD91               B      PENT-1                                               7  03145  J03405
   AD92     PMDXXT    CW     ERWAND                                               6  03152  ¤08248
   AD93               MLNS   PDTS&1,BRTBGW&3        MOVE DRIVE NUMBER            12  03158  D06646004871
   AD94               MLCS   PDTS,PLE               MOVE CHAR TO LOOKUP          12  03170  D06645066743
   AD95               LE     PLE,PCHTBL             FIND CHANNEL LETTER          12  03182  T06674066222
   AD96               SBR    *&6                    STORE ADDRESS OF CHANNEL CHAR  7  03194  G032068
   AD97               MLCS   00000,BBKSPM&1         STORE 1ST CHANNEL INDICATOR  12  03201  D00000006963
   AD98               SAR    PMDTRX                 STORE ADDRESS OF BA OP        7  03213  G03278A
   AD99               B      PMANYA                 GO STORE CHANNEL INDICATORS   7  03220  J01897
   AE                 DCW    BBKSPM&1                                             5  03231  00696
   AE 1               DCW    PREWND&1                                             5  03236  07975
   AE 2               DCW    ERWDSO&1                                             5  03241  08256
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PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
AE 4		CCW	ESPASO&1	CHANNEL CHARACTER	5	03246	08854
AE 5		CCW	EINCCO		5	03251	09049
AE 6		CCW	BRTBGW&1		5	03256	00485
AE 7		CCW	PMCRE&1		5	03261	03372
AE 8		CCW	PMCSP&1		5	03266	03389
AE 9		B	PMANYA	STORE BA CP	7	03267	J01897
AE10	PMCTRX	CCW	@ @		5	03278	
AE11		CCW	BRTBGW&1C		5	03283	00494
AE12		CCW	BBKSPM&5		5	03288	00700
AE13		CCW	PREWND&5		5	03293	07979
AE14		CCW	ERWCSO&5		5	03298	08260
AE15		CCW	ESPASO&1C	BA CP	5	03303	08863
AE16		CCW	EINCCO&1		5	03308	09050
AE17		CCW	BBEFCF		5	03313	00501
AE18		CCW	PMCRE&10		5	03318	03381
AE19		CCW	PMCSP&10		5	03323	03398
AE20		B	PMANYA	STORE DRIVE NUMBER	7	03324	J01897
AE21		CCW	BRTBGW&3		5	03335	00487
AE22		CCW	PREWND&3		5	03340	07977
AE23		CCW	ERWCSO&3		5	03345	08258
AE24		CCW	ESPASO&3	DRIVE NUMBER	5	03350	08856
AE25		CCW	EINCCO&2		5	03355	09051
AE26		CCW	BBKSPM&3		5	03360	00698
AE27		CCW	PFCRE&3		5	03365	03374
AE28		CCW	PMCSP&3		5	03370	03391
AE29	PMCRE	RWD	10	REWIND DUMP TAPE	5	03371	U%UOR
AE30		CCW	@N @	SPACER LOCATION	5	03380	
AE31		BAL	BERRCR		7	03381	ROC306M G
AE32	PMCSP	CCW	@U%U1A@	SPACE 1 RECORD	5	03388	
AE33		CCW	@N @	SPACER LOCATION	5	03397	
AE34		BAL	BERRCR	ANY ERRCR	7	03398	ROC306M G
AE35		NCPWM			1	03405	N
AE36	PENT	B	LYES	SWITCH	7	G3406	J03606
AE37	PECIS	B	TYP1		7	03413	J06087
AE38		CCW	@CARD IMAGE SOURCE M@,G	Q	19	03438	

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   PGLIN     LABEL      OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

   AE40      ************************************************************
   AE41      * MODIFY FOR CARD IMAGE SOURCE AND READ THE FIRST ONE INTO
   AE42      * THE CARD IMAGE AREA
   AE43      PECIR      RCP    PCCS-1           READ CARD IMAGE SOURCE          10  03440  M&T006637R
   AE44                 SBR    PSY              STORE BAR                        7  03450  G06644B
   AE45                 BEX1   PECIR,M                                         7  03457  R03440MS
   AE46                 BA1    *&1              ANY ERRORS                      7  03464  R03471MG
   AE47                 C      PSY,PEPCIS       ANY ENTRY                      11  03471  C0664406604
   AE48                 BL     PYES             BRANCH IF ANY ENTRY             7  03482  J03510/
   AE49                 SW     BMCDON&1         SET MOD DONE SWITCH             6  03489  ,00520
   AE50                 NCP                                                     1  03495  N
   AE51      LNC        B      PECENA           GO IF NO CONTROL CARD CHANGES   7  03496  J04825
   AE52                 B      LYES                                             7  03503  J03606
   AE53      PYES       B      PCRDIM           BRANCH TO READ CARD IMAGE       7  03510  J06132
   AE54           B     B      PCKECF           GO-INVALID IO UNIT OR ECF       7  03517  J03560
   AE55           B     BCE    PYES,CIMAGE,     BRANCH TO IGNORE BLANK CARD    12  03524  B0351000601
   AE56           B     BCE    PLEVEL,CIMAGE,L  BRANCH IF TAPE LEVEL CHANGE CARD 12  03536  B0983900601L
   AE57           B     BCE    LYES,CIMAGE,X    AH HA-FOUND CHANGE CARD-GO PROCES 12  03548  B0360600601X
   AE58      PCKECF B     BE     PYES             TRY AGAIN IF EOF ON READER      7  03560  J03510S
   AE59           B     B      TYP1             GO TYPE ERROR MESSAGE           7  03567  J06087
   AE60           B     DCW    @CARD IMAGE ERROR-FIXIT@,G                      22  03595
   AE61           B     B      PECIS                                            7  03597  J03413
   AE62           B     DCW    @N @  UNNECESSARY-REMOVE LATER IF SPACE IS NEEDED. 2  03605
   AE63      LYES       MLCA   PCRDAA&3,BREADC&3  MODIFY CARD IMAGE            12  03606  D0633800711T
   AE64                 B      PMANYA             READ                         7  03618  J01897
   AE65                 DCW    PCRDAA&1C           INSTRUCTION                 5  03629  06345
   AE66                 DCW    BREADC&1C                                       5  03634  00718
   AE67                 DCW    BREADC&17                                       5  03639  00725
   AE68                 DCW    CPHDCO&5                                        5  03644  08321
   AE69                 MLCS   PCRDAA&3,CPHDCO&3                              12  03645  D06338083193
   AE70                 MLCS                                                    1  03657  D
   AE71                 MLCS                                                    1  03658  D
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   PGLIN    LABEL     OPCOD  OPERAND                                              CT  ADDRS  INSTRUCTION

   AE73     *************************************************************
   AE74     * MOCIFY PROGRAM FOR THE LOCATION OF THE BUFFER TAPE
   AE75               B      PECENB             GC CHECK ON AUTC EDIT              7  03659  J04838
   AE76     PBUFER    B      TYP1                                                  7  03666  J06087
                                                Q
   AE77               DCW    @BUFFER TAPE DRIVE Ma,G                              19  03691
   AE78     LYER      RCP    PDTS               READ                              10  03693  M%T006645R
   AE79               SBR    PSY                STORE BAR                          7  03703  G06644B
                                  S                                                             S
   AE80               BEX1   LYER,M                                                7  03710  R03693M
                                                                                                G
   AE81               BA1    PBUFER                                                7  03717  R03666M
   AE82               C      PSY,PBPDTS         ANY ENTRY                         11  03724  C0664406609
   AE83               BE     PBUFER             NC ENTRY                           7  03735  J03666S
   AE84               MLCS   PDTS&1,LBUWT&3     MODIFY BUFFER TAPE                12  03742  D06646009033
   AE85               MLCS   PDTS,PLE           MCVE CHAR TO TABLE LOOKUP         12  03754  D06645066743
   AE86               LE     PLE,PCHTBL         FIND CHANNEL CHAR IN TABLE        12  03766  T06674066222
   AE87               SBR    *&6                STORE BAR                          7  03778  G03790B
   AE88               MLCS   0,LBUWT&1          STORE CHANNEL CHARACTER           12  03785  D00000009013
   AE89               SAR    *&6                STORE BAR                          7  03797  G03809A
   AE90               MLCS   0,LBUWT&10         STORE BA OP                       12  03804  D00000009103
   AE91               BU     PBUFER             INVALID SELECTION                  7  03816  J03666/
   AE92               B      PSTRBF             GC STORE BA OP,OR NO,CHNL CHAR     7  03823  J05812
   AE93     PBCRE   * RWD    10                 REWIND BUFFER TAPE                 5  03830  U%UOR
   AE94               DCW    @N    @            SPACER LOCATION                    5  03839
                                                                                                G
   AE95             * BA1    BERROR                                                7  03840  R00306M
   AE96     *************************************************************
   AE97     *FINC ALL OUTPUT TAPE LOCATICNS-MODIFY ACCORDINGLY.
   AE98     POUTY     B      TYP1                                                  7  03847  J06087
                                                  G
   AE99               DCW    @OUTPUT TAPE DRIVES Ma,G                             20  03873
   AF                 B      *&8                GC GET OUTPUTS                     7  03875  J03889
   AF 1               B      PREOT                                                 7  03882  J04197
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PGLIN    LABEL     OPCOD  OPERAND                                      CT  ADDRS  INSTRUCTION

AF 3     ****************************************************************
AF 4     *CLOSED SUBROUTINE TO GET OUTPUT TAPE DRIVES.
AF 5     PEDYEE    SBR    PACER-7             SET RETURN ADDRESSES      7  03889  G04094B
AF 6               SBR    PACER&5                                       7  03896  G04106B
AF 7               RCP    POUTRS              READ                     10  03903  M%T006648R
AF 8               SBR    PSY                 STORE BAR                 7  03913  G06644B
                                S                                                       S
AF 9               BEX1   *-23,M              BRANCH ANY BUT WLR        7  03920  R03903M
                                                                                        G
AF10               BA1    *&1                 TURN OFF INTERLOCK        7  03927  R03934M
AF11               SW     PRDTAB&2                                      6  03934  ,07994
AF12               SAR    PMLN&10             PRDTAB&1 TO PMLN&10       7  03940  G04147A
AF13               SW                                                   1  03947  ,
AF14               SAR    PMLC&10             PRDTAB TO PMLC&10         7  03948  G04039A
AF15               C      PSY,POUONE          ANY ENTRY                11  03955  C0664406599
AF16     PEDYEJ    BE     POLTY               NO ENTRY                  7  03966  J03847S
AF17               S      INDEXB              ZERO INDEX REG            6  03973  S00044
AF18               MLCS   POUTY&6,POUTRS&24   INHIBIT TABLE OVERFLOW   12  03979  D03853066723
AF19               MLCS   POUTRS&INDEXB,PLE   MOVE FIRST CHAN IND      12  03991  D06W48066743
AF20     PLUE      LE     PLE,PCHTBL          FIND CHANNEL LETTER      12  04003  T06674066222
AF21               SBR    PMLC&5                                        7  04015  G04034B
AF22     PEDYEH    BU     POLTY               GO IF INVALID CHANNEL     7  04022  J03847/
AF23     PMLC      MLCS   00C00,PRDTAB&INDEXB                          12  04029  D0000007Z923
AF24               SAR    PMLX&5                                        7  04041  G04071A
AF25               SBR    PMLX&10                                       7  04048  G04076B
AF26               A      PACER,PMLX&10       ADD 2                    11  04055  A0410104076
AF27     PMLX      MLCS   00C00,00C0C                                  12  04066  D00000000003
AF28     PAD       A      @1@,INDEXB          INCREASE IX REG          11  04078  A0668300044
                                            G                                             G
AF29               BCE    PREOT,PRDTAB&2&INDEXB,M   GO IF 2ND TBL FULL     12  04089  B0419707Z94M
AF30     PADER     BCE    PREOT,POUTRS&INDEXB,    GO IF 1ST TBL FULL      12  04101  B0419706W48
                                            G                                             G
AF31     PEDYEG    BCE    POUTY,POUTRS&INDEXB,M  GO IF TBL FULL & EDITING  12  04113  B0384706W48M
AF32               BBE    PZON,POUTRS&INDEXB,&  GO IF ZONE PRESENT     12  04125  W0415606W48&
AF33     PMLN      MLNS   POLTRS&INDEXB,PRDTAB&1&INDEXB                12  04137  D06W4807Z931
AF34               B      PAC                 MOVE NEXT CHAR            7  04149  J04078
AF35     PZON      MLCS   POUTRS&INDEXB,PLE   MOVE CHAR FOR LOOKUP     12  04156  D06W48066743
AF36               A      @1@,PMLC&10         UPDATE ADDRESS           11  04168  A0668304039
AF37               A      @1@,PMLN&10         UPDATE ADDRESS           11  04179  A0668304147
AF38               B      PLUE                                          7  04190  J04003
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DE 3-8220

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TC50                                  UPDATE SECTION  PRE-PHASE                                 PAGE   59
  PGLIN     LABEL      CPCOD  CPERANC                                               CT  ADDRS   INSTRUCTION

  AF40      ******************************************************************
  AF41      *CHECK FCR SINGLE PHASE OPERATION.
  AF42      PREOT      BW     *&E,BMODDN&1          GO IF MCD DCNE SET-NO CRD IMAGE    12  04197   V04216005201
  AF43                 B      *&13                  MCRE THAN ONE PHASE                 7  04209   J04228
  AF44                 BW     PONEPH,LNC            GO-NO CNTRL CRD CHANGES EITHER     12  04216   V01824034961
  AF45                 ZS     a5a,PREWND            NOP SOURCE TAPE REWIND FOR         11  04228   -0668907974
  AF46                 ZS     a5a,PREWND&5            MULTIPLE PHASE CPERATION         11  04239   -0668907979
  AF47      PTWCPH     B      PDMPPH                GC RELOCATE PHASES 2 & 3            7  04250   J04264
  AF48      PTCRTH     B      BPHASE                GO OPERATE 2 OR 3 PHASES            7  04257   J00476
  AF49      ******************************************************************
  AF50      *CLOSEC SUBRCUTINE TC RELOCATE PHASES 2 & 3 TO UPPER MEMCRY
  AF51      *FCR DUMPING.
  AF52      PDMPPH     SBR    PDMEXI&5              SET RETURN ADDRESS                  7  04264   G04341H
                                                                                                            D
  AF53      PRELPC  *  MRCWG  PPHASE,PPHASE         B ADDRESS MCDIFIED                 12  04271   D07695076955L
  AF54                 MRCWG                                                            1  04283   D
  AF55                 MRCWG                                                            1  04284   D
  AF56                 MRCWG                                                            1  04285   D
  AF57                 MRCWG                                                            1  04286   D
  AF58                 MRCWG                                                            1  04287   D
  AF59                 MRCWG                                                            1  04288   D
  AF6C                 MRCWG                                                            1  04289   D
  AF61      ******************************************************************
  AF62      *DUMP PHASES 2 & 3.
  AF63      PWTPHC  *  WTBEW  11,PPHASE             B ADDRESS MCDIFIEC                 10  04290   L%B107695X
                                                                                                         G
  AF64            *    BA1    BERRCR                                                    7  04300   ROC306M
  AF65      PSETCR     MLCWA  PCRSZ&4,INCEXA        SET CORE SIZE FOR PH IS USE        12  04307   D0663200039X
  AF66                 A      *-1C,INCEXA           ADD 1                              11  04319   A0431900039
  AF67                 SW     CIMAGE                DEFINE BRANCH LENGTH                6  04330   ,00601
  AF68      PDMEXI     B      COCCC                 RETURN                              7  04336   J0C000
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PGLIN   LABEL    CPCOD  CPERAND                                                CT  ADDRS  INSTRUCTION

AF70            ****************************************************************
AF71            *PRE-PHASE RCUTINE TC READ CCNFIGURATION CONTROL CARC IMAGES
AF72    PCARC        B      PCRCIM             GC READ CARD IMAGE               7  04343  J06132
AF73                 B      PCARDA             ERROR OR EOF RETURN              7  04350  J04497
AF74               B MLCWS  PWMGMR&1,CIMAGE&68  SET ‡ TC STOP MOVE IF CHNL CARD 12  04357  D07694006697
AF75                 LE     CIMAGE&3,PCRCBL    FIND PRCPER ADDRESS             12  04369  T00604044962
AF76                 SBR    *&6                                                 7  04381  G043938
AF77                 MLNA   CCCCC,*&6                                          12  04388  D00000044057
AF78                 BE     CCCCC              GC FIX                           7  04400  J0C000S
AF79                 BCE    PCHCRD,CIMAGE,X    GC IF READ CHANGE CARD          12  04407  B0469600601X
AF80               B BCE    PLEVEL,CIMAGE,L    BRANCH IF TAPE LEVEL CHANGE CARD 12 04419  B0983900601L
AF81                 BCE    PCARD,CIMAGE,      GC IF BLANK CARC                12  04431  B04343006O1
AF82                 B      PCRCRR                                              7  04443  J04716
AF83                 DCW    @1@                                                 1  04450
AF84                 DCW    @1@                                                 1  04451
AF85                 DCW    PCARDB                                              5  04456  04523
AF86                 DC     @SYS1@                                              4  04460
AF87                 DCW    PCARDC                                              5  04465  04560
AF88                 DC     @CHN1@                                              4  04469
AF89                 DCW    PCARDD                                              5  04474  04585
AF90                 DC     @CHN2@                                              4  04478
AF91                 DCW    PCARDE                                              5  04483  04610
AF92                 DC     @CHN3@                                              4  04487
AF93                 DCW    PCARDF                                              5  04492  04635
AF94    PCRCBL       DC     @CHN4@                                              4  04496
AF95    PCARCA       BU     PCRCRR             GC DUE TO ERROR                  7  04497  J04716/
AF96                 BW     PANYCD,PANYCD&1    GC IF A CARD WAS READ           12  04504  V04702047031
AF97                 B      PCARD              GC TRY AGAIN-EOF WAS ON          7  04516  J04343
AF98    PCARCB       CW     LOSYS1             CLEAR INDICATCR                  6  04523  ¤00045
AF99                 MLCWS  PWMGMR&1,CIMAGE&44  SET ‡ TO STCP MOVE FOR SYSTEM  12  04529  D07694006457
AG                   MRCR   CIMAGE&12,LCSYS1   MCVE NEW SYSTEM CARD            12  04541  D00613000045.
AG 1                 B      PCCMMN                                              7  04553  J04677
AG 2    PCARCC       CW     LOCHN1             CLEAR INDICATOR                  6  04560  ¤00078
AG 3                 MRCR   CIMAGE&12,LOCHN1   MCVE NEW CHNL 1 CARC            12  04566  D0C61300078.
AG 4                 B      PCCMMN                                              7  04578  J04677
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PGLIN	LABEL		OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
AG 6	PCARCD		CW	LOCHN2	CLEAR INDICATOR	6	04585	¤00135
AG 7			MRCR	CIMAGE&12,LOCHN2	MOVE NEW CHNL 2 CARD	12	04591	D0061300135,
AG 8			B	PCCMMN		7	04603	J04677
AG 9	PCARCE		CW	LOCHN3	CLEAR INDICATOR	6	04610	¤00192
AG10			MRCR	CIMAGE&12,LOCHN3	MOVE NEW CHNL 3 CARD	12	04616	D0061300192,
AG11			B	PCCMMN		7	04628	J04677
AG12	PCARCF		CW	LOCHN4	CLEAR INDICATOR	6	04635	¤00249
AG13		B	DCW	@N	@ UNNECESSARY NOP	24	04664	
AG14			MRCR	CIMAGE&12,LOCHN4	MOVE NEW CHNL 4 CARD	12	04665	D0061300249,
AG15	PCCMMN		SW	PANYCD&1	SET CNTRL CRD READ SWITCH	6	04677	,04703
AG16			CW	LNC		6	04683	¤03496
AG17			B	PCARD	GO READ ANOTHER CARD	7	04689	J04343
AG18	PCHCRD		SW	PENT	SET CHANGE CARD INDICATOR	6	04696	,03406
AG19	PANYCD		NOPWM			1	04702	N
AG20			B	PRWDCI	GO IF AT LEAST ONE CARD READ	7	04703	J04749
AG21			CW	PENT	CLEAR CHANGE CARD INDICATOR	6	04710	¤03406
AG22	PCRDRR		B	TYP1		7	04716	J06087
AG23			DCW	@INVALID CARD IMAGE@,G		18	04740	
AG24			B	PTYA	GO RE-REQUEST	7	04742	J02260
AG25	PRWDCI		BCE	PRWDC,PCRDAA&2,B	GO IF TAPE SOURCE	12	04749	B04768063378
AG26			B	PMCTS		7	04761	J02949
AG27	PRWDC		BW	PMCTS,PENT	GO IF CHANGE CARD ON SAME TAPE	12	04768	V02949034061
AG28			MLCS	PCRDAA&3,PRWCD&3	PREPARE TO RWU CNTRL CRD SOURCE	12	04780	D06338048093
AG29			MLCS			1	04792	D
AG30			MLCS			1	04793	D
AG31			MLCS	PCRDCC,PRWCD&5		12	04794	D06345048113
AG32	PRWDC		RWU	11	RWU CONTROL CARD SOURCE TAPE	5	04806	U%U1U
AG33			BAI	*-11		7	04811	R04806M G
AG34			B	PMCTS		7	04818	J02949

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
AG36	**********						
AG37	*PREPARE FOR AUTO EDIT IF DESIRED.						
AG38	PEDENA	SW	PEDEND	ENTRY IF NO CHANGES	6	04825	,04859
AG39		B	PEDENC		7	04831	J04844
AG40	PEDENB	CW	PEDEND	ENTRY IF CHANGES	6	04838	¤04859
AG41	PEDENC	B	PEDSHA	GO FIND OUT IF EDIT IS DESIRED	7	04844	J04873
AG42		B	PEDYEA	RETURN HERE IF YES	7	04851	J04978
AG43		NOP		RETURN HERE IF NO	1	04858	N
AG44	PEDEND	B	POUTY	EXIT IF NO CHANGES-NO EDIT	7	04859	J03847
AG45	PEDENE	B	PBUFER	EXIT IF CHANGES-NO EDIT	7	04866	J03666
AG46	**********						
AG47	*SHOULD THIS BE AN AUTO EDIT RUN.						
AG48	PEDSHA	SBR	PEDSHB&5		7	04873	G049748
AG49	PEDSHC	B	TYP1		7	04880	J06087
AG50		DCW	@AUTO EDIT M Y/N@,G		15	04901	
AG51		ROP	PEDSHD		10	04903	M%T004976R
AG52		BEX1	*-16,M S		7	04913	R04903M S
AG53	PONSTR	BA1	*&1		7	04920	R04927M G
AG54		BCE	PEDSHB,PEDSHC,Y		12	04927	B0496904976Y
AG55		BCE	*&8,PEDSHC,N		12	04939	B0495804976N
AG56		B	PEDSHC		7	04951	J04880
AG57		A	PEDSHA,PEDSHB&5		11	04958	A0487304974
AG58	PEDSHB	B	COCOC		7	04969	J0C000
AG59	PEDSHD	DCW	@ @,G	ANSWER	1	04976	

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   PGLIN     LABEL      OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

   AG62      ************************************************************
   AG63      *REQUEST EDIT OUTPUT DRIVES
   AG64      PEDYEA     MLNS   *&13,PEDYE          SET TO REQUEST 1 DRIVE      12  04978  D05002050261
   AG65                 BW     *&12,PEDEND         GO IF SINGLE PHASE          12  04990  V05013048591
   AG66                 A      *-10,PEDYE          CHANGE TO REQUEST 2 DRIVES  11  05002  A0500205026
   AG67                 CW     CMASTM&1            PROVIDE FOR EDIT MASTER MESSAGE  6  05013  ¤08268
   AG68      PEDYEC     B      TYP1                                             7  05019  J06087
   AG69       PEDYE     DCW    @0 OUTPUT TAPES Ma,G                            16  05026
   AG70      PEDYEB     MLCS   PLE-1,POUTRS&5      SET GM/WM & CLEAR READ AREA 12  05043  D06673066533
   AG71                 MLCS                                                    1  05055  D
   AG72                 MLCS                                                    1  05056  D
   AG73                 MLCS                                                    1  05057  D
   AG74                 MLCS                                                    1  05058  D
   AG75                 MLCS                                                    1  05059  D
   AG76                 CW     PEDYEC&1            INITIALIZE ADDRESSES        6  05060  ¤05020
   AG77                 SAR    PEDYEG&5                                        7  05066  G04118A
   AG78                 SAR    PEDYEH&5                                        7  05073  G04027A
   AG79                 SAR    PEDYEJ&5                                        7  05080  G03971A
   AG80      PEDYZX     B      PEDYEE              GO GET OUTPUTS              7  05087  J03889
   AG81                 MLCS   *-12,POUTRS&5      ELIMINATE GM/WM             12  05094  D05093066533
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   PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

   AG83      ********************************************************************
   AG84      *STORE SELECTION CHARACTERS FOR EDITING.
   AG85                BBE    PEDYEC,POUTRS&1,&  GO IF INVALID DRIVE            12  05106  W0501906649&
   AG86                MLCS   POUTRS&1,PMESMX&1  OUTPUT 1 CHNL & DRIVE CHARS.   12  05118  D06649090313
   AG87                MLCS                                                     1  05130  D
   AG88                MLCS   POUTRS&1,PMESMZ&1                                 12  05131  D06649083433
   AG89                MLCS                                                     1  05143  D
   AG90                BCE    PEDYEC,POUTRS&1,   GO IF NO DRIVE NUMBER          12  05144  B0501906649
   AG91                MLCB   PRDTAB&2,EOUTPT    SET PHASE 3 OUTPUT            12  05156  D0799409029L
   AG92                MLCS   PRDTAB,LBUWT&1     MOVE OUTPUT 1 CHNL INDIC-PH1  12  05168  D07992009013
   AG93                MLCS   PRDTAB&1,LBUWT&10  MOVE OUTPUT 1 BA OP CODE-PH1  12  05180  D07993009103
   AG94                MLCS   PRDTAB&2,LBUWT&3   MOVE OUTPUT 1 DRIVE NUMBER-PH1 12  05192  D07994009033
   AG95                B      PSTRBF             GO STORE DR NO,BA OP,CHNL CHAR  7  05204  J05812
   AG96                BW     PED,PEDEND         GO IF SINGLE PHASE EDIT         12  05211  V05391048591
   AG97                MLCS   PCNSTR,CSDCDO&11   PREVENT UNLOAD END OF PHASE 2  12  05223  D04920079413
   AG98                BBE    PEDOTT,POUTRS&2,&  GO IF OUTPUT 2 IS DIFF CHNL     12  05235  W0529006650&
   AG99                BCE    PEDYEC,POUTRS&2,   GO IF NO OUTPUT 2 DRIVE        12  05247  B0501906650
   AH                  MLNS   PRDTAB&3,PRDTAB&2  OUTPUT 2 TO OUTPUT 1 POSITION  12  05259  D07995079941
   AH 1                MLCS   POUTRS&2,PMESMZ&1  OUTPUT 2 DRIVE NUMBER          12  05271  D06650083433
   AH 2                B      PEDOTA                                           7  05283  J05341
   AH 3      PEDOTT    BBE    PEDYEC,POUTRS&3,&  GO IF DRIVE 2 INVALID         12  05290  W05019066516
   AH 4                BCE    PEDYEC,POUTRS&3,                                 12  05302  B0501906651
   AH 5                MLCS   PRDTAB&5,PRDTAB&2  OUTPUT 2 TO OUTPUT 1 POSITION  12  05314  D07997079943
   AH 6                MLCS                       FOR PHASE 2 OUTPUT            1  05326  D
   AH 7                MLCS                                                     1  05327  D
   AH 8                MLCS   POUTRS&3,PMESMZ&1  OUTPUT 2 DRIVE NUMBER          12  05328  D06651083433
   AH 9                MLCS                         & OUT 2 CHANNEL CHAR        1  05340  D
   AH10      PEDOTA    MLCS   PRDTAB&2,EINCDO&2  SET PH3 INPUT-OUT 2--PH2 OUTPUT 12  05341  D07994090513
   AH11                MLCS                                                     1  05353  D
   AH12                MLCS                                                     1  05354  D
   AH13                MLCS   PRDTAB&2,ESPASO&3  DRIVE NUMBER                   12  05355  D07994088563
   AH14                MLCS   PRDTAB&1,ESPASO&10  BA OP                         12  05367  D07993088633
   AH15                MLCS   PRDTAB,ESPASO&1    CHANNEL CHARACTER              12  05379  D07992088543
   AH16      PED       MLCA   @   @,PRDTAB&5     LIMIT PHASE 2 OUTPUT TO 1 DRIVE 12  05391  D0669207997T
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   PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
   AH18      ********************************************************************
   AH19      *MODIFY PHASE 2 FOR PHASE 3 EDIT OPERATION
   AH20      PEDMCD    MRCWG  ENDCPH,CTBCUZ      REPLACE PHASE 2 END ROUTINE    12  05403  00856007996LD
   AH21                CW     ENDPHA&1                                         6  05415  ¤00778
   AH22                SAR    CSDCDO&5                                         7  05421  G07935A
   AH23                B      PEDRWD             REWIND OUTPUT 1               7  05428  J05524
   AH24                BW     PEDNOP,PEDEND        GO IF SINGLE PHASE EDIT     12  05435  V05461048591
   AH25                B      PDMPPH               GO WRITE PHASES 2&3 ON OUTPUT 1  7  05447  J04264
   AH26                B      BPHASE               GO START MULTI EDIT         7  05454  J00476
   AH27      PEDNOP    ZA     ESPASO&5,ESPASO      NOP PH3 SPACE OVER LOAD     11  05461  &0885808853
   AH28                ZA     ESPASO&5,ESPASO&10                               11  05472  &0885808863
   AH29                B      PDMPPH               GO WRITE PHASES 2&3 ON OUTPUT 1  7  05483  J04264
   AH30                CW     PEDRDS&1                                         6  05490  ¤05518
   AH31                SAR    BRTBGM&22                                        7  05496  G00030A
   AH32                B      PEDRWD             GO REWIND OUTPUT 1            7  05503  J05524
   AH33                B      BRTBGM             GO READ PHASES 2&3 IN LOWER   7  05510  J00008
   AH34      PEDRDS    B      ENDPHA             GO END PHASE 2                7  05517  J00777
   AH35      ********************************************************************
   AH36      *CLOSED SUBROUTINE TO REWIND OUTPUT 1.
   AH37      PEDRWD    SBR    *&18               REWIND OUTPUT 1               7  05524  G055488
   AH38      PEDMCE  *  RWD    11                                               5  05531  U%U1R
   AH39              *  BAI    *-11                                             7  05536  R05531MG
   AH40      PEDSPC    B      00000                                            7  05543  J00000
   AH41                H                         TERMINATION                   1  05550  .
   AH42      ********************************************************************
   AH43      *PERMANENT STORAGE LOCATIONS FOR CONFIGURATION CONTROL CARDS
   AH44      *WITHIN TAPE CONTROL PRE PHASE.
   AH45       TCSYS1   DCW    a                                  *a             33  05551
   AH46       TCCHN1   DCW    a                                        a        40  05584
   AH47                DC     a                *a                             17  05640
   AH48       TCCHN2   DCW    a                                        a        40  05641
   AH49                DC     a                *a                             17  05697
   AH50       TCCHN3   DCW    a                                        a        40  05698
   AH51                DC     a                *a                             17  05754
   AH52       TCCHN4   DCW    a                                        a        40  05755
   AH53                DC     a                *a                             17  05811
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PGLIN   LABEL    OPCOD  OPERAND                                         CT  ADDRS  INSTRUCTION

AH55    ******************************************************************
AH56    *CLOSED SUBROUTINE TC SET BUFFER TAPE INFORMATION.
AH57    PSTRBF   SBR    PSTRBD&5          SET EXIT                      7   05812  G06085B
AH58             B      PMANYA            GO STORE DRIVE NUMBER         7   05819  J01897
AH59             DCW    LBLWT&3           1                             5   05830  00903
AH60             DCW    PPHASE&3          2                             5   05835  07698
AH61             DCW    PWTPHC&3          P                             5   05840  04293
AH62             DCW    BENDPH&3          1                             5   05845  00965
AH63             DCW    BRWBBF&3          1                             5   05850  00982
AH64             DCW    BRTBGM&3          1                             5   05855  00011
AH65             DCW    CPHCDD&3          2                             5   05860  08221
AH66             DCW    CPHCDD&15         2                             5   05865  08233
AH67             DCW    PBCRE&3           P                             5   05870  03833
AH68             DCW    EDUMP&3           3                             5   05875  09446
AH69             DCW    PECYEL&3          3                             5   05880  09470
AH70             DCW    PECYEM&3          3                             5   05885  09499
AH71             DCW    ENCCPH&3          3                             5   05890  08563
AH72             DCW    ENCCPI&3          3                             5   05895  08575
AH73             DCW    PECMOE&3          P                             5   05900  05534
AH74             B      PMANYA            GO STORE BA OP CODE           7   05901  J01897
AH75             DCW    LBLWT&10          1                             5   05912  00910
AH76             DCW    PWTPHC&10         P                             5   05917  04300
AH77             DCW    PPHASE&10         2                             5   05922  07705
AH78             DCW    PPHASE&17         2                             5   05927  07712
AH79             DCW    BENDPH&10         1                             5   05932  00972
AH80             DCW    BRWBBF&5          1                             5   05937  00984
AH81             DCW    BRTBGM&10         1                             5   05942  00018
AH82             DCW    CPHCDD&5          2                             5   05947  08223
AH83             DCW    CPHCDD&22         2                             5   05952  08240
AH84             DCW    PBCRE&10          P                             5   05957  03840
AH85             DCW    EDUMP&10          3                             5   05962  09453
AH86             DCW    PECYEL&10         3                             5   05967  09477
AH87             DCW    PECYEM&5                                        5   05972  09501
AH88             DCW    ERSTRT            3                             5   05977  09057
AH89             DCW    ENCCPH&5          P3                            5   05982  08565
AH90             DCW    ENCCPI&10         P3                            5   05987  08582
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 PGLIN     LABEL      OPCOD  OPERAND                                                CT  ADDRS  INSTRUCTION

 AH92                 DCW    PECMDE&5            P                                   5  05992  05536
 AH93                 B      PMANYA              GO STORE CHANNEL CHARACTER          7  05993  J01897
 AH94                 DCW    LBLWT&1             1                                   5  06004  00901
 AH95                 DCW    PWTPHC&1            P                                   5  06009  04291
 AH96                 DCW    PPHASE&1            2                                   5  06014  07696
 AH97                 DCW    BENDPH&1            1                                   5  06019  00963
 AH98                 DCW    BRWBBF&1            1                                   5  06024  00980
 AH99                 DCW    BRTBGM&1            1                                   5  06029  00009
 AI                   DCW    CPHCDO&1            2                                   5  06034  08219
 AI 1                 DCW    CPHCDO&13           2                                   5  06039  08231
 AI 2                 DCW    PBCRE&1             P                                   5  06044  03831
 AI 3                 DCW    EDUMP&1             3                                   5  06049  09444
 AI 4                 DCW    PECYEL&1            3                                   5  06054  09468
 AI 5                 DCW    PECYEM&1            3                                   5  06059  09497
 AI 6                 DCW    ERSTRT&2            3                                   5  06064  09059
 AI 7                 DCW    ENDCPH&1            3                                   5  06069  08561
 AI 8                 DCW    ENDCPI&1            3                                   5  06074  08573
 AI 9                 DCW    PECMDE&1            P                                   5  06079  05532
 AI10      PSTRBD     B      00C00               RETURN                              7  06080  J00000
 AI11      ****************************************************************
 AI12      * STANDARD TYPE ROUTINE 2.
 AI13      TYP1       SBR    TYP2&8          STORE MESSAGE ADDRESS                   7  06087  G06102B
 AI14      TYP2       WCP    0               TYPE MESSAGE                           10  06094  M%T000000W
 AI15                 SBR    TYP3&5          SET RETURN ADDRESS                      7  06104  G06130B
 AI16                 BCB1   *-23            BRANCH BUSY                             7  06111  R060942
                                                                                                     G
 AI17                 BA1    *&1             BRANCH ANY                              7  06118  R06125M
 AI18      TYP3       B      0               RETURN TO PROGRAM                       7  06125  J00000
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PGLIN   LABEL     OPCOD  OPERAND                                                   CT  ADDRS  INSTRUCTION

AI20              **********************************************************
AI21              *PRE-PHASE CLOSED SUBROUTINE TC READ CARD IMAGES.
AI22    PCRDIM    SBR    PCRDEX&5           SET EXITS                             7  06132  G06382B
AI23              SBR    PCRERX&16                                                 7  06139  G06400B
AI24              A      *-17,PCRDEX&5      ADD 7 TC EXIT                         11  06146  A0613906382
AI25              LLE    PCCS-1,PCHTBL      FIND CHANNEL                          12  06157  T06637066223
AI26              SBR    PCRDBB&5                                                  7  06169  G06188B
AI27              BU     PCRERX             ERROR-INVALID CHANNEL                  7  06176  J06384/
AI28    PCRDBB    MLCS   00C00,PCRDAA&1     MOVE CHANNEL SELECT CHARACTER         12  06183  D00000063363
AI29              SAR    *&6                                                       7  06195  G06207A
AI30              MLCS   00C00,PCRDCC       SET BA OP CODE                        12  06202  D00000063453
AI31              MLCA   PCRDRD,PCRDAA&3    SET FOR CARD READER                   12  06214  D06594063387
AI32              MLCS   @1@,BERHLT&12      MCVE 1 TO IO ERROR RTN BCE            12  06226  D06683004193
AI33              BCE    PCRDAA,PCCS,C      GO IF CARD READER                     12  06238  B06335066380
AI34              MLCA   @Z/C@,PCRDAA&3     SET FOR 7223 CARD READER              12  06250  D06694063387
AI35              MLCS   *&12,BERHLT&12     MCVE Z TO IO ERROR RTN BCE            12  06262  D06285004193
AI36              BCE    PCRDAA,PCCS,Z      GO IF 7223 READER                     12  06274  B0633506638Z
AI37              BBE    PCRERX,PCCS,&      ERROR-INVALID TAPE SELECTION          12  06286  W0638406638&
                                 T                                                                       T
AI38              BBE    *&8,PCCS,M         GO-OK                                 12  06298  W0631706638M
AI39              B      PCRERX             GO-INVALID TAPE SELECTION              7  06310  J06384
AI40              MLCS   PCCS,PCRDAA&3      SET DRIVE SELECTION                   12  06317  D06638063383
AI41              MLCS   @B@                SET FOR TAPE                           6  06329  D06695
AI42    PCRDAA    LU     %11,CIMAGE,$                                             10  06335  L%11006015
                                                                                                   G
AI43    PCRDCC    BA1    BERROR                                                    7  06345  R00306M
AI44              SW     CIMAGE                                                    6  06352  ,00601
AI45              MLCS   PCRDCC,*&1                                               12  06358  D06345063703
AI46              BEF1   PEOFER             GO-NOTHING TO READ                     7  06370  R064028
AI47    PCRDEX    B      00000              NORMALEXIT                             7  06377  J00000
AI48    PCRERX    C      PCRERX,PCRDEX      SET UNEQUAL INDICATOR FOR ERROR       11  06384  C0638406377
AI49              B      00000              ERROR OR EOF EXIT                      7  06395  J00000
AI50    PEOFER    C      PEOFER,PEOFER      SET EQUAL INDICATOR FOR EOF           11  06402  C0640206402
AI51              B      PCRERX&11                                                 7  06413  J06395
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PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
A152	**********						
A153	*CLOSED SUBRCUTINE TC MOVE CONTROL CARDS BETWEEN LOWER MEMORY AND						
A154	*THE CONTROL CARD AREA OF TAPE CONTROL.						
A155	PCARDS	MLWS	LOSYS1,PCSWSY	SET SWITCHES	12	06420	D00045064814
A156		MLWS	LOCHN1,PCSWCN		12	06432	D00078064944
A157		MLWS	LOCHN2,PCSWTC		12	06444	D00135065074
A158		MLWS	LOCHN3,PCSWTR		12	06456	D00192065204
A159		MLWS	LOCHN4,PCSWFR		12	06468	D00249065334
A160		NOP		MOVE OLD CARDS DOWN IF NOT	1	06480	N
A161	PCSWSY	MRCR	TCSYS1,LCSYS1	REPLACED BY NEW CARDS	12	06481	D0555100045,
A162		NOP			1	06493	N
A163	PCSWCN	MRCR	TCCHN1,LCCHN1		12	06494	D0558400078,
A164		NOP			1	06506	N
A165	PCSWTC	MRCR	TCCHN2,LCCHN2		12	06507	D0564100135,
A166		NOP			1	06519	N
A167	PCSWTR	MRCR	TCCHN3,LCCHN3		12	06520	D0569800192,
A168		NOP			1	06532	N
A169	PCSWFR	MRCWR	TCCHN4,LCCHN4		12	06533	D0575500249M S
A170		MRCR	LOSYS1,TCSYS1	MOVE ALL 5 CARDS UP TO	12	06545	D0004505551,
A171		MRCR		TAPE CONTROL.	1	06557	D
A172		MRCR			1	06558	D
A173		MRCR			1	06559	D
A174		MRCR			1	06560	D
A175		B B	PUPLEV	GO UPDATE LEVEL	7	06561	J07296
A176	**********						
A177	*TAPE CONTROL PRE-PHASE CONSTANTS AND STORAGE.						
A178	PSYSYS	DCW	LOSYS1&1		5	06572	00046
A179	PSYONE	DCW	LOCHN1&1		5	06577	00079
A180	PSYTWO	DCW	LOCHN2&1		5	06582	00136
A181	PSYTHR	DCW	LOCHN3&1		5	06587	00193
A182	PSYFOR	DCW	LOCHN4&1		5	06592	00250
A183	PCRDRD	DCW	@12@	FOR CARD READ X CONTROL FIELD	2	06594	
A184	PCUONE	DCW	PCLTRS&1		5	06599	06649
A185	PEPCIS	DCW	PCIS&1		5	06604	06638
A186	PEPCTS	DCW	PCTS&1		5	06609	06646

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
A188		DCW	â.â	TABLE OF CHANNELS	1	06610	
A189		DCW	âR2Eâ		3	06613	
A190		DCW	âXEFâ		3	06616	
A191		DCW	â3MGâ		3	06619	
A192	PCHTBL	DCW	â1.Hâ		3	06622	
A193	PSTPMV	DCW	CPHBEG-1	FIRST LOCATION OF PHASE 2 -1	5	06627	07694
A194	PCRSZ	DCW	â099999â	CORE SIZE	5	06628	
A195	PSZ	DC	âCâ,G		1	06633	
A196	PCRSIZ	DCW	09	CORE SIZE	2	06635	
A197	PCCS	DCW	â â,G	CONTROL CARD SOURCE	2	06638	
A198	PSY	DCW	CCCCC		5	06644	
A199	PCTS	DCW	â â,G		2	06645	
AJ	PCIS	EQU	PCCS-1				
AJ 1	PCUTRS	DCW	â â		1	06648	
AJ 2		DCW	â â		1	06649	
AJ 3		DCW	â â		1	06650	
AJ 4		DCW	â â		1	06651	
AJ 5		DCW	â â		1	06652	
AJ 6		DCW	â â		1	06653	
AJ 7		DCW	â â		1	06654	
AJ 8		DCW	â â		1	06655	
AJ 9		DCW	â â		1	06656	
AJ10		DCW	â â		1	06657	
AJ11		DCW	â â		1	06658	
AJ12		DCW	â â		1	06659	
AJ13		DCW	â â		1	06660	
AJ14		DCW	â â		1	06661	
AJ15		DCW	â â		1	06662	
AJ16		DCW	â â		1	06663	
AJ17		DCW	â â		1	06664	
AJ18		DCW	â â		1	06665	
AJ19		DCW	â â		1	06666	
AJ20		DCW	â â		1	06667	
AJ21		DCW	â â		1	06668	
AJ22		DCW	â â		1	06669	
AJ23		DCW	â â		1	06670	

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PGLIN    LABEL     OPCOD  OPERAND                                                 CT  ADDRS  INSTRUCTION

AJ26               DCW    @ @                                                  1  06671
AJ27               DCW    @ @,G                                                1  06672
AJ28     PLE       DCW    @ @                                                  1  06674
AJ29     ********************************************************************
AJ30     *TAPE CONTROL PRE-PHASE LITERAL CONSTANTS
AJ31               LTORG  *                                                       06675
AJ31                      @BB@                                                 2  06676
AJ31                      @,B@                                                 2  06678
AJ31                      @NN@                                                 2  06680
AJ31                      @  @                                                 2  06682
AJ31                      @1@                                                  1  06683
AJ31                      PDTS                                                 5  06688  06645
AJ31                      @5@                                                  1  06689
AJ31                      @   @                                                3  06692
AJ31                      @Z0@                                                 2  06694
AJ31                      @B@                                                  1  06695
AJ32     ********************************************************************
AJ33     *FIRST ADDRESS OF FIRST BLOCK TO BE RELOCATED INCLUDING PHASE ONE.
AJ34     CNEGC     ORG    00001                                                   00001
AJ35     CNELCC    CCORG                                                06696     00001
AJ36               B      20&INDEXB          GC ON RESET/START          06696  7  00001  J00*20
AJ37     PRTBGM    CCORG  *                                             06703     00008
AJ38     BRTBGM *  RTBGW  11,CAREA           READ PHASE TWO INTO CORE   06703 10  00008  L%B100476$
                                                                                            G
AJ39            *  BA1    BERROR             GO ON ANY INDICATOR        06713  7  00018  R00306M
AJ40               B      CPHTPI             GO START PHASE 2           06720  7  00025  J00999
AJ41     BXSECN    DCW    @   @              SEQUENCE NUMBER OF PRESENT PROGR06729  3  00034
AJ42     PECBLN    CCORG  *                                             06730     00035
AJ43               DCW    @     @            INDEX REG X3               06734  5  00039
AJ44               DCW    @     @            INDEX REG X4               06739  5  00044
AJ45     ********************************************************************
AJ46     *TEMPORARY STORAGE AREAS FOR CONFIGURATION CONTROL CARDS.
AJ47      LCSYS1   DCW    @                              *@             06740 33  00045
AJ48      LOCHN1   DCW    @                                      @      06773 40  00078
AJ49               DC     @                *@                           06829 17  00134
AJ50      LOCHN2   DCW    @                                      @      06830 40  00135
AJ51               DC     @                *@                           06886 17  00191
AJ52      LOCHN3   DCW    @                                      @      06887 40  00192
AJ53               DC     @                *@                           06943 17  00248
```

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PGLIN   LABEL    OPCOD  OPERAND                                                      CT  ADDRS  INSTRUCTION

AJ55    LOCFN4   DCW    @                                          @           06944 40  00249
AJ56             DC     @                  *@                                  07000 17  00305
AJ57    ***************************************************************
AJ58    *IO CPERATION ERROR ROUTINE-THIS ROUTINE IS COMMON TC ALL IO
AJ59    *OPERATIONS IN THIS PROGRAM.
AJ60    BERROR   SBR    INDEXB             SET RETURN IN INDEX REG             07001  7  00306  G00044B
AJ61             S      BWENTY&1,INDEXB      SUBTRACT 20 FROM INDEXB           07008 11  00313  S0045800044
AJ62             MLCS   13&INDEXB,BERREX     SET OP FOR BUSY/NT RDY CHK        07019 12  00324  D00*13003843
AJ63             MLCS   BERREX,BERREX-7      SET OP FOR DATA CHECK CHK         07031 12  00336  D00384003773
AJ64             CW                                                            07043  1  00348  ¤
AJ65             CW                                                            07044  1  00349  ¤
AJ66             CW                                                            07045  1  00350  ¤
AJ67             CW                                                            07046  1  00351  ¤
AJ68             CW                                                            07047  1  00352  ¤
AJ69             CW                                                            07048  1  00353  ¤
AJ70             MLCS                        SET OP FOR EOF CHK                07049  1  00354  D
AJ71    BERBSK   MLCS   BBEFER,BERBAD      SET BA OP FOR BKSP-SKIP             07050 12  00355  D00370004393
AJ72             MLCS                      SET BKSP D MOD                      07062  1  00367  D
AJ73    BDMODU   DCW    @NB@                 D MOD FOR BKSP-SKIP BA OP         07064  2  00369
AJ74    BBEFER   BEF1   20&INDEXB          CONTINUE PROGRAM IF EOF             07065  7  00370  R00*208
AJ75             BER1   BERHLT             GC ERROR HALT IF DATA CHK           07072  7  00377  R004074
AJ76    BERREX   BEX1   3&INDEXB,3         REDO IO OP IF BUSY OR NOT RDY       07079  7  00384  R00*033
AJ77             B      20&INDEXB          CONTINUE PROGRAM IF WLR             07086  7  00391  J00*20
AJ78             H                         TERMINATE HALT                      07093  1  00398  .
AJ79             ORG    ONEGO&399                                                        00400
AJ80             CDORG  ONELOC&399                                             07095     00400
AJ81             B      BREADC             EXIT FOR EXECUTE CARDS              07095  7  00400  J00708
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   PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

   AJ83      BERHLT    H                          ERROR HALT                    07102  1  00407  .
   AJ84      ************************************************************
   AJ85      *THIS HALT HAS OCCURRED DUE TO A DATA CHECK ON THE LAST IO
   AJ86      *OPERATION.THE IO UNIT IS STILL SELECTED.
   AJ87      *1.IF A TAPE DRIVE IS SELECTED-
   AJ88      *       -TO ATTEMPT TO CORRECT ERROR BY REPEATING THE READ OR
   AJ89      *        WRITE OPERATION,DEPRESS START.
   AJ90      *       -A RESET-START ACTION WILL CAUSE THE PROGRAM TO ATTEMPT
   AJ91      *        TO CONTINUE WITHOUT CORRECTING THE BAD DATA.-CAUTION-
   AJ92      *2.IF CARD READER IS SELECTED-
   AJ93      *       -IF BAD CARD-CORRECT,MAKE READER READY,START.
   AJ94      *       -IF CARD READER ERROR-REPLACE CARD IN READER,MAKE READER
   AJ95      *        READY,START-TO TRY TO READ CARD AGAIN
   AJ96      *       -TO ATTEMPT TO USE BAD DATA-RESET,START.-CAUTION-
   AJ97      ************************************************************
   AJ98                BCE    3&INDEXB,5&INDEXB,1  GO REREAD IF CARD READER    07103 12  00408  B00#0300#051
   AJ99      BRPBKS    MLCS   6&INDEXB,BERBSP&3     SET DRIVE FOR BKSP-SKIP OP  07115 12  00420  D00#06004373
   AK                  MLCS                        SET TAPE CHAR FOR BKSP-SKIP 07127  1  00432  D
   AK 1                MLCS                        SET CHNL CHAR FOR BKSP-SKIP 07128  1  00433  D
   AK 2      BERBSP    BSP    11                   BACKSPACE SKIP              07129  5  00434  U%U18
   AK 3      BERBAO    BAI    BERBSP               RESET INTERLOCK             07134  7  00439  R00434M
                                                                                                  G
   AK 4                S      BRTBGM,BERBSP&4      SUB -3 FROM D MCD           07141 11  00446  S0000800438
   AK 5      BWENTY    BCE    BRPBKS,BERBSP&4,E                                07152 12  00457  B0042000438E
   AK 6      BERBXT    B      3&INDEXB               GO REREAD/REWRITE RECORD  07164  7  00469  J00#03
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                PGLIN   LABEL     OPCOD  OPERAND                                                    CT  ADDRS  INSTRUCTION
                AK 8    ********************************************************************
                AK 9    *PHASE ONE STARTS HERE.PHASE ONE IS RESPONSIBLE FOR 1.READING DUMP
                AK10    *RECCRDS FROM A PREVIOUSLY RECORDED DIAGNOSTIC SYSTEM TAPE. 2.READ-
                AK11    *ING DELETE , PATCH , AND NEW CHANGE CARD IMAGES FROM A CARD READER
                AK12    *OR TAPE CRIVE. 3.DELETING PROGRAMS , READING PATCH CARD IMAGES ,
                AK13    *AND REACING NEW PROGRAM CARC IMAGES. 4.UPDATING CONFIGURATION
                AK14    *CCNTROL CARDS IN THE TAPE CCNTROL PROGRAM. 5.COMBINING ALL INPUTS
                AK15    *AND PLACING THEM ON THE BUFFER TAPE IN LONG MEMORY DUMP FORM OR
                AK16    *ON THE OUTPUT TAPES IN SHORT MEMORY DUMP FROM IF THERE ARE NO CARD
                AK17    *IMAGE INPUTS.
                AK18    ********************************************************************
                AK19    *REAC SHORT DUMP FROM DIAGNOSTIC SYSTEM TAPE IF AVAILABLE.
                AK20    BPHASE  NOPWM                    SWITCH-BRANCH IF NO MORE INPUT  07171  1  00476  N
                AK21            B       BSTMON           DUMP RECORDS AVAILABLE.         07172  7  00477  J00924
                AK22    PRTBGW  CDORG   *                                                07179     00484
                AK23    BRTBGW  *       RTBGW   10,FIELD READ SHORT DUMP FROM MASTER     07179 10  00484  L%B0010000$
                                                                                                              G
                AK24    BBADMP  *       BA1     BERROR   GO ON ANY INDICATOR             07189  7  00494  R00306M
                AK25    BBEFCF  *       BEF1    BSTMON   GO SET MASRER DONE IF EOF       07196  7  00501  R009248
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PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
AK26	**********						
AK27	*SET UP FOR MANIPULATION OF CARD IMAGE INPUTS IF AVAILABLE.						
AK28	BSETUP	CW	BBKSPS&1,BCMPSW&1	CLEAR FOR BACKSPACE & DUMPING	07203 11	00508	B0068800881
AK29	BMCCCN	NCPWM		SWITCH-BRANCH IF NO MORE CARD	07214 1	00519	N
AK30		B	BCFKTC	IMAGE INPUTS.	07215 7	00520	J00888
AK31		MLNB	PROGSQ,BXSEQN	STORE PROGRAM SEQUENCE NUMBER	07222 12	00527	D01247000034J
AK32		C	CIMAGE&4,BXSEQN	COMP CHANGE SEQ TO PROG. SEQ.	07234 11	00539	C0C60500034
AK33	BCMLCW	BL	BCFKTC	GO IF SUBJ.PROG NOT REACHED	07245 7	00550	J00888T
AK34		BF	BCKCRD	GO IF PAST SUBJ. PROGRAM	07252 7	00557	J00582U
AK35	BEQUAL	SW	BBKSPS&1	SET FOR NO BACKSPACE	07259 6	00564	,00688
AK36		BCE	BBKSPS,CIMAGE&1,P	EQUAL SO GO IF PATCH CARD	07265 12	00570	B0068700602P
AK37	BCKCRD	BCE	BBKSPS,CIMAGE&1,N	GO IF NEW TYPE CHANGE CARD	07277 12	00582	B0068700602N
AK38		B	BSKPCI		07289 7	00594	J00681
AK39		ORG	ONEGC&60C			00601	
AK40	*	B	PRE-PHASE SUBROUTINE TO UPDATE LEVEL OF NEW TAPE				
AK41	PUPLEV	B	CCORG ONELCC&60C		07296	00601	
AK42	CIMAGE	B	MLCB PWMGMR-27,PUPOLD&3	OLD LEVEL TO TYPEOUT	07296 12	00601	D0766607346L
AK43		B	MLCA BENCPH&9,PWMGMR-27	NEW LEVEL OLD TC50 TO NEW TC50	07308 12	00613	D0097107666T
AK44		B	MLCB PWMGMR-27,PUPNEW&3	NEW LEVEL TO TYPEOU	07320 12	00625	D0766607362L
AK45		B	B TYP1		07332 7	00637	J06087
AK46		B	DCW @OLD-@		07342 4	00647	
AK47	PUPOLD	B	CCORG *		07343	00648	
AK48		B	DCW @ @,G		07346 4	00651	
AK49		B	B TYP1		07346 7	00653	J06087
AK50		B	DCW @NEW-@		07358 4	00663	
AK51	PUPNEW	B	CCORG *		07359	00664	
AK52		B	DCW @ @,G		07362 4	00667	
AK53		B	B PEXITC		07364 7	00669	J01993
AK54		B	DCW @ @	FILL OUT 80 CHAR. READ IN AREA	07375 5	00680	
AK55	BSKPCI	SW	BCMPSW&1	SET TO SKIP DUMP OF RECORD	07376 6	00681	,00881
AK56	**********						
AK57	*BACKSPACE MASTER TAPE IF SWITCH IS CLEARED.						
AK58	BBKSPS	NCP		SWITCH TO BYPASS BACKSPACE OF	07382 1	00687	N
AK59		B	BREADC	MASTER TAPE	07383 7	00688	J00708
AK60	PBKSPM	CCORG	*		07390	00695	
AK61	BBKSPM *	BSP	10	BACKSPACE MASTER TAPE	07390 5	00695	U&L0B
AK62	BBABKS *	BA1	BBKSPM	GO ON ANY INDICATOR	07395 7	00700	R00695M

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   PGLIN     LABEL      OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

   AK64      ************************************************************
   AK65      *READ CARD IMAGE INTO CARD IMAGE READ AREA.
   AK66                 NOP                                                07402  1  00707  N
   AK67      BREADC     EQUATE *                                           07403     00708
   AK68      BREADC *   LU     %11,CIMAGE,$                                07403 10  00708  L%11006015
   AK69      BBADRD *   BAL    BERROR          GO ON ANY INDICATOR         07413  7  00718  R00306M
   AK70      BBEFCD *   BEF1   BSTMOD          GO SET MOD DONE SWITCH      07420  7  00725  R008748
   AK71                 L      CIMAGE          DEFINE BRANCH LENGTH        07427  6  00732  ,00601
   AK72                 BCE    BCMPSW,CIMAGE,X GO IF CHANGE CARD           07433 12  00738  B0088000601X
   AK73                 BW     BSTRCD,CIMAGE&5 GO STORE CARD IF PROGRAM CARD 07445 12  00750  V00795006061
   AK74      BCKBXC     BCE    BREADC,CIMAGE&71,* GO IF BRANCH CONTROL     07457 12  00762  B0070800672*
   AK75      BCRCLR     SW        20K SYS-STEP AAR/BAR-BCE IF 10K SYS,20K C.C.  07469  1  00774  ,
   AK76                 BCE                          BCE IF 10K/20K SYS,40K C.C.07470  1  00775  B
   AK77                 BCE    CIMAGE&1,CIMAGE,E GO EXECUTE EXECUTE CARD   07471 12  00776  B00602006015
   AK78                 B      BREADC          GO READ NEXT CARD           07483  7  00788  J00708
   AK79      ************************************************************
   AK80      *STORE CARD IMAGE IN ITS PROPER LOCATION.
   AK81      BSTRCD     MLNA   CIMAGE&4,BCRDMV&10  STORE STARTING ADDRESS   07490 12  00795  D0060500858/
   AK82                 A      CIMAGE&9,CIMAGE&4   CALCULATE HI CRD ADR &1 07502 11  00807  A0061000605
   AK83                 ZA     CIMAGE&9,INDEXB     LENGTH OF FIELD TO IX REG 07513 11  00818  &0061000044
   AK84                 C                          IS MEMORY TOO SMALL      07524  1  00829  C
   AK85                 BL     BREADC              GO IF YES                07525  7  00830  J00708T
   AK86      BSUBCN     A      BCRDAG,INDEXB       SUBT 1 FROM INDEX        07532 11  00837  A0086700044
   AK87      BCRDMV     MLCWS  CIMAGE&1C&INDEXB,0&INDEXB  STORE CHARACTER   07543 12  00848  D0CW1100+007
   AK88                 BZ     BREADC           RELOCATED-GO READ NEXT CARD 07555  7  00860  J00708V
   AK89      BCRDAG     B      BSUBCN           MOVE NEXT CHARACTER         07562  7  00867  J00837
   AK90      ************************************************************
   AK91      *SET MOD DONE SWITCH
   AK92      BSTMOD     SW     BMODDN&1                                    07569  6  00874  ,00520
   AK93      ************************************************************
   AK94      *DUMP THIS PROGRAM ON THE BUFFER TAPE IF PROGRAM IS NOT DELETED.
   AK95      BDMPSW     NOP                                                07575  1  00880  N
   AK96                 B      BPHASE           GO IF DUMP NOT DESIRED      07576  7  00881  J00476
   AK97      BCHKTC     BCE    PENTRY,PROGSC,V  GO STR CTL CDS IN TAPE CONTROL 07583 12  00888  B01979012475
   AK98      LBUWT      WTBEW  11,FIELD         WRITE BUFFER DUMP           07595 10  00900  L%B101000X
   AK99                 BAL    BERROR           GO ON ANY INDICATOR        07605  7  00910  R00306M
   AL                   B      BPHASE           GO RESTART PHASE ONE       07612  7  00917  J00476
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   PGLIN     LABEL      OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

   AK91      ************************************************************
   AK92      *PHASE ONE RCUTINE-SET MASTER DONE
   AK93      BSTMDN     SW     BPHASE&1          SET MASTER DONE SWITCH         07619  6  00924  ,00477
   AK94                 CW     BENDPH&1,BEQUAL&1                                07625 11  00930  ¤0096300565
   AK95                 SAR    BMCDDN&6          STORE FOR WRITING TAPE MARK    07636  7  00941  G00525A
   AK96                 SBR    BCMLOW&5          STORE TO BRANCH ON LOW         07643  7  00948  G00555B
   AK97                 B      BSETUP                                           07650  7  00955  J00508
   AK98      ************************************************************
   AK99      *PHASE ONE RCUTINE TC END PHASE ONE
   AL        BENDPH   *  WTM    11                WRITE TAPE MARK                07657  5  00962  U%U1M
   AL 1                 DCW    @N    @                                          07666  5  00971
   AL 2                *  BAI    BERROR            GO ON ANY INDICATOR            07667  7  00972  R00306M
                                                                                                   G
   AL 3      BRWBBF   *  RWD    11                REWIND BUFFER TAPE             07674  5  00979  U%U1R
   AL 4      BBABFR   *  BAI    BRWBBF            GO ON ANY INDICATOR            07679  7  00984  R00979M
                                                                                                   G
   AL 5                 B      BRTBGM            GO READ PHASE 2 INTO CORE      07686  7  00991  J00008
   AL 6                 DCW    @M@               TERMINATE BRANCH               07693  1  00998
                                  G
   AL 7                 ORG    CNEGO&997         ENSURE WM IN 00998                    00998
   AL 8      PWMGMR     CCORG  ONELOC&997                                       07693     00998
   AL 9       WMGM      DCW    @M+@              TERMINATE MCVE                 07693  2  00998
                                  G
   AL10      ************************************************************
   AL11      *PHASE TWO SECTION-PHASE TWO 1.READS LONG DUMPS FROM THE BUFFER
   AL12      *TAPE. 2.ADDS APPLICABLE CONFIGURATION CONTROL CARDS TO THE
   AL13      *DIAGNOSTIC PROGRAMS. 3.WRITES SHORT DUMPS ON ALL OUTPUT TAPES.
   AL14      CPHASE     ORG    BPHASE                                                00476
   AL15      CPHBEG     CCORG  *                                               07695     00476
   AL16      PPHASE     CCORG  *                                               07695     00476
   AL17      ************************************************************
   AL18      *READ BUFFER TAPE DURING PHASE 2 - READ NEW MASTER IF PHASE 3.
   AL19      CPHASD   *  RTBGW  11,FIELD          READ LONG DUMP FROM BUFFER     07695 10  00476  L%B1010008
   AL20               *  BAI    BERROR            GO ON ANY                      07705  7  00486  R00306M
                                                                                                   G
   AL21               *  BEF1   CCHWTM            GO CHANGE WTBEW TO WTM         07712  7  00493  R007238
   AL22                  B      CMVACC            GO MANIPULATE CONTRCL CARDS    07719  7  00500  J00845
   AL23      CASTER     DCW    @*@               CONSTANT ASTERISK              07726  1  00507
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TC50                                                                                          CT  ADDRS  INSTRUCTION
  PGLIN   LABEL     OPCOD  OPERANC

  AL25    ***************************************************************
  AL26    *RELCCATE DIAGNOSTIC TO UPPER MEMORY TC MAKE A SHORT DUMP.                               00508
  AL27              ORG    BSETUP                                                     07727      00508
  AL28    CSINGL    CCORG  *                  SET TOP 1000S ADDR OF PROG              07727 12   00508  D0124900950J
  AL29    CRELPR    MLNB   TOPTHO,CRELPC-3    INDEXA TO TOP 1000S OF PROG             07739 12   00520  D0095300039X
  AL30              MLCWA  CRELPC,INDEXA      INDEXX TO TOP 1000S OF MEM              07751  1   00532  D
  AL31              MLCWA                     IS PROGRAM LARGER THAN CORE             07752 11   00533  C0003900034
  AL32              C      INCEXA,INDEXX      GO SKIP THIS ONE IF YES                 07763  7   00544  J00476T
  AL33              BL     CPHASE             MCVE PART OF PROG UP                    07770 12   00551  D000&0000-0X
  AL34    CRELPA    MLCWA  0&INDEXA,0&INDEXX  SET FOR NEXT MOVE                       07782  7   00563  G00039A
  AL35              SAR    INCEXA                                                     07789  7   00570  G00034B
  AL36              SBR    INCEXX             IS ENTIRE PROGRAM MCVED                 07796 11   00577  C0003900943
  AL37              C      INCEXA,CZFLDL      GO IF NCT COMPLETE                      07807  7   00588  J00551/
  AL38              BU     CRELPA
  AL39    ***************************************************************
  AL40    *WRITE THIS CIAGNOSTIC ON ALL OUTPUT TAPES IN SHORT DUMPS.
                                              SET INITIAL TAPE TABLE ADDRESS         I07814  6   00595  ,00774
  AL41    CSDUMP    SW     CTBOUT&1           INDEX REGISTER                          07820  7   00601  G00039A
  AL42              SAR    INCEXA             SET CHNL CHAR. IN WRITE OP              07827 12   00608  D000&000659#
  AL43    CSCUMA    MRC    0&INDEXA,CSDWRT&1  SET BA OP CCDE                          07839 12   00620  D000&100668#
  AL44              MRC    1&INDEXA,CSDUBA    SAVE ADDRESS                            07851  7   00632  G00039A
  AL45              SAR    INCEXA             SET DRIVE NO. IN WRITE OP               07858 12   00639  D000&000661#
  AL46    CSCDRI    MRC    0&INDEXA,CSDWRT&3                                          07870  7   00651  G00039A
  AL47              SAR    INDEXA                                                     07877      00658
  AL48    PCSDW     CCORG  *                  DUMP FROM PROGRAMS START                07877 10   00658  L%B1000-3X
                                                                                                              G
  AL49    CSCWRT  * WTBEW  11,3&INDEXX        GO ON ANY INDICATOR                     07887  7   00668  R00306M
  AL50    CSCUBA    BA1    BERROR             IF ZONE-GO SET NEW CHNL IN OP           07894 12   00675  W00608000&0&
                                                                                                                T
  AL51              BBE    CSCUMA,0&INDEXA,&  GO WRT NEXT DRIVE IF NUMERIC            07906 12   00687  W00639000&0M
                                           T
  AL52              BBE    CSCDRI,0&INDEXA,M  GO TYPE TITLE                           07918 12   00699  B0095600658L
  AL53    CSCDWN    BCE    CTYPEO,CSDWRT,L                                            07930      00711
  AL54    CSCCCO    CCORG  *                                                          07930 12   00711  B0075500662U
  AL55    CSDDCN    BCE    CREWND,CSDWRT&4,U  GO IF REWOUND
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   PGLIN     LABEL      OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

   AL57      CCHWTM     MLCWA  CCWTMX,CSDWRT&5    CHANGE WTBEW TO WTM TO RWU    07942 12  00723  D0093800663X
   AL58                 MLCWA                                                    07954  1  00735  D
   AL59                 MLCS   CSDCON&11,CCWTMX-1  SET TO MAKE RWU NEXT TIME    07955 12  00736  D00722009373
   AL60                 B      CSDUMP             GO WRITE TAPE MARKS OUTPUT DRIVE07967  7  00748  J00595
   AL61      ************************************************************
   AL62      *REWIND SOURCE TAPE TO END DUPLICATION PASS. NOPD OTHER PASSES.
   AL63      PREWND     CCORG  *                                                 07974     00755
   AL64      CREWND   * RWD    11                 REWIND SOURCE TAPE            07974  5  00755  U%U1R
   AL65               * BAI    CREWND             GO ON ANY                     07979  7  00760  R00755M
   AL66      CREEND     H      CREEND                                           07986  6  00767  .00767
   AL67      ************************************************************
   AL68      *TABLE OF OUTPUT TAPE DRIVES AND TAPE CHANNELS.THIS TABLE IS SET UP
   AL69      *FOR UP TO 20 OUTPUT TAPES.
   AL70      PRDTAB     CCORG  *                                                 07992     00773
   AL71      CTBOUT     DCW    a a                                               07992  1  00773
   AL72                 DCW    a a                                               07993  1  00774
   AL73                 DCW    a a                                               07994  1  00775
   AL74                 DCW    a a                                               07995  1  00776
   AL75      CTBOUZ     CCORG  *                                                 07996     00777
   AL76      CTBOUX     DCW    a a                                               07996  1  00777
   AL77                 DCW    a a                                               07997  1  00778
   AL78                 DCW    a a                                               07998  1  00779
   AL79                 DCW    a a                                               07999  1  00780
   AL80                 DCW    a a                                               08000  1  00781
   AL81                 DCW    a a                                               08001  1  00782
   AL82                 DCW    a a                                               08002  1  00783
   AL83                 DCW    a a                                               08003  1  00784
   AL84                 DCW    a a                                               08004  1  00785
   AL85                 DCW    a a                                               08005  1  00786
   AL86                 DCW    a a                                               08006  1  00787
   AL87                 DCW    a a                                               08007  1  00788
   AL88                 DCW    a a                                               08008  1  00789
   AL89                 DCW    a a                                               08009  1  00790
   AL90                 DCW    a a                                               08010  1  00791
   AL91                 DCW    a a                                               08011  1  00792
```

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   PGLIN     LABEL      OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
   AL93                 DCW    @ @                                  08012  1   00793
   AL94                 DCW    @ @                                  08013  1   00794
   AL95                 DCW    @ @                                  08014  1   00795
   AL96                 DCW    @ @                                  08015  1   00796
   AL97                 DCW    @ @                                  08016  1   00797
   AL98                 DCW    @ @                                  08017  1   00798
   AL99                 DCW    @ @                                  08018  1   00799
   AM                   DCW    @ @                                  08019  1   00800
   AM 1                 DCW    @ @                                  08020  1   00801
   AM 2                 DCW    @M@                                  08021  1   00802
   AM 3                 ORG    CPHASE&369       ENSURE WM IN 00998              00845
   AM 4                 CCORG  PPHASE&369                           08064      00845
   AM 5      ************************************************************
   AM 6      *MOVE APPLICABLE CONTROL CARDS FROM LOWER MEMORY TO DIAGNOSTIC.
   AM 7      CMVACC     BBE    CMFIVE,TOPTHO-1,8  GO MOVE SYS1,CHN1,CHN2,CHN3,CHN408064 12  00845  W00888012488
   AM 8                 BBE    CMTHRE,TOPTHO-1,-  GO MOVE SYS1,CHN1,CHN2 ONLY  08076 12  00857  W00901012488-
   AM 9                 BBE    CMCNNE,TOPTHO,8    GO MOVE SYS1 ONLY            08088 12  00869  W00914012498
   AM10                 B      CRELPR             DONT MOVE ANY CARDS          08100  7  00881  J00508
   AM11      CMFIVE     MRCR   LOCHN3,CHN3         MOVE CHN3 CARD               08107 12  00888  D0019201403,
   AM12                 MRCR                      MOVE CHN4 CARD               08119  1  00900  D
   AM13      CMTHRE     MRCR   LOCHN1,CHN1         MOVE CHN1 CARD               08120 12  00901  D0007801289,
   AM14                 MRCR                      MOVE CHN2 CARD               08132  1  00913  D
   AM15      CMCNNE     MRCR   LOSYS1,SYS1         MOVE SYS1 CARD               08133 12  00914  D0004501256,
   AM16                 B      CRELPR             GO CONTINUE PHASE 2          08145  7  00926  J00508
   AM17      ************************************************************
   AM18      *PHASE 2 CONSTANTS AND STORAGE.
   AM19                 DCW    @U%U1M@                                  08156  5  00937
   AM20      CCWTMX     DCW    @N@                                      08157  1  00938
   AM21      CZFLDL     DCW    FIELDS                                   08162  5  00943  00997
   AM22      PCREL      CCORG  *                                        08163      00944
   AM23                 *DCW   @00999@           TOP THOUSANDS ADDR OF MEM    08167  5  00948
   AM24      CRELPC     DCW    @0C999@           TOP THOUSANDS ADDR OF PROG   08172  5  00953
   AM25      CXBLNK     DCW    @ @                                      08174  2  00955
```

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PGLIN    LABEL      OPCOD  OPERAND                                                     CT  ADDRS  INSTRUCTION

AM27     ******************************************************************
AM28     *TYPE THIS DIAGNOSTICS SEQUENCE NUMBER AND IDENTITY.
AM29     CTYPEO     ZA     TOPTHO-997&INDEXX  CLEAR SEQUENCE ZONES             08175  6  00956  &002N2
AM30                MLCA   CXBLNK,TOPTHC-997&INDEXX  CLEAR TOPTHO IN PROGRAM   08181 12  00962  D00955002N2T
AM31     CTYPEW     WCP    PROGSQ-999&INDEXX  TYPE IT                          08193 10  00974  M%T0002M8W
                                                                                                      G
AM32                BA1    CTYPEW                                              08203  7  00984  R00974M
AM33     CTYPPD     B      CPHASE              GO DUMP NEXT PROGRAM            08210  7  00991  J00476
AM34     CPHEND     CCORG  *                   LAST ENTRY IN PHASE 2           08217     00998
                           G
AM35                DCW    @M@     STOP OVERLAY-THIS GM/WM MUST BE IN 00998    08217  1  00998
AM36     ******************************************************************
AM37     *REAC PHASES 2 & 3 BACK INTO UPPER CORE.
AM38     *REWIND & UNLOAD CARC IMAGE TAPE IF MODIFYING FROM TAPE.
AM39     CPHCCO     CCORG  *                                                   08218     00999
AM40     CPHTPI  *  BSP    11                  BACKSPACE BUFFER                08218  5  00999  U%U1B
                                                                                                      G
AM41             *  BA1    *-11                                                08223  7  01004  R00999M
AM42             *  RTBGW  11,PPHASE           REREAD PHASES 2&3 INTO          08230 10  01011  L%B107695$
                                                                                                      G
AM43             *  BA1    BERROR                UPPER MEMORY                  08240  7  01021  R00306M
AM44                NOP                                                        08247  1  01028  N
AM45     ERWAND     CCORG  *                                                   08248     01029
AM46                B      *&13                GO IF NO SOURCE TAPE            08248  7  01029  J01048
AM47     ERWDSO     CCORG  *                                                   08255     01036
AM48             *  RWU    11                  REWIND/UNLOAD SOURCE TAPE       08255  5  01036  U%U1U
                                                                                                      G
AM49             *  BA1    *-11                                                08260  7  01041  R01036M
AM50     CMASTM     CCORG  *                                                   08267     01048
AM51                NOP                                                        08267  1  01048  N
AM52     CMSTMS     B      *&18                                                08268  7  01049  J01073
AM53                WCP    PMESMZ              TYPE MASTER TAPE MESSAGE        08275 10  01056  M%T008342W
                                                                                                      G
AM54                BA1    *-16                                                08285  7  01066  R01056M
AM55                BCE    CWTLAD,CPHTPA&2,1   GO IF MODIFYING FROM CARDS      08292 12  01073  B01109010991
AM56                BCE    CWTLAD,CPHTPA&2,Z                                   08304 12  01085  B01109010992
AM57     CPHOCO     CCORG  *                                                   08316     01097
AM58     CPHTPA  *  RWU    11                                                  08316  5  01097  U%U1U
                                                                                                      G
AM59             *  BA1    *-11                                                08321  7  01102  R01097M
AM60     CWTLAD     B      PWTLOD              GO RWD-WT LOAD PROG ALL OUTPUTS 08328  7  01109  J08361
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PGLIN   LABEL     OPCOD  OPERAND                                                    CT  ADDRS  INSTRUCTION

AM62              B      CPHASE                                             08335  7  01116  J00476
AM63    PMESMZ    CCORG  *                                                  08342     01123
AM64              DCW    @XX-NEW MASTER TAPE@,G                             08359 18  01140
AM65    CPHTPB    CCORG  *                                                  08361     01142
AM66              ORG    CPHTPB                                                       08361
AM67    ****************************************************************
AM68    *REWIND AND WRITE LOAD PROGRAM ON OUTPUT DRIVES.
AM69    PWTLCD    SBR    PDCN&5              SET EXIT                              7  08361  G08542B
AM70              CW     PREND&1             FIND ADDRESS                          6  08368  □08402
AM71              SBR    PWBAR&5             STORE IT                              7  08374  G08511B
AM72              MLCWA  PRWD&5,PWT&5        MOVE REWIND INSTRUCTION              12  08381  D0854908494X
AM73              MLCWA                                                            1  08393  D
AM74              B      PFIN                GO TO REWIND ALL OUTPUTS              7  08394  J08426
AM75    PREND     CW     PDCN&1              FIND ADDRESS                          6  08401  □08538
AM76              SBR    PWBAR&5             RESTORE IT                            7  08407  G08511B
AM77              MLCWA  PWTSA&9,PWT&9       RESTORE WRITE INSTRUCTION            12  08414  D0855908498X
AM78    PFIN      SW     PRCTAB&1            FIND ADDRESS OF TABLE                 6  08426  ,07993
AM79              SAR    INDEXA              STORE IT                              7  08432  G00039A
AM80    PMRC      MRC    0&INDEXA,PWT&1      MOVE CHNL INDICATOR                  12  08439  D000&008490#
AM81              MRC    1&INDEXA,PWBA       MOVE STATUS INDICATOR                12  08451  D000&108499#
AM82              SAR    INDEXA              SAVE ADDRESS                          7  08463  G00039A
AM83    PMWT      MRC    0&INDEXA,PWT&3      MOVE DRIVE NUMBER                    12  08470  D000&008492#
AM84              SAR    INDEXA              SAVE ADDRESS                          7  08482  G00039A
AM85    PWT       WTBW   11,LPR              WRITE TAPE                           10  08489  L%B108597W
                                                                                                    G
AM86    PWBA      BA1    BERROR              BRANCH ANY ERROR                      7  08499  R00306M
AM87    PWBAR     BCE    PDCN,0&INDEXA,      GC IF ALL DRIVES WRITTEN             12  08506  B08537000&0
AM88              BBE    PMRC,0&INDEXA,&     IF ZONE BITS-GO CHANGE CHNL          12  08518  W08439000&0&
AM89              B      PMWT                BRANCH TO NEW DRIVE                   7  08530  J08470
AM90    PDCN      B      00000               EXIT                                  7  08537  J00000
AM91    PRWC      DCW    @U%U1R@             REWIND INSTRUCTION                    5  08544
AM92              DCW    @N@                                                       1  08549
AM93    PWTSA     WTBW   11,LPR              WRITE INSTRUCTION                    10  08550  L%B108597W
AM94    ENDCXH    ORG    *                                                            08560
```

```
   PGLIN    LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

   AM96     **********************************************************************
   AM97     *END OF PHASE 2 IF PHASE 3 IS TO BE RUN.
   AM98              ORG    CTBOUX                                                 00777
   AM99     ENDCPH   CDORG  ENDCXH                                  08560          00777
   AN       ENCPHA * RWD    11              REWIND TAPE WITH 2&3 ON IT  08560  5   00777  U%U1R
   AN 1             * BAL    ENCPHA                                  08565  7   00782  R00777M
                                                                                       G
   AN 2     ENDCPI   CDORG  *                                       08572          00789
   AN 3     ENCPHB * RTBGW  11,PPHASE       READ PHASES 2&3 INTO UPPER CORE 08572 10   00789  L%81076955
   AN 4             * BAL    BERROR                                  08582  7   00799  R00306M
                                                                                       G
   AN 5              B      EPHASE          GO TO PHASE 3           08589  7   00806  J08834
   AN 6     ENCPND   CDORG  *                                       08596          00813
   AN 7     ENCSTP   DCW    aMa             STOP OVERLAY            08596  1   00813
                            G
```

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PGLIN   LABEL   OPCOD  OPERAND                                                  CT  ADDRS  INSTRUCTION

AN 9    ************************************************************
AN10    * LOAD PROGRAM TC BE PUT ON THE OUTPUT TAPES AS THE FIRST RECORD
AN11            ORG    00C11                                                        00011
AN12    LPR     CCORG  *                                                08597       00011
                                   S                                                            S
AN13            BBE    LBLT-1C,00C01,B     GO IF LOAD BUTTCN WAS USED   08597 12    00011  W00123000018
                                                                                                T
AN14            MRCW   0,LBA               INITIALIZE READ TAPE         08609 12    00023  D0000000071M
                                                                                                T
AN15            MRCW   0,LBB               AND STATUS                   08621 12    00035  D0000000088M
                                                                                                T
AN16            MRCW   0,LBC               INDICATCRS                   08633 12    00047  D0000000095M
AN17            MLCS   2,LRT&1                                          08645 12    00059  D00002000793
                                                                                                 G
AN18    LBA     BA1    LRT                 TURN OFF I/O INTERLOCK       08657  7    00071  R00078M
AN19    LRT     RTBGW  10,FIELD            READ FIRST PROGRAM           08664 10    00078  L%B001000$
AN20    LBB     BEX1   LRT,3               BRANCH IF NOT READY OR BUSY  08674  7    00088  R000783
                                                                                                 G
AN21    LBC     BA1    *&1                 TURN OFF INTERLOCK           08681  7    00095  R00102M
AN22            MLCWA  LRT&10,332          SAVE STATUS INDICATOR        08688 12    00102  D0008800332X
AN23            MLCWA  LRT&9,331           SAVE READ INSTRUCTION        08700 12    00114  D0008700331X
AN24            B      PCPU                GO TO CC01                   08712  7    00126  J02000
                                                                                                 G
AN25    LBUT    BA1    *-9                 TURN OFF INTERLOCK           08719  7    00133  R00130M
AN26    LRTB    RTBGW  10,FIELD            READ FIRST PROGRAM           08726 10    00140  L%B001000$
AN27            BEX1   *-26,3              BRANCH IF NOT READY OR BUSY  08736  7    00150  R001303
                                                                                                 G
AN28            BA1    *-9                 TURN OFF I/O INTERLCCK       08743  7    00157  R00154M
AN29            MLCWA  LRTB,332            SAVE STATUS INDICATOR        08750 12    00164  D0014000332X
AN30            MLCWA  LRTB-1,331          SAVE READ INSTRUCTION        08762 12    00176  D0013900331X
AN31            B      PCPU                GO TO CC01                   08774  7    00188  J02000
AN32            H                          TERMINATE BRANCH OP          08781  1    00195  *
                                     S S S
AN33            DC     @121242484888B-B- - 1 @  FLOATING BIT            08802 21    00216
                         Lh    WLLh    WLLW
AN34            DC     @TS$GF$STTS$FG$STTS$GF@  FLOATING NOT BITS       08823 21    00237
AN35            DCW    @1@                 WORD MARKED BITS             08824  1    00238
AN36            DCW    @2@                                              08825  1    00239
AN37            DCW    @4@                                              08826  1    00240
AN38            CCW    @8@                                              08827  1    00241
                         S
AN39            DCW    @B@                                              08828  1    00242
AN40            CCW    @-@                                              08829  1    00243
AN41            CCW    @ @                                              08830  1    00244
                        Wh
AN42            DC     @SS@                WORD SEPERATORS              08832  2    00246
                        G
AN43            DCW    @M@                                              08833  1    00247
```

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   PGLIN    LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION

   AN45     ********************************************************************
   AN46     *PHASE 3 STARTS HERE.  PHASE 3 IS THE PROGRAM EDIT PHASE. PHASE
   AN47     *3 DUPLICATES SHORT MEMORY DUMP PROGRAMS FROM THE NEW MASTER TAPE
   AN48     *CREATED BY PHASE 2 ONTO THE NEW OUTPUT TAPE. THIS NEW OUTPUT
   AN49     *TAPE CONTAINS ONLY THOSE PROGRAMS APPLICABLE TO A SPECIFIC
   AN50     *SYSTEM AS DETERMINED BY PHASE 3 FROM THE MACHINE CONFIGURATION
   AN51     *CONTROL CARDS ON THE NEW MASTER TAPE.
   AN52     EACEPT    EQU    ERELPR            ACCEPT ADDR TO PROG RELOCATE
   AN53     ERJECT    EQU    CPHASD            REJECT ADDR TO READ BUFFER
   AN54     ERESLT    EQU    CASTER            EDIT RESULT CHARACTER
   AN55     EINCDO    EQU    EINPUT
   AN56     EPHTRX    CDORG  *                                    08834     00248
   AN57               ORG    EPHTRX                                       08834
   AN58     ********************************************************************
   AN59     *OVERLAY PHASE 2 WITH PHASE 3 SECTIONS.
   AN60     EPHASE    MLCA   EOUTPT,PRDTAB&2   SET UP PHASE 3 OUTPUT TABLE      12  08834  D09029079947
   AN61               B      PWTLOD            GO RWD/WRT LOAD ON OUT 1         7  08846  J08361
   AN62      ESPASD * DCW    @U%U1A@           SPACE OVER LOAD PROGRAM          5  08853
   AN63               DCW    @N    @             ON OUTPUT 2 IF MULTI PHASE   5  08862
   AN64             * BAI    BERROR              NO SPACE IF SINGEL PHASE EDIT  7  08863  R00306M
                                                                                        G
   AN65               MRCWG  EINDEX,ERELIN     OCCUPY 00025-00305               12  08870  D09052000085
                                                                                        D
   AN66               MRCWG  EDMP,ENEWDP       OCCUPY 00508 UP                  12  08882  D09347005085
                                                                                        D
   AN67               MLCS   EINPUT,CPHASD&1   READ INPUT                       12  08894  D09049004773
   AN68               MLCS   EINPUT,EINRWU&1   REWIND INPUT                     12  08906  D09049006463
   AN69               MLCS   EINPUT&1,CPHASD&10  READ INPUT                     12  08918  D09050004863
   AN70               MLCS   EINPUT&1,CPHASD&17  READ INPUT                     12  08930  D09050004933
   AN71               MLCS   EINPUT&1,EINRWU&5   REWIND INPUT                   12  08942  D09050006503
   AN72               MLCS   EINPUT&2,CPHASD&3  READ INPUT                      12  08954  D09051004793
   AN73               MLCS   EINPUT&2,EINRWU&3  REWIND INPUT                    12  08966  D09051006483
   AN74               CW     EDIT&1,ECHWTM&1                                   11  08978  ¤0005600629
   AN75               SAR    CPHASD&29                                          7  08989  G00505A
   AN76               SBR    CPHASD&22                                          7  08996  G00498B
   AN77               WCP    PMESMX                                            10  09003  M%T009030W
   AN78               BAI    *-16                                               7  09013  R09003M
                                                                                        G
   AN79               B      CPHASE            GO START PHASE 3 EDIT            7  09020  J00476
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  PGLIN     LABEL      OPCOD  OPERAND                                                CT  ADDRS  INSTRUCTION

  AN81      EOUTPT     DCW    @%R1@              PH 3 OUTPUT-OUT 1                          3 09029
  AN82       PMESMX    DCW    @XX-NEW EDITED TAPE@,G                                      18 09030
  AN83       EINPUT *  DCW    @%R1@              TAPE DRIVE FOR PHASE 3 INPUT               3 09049
  AN84      ************************************************************************
  AN85      *PHASE 3 SECTIONS TO OVERLAY PHASE 2 FOR PHASE 3 OPERATION.
  AN86      ERELIN     ORG    00008                                                           00008
  AN87      EINDEX     CCORG                                                       09052      00008
                              S
  AN88      ECNSTT     DCW    @BJ242@            01242 & IX REG 6 ZONES            09056  5   00012
  AN89      ERSTRT     CCORG  *                                                    09057      00013
  AN90      ERSTBA     DCW    @ @                BA OP CODE                        09057  1   00013
  AN91                 RTBGW  10,00011           RESET & START OP                  09058 10   00014  L%B000011$
  AN92                 DCW    @*@                TERMINATE & STOP MOVE             09068  1   00024
  AN93                 DCW    @01403@            IX 1 FOR CHN3                     09073  5   00029
  AN94                 DCW    @01346@            IX 2 FOR CHN2                     09078  5   00034
  AN95                 DCW    @01460@            IX 3 FOR CHN4                     09083  5   00039
  AN96                 DCW    @0C000@            IX 4 FOR IO ERR & OTHER           09088  5   00044
  AN97                 DCW    @0C000@            IX REG 5 FOR GENERAL USE          09093  5   00049
  AN98                 DCW    @01256@            IX 6 FOR SYS1 & CHN1              09098  5   00054
  AN99      ************************************************************************
  AC        *FIND & STORE IN X1 THE LEFT ADDRESS OF THE LEFT BLOCK.
  AC 1      EDIT       ZA     ECNSTT,X4          SET BLOCK ADDRESS COUNT 01242     09099 11   00055  &0001200044
  AC 2      EDITA      A      ESCWRT,X4          SUBTRACT 3 FROM X4                09110 11   00066  A0060400044
  AC 3                 BW     EBLANK,3&X4        GO WHEN FOUND                     09121 12   00077  V0009600*031
  AC 4                 B      EDITA                                                09133  7   00089  J00066
  AC 5      ************************************************************************
  AC 6      *EXIT IF NO CONDITIONS.
  AC 7      EBLANK     BBE    EACEPT,TOPTHO,-    B BIT IN 01249-ACCEPT UNCOND.     09140 12   00096  W0050801249-
  AC 8                 ZA     *-10,ERESLT        SET RESULT CHARACTER TO &0        09152 11   00108  &0010800507
  AC 9                 ZA     *-10,ERSULT        SET RESULT STORAGE TO &0          09163 11   00119  &0011900998
```

```
  PGLIN   LABEL     OPCOD  OPERAND                                                CT  ADDRS  INSTRUCTION

  AC11    ***********************************************************
  AC12    *DETERMINE SECTION SIGN.
  AC13    ESCTCN    CW     EBLOCZ&1,ESINSW    ASSUME OR CONDITION       09174 11  00130  ¤0025400228
  AC14              SAR    ESIGNE&5                                     09185  7  00141  G00220A
  AC15              BBE    *&20,4&X4,-        GO IF OR SECTION          09192 12  00148  W0017900‡04-
  AC16              CW     ENDBRX&1           SET UP FOR . CONDITION    09204  6  00160  ¤00236
  AC17              SAR    ESIGNE&5                                     09210  7  00166  G00220A
  AC18              SW     ESINSW                                       09217  6  00173  ,00228
  AC19    ***********************************************************
  AC20    *DETERMINE & SET UP FOR SIGN OF THIS BLOCK.
  AC21              CW     ESWCHX             CLEAR SWITCH X            09223  6  00179  ¤00749
  AC22    EBLOCK    S      ESCWRT,X4          ADD 3 TO BLOCK ADDRESS    09229 11  00185  S0060400044
  AC23              CW     ETRYGN&1           INITIALIZE ADDRESS        09240  6  00196  ¤00777
  AC24              SBR    EBCE&5             SET BCE A ADDRESS TO TRY AGAIN 09246  7  00202  G00761B
  AC25              SW     EBCESW             SET TO END IF BCE NO BRANCH    09253  6  00209  ,00769
                                      S                                                               S
  AC26    ESIGNE    BBE    00000,1&X4,B       GO IF NOT CHAR-A BIT IN ZONE   09259 12  00215  W0000000‡018
  AC27              NOP                                                 09271  1  00227  N
  AC28    ESINSW    B      EBLOCZ                                       09272  7  00228  J00253
  AC29    ENDBRX    CW     EBCESW,EQUICK&1    SET BCE SWITCH TO DROP THRU    09279 11  00235  ¤0076900911
  AC30              SBR    EBCE&5             SET BCE TO END IF BRANCH       09290  7  00246  G00761B
  AC31    ***********************************************************
  AC32    *SET UP FOR THIS BLOCK.
  AC33    EBLOCZ    MLCS   EBLANK,EBCE        SET FOR BBE OP CODE       09297 12  00253  D00096007563
  AC34              BW     *&12,2&X4          GO IF BBE WANTED          09309 12  00265  V0028800‡021
  AC35              ZA     EALLDN,EBCE        SET FOR BCE OP CODE       09321 11  00277  &0082400756
  AC36              B      ESTDMD             GO TO NEXT SECTION        09332  7  00288  J00687
  AC37    EZFLCL    DCW    &FIELDS                                      09343  5  00299  00997
  AC38    EXBLNK    DCW    a a                                          09345  2  00301
                            G
  AC39              DCW    aMa                STOP PHASE 3 OVERLAY      09346  1  00302
```

```
   PGLIN     LABEL      OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

   AC41      ***************************************************************
   AC42      *RELOCATE DIAGNOSTIC TO UPPER MEMORY TO MAKE A SHORT DUMP.
   AC43      ENEWCP     ORG    BSETUP                                                 00508
   AC44      EDMP       CCORG  *                                              09347    00508
   AC45      ERELPR     MLNB   TOPTHO,ERELPC-3    SET TOP 1000S ADDR OF PROG  09347 12  00508  D0124900994J
   AC46                 ZA     ERELPC,X4          X4 TO TOP 1000S OF PROGRAM  09359 11  00520  &0099700044
   AC47                 ZA     ERELPC-5,X5        X5 TO TOP THOUSANDS OF MEMORY 09370 11 00531  &0099200049
   AC48                 C      X4,X5              IS PROGRAM LARGER THAN CORE 09381 11  00542  C0004400049
   AC49                 BL     CPHASE             GO SKIP THIS ONE IF YES     09392  7  00553  J00476T
   AC50      ERELPA     MLCWA  0&X4,0&X5          MOVE PART OF PROGRAM UP     09399 12  00560  D00*0000**0X
   AC51                 SAR    X4                 SET FOR NEXT MOVE           09411  7  00572  G00044A
   AC52                 SBR    X5                                             09418  7  00579  G00049B
   AC53                 C      X4,EZFLDL          IS ENTIRE PROGRAM MOVED     09425 11  00586  C0004400299
   AC54                 BU     ERELPA             GO IF NOT                   09436  7  00597  J00560/
   AC55      ***************************************************************
   AC56      *WRITE THIS DIAGNOSTIC ON AN OUTPUT TAPE.
   AC57      EDUMP      CCORG  *                                              09443    00604
   AC58      ESCWRT   * WTBEW  11,3&X5            DUMP FROM START OF PROGRAM  09443 10  00604  L%B100**3X
   AC59               * BAI    BERROR                                         09453  7  00614  R00306M
                                                                                                   G
   AC60                 B      ETYPEO             GO TYPE TITLE               09460  7  00621  J00946
   AC61      ***************************************************************
   AC62      *WRITE TAPE MARK AND REWIND/UNLOAD ROUTINES.
   AC63      PECYEL     CCORG  *                                              09467    00628
   AC64      ECHWTM   * WTM    11                 WTM ON NEW WORK TAPE        09467  5  00628  U%U1M
   AC65                 DCW    @N    @            09476  5  00637
   AC66                 BAI    BERROR                                         09477  7  00638  R00306M
                                                                                                   G
   AC67      EINRWU   * RWU    11                 REWIND NEW MASTER           09484  5  00645  U%U1U
   AC68               * BAI    *-11                                           09489  7  00650  R00645M
                                                                                                   G
   AC69      PECYEM     CCORG  *                                              09496    00657
   AC70               * RWU    11                 REWIND NEW EDITED TAPE      09496  5  00657  U%U1U
   AC71               * BAI    *-11                                           09501  7  00662  R00657M
                                                                                                   G
   AC72                 MRCWR  ERSTBA,000C0       SET RESET & START OP CODES  09508 12  00669  D0001300000M
                                                                                                          S
   AC73                 H      *-5                END OF PHASE 3              09520  6  00681  .00681
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
AC86      ********************************************************************
AC87      *SET UP FOR THIS BLOCK.
AC88      ESTDMC    MLCS   0&X4,EBCE&11      SET BCE/BBE D MOD CHAR.        09526 12 00687  D00*00007673
AC89                MLCS   2&X4               SET BCE/BBE B FIELD NUMERICS   09538  6 00699  D00*02
AC90                MLCS                                                    09544  1 00705  D
AC91      ********************************************************************
AC92      *SET BCE/BBE B FIELD FOR PROPER INDEX REGISTER.
AC93      ESETBF    MLZA   ECHSTT-2,EBCE&10  SET BCE/BBE B FIELD FOR X6     09545 12 00706  D00010007665
AC94                BZN    EPREPX,2&X4,      GO IF REFERENCE SYS1 OR CHN1   09557 12 00718  V0074800*022
AC95                MLZS   2&X4,EBCE&9       SET BCE/BBE B FIELD FOR-       09569 12 00730  D00*02007652
AC96                MLZS   *                  -X1/CHN3-X2/CHN2-X3/CHN4.     09581  6 00742  D00747
AC97      ********************************************************************
AC98      *SWITCH X.
AC99      EPREPX    NOP                      SWITCH X                       09587  1 00748  N
                                                                            09588  7 00749  J00776
AP        ESWCHX    B      ETRYGN
AP 1      EBCE      BCE    0&&&&,&&&&&,M(G)  CHECK FOR CHECK CHARACTER       09595 12 00756  B0000000&&&&M(G)
AP 2                NOP                      SW CLR TO DROP THRU            09607  1 00768  N
AP 3      EBCESW    B      EQUICK                                           09608  7 00769  J00910
AP 4      ********************************************************************
AP 5      *END SECTION HOUSEKEEPING.
AP 6      ETRYGN    BW     *&13,1&X4         GO IF END OF SECT 1 OF 2       09615 12 00776  V00800004011
AP 7                BBE    EBLOCK,X4,.       GO IF NOT END OF ALL SECTIONS  09627 12 00788  W00185&&0044.
AP 8      ESECCN    BW     EALLCN,ESWCHX     GO IF SWITCH X IS SET          09639 12 00800  V00824007491
AP 9                BW     ESTACC,ESINSW     GO SET ACCEPT IF . CONDITION   09651 12 00812  V00922002281
AP10      ********************************************************************
AP11      *CHECK FOR COMPLETION OF THIS PROGRAMS EDIT.
AP12      EALLCN    BCE    EDCIDE,X4,8       GO IF NO MORE SECTIONS         09663 12 00824  B00855&0044B
AP13                MLZS   1&X4,ERSULT       STORE INTER SECTION SIGN       09675 12 00836  D00*01009982
AP14                B      ESCTON            GO CHECK SECOND SECTION        09687  7 00848  J00130
AP15      ********************************************************************
AP16      *DECIDE WHETHER TO ACCEPT OR REJECT THIS PROGRAM.
AP17      EDCIDE    MLZS   ERSULT,ERESLT     SET FINAL RESULT               09694 12 00855  D00998005072
AP18                BBE    ERJECT,ERESLT,8   REJECT IF RESULT IS ZERO       09706 12 00867  W00476005078
AP19                BBE    EACEPT,ERESLT,-   ACCEPT IF B BIT IN RESULT      09718 12 00879  W00508005&7-
AP20                BBE    ERJECT,ERESLT,1   REJECT IF 1 & NOT B BITS       09730 12 00891  W00476005071
AP21                B      EACEPT            ACCEPT IF 2 & NOT B BITS       09742  7 00903  J00508
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   PGLIN     LABEL      OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
   AP23      ********************************************************************
   AP24      *END SECTION HOUSEKEEPING.
   AP25      EQUICK     BK     ESTSWX,ESINSK      IF . COND,LEAVE UNACCEP TABLE 09749 12  00910  V00933002281
   AP26      ESTACC     A      *-IC,ERESLT        SET SECTION ACCEPTABLE        09761 11  00922  A00922005C7
   AP27      ESTSWX     SW     ESWCHX             SET SWITCH X                  09772  6  00933  ,00749
   AP28                 B      ETRYGN                                           09778  7  00939  J00776
   AP29      ********************************************************************
   AP30      *TYPE THIS DIAGNOSTICS SEQUENCE NUMBER AND IDENTITY.
   AP31      ETYPEC     ZA     TOPTHO-9999X5      CLEAR SEQUENCE ZONES          09785  6  00946  E00SV2
   AP32                 MLCA   EXELNK,TOPTHO-9999X5                            09791 12  00952  D00301C0SV2I
   AP33      ETYPEW     WCP    PROGSC-9999X5      TYPE IT                       09803 10  00964  MXIC0CSU8W
   AP34                 EAI    ETYPEW                                           09813  7  00974  R00964M
   AP35      ETYPPC     B      CPHASE             GO GET NEXT PROGRAM           09820  7  00981  J00476
   AP36      ********************************************************************
   AP37      *PHASE 3 CONSTANTS AND STORAGE.
   AP38      ECREL      CLORG  *                                                09827     00988
   AP39                *  DCW    @CC9998            TOP THOUSANDS ADDRESS OF MEMORY 09831  5  00992
   AP40      ERELPC     DCW    @CC9992            TOP THOUSANDS ADDR OF PROGRAM 09836  5  00997
   AP41      ERSULT     DCW    @ @                                              09837  1  00998
   AP42      EENDPH     CLORG  *                                                09838     00999
   AP43                 DCW    @M@                STOP PHASE 3 OVERLAY          09838  1  00999
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PGLIN	LABEL		OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
AP45	**********							
AP46	*SUBROUTINE TO CHECK & UPDATE TAPE LEVEL.							
AP47		@	ORG	@ENDPH@1			09839	
AP48	PLEVEL	@	MLNS	CIMAGE@1C,@ENDPH@9	NEW LEVEL TO LOWER PHASE 1	12	09839	D00611009711
AP49		@	MLNS			1	09851	D
AP50		@	MLNS			1	09852	D
AP51		@	MLNS			1	09853	D
AP52		@	MLNB	PWMGMR-27,PLEVOL	ISOLATE OLD LEVEL NUMERICS	12	09854	D0766609968J
AP53		@	C	CIMAGE@5,PLEVOL		11	09866	C0C60609968
AP54		@	BL	PLEVMS	GO IF A CHANGE IS MISSING	7	09877	J09909T
AP55		@	C	CIMAGE@1C,PLEVOL		11	09884	C0061109968
AP56		@	BH	PLEVBK	GO IF THIS IS A CHANGE BACKWARDS	7	09895	J09928U
AP57	PLEVNO	@	B	PCRDIM@25	GO READ NEXT CARD	7	09902	J06157
AP58	PLEVMS	@	MLZS	*@1,@ENDPH@6	SET MISSING LEVEL FLAG IN 1000S	12	09909	D09921009682
AP59		@	B	*@13		7	09921	J09940
AP60	PLEVBK	@	MLZS	*@1,@ENDPH@7	SET BACK LEVEL FLAG IN 100S	12	09928	D09940009692
AP61		@	@	TYP1		7	09940	J06087
AP62		@	CCW	@*LEVEL ERR@,G		10	09956	
AP63		@	B	PLEVRC		7	09958	J09902
AP64	PLEVOL	@	CCW	@ @	OLD TAPE LEVEL NUMERICS	4	09968	
AP65			END	PSTART	D.E.B. C.R.M.			J02000

END OF ASSEMBLY