

 SPERRY RAND

UNIVAC

**TYPE 1219B  
DIGITAL DATA  
COMPUTER**

**DIAGNOSTIC  
MANUAL  
VOLUME I**

**DIAGNOSTIC MANUAL**

**for**

**TYPE 1219B  
DIGITAL DATA COMPUTER**

**VOLUME I  
SECTIONS 1-3**

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## SECTION 1 - GENERAL INFORMATION

1.0

### INTRODUCTION

1.0

This manual is a diagnostic troubleshooting manual. The operating instructions and malfunction isolation processes contained herein are used with the UNIVAC Type 1219B Digital Data Computer diagnostic programs to verify proper computer operation and to isolate malfunctions detected by the diagnostic programs.

The malfunction isolation procedures contained in this manual assume that the diagnostic programs can be loaded into memory or are already stored in memory. If the program is not loaded or cannot be loaded in memory, the operator must rely on conventional troubleshooting techniques (functional schematics and circuit analysis) to isolate the load-inhibiting malfunction.

There are three 1219B diagnostic programs: CONTBASI, MEDIA, and IOTA. CONTBASI is a logic diagnostic program which checks the arithmetic and control sections of the computer. MEDIA is a memory diagnostic program which checks the computer memory and its associated circuitry. IOTA is an input/output diagnostic program which checks the input/output section of the computer. Each program is contained on a single reel of paper tape.

The diagnostic programs and the test data contained in this manual are written for use on a 1218B Digital Data Computer having the following characteristics:

- 1) Any memory size from 8K to 65K.
- 2) From four to 16 input/output channels in increments of four.
- 3) Paper tape bootstrap on any channel.

1.1

### MANUAL ORGANIZATION

1.1

The diagnostic manual is divided into four sections: General Information, Operating Instructions, Malfunction Isolation Data, and Program Listing. The content of each section is described in the following paragraphs.

Section 1, General Information, contains a description of the diagnostic programs and their major subroutines, instructions on proper use of this manual, instructions on locating referenced test points and replacing circuit cards, a list of the test equipment required to perform the tests and a glossary of special terms and abbreviations used in this manual.

Section 2, Operating Instructions, contains detailed instructions for loading and executing the tests, instructions for recycling the entire test or portions of the test, and procedures to follow in the event the computer faults, loops, stops, or otherwise operates abnormally while the diagnostic programs are being loaded or run.

Section 3, Malfunction Isolation Data, contains detailed step-by-step instructions which, when used with the procedures in Section 2, Operating Instructions, enable the operator to isolate equipment malfunctions and restore normal operation.



1.1  
(Cont)

1.1  
(Cont)

Section 4, Program Listing, contains side-by-side assembly listings of the source programs and object programs for CONTBASI, MEDIA, and IOTA and the two loader routines: EZLOAD and EASIER.

It is recommended that the user become familiar with the organization and content of the manual prior to performing any of the operating procedures or malfunction isolation procedures detailed in Sections 2 and 3. The general information section and the introductory material in Section 3 contain especially important information.

## 1.2 PROGRAM DESCRIPTION 1.2

The three 1219B diagnostic programs are the Control/Arithmetic Test (CONTBASI), the Memory Test (MEDIA) and the Input/Output Test (IOTA).

CONTBASI is loaded by a combination loader and diagnostic test labeled EZLOAD. All interrupts are locked out when CONTBASI is run.

MEDIA, which checks the main memory, control memory, and bootstrap memory, is loaded by EASIER, which is a paper tape loader. This program is recommended for malfunction isolation. All interrupts are locked out when MEDIA is run.

IOTA is loaded by EASIER. The program requires a strict off-line attitude; that is, no request on any channel, no response from any peripheral, and no interference between odd-even channel pairs.

### 1.2.1 LOGIC TEST DESCRIPTION 1.2.1

#### 1.2.1.1 CONTBASI (FIRST ROUTINE) 1.2.1.1

This subroutine checks the ability to recognize fault instructions and the proper referencing of the fault entrance address. Control instructions are inserted in the fault entrance address and then three illegal codes are forced. Each function code error is recorded and the final error is displayed in the A<sub>L</sub> register.

#### 1.2.1.2 SKIP/STOP 1.2.1.2

This subroutine is a manual check of the program skips and stops. Each switch is tested in each position.

1.2.1.3

PRELIM

1.2.1.3

This subroutine checks the functions required to execute the Executive and verify the results of the remaining unchecked instructions. If an error is detected, the program stops and the contents of the various registers are used to determine the location of the malfunction.

1.2.1.4

DEEDEE

1.2.1.4

This subroutine checks the ability to enter and store the  $A_U$  register properly. The error is displayed in the  $A_L$  register.

1.2.1.5

KONG

1.2.1.5

This subroutine checks the ADDALK instruction and all conditional jump instructions. The jumps are checked for both conditions and each error is recorded. A total error result is displayed in the  $A_L$  register.

1.2.1.6

SLUP

1.2.1.6

This subroutine checks the selective and complement instructions. Complementary patterns are used to verify all logic involved, plus the complementing of positive zero. Each instruction has individual error stops with the  $A_U$  and  $A_L$  registers displaying the error.

1.2.1.7

ICEBERG

1.2.1.7

This subroutine checks the ability to select a particular ICR register, enter its location with various patterns and store the K portion of the ICR instruction. The BJP, BKS, ISK and various instructions that pertain to and use the  $B \pm 1$  network, the  $B = 0$  evaluation and the B register are checked. Each instruction has its own error stop with the  $A_U$  and  $A_L$  contents defining the error.

1.2.1.8

CAMEO

1.2.1.8

This subroutine checks all the B modified portions of instructions that have previously been checked. Each instruction has individual error stops with the  $A_U$  and  $A_L$  contents providing error displays.

1.2.1.9

SUPEREG

1.2.1.9

This subroutine checks the ability to enter any bank and return to the main program bank properly. It also checks the SR register and the ability to store the

1.2.1.9  
(Cont)

1.2.1.9  
(Cont)

K portion of the SR instruction. Finally the routine checks the ability to select a particular bank and correctly remove particular contents from that bank. Errors are accumulated and displayed in  $A_L$ .

1.2.1.10

KAYADDER

1.2.1.10

This subroutine checks the K Adder initially with the scale factor instruction. This partial check has its own error stop with the error displayed in  $A_L$ . The remaining portion of the K Adder is checked by repeatedly adding 1 and comparing the result until the maximum K count is achieved. If an error is detected, the program stops immediately and displays the K contents.

1.2.1.11

SHIFTLESS

1.2.1.11

This subroutine checks the ability to shit properly. Each register ( $A_U$ ,  $A_L$ , and  $A$ ) is checked individually for normal end-off right shift, end-around left shift, and sign analyzed after detection; when distinguished, the program stops with error display present.

1.2.1.12

ADDSUBAD

1.2.1.12

This subroutine uses an ADDAL instruction with various test patterns to check the entire main subtractive adder. Each separate add result is complemented to zero by the SLCP instruction, allowing the result to be checked by a JPALZ instruction which is independent of the adder. Each pattern has a specific error stop so that, when an error is detected, the computer stops with  $A_L$  displaying the error. The final portion of the test checks the remaining arithmetic instructions (ADDALB, SUBALB, ADDA and SUBA) for command enable errors.

1.2.1.13

MUDDIVE

1.2.1.13

This subroutine uses eight different patterns with all possible sign combinations. The patterns are checked with a MULALB and a DIVAB instruction; the final result is checked for correctness. The RND and remaining multiply/divide instructions are checked for command enable errors.

1.2.1.14

PARITY

1.2.1.14

This subroutine checks all parity logic elements and partially checks the parity flip-flop by running 14 odd and 13 even patterns through the parity circuit. As each pattern is extracted from a table and run through the circuit, a check for even or odd parity is made. Each time the answer is odd parity for an even pattern being tested, an error is recorded and saved. The even parity case of odd

1.2.1.14  
(Cont)

1.2.1.14  
(Cont)

patterns is handled in a similar manner, with the errors being noted and stored in another location. After all patterns have been tested, the two error storage locations are tested for zero (indicating no errors). If either location is nonzero, the contents of both locations are displayed in the  $A_U$  and  $A_L$  registers and the computer comes to an error stop.

1.2.1.15

FTA

1.2.1.15

This subroutine is only referenced in logic testing documentation. Certain conditions must be set before starting the test. FTA assumes that the error is in the function code translator and is written from the premise that only STRAL, ENTAL, JP and STOP instructions are operational. The test executes every function code except I/O instructions and compares the final result for errors. FTA uses special instructions in specific locations to maintain control in the event that any false instruction could result from a malfunction. The final error stop gives a totalled sum of each function code error displayed in the  $A_U$  and  $A_L$  registers.

1.2.2

MEMORY TEST DESCRIPTION

1.2.2

**MEDIA** is the Memory Test for the 1219B Computer. It can test any available memory option; that is, any Control Memory or Main Memory size (up to 65K) with a paper tape bootstrap.

The program is first inserted into stack zero which then proceeds to test the next stack. Each stack is tested individually, including stack zero. The testing of this stack is accomplished by automatically moving the MEDIA program to a previously tested stack having no malfunctions. After stack zero is tested, the program is returned so that it may be recycled.

Each address is tested for a bit dropped or picked up by inserting all ones, zeros, and a worst pattern. The worst pattern is defined by a parity mask on the address with either 000000 or 777777 being written into the address, depending on the parity. Two worst patterns are generated; one by using the skip on even parity instruction and the other, the complement of the first, by using the skip on odd parity instruction.

If an error is detected the program proceeds to various subroutines to determine the failing bits and the possible cause. These subroutines then select a unique error stop.

1.2.3

INPUT/OUTPUT TEST DESCRIPTION

1.2.3

The Input/Output (I/O) Test is run with any two channels jumpered input to output on the same channel. After successfully completing the I/O Test in this manner, the jumper cables can be moved to a different set of channel combinations and the I/O test rerun. This process is repeated until all desired channels have been tested.

1. 2. 3  
(Cont)

1. 2. 3  
(Cont)

It should be noted that when an error stop occurs while running the I/O test, careful inspection of the  $A_U$  and  $A_L$  registers is necessary to correctly determine jumper channel and chassis information and card replacements. In most cases, the failing channel will be displayed in the  $A_U$  register ( $A_U$  bit 1 indicates channel 1, etc.) and the I/O instruction being executed will be displayed in the  $A_L$  register.

To further clarify the meaning of bits set in the  $A_U$  and  $A_L$  registers, it is recommended that reference be made to the program listing and to the notes provided for the particular error stop address.

1. 2. 3. 1

### IOTA EXECUTIVE ROUTINE

1. 2. 3. 1

This routine controls the order of execution of all the other main tests in the I/O Test (IOTA). Part of IOTA is located in the upper part of memory stack 0 with the bulk of the test in stack 1. Stack 0 contains IJP reference addresses since most of the interrupt routines are in stack 1. By setting various SKIP and STOP keys, parameter entry stops may be ignored or only specific portions of these may be selected for running. The UPRAM (unpack parameters) routine unpacks and stores parameters entered during the parameter entry stop. The CHSET (channel set) routine determines the value of the channel parameter that was entered. From this, CHSET sets a value in the index register that is used in looping when checking all channels, and also storing a value in CHTBL (channel table) locations so that the proper table is referenced for various I/O sizes. The HONINT (honor interrupt) routine clears all interrupts by storing RIL's in all interrupt entrance addresses. The TERMAL (terminate all) routine terminates all actives. The SRSMAL (set resume all) routine sets resumes on all channels.

1. 2. 3. 2

I/01

1. 2. 3. 2

This routine checks for a constant input, output, or external function active. The program does the checking by doing a skip if the function being checked is inactive. If the function is active, an error is recorded without coming to an error stop immediately. All channels are checked in order, with the highest channel being checked first. After checking input, output, and external function active on all channels, the error storage locations are checked to see if any errors were recorded. If an error was recorded, the program comes to an error stop with the contents of the error storage locations displayed in  $A_U$ ,  $A_L$  and the low even C register. If no errors, the test goes to the next routine. The JMPRD (jumpered) routine finds the lowest even non-jumpered channel and uses it in the display on C routine. RECORDI, RECORDO, and RECORDF are error recording routines. The DISPOC (display on C routine) causes one of the error storage locations to be displayed on  $C_E$  lower register.

1. 2. 3. 3

I/02

1. 2. 3. 3

This routine checks for the false running of the real-time clock, false input data requests, false external function requests, and also checks the ability to clear the active flip-flops. The RTC portion of the routine clears the RTC word location in control memory and then waits until this location has had time to be incremented by the false running of the real-time clock with an error stop if the RTC word was falsely incremented. The input, output and external functions are set active in turn and then checked for false termination due to a false request. Errors are recorded for those channels with false requests and the error storage locations are checked after all channels have been checked, with an error stop if errors were recorded. Buffer control word storage locations are also checked to see if such locations incremented or decremented.

1. 2. 3. 4

I/03

1. 2. 3. 4

This routine checks the proper functioning of the resume circuitry. The resume flip-flop is set for each channel in turn (highest channel first) and then this setting is checked by doing a skip on no resume instruction. If the resume flip-flop does not set, a force is done to further isolate the error. After all channels are checked, error storage locations are checked for errors and the program stops with error data displayed if any were detected, and continues to the next routine for the no error condition.

1. 2. 3. 5

I/0456

1. 2. 3. 5

This routine checks for the false termination of all lower channels when the highest channel in the group is terminated. Contained within this routine are subroutines 104, 105, and 106. 104 checks the input function by initially setting all inputs active with the STALAC (set all active) routine, resetting the B register according to the number of channels being checked, terminating the highest channel, and then checking all lower channels for false termination. The highest channel input is then activated, a lower channel is terminated, and the high channel is checked for false terminations. 105 and 106 check the output and external functions in a similar manner.

1. 2. 3. 6

I/0789

1. 2. 3. 6

This routine contains three subroutines, 107, 108, and 109 for input, output, and external function, respectively. Therefore, a description of input (107) will suffice for all three. All input channels are initially terminated with the TERMAL (terminate all) routine, the highest channel is then set active and all lower channels are checked for false activation, noting errors as they are detected. The highest channel is then terminated and a lower one is activated with false activation of the highest one being checked.

1. 2. 3. 7

I/010

1. 2. 3. 7

This routine checks the interaction of function enables. All functions are initially terminated, then EF is set active on a channel and output and input are checked to see if they were falsely activated.

1. 2. 3. 8

I/011

1. 2. 3. 8

This routine checks the proper storage of BCW in control memory for input, output, and external function. A check is also made of false termination occurring without doing a force. If BCW are not stored properly, the SRCHM (search memory) routine is used to search for them in other areas of control memory and parts of main memory in stack 0.

1. 2. 3. 9

I/012

1. 2. 3. 9

This routine checks the EXFOV circuitry and the processing of requests, premature and normal buffer termination, and the B ≠ ZP circuit. A two-word EF buffer is done and then checked for early termination after only one force, and a check of the B ≠ ZO circuit is done for further isolation if there was early termination. The CACW is then checked for proper incrementation and the second word is forced and proper termination is checked with a check of CDM (using CKCM routine) being made for a nontermination condition to isolate.

1. 2. 3. 10

I/013

1. 2. 3. 10

This routine checks OUTOV circuitry, false input data requests, and false monitor on termination. A two-word output is done with only one force and the input buffer area is checked to ensure it was not changed. Normal incrementation of the BCW is checked. The second and final word is forced and a check is made for normal termination.

1. 2. 3. 11

I/014

1. 2. 3. 11

This test checks for functioning of a backward buffer and a backward buffer with CDM upon termination. A two-word EF buffer is initially done and checked, then an OUT buffer is done and checked for normal termination and the proper transfer of BCW from the CDM area to the OUT buffer area.

1. 2. 3. 12

I/016

1. 2. 3. 12

This routine checks the proper processing of output and EF monitors. The STINK routine stores stops in control memory except for the interrupt address desired, so that if a monitor references the wrong interrupt address, the stop instruction will be read up and executed. Both output and external function are checked for each channel.

1.2.3.13

RLJPEI

1.2.3.13

This test checks the proper releasing of lockout by the RIL and IJPEI instructions. An output with monitor is done on channels 0 and 2, channel 2 is then forced and the monitor honoring is checked after doing an RIL to release lockouts. The same thing is then done on channel 0 using an IJPEI to release lockouts.

1.2.3.14

I/015

1.2.3.14

This routine checks the ability of the SIL instructions to lock out interrupts. An EF and OUT with monitor is done on each channel in turn with interrupts locked out and a check is made to see if interrupts remain locked out by noting errors for any that are falsely honored.

1.2.3.15

I/017

1.2.3.15

This test checks channel priority. Using the output function with monitor and interrupts locked out, the highest channel and the next lowest channel are checked to see that the monitor interrupt was honored on the highest channel first. After the highest channel is checked against each of the lower channels in turn, the highest channel number is decremented by one. This is then considered the highest channel and it is checked against all the lower channels in turn until all combinations have been checked. (For example, channels are checked in pairs as follows: 17-16, 17-15, 17-14, 17-13, ..... 17-0, 16-15, 16-15, .... 16-0, ..... 2-1, 2-0, .... 1-0.)

1.2.3.16

I/018

1.2.3.16

This routine checks the proper honoring of interrupts when two functions are on the same channel (all channels are checked). An OUT and EF are done on the highest channel first and then a check is made to see that the EF function is honored before the OUT function.

1.2.3.17

WAITCK

1.2.3.17

The WAITCK (wait check) routine checks the WTFI channel 0 and forced with a WTFI instruction immediately following. If there is no wait due to the WTFI, the program will come to a stop.

1.2.3.18

CMPLKO

1.2.3.18

This routine checks the ability of the compare instructions to lock out interrupts. An output function is done and forced with interrupts locked out, then an RIL and compare are done to see if the compare will lock out the interrupts.



1.2.3.19

EXFEIC (EXTERNAL FUNCTIONS AND  
EXTERNAL INTERRUPT CONTROL TEST)

1.2.3.19

This program tests for false external interrupts using the STINK routine. One channel at a time, higher jumpered channel first, the ability of the computer to communicate with an external device is tested. If any error is detected while attempting EXF/EI transfers, the basic IN/OUT control and EI Lockout circuitry is tested to gather data for isolating the malfunction. External Interrupt Lockout circuitry is tested by the LOCKOB routine.

1.2.3.20

INOUTC (INPUT AND OUTPUT CONTROL TEST)

1.2.3.20

This program tests the ability to do INPUT and OUTPUT on one channel at a time, higher jumpered channel first. The ability to recognize an Input Data Request and Data is tested. The ability to recognize an Output Data Request through the ODR gates is tested along with the ability to terminate an INPUT. The presence of the correct buffering mode is tested.

1.2.3.21

CSDATA (C REGISTER, INPUT SELECTOR AND  
DATA TEST)

1.2.3.21

This program tests, on each jumpered channel, the transfer of a word of all zeros and all ones. Error data is collected showing single bits picked up or dropped, multi-bits dropped or picked up, and the condition of the output registers.

1.2.3.22

MONTIN (INPUT MONITOR INTERRUPT TEST)

1.2.3.22

This program tests the ability to properly honor the Input Monitor Interrupt on both jumpered channels.

1.2.3.23

ATIME (ACKNOWLEDGE TIMING TEST)

1.2.3.23

This program tests for the approximately correct duration of the OD/EF and ID acknowledges if slow interface. It tests the proper timing of two consecutive force (override) instructions in either slow or fast interface.

1.2.3.24

CDMIN (INPUT CONTINUOUS DATA MODE TEST)

1.2.3.24

This program tests CDM operation on any 1219B I/O Operating Mode using the higher jumpered channel.

1. 2. 3. 25

## FUNPGA (GROUP FUNCTION PRIORITY TEST)

1. 2. 3. 25

This program tests the function priority circuitry of the group associated with each jumpered channel. The Priority Alternation of Input and Output functions are tested by preparing the basic test routine (PR 2345), for an Output-last or Input-last condition. This program is not run if the 1219B is in the standard 1218 Mode.

1. 2. 3. 26

## SPECIA (SPECIAL I/O OR REAL-TIME CLOCK AND INTER-COMPUTER TEST)

1. 2. 3. 26

This program assumes that the Single-Channel Normal Tests have been successfully completed. The jumpered channels are placed in Inter-Computer Mode and the RTC is enabled manually. The RTC section is tested first. The ability to properly increment the RTC and to receive all the associated RTC interrupts is tested. If a failure occurs, the Inter-Computer Resume Fault Interrupt is requested for added malfunction isolation data. The Inter-Computer portion tests operation on both channels and the SKPNR and SRSM operating instructions. The SPRI routine tests the RTC Monitor and the RSMFLT Interrupt priority.

1. 3

## LIST OF TEST EQUIPMENT

1. 3

The following test equipment is required to perform the tests in this manual.

- |                       |   |
|-----------------------|---|
| 1) Oscilloscope       | Tektronix, Model 545A (or equivalent)                       |
| 2) Preamplifier       | Tektronix, CA-Dual Trace,<br>0.01 microsecond rise time     |
| 3) AC Current Probe   | Tektronix, P6016  |
| 4) Voltage Probes     | Tektronix, P6000X10 attenuated<br>Tektronix, P6001 straight |
| 5) Module Extractor   | Univac Part No. 2804939                                     |
| 6) Multimeter         | Triplet, Model 630 (or equivalent)                          |
| 7) Two (2) I/O Cables | Univac Part No. 7051128-05                                  |

1. 4

## APPLICABLE REFERENCES

1. 4

For additional information on the Type 1219B Digital Data Computer, refer to the following sections in the Technical Manual for the Type 1219B Digital Data Computer (PX 4682).

Section 1, for general information.

Section 2, for installation instructions and initial checkout procedures.

Section 3, for operating instructions not covered in this manual, the instruction repertoire, and basic programming information.

1.4  
(Cont)

1.4  
(Cont)

- Section 4, for detailed theory of operation and instruction timing.
- Section 5, for general troubleshooting information.
- Section 6, for service and repair instructions including component replacement, memory current adjustment, power supply adjustment, and clock adjustment.
- Section 7, for maintenance parts list.
- Section 8, for information on circuit symbology, reference designations, card identification and location, and physical and functional characteristics of printed circuit cards.
- Section 9, for the functional schematics.

1.5 TEST POINT LOCATION AND CIRCUIT CARD REPLACEMENT INSTRUCTIONS 1.5

1.5.1 LOCATING REFERENCED TEST POINTS 1.5.1

The test points referenced throughout Section 3, Malfunction Isolation Data, are located on test blocks behind the front panel of each computer drawer. The logic drawers each contain four test blocks (two per chassis); the memory drawers each contain two test blocks. Individual test points on each test block are lettered from left to right and numbered from top to bottom.

To expose the test blocks on any chassis, perform the following steps:

- Step 1. Remove the knurled protective knob from the front of the appropriate drawer.
- Step 2. Using the combination tool supplied with the computer, turn the three panel retaining screws on the front of the drawer panel.
- Step 3. Swing the front panel out to expose the test blocks and the connections to the front panel switches and indicators.
- Step 4. Locate the test block and test point referenced in the scoping instructions.

NOTE

In the scoping instruction the chassis is identified by the number in the C column (1 through 10); the test block is identified by the first number in the TP (Test Point) column.

1.5.2 REPLACING CIRCUIT CARDS 1.5.2

To replace a faulty circuit card open and extend the drawer from the computer. Perform the following steps;

1. 5. 2  
(Cont)

1. 5. 2  
(Cont)

- Step 1. At the Power Control Panel, set Power ON/OFF switch to OFF to remove AC and DC power from computer before extending drawer to prevent possible damage to printed circuit cards.
- Step 2. Ensure that the three panel retaining screws on the front panel are secured.
- Step 3. Remove the knurled protective knob from the front of the drawer.
- Step 4. Using the combination tool supplied with the computer, turn the exposed drawer locking screw counterclockwise until the plugs on the rear of the drawer are disengaged from the jacks on the rear panel.

#### CAUTION

If the computer is not securely fastened to the floor, do not extend more than one upper drawer or two lower drawers from the cabinet at any one time. Extending more than this number may upset the balance of the cabinet and tip the cabinet forward.

- Step 5. Slowly pull the drawer forward to its fully extended position at which time the slide catch will engage.

#### NOTE

It may be necessary to lift the front of the drawer slightly to engage the slide catch.

- Step 6. Locate the referenced circuit card on the specified chassis.
- Step 7. Remove the hold-down strap or straps that hold the card in place. Then grasp the ends of the card between the thumb and forefinger and, while gently rocking the card back and forth to free it from the jack, pull upward.
- Step 8. Replace the card by inserting it in the jack and pressing downward while exerting a slight back and forth motion on the card.
- Step 9. Ensure the card is seated properly, then replace the hold-down strap(s).
- Step 10. Return the drawer to its operating position by releasing the slide catch and pushing the drawer into the cabinet.
- Step 11. Using the combination tool, turn the drawer locking screw clockwise until the drawer is fully seated in the cabinet.
- Step 12. Replace the knurled protective knob removed in step 3.

A number of special terms and abbreviations are used in this manual. These terms and abbreviations are defined below.

- C Refers to chassis number.
- ERROR STOP A condition causing the computer to stop with the PROGRAM STOP 5 indicator lit. Denotes the occurrence of a malfunction.
- FAULT A condition causing the computer to stop with the PROGRAM FAULT and PROGRAM RUN indicators lit.
- FAULT LOOP A condition causing the computer to continuously cycle (loop) through the same sequence of instructions. In a loop condition, the PROGRAM RUN and PROGRAM FAULT indicators are lit and the computer appears to be running.
- FIG. References figure number in Section 9, Functional Schematics.
- g Unless specified otherwise, refers to the I/O chassis number for the channels under test. The chassis groups and corresponding g terms are as follows:

<u>CHASSIS GROUP</u>	<u>g TERM</u>
1, 3, 5, 7	1
0, 2, 4, 6	2
11, 13, 15, 17	9
10, 12, 14, 16	10

- H An abbreviation used in the fault isolation procedures to denote a logical high or nominal dc level of zero volts (+2.5 volts in memory).
- HALT An erroneous interruption of the MAIN TIMING cycles or computer sequencing. (For a Halt, the PROGRAM RUN indicator will be lit, but no instruction execution will occur.)
- ITEM In the procedural steps throughout this manual, the term "replace item 1" or "scope item 1" is a reference to the listing included at the end of each test procedure.
- L An abbreviation used in the fault isolation procedures to denote a logical low or nominal dc level of -4.5 volts (zero volts in memory).
- LOOP A condition causing the computer to repeatedly cycle (loop) throughout the same sequence of instructions. In a loop condition the PROGRAM RUN indicator is lit, the PROGRAM FAULT indicator is extinguished, and the computer appears to be running.

1.6  
(Cont)

1.6  
(Cont)

SCOPE

To monitor a specified test point with an oscilloscope.

T

An abbreviation used in the fault isolation procedures to denote a signal that is alternately toggling between two different dc levels.

TERM

Identifies logic module in functional schematics.

TL

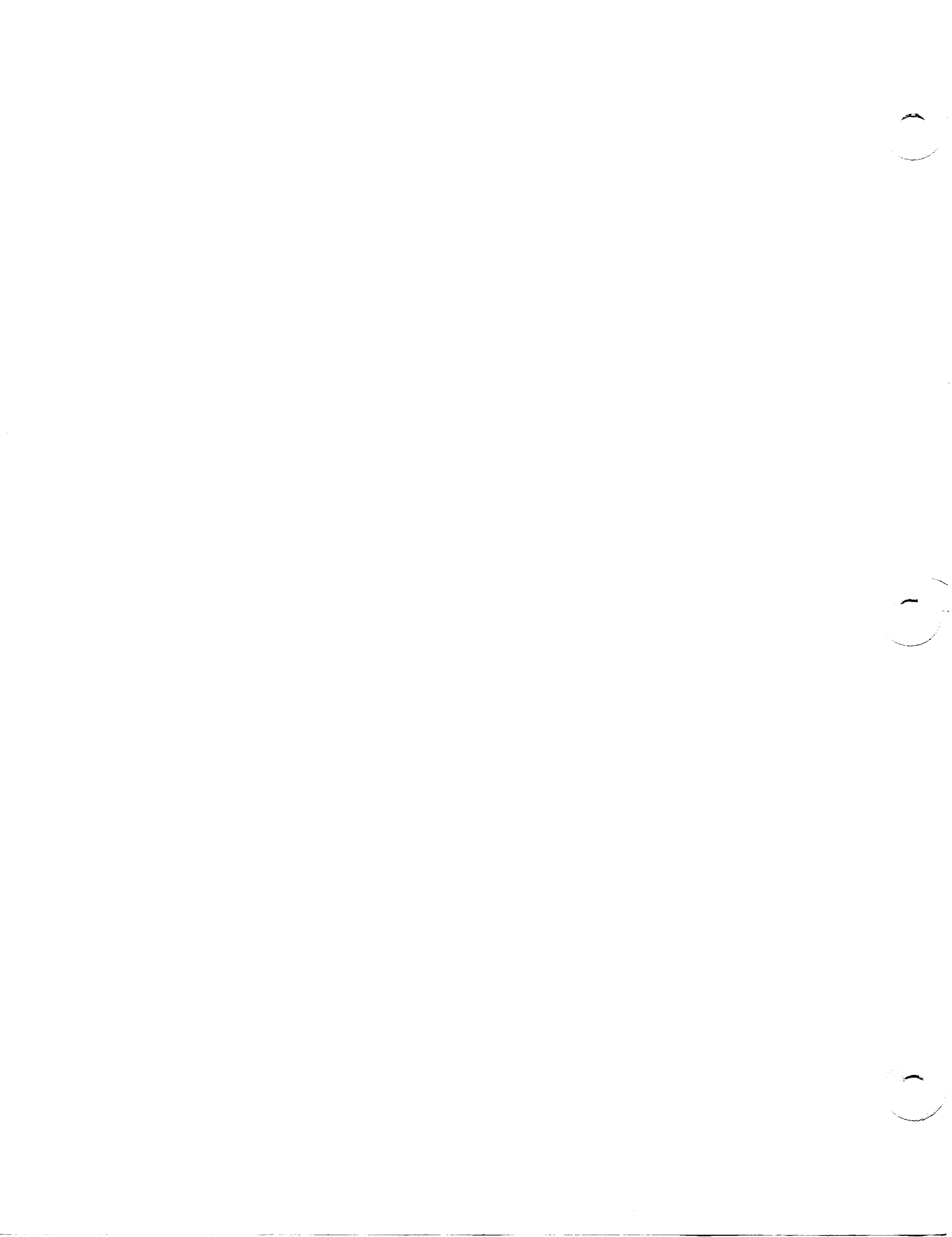
Test level.

TP

Test point coordinates.

X

Unless specified otherwise, an X in a register value indicates any value (0 through 7).



## SECTION 2 - OPERATING INSTRUCTIONS

2.0

### INTRODUCTION

2.0

This section of the manual contains detailed step-by-step procedures for loading and executing the diagnostic tests. It also contains a procedure for checking the computer prior to loading the diagnostic tests.

2.1

### PRETEST PROCEDURE

2.1

Prior to loading any test, perform the following steps:

- Step 1. At Power Control Panel, momentarily set POWER ON/OFF switch to ON to apply AC and DC power to the computer.
- Step 2. Press LOAD MODE.
- Step 3. Set I/O CLEAR/MASTER CLEAR to MASTER CLEAR, then observe that all the following conditions exist. If these conditions do not exist, refer to step 1 of test 3.1 and do as directed.
- LOAD MODE should be lit.
  - TIMING indicators should be dimly lit except 52 which should be extinguished.
  - SEQ DES I should be lit.
  - S<sub>1</sub> register should equal 000500.
  - I/O TRANSLATOR FUNCTION should equal 3.
  - I/O TRANSLATOR CHANNEL should equal 06.
  - LOCAL CONTROL should be lit.
  - All other indicators should be extinguished. (Ignore Z1 and POWER indicators).
- Step 4. Press OP STEP MODE, then observe the following:
- OP STEP MODE is lit.
  - LOAD MODE is not lit.
  - TIMING 11 is only TIMING indicator lit.
  - Observe that no obvious changes in the computer's status have taken place.
    - If correct, do step 5.
    - If incorrect, refer to step 2 of test 3.1.
- Step 5. Press PHASE STEP MODE, then observe that PHASE STEP MODE is lit and that OP STEP MODE is not lit.
- If correct, do step 6.
  - If incorrect, refer to test 3.1.3.
- Step 6. Press RUN MODE, then observe the following:
- RUN MODE is lit.
  - PHASE STEP MODE is not lit.
  - Observe that no obvious changes in the computer's status have taken place.
    - If correct, do step 7.
    - If incorrect, refer to step 3 of test 3.1.



2.1  
(Cont)

2.1  
(Cont)

- Step 7. Master clear computer.
- Step 8. Set FUNCTION REPEAT up.
- Step 9. Set FUNCTION CODE register to 40.
- Step 10. Observe that FUNCTION CODE register equals 40.
  - a) If correct, do step 11.
  - b) If incorrect, refer to test 3.1.11.
- Step 11. Set RESTART/START STEP to START STEP. Observe that PROGRAM FAULT indicator is not lit and that P register advances through all addresses, thus indicating that all memory addresses are being cleared.
  - a) If correct, do step 12.
  - b) If incorrect, refer to test 3.1.12.
- Step 12. Set SEQ STEP/STOP to STOP, FUNCTION REPEAT switch down, and master clear computer. If P register or FUNCTION CODE register will not clear, refer to test 3.1.8.
- Step 13. Refer to operating procedures in paragraph 2.2.

2.2

## OPERATING PROCEDURES

2.2

- Step 1. At the I/O panels, set all CHANNEL INTER-COMPUTER/CHANNEL NORMAL switches down. Set all CHANNEL FUNCTION switches to SINGLE.
- Step 2. On panel A2, set I/O CLEAR/MASTER CLEAR, SEQ STEP/STOP, and RESTART/START STEP switches to center. Set FUNCTION REPEAT, PHASE REPEAT, AUTO RECOVERY, and DISC ADV P switches down.
- Step 3. On panel A4, set all PROGRAM STOP and PROGRAM SKIP switches down. Set EXT SYNC/DISC, RTC/DISC, and BOOTSTRAP MODE switches up.
- Step 4. Master clear computer.
- Step 5. Observe that the only indicators lit are RUN MODE, SEQ DES I, I/O TRANSLATOR/FUNCTION bits 0 and 1, and I/O TRANSLATOR/CHANNEL bits 1 and 2. (Ignore the Z1 and S1 registers.)
  - a) If correct, do step 6.
  - b) If incorrect, refer to test 3.1.8.
- Step 6. Mount the Logic Test tape (CONTBASI) in the reader.
- Step 7. Set all PROGRAM STOP switches up.
- Step 8. Press LOAD MODE.

Ab = 9 bit

- Step 9. Set RESTART/START STEP to START STEP and observe that the loader portion of the tape loads, that the computer stops with P equal to 000542, and that all PROGRAM STOP indicators are lit.
- Step 10. Set PROGRAM STOP switches 2 and 3 down.
- Step 11. Set PROGRAM SKIP switches 1 and 3 up.
- Step 12. Set RESTART/START STEP to START STEP and observe that the Logic Test (CONTBASI) is loaded, PROGRAM STOP 4 is lit and P equals 000710.  
a) If correct, do step 14.  
b) If incorrect, do step 13.
- Step 13. Observe the following:  
a) If any other PROGRAM STOP indicator is lit and the PROGRAM FAULT indicator is not lit, refer to test 3.2.  
b) For any other condition, refer to test 3.3.
- Step 14. Set RESTART/START STEP to START STEP and observe that PROGRAM STOP 0 indicator is lit and P equals 001302.  
a) If correct, do step 15.  
b) If incorrect, refer to test 3.4.
- Step 15. Mount the Memory Test tape (MEDIA) in the reader.
- Step 16. Master clear computer.
- Step 17. Observe the following:  
a) If memory parameters have been properly pre-entered, do step 23.  
b) If memory parameters have not been pre-entered, do step 18.

#### NOTE

To build a pre-entered parameter tape of the Memory or the I/O Test:

- 1) Enter the desired parameters as indicated in the operating procedures.
- 2) Execute the program once.
- 3) Dump the program using the appropriate UPAC.

Step 18. Press LOAD MODE.

Step 19. Set RESTART/START STEP to START STEP and observe that the computer stops with PROGRAM STOP 5 lit and P equal to 001010 after loading the Memory Test.

- Step 20. Enter parameters in  $A_U$  as follows:
- a) If control memory is 128 words in length, leave  $A_U$  cleared.
  - b) If control memory is 256 words in length, set  $A_U$  to any non-zero value.

NOTE

The Control Memory Unit is located in chassis 8. The part number of the 128-word control memory stack is 7024775-00. The part number of the 256-word control memory stack is 7024775-01.

- Step 21. Enter parameters in  $A_L$  as follows. Set  $A_L$  to the number of stacks in memory (octally) as indicated in the following list.

<u>MEMORY SIZE</u>	<u>SET <math>A_L</math> TO</u>
8K	2
16K	4
24K	6
32K	10

NOTE

To determine the memory size of the computer, extend the memory drawer (lower left-hand drawer) and count the actual number of 4K memory stacks.

- Step 22. Set RESTART/START STEP to START STEP and observe that the computer comes to a PROGRAM STOP 1 with P equal to 001015.
- a) If correct, do step 26.
  - b) If incorrect, refer to test 3.4.
- Step 23. Set PROGRAM SKIP 0 up (switches 1 and 3 should already be up).
- Step 24. Press LOAD MODE.
- Step 25. Set RESTART/START STEP to START STEP and observe that the Memory Test (MEDIA) is loaded and executed, and that the computer comes to a PROGRAM STOP 1 with P equal to 001015.
- a) If correct, do step 26.
  - b) If incorrect, refer to test 3.4.
- Step 26. Set PROGRAM SKIP 2 up and all other PROGRAM SKIPS and STOPS down.
- Step 27. Mount the I/O Test tape (IOTA) in the reader.
- Step 28. Master clear computer.
- Step 29. Press LOAD MODE.

- Step 30. Set RESTART/START STEP to START STEP and observe that the computer comes to a PROGRAM STOP 5 with P equal to 010014.
- Step 31. Ensure that all peripheral equipments connected to the computer are placed in strict off-line conditions; no requests on the lines, no response to computer commands possible, and no logical 1 data present in upper 18 bits of 36-bit word.
- Step 32. Jumper the input to its own output on two test channels (for 18 data bit cables, channels 5 and 12, for example, but any two channel combinations may be used).
- Step 33. Set I/O CLEAR/MASTER CLEAR to I/O CLEAR.
- Step 34. Observe the following:
- If I/O parameters have been properly pre-entered as instructed in the note following step 17, set P register to 010020, and do step 37.
  - If I/O parameters have not been pre-entered, do step 35.
- Step 35. Enter parameters in A<sub>J</sub> as follows:
- Set bit 17 if the high jumpered channel is fast interface.
  - Bit 17 should be clear if the high jumpered channel is slow interface. (See Note 1 below.)
  - Set bits 9 through 12 equal to the higher-numbered jumpered channel.
  - Set bit 8 if the low jumpered channel is fast interface.
  - Bit 8 should be clear if the low jumpered channel is slow interface. (See Note 2 below.)
  - Set bits 0 through 3 equal to the lower-numbered jumpered channel.

NOTE 1

If high-numbered channels are fast interface, cards at 9J23G and 10J23G will have part number 7002321. If these cards have part number 7002090, the upper channels are slow interface.

NOTE 2

If low-numbered channels are fast interface, cards at 1J23G and 2J23G will have part number 7002321. If these cards have part number 7002090, the lower channels are slow interface.

- Step 36. Enter parameters in A<sub>L</sub> as follows:
- Set bit 17 if there is no CDM and one of the 1218 modes is used. (See Note 1 below.)
  - Bit 17 should be clear if there is CDM and 1219 mode. (See Note 2 below.)
  - Set bit 8 if standard 1218 buffer mode is used. (See Note 3 Below.)
  - Bit 8 should be clear if NTDS compatible buffer mode is used. (See Note 4 below.)

2.2  
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2.2  
(Cont)

- Step 36. e) Set bits 0 through 3 equal to:  
(Cont) 1) 17 for 16 I/O channel computer.  
2) 16 for 12 I/O channel computer.  
3) 07 for 8 I/O channel computer.  
4) 06 for 4 I/O channel computer.

NOTE 1

This bit always will be set if in 1218 standard mode or 1218 NTDS mode. There is no 1218 CDM mode.

NOTE 2

- ✘ A card in location 7J04G indicates 1219 mode. 1219 always has CDM mode.

NOTE 3

- ✘ A card in location 7J05G indicates standard 1218 buffer mode.

NOTE 4

- ✘ A card in location 7J05F indicates 1219 NTDS buffer mode.

- Step 37. Set RESTART/START STEP to START STEP and observe that the computer comes to a PROGRAM STOP 5 with P equal to 016634.  
a) If correct, do step 38.  
b) If incorrect, refer to test 3.4.
- Step 38. Set the CHANNEL INTER-COMPUTER/CHANNEL NORMAL switches of the two test channels to CHANNEL INTER-COMPUTER.
- Step 39. Set RTC/DISC to RTC.
- Step 40. Set PROGRAM STOP 2 up.
- Step 41. Set RESTART/START STEP to START STEP and observe that the computer comes to a PROGRAM STOP 2 with P equal to 017540.  
a) If correct, do step 42.  
b) If incorrect, refer to test 3.4.
- Step 42. Arrival at this step indicates that the Logic Test (CONTBASI), the Memory Test (MEDIA), and the I/O Test (IOTA) have been executed without detecting a malfunction. Do step 43.

- Step 43. If desired, any combination of the following options may be performed.
- a) To verify the computer SKIP/STOP circuitry, refer to test 2.2.1.
  - b) To verify the computer PROGRAM FAULT and DISC ADV P circuitry, refer to test 2.2.2.
  - c) To recycle any of the three tests, refer to test 2.2.3.
  - d) To execute the I/O Test (IOTA) using different test channels, do the following:
    - 1) Install the jumper cables on the new test channels.
    - 2) Master clear computer.
    - 3) Ensure that PROGRAM SKIP 2 is up and all other PROGRAM STOP and SKIP switches are down.
    - 4) Set P register to 007700.
    - 5) Set RESTART/START STEP to START STEP.
    - 6) Refer to step 35 of paragraph 2.2, Operating Procedures, and do as directed.

2.2.1                      SKIP/STOP TEST OPERATING PROCEDURES                      2.2.1

- Step 1. Load the Logic Test (CONTBASI).
- Step 2. Master clear computer.
- Step 3. Set RTC/DISC to DISC.
- Step 4. Set P to 001107.
- Step 5. Set all PROGRAM STOPS and SKIPS up.
- Step 6. Set RESTART/START STEP to START STEP and observe that the computer stops with P equal to 001151 and all PROGRAM STOP indicators lit.
  - a) If correct, do step 7.
  - b) If incorrect, refer to test 3.5.1.1.
- Step 7. Set all PROGRAM SKIPS and STOPS down.
- Step 8. Press OP STEP MODE and master clear computer.
- Step 9. Observe PROGRAM STOP indicators.
  - a) If none are lit, do step 10.
  - b) If any are lit, refer to test 3.5.1.3.
- Step 10. Press RUN MODE.
- Step 11. Set p to 001151.
- Step 12. Set RESTART/START STEP to START STEP and observe that the computer comes to a PROGRAM STOP 5 with P equal to 001200.
  - a) If correct, the PROGRAM SKIP and STOP circuitry has been verified.
  - b) If incorrect, refer to test 3.5.1.2.

2.2.2 PROGRAM FAULT AND DISC ADV P TEST 2.2.2  
OPERATING PROCEDURES

- Step 1. Load the Logic Test (CONTBASI).
- Step 2. Set P to 000<sup>7/2</sup>10.
- Step 3. Set only PROGRAM SKIP 3 up.
- Step 4. Set only PROGRAM STOP 0 up.
- Step 5. Set RTC/DISC to RTC.↑
- Step 6. Set RESTART/START STEP to START STEP and observe that PROGRAM FAULT and PROGRAM RUN indicators are lit, P equals 001001 and A<sub>L</sub> equals 000000.  
a) If correct, do step 7.  
b) If incorrect, refer to test 3.5.2.1.
- Step 7. Master clear computer, and observe that only PROGRAM FAULT indicator was cleared by master clear.  
a) If correct, do step 8.  
b) If incorrect, refer to test 3.5.2.2.
- Step 8. Set DISC ADV P up and observe that PROGRAM RUN indicator is lit with P equal to 001000.  
a) If correct, do step 9.  
b) If incorrect, refer to test 3.5.2.3.
- Step 9. Press P register bit 0 and observe that PROGRAM RUN indicator is lit with P equal to 001001.  
a) If correct, do step 10.  
b) If incorrect, refer to test 3.5.2.3.
- Step 10. Press P register bit 1 and observe that PROGRAM RUN indicator is lit with P equal to 001202.  
a) If correct, do step 11.  
b) If incorrect, refer to test 3.5.2.3.
- Step 11. Set DISC ADV P down and observe that computer has come to a PROGRAM STOP 0.  
a) If correct, the PROGRAM FAULT and DISC ADV P circuitry has been verified.  
b) If incorrect, refer to test 3.4.

2.2.3 PROGRAM RECYCLING OPERATING PROCEDURES 2.2.3

To recycle any of the tests, refer to the applicable test reference:

- a) To recycle the Logic Test (CONTBASI) refer to test 2.2.3.1.
- b) To recycle the Memory Test (MEDIA) refer to test 2.2.3.2.
- c) To recycle the I/O Test (IOTA) refer to test 2.2.3.3.

2.2.3.1                      CONTBASI RECYCLING INSTRUCTIONS                      2.2.3.1

- Step 1.    Ensure that the program is loaded.
- Step 2.    Execute the program with PROGRAM SKIPS 1, 3 and PROGRAM STOP 4 up. All other STOPS and SKIPS should be down. The program will continue to cycle with the STOPS and SKIPS in this position.

2.2.3.2                      MEDIA RECYCLING INSTRUCTIONS                      2.2.3.2

- Step 1.    Ensure that the program is loaded.
- Step 2.    Execute the program with PROGRAM SKIP 3 up and all other STOPS and SKIPS down. The program will continue to cycle with the PROGRAM SKIPS and STOPS in this position.

2.2.3.3                      IOTA RECYCLING INSTRUCTIONS                      2.2.3.3

- Step 1.    Ensure that the program is loaded.
- Step 2.    Execute the program with all PROGRAM SKIPS and STOPS down. The program will continue to cycle with the SKIPS and STOPS in this position.





## SECTION 3 – MALFUNCTION ISOLATION DATA

3.0

### INTRODUCTION

3.0

This section contains procedures used to isolate malfunctions within the 1219B computer. It includes all manual tests and procedures necessary to isolate malfunctions detected by the running program.

3.1

### MANUAL TESTS

3.1

An unsuccessful attempt to perform the Pretest Procedures in paragraph 2.1 indicates a failure has occurred which requires manual procedures to isolate.

- Step 1. Observe computer control panel. Do the following:
- If any PHASE indicators are lit, refer to test 3.1.1.
  - If all TIMING indicators are not dimly lit (except 52 which should be extinguished), refer to test 3.1.2.
  - If LOAD MODE is not lit, refer to test 3.1.3.
  - If SEQ DES I is not lit, refer to test 3.1.4.
  - If S<sub>1</sub> does not equal 000500, refer to test 3.1.5.
  - If computer control panel is in a MASTER CLEAR condition, but I/O TRANSLATOR FUNCTION does not equal 3, refer to test 3.1.6.
  - If computer control panel is in a master clear condition, but I/O TRANSLATOR CHANNEL does not equal 6, refer to test 3.1.7.
  - For any other improper condition, refer to test 3.1.8.
- Step 2. Observe computer control panel.
- If OP STEP MODE is not lit, refer to test 3.1.3.
  - If LOAD MODE is lit, refer to test 3.1.3.
  - If a TIMING indicator other than 11 is lit, refer to test 3.1.2.
  - If computer is in a master clear condition with the exception of a register(s) (ignore B register), refer to test 3.1.8.
  - For any other improper condition, refer to test 3.1.9.
- Step 3. Observe computer control panel, then refer to test 3.1.9.
- If RUN MODE is not lit, refer to test 3.1.3.
  - If PHASE STEP MODE is lit, refer to test 3.1.3.
  - For any other improper condition, refer to test 3.1.10.

3.1.1

#### MASTER CLOCK

3.1.1

The following is a manual test procedure for stepping through and validating one complete clock cycle, and also for checking the performance of the function repeat circuitry. It should be used in conjunction with test 3.1.2, MAIN TIMING, to isolate any error caused by a timing malfunction.

Step 1. Press OP STEP MODE and master clear computer.

Step 2. Press PHASE STEP MODE.

Step 3. Press PHASE 1, 2, 3, and 4. All four indicators should remain lit; if not, replace item 1.

3. 1. 1  
(Cont)

3. 1. 1  
(Cont)

- Step 4. Clear PHASE register. All PHASES should extinguish; if not, replace items 1 and 2.
- Step 5. Press PHASE 1, then set RESTART/START STEP to START STEP once. PHASE 2 should be lit, and PHASE 1 not lit.
- a) If correct, do step 6.
  - b) If PHASE 1 and 2 are both lit, replace item 3.
  - c) If PHASE 1 is lit and PHASE 2 is not lit, set PHASE REPEAT up and scope item 4.
  - d) If PHASE 3 or 4 are lit, replace item 14.
- Step 6. Set RESTART/START STEP to START STEP once. Only PHASE 3 should be lit; if not, replace item 15.
- Step 7. Set RESTART/START STEP to START STEP once. Only PHASE 4 should be lit; if not lit, replace item 16.
- Step 8. Set RESTART/START STEP to START STEP once. Only PHASE 1 should be lit; if not lit, replace item 17.
- Step 9. Clear PHASE register.
- Step 10. Set PHASE REPEAT up.
- Step 11. Press PHASE 1 and 2, then scope item 18.
- Step 12. Clear PHASE register.
- Step 13. Press PHASE 3 and 4, then scope item 21.
- Step 14. This completes the manual test for the Master Clock and Phase Step logic. If referred to this procedure for a malfunction in the Timing Circuitry, refer to test 3. 1. 2 to complete timing test.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 3J32G 3J33G 3J35F
2						Replace 3J34E
3						Replace 3J35G 3J32G
4	9-4	30J06	3	1A33	H	If H scope item 5 If L replace 3J34F
5	9-3	23J10	3	2A31	L	If L scope item 6 If H replace 3J31D
6	9-3	2XJ10	3	2D32	H	If H scope item 7 If L replace 3J31C

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
7	9-4	24J06	3	1G1	H	If H scope item 8 If L replace 3J34A 3J30G
8	9-4	60C01	3	1B32	T	If T scope item 9 If not T replace 3J34C 3J35A 3J35F
9	9-4	63C24	3	1C32	T	If T scope item 12 If not T scope item 10
10	9-4	60C00	3	1B31	T	If T replace 3J35F 3J34C 3J34E 3J34F If not T scope item 11
11	9-4	63C13	3	1C33	T	If T replace 3J35F 3J34C 3J35C If not T replace 3J35C 3J35D 3J35B
12	9-4	7XC13	3	1B33	T	If T replace 3J26B 3J34G 3J32G If not T scope item 13
13	9-4	63C13	3	1C33	T	If T replace 3J34D 3J33D If not T replace 3J35F 3J34F 3J34C
14						Replace 3J34G 3J32G 3J33G
15						Replace 3J33F 3J35G 3J33G
16						Replace 3J33F 3J35G 3J33G
17						Replace 3J32F 3J34G 3J32G

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
18	9-5	84C01	4	2G32	T	If T scope item 19 If not T replace 4J03D
19	9-5	95C01	7	1G31	T	If T scope item 20 If not T replace 7J02D 3J32E 7J18D
20	9-5	84C02	4	2F32	T	If T do step 12 If not T replace 3J33E 3J33F 4J03D
21	9-5	84C03	4	2E32	T	If T scope item 22 If not T replace 3J33F 3J34E 4J04D
22	9-5	94C04	4	2C32	T	If T do step 14 If not T replace 3J33F 3J35E 4J03B 4J04D

## 3. 1. 2

## MAIN TIMING

## 3. 1. 2

The following is a manual test procedure for stepping through and validating one complete cycle of the main timing chain. Test 3.1.1 should be performed prior to this test to verify that the Master Clock is performing correctly.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Observe TIMING 11 indicator.  
a) If lit, do step 3.  
b) If not lit, scope item 1.  
c) If all TIMING indicators are dimly lit or if timing chain continues to cycle, replace item 3.
- Step 3. Clear PHASE register, then press PHASE STEP MODE.
- Step 4. Press PHASE 3, then set RESTART/START STEP to START STEP once.
- Step 5. Observe TIMING indicators.  
a) If TIMING 11 and 12 are lit, do step 6.  
b) If TIMING 11 and 12 are not lit, replace item 4.
- Step 6. Set RESTART/START STEP to START STEP.
- Step 7. Observe TIMING indicators.  
a) If TIMING 11, 12, and 13 are lit, do step 8.  
b) If TIMING 11, 12, and 13 are not lit, replace item 5.

Step 8. Set RESTART/START STEP to START STEP.

Step 9. Observe TIMING indicators.  
a) If TIMING 11 through 14 are lit, do step 10.  
b) If TIMING 11 through 14 are not lit, replace item 6.

Step 10. Set RESTART/START STEP to START STEP.

Step 11. Observe TIMING indicators.  
a) TIMING 11 should not be lit; if lit, scope item 1.  
b) If TIMING 12 through 21 are lit, do step 12; if not lit, replace item 7.

Step 12. Set RESTART/START STEP to START STEP.

Step 13. Observe TIMING indicators.  
a) TIMING 12 should not be lit; if lit, replace item 4.  
b) If TIMING 13 through 22 are lit, do step 14; if not lit, replace item 8.

Step 14. Set RESTART/START STEP to START STEP.

Step 15. Observe TIMING indicators.  
a) TIMING 13 should not be lit; if lit, replace item 5.  
b) If TIMING 14 through 23 are lit, do step 16; if not lit, replace item 9.

Step 16. Set RESTART/START STEP to START STEP.

Step 17. Observe TIMING indicators.  
a) TIMING 14 should not be lit; if lit, replace item 6.  
b) If TIMING 21 through 24 are lit, do step 18; if not lit, replace item 10.

Step 18. Set RESTART/START STEP to START STEP once.

Step 19. Observe TIMING indicators. TIMING 22 through 31 should be lit and TIMING 21 extinguished; if not replace item 11.

Step 20. Set RESTART/START STEP to START STEP once.

Step 21. Observe TIMING indicators. TIMING 23 through 32 should be lit and TIMING 22 extinguished; if not, replace item 12.

Step 22. Set RESTART/START STEP to START STEP once.

Step 23. Observe TIMING indicators. TIMING 24 through 33 should be lit and TIMING 23 extinguished; if not, replace item 13.

Step 24. Set RESTART/START STEP to START STEP once.

Step 25. Observe TIMING indicators. TIMING 31 through 34 should be lit and TIMING 24 extinguished; if not, replace item 14.

Step 26. Set RESTART/START STEP to START STEP once.

- Step 27. Observe TIMING indicators. TIMING 32 through 41 should be lit and TIMING 31 extinguished; if not, replace item 15.
- Step 28. Set RESTART/START STEP to START STEP once.
- Step 29. Observe TIMING indicators. TIMING 33 through 42 should be lit and TIMING 32 extinguished; if not, replace item 16.
- Step 30. Set RESTART/START STEP to START STEP once.
- Step 31. Observe TIMING indicators. TIMING 34 through 43 should be lit and TIMING 33 extinguished; if not, replace item 17.
- Step 32. Set RESTART/START STEP to START STEP once.
- Step 33. Observe TIMING indicators. TIMING 41 through 44 should be lit and TIMING 34 extinguished; if not, replace item 18.
- Step 34. Set RESTART/START STEP to START STEP once.
- Step 35. Observe TIMING indicators.  
a) TIMING 41 should not be lit; if lit, replace item 19.  
b) TIMING 42, 43, 44 and 11 should be lit; if not lit, scope item 20.
- Step 36. Set RESTART/START STEP to START STEP once.
- Step 37. Observe TIMING indicators.  
a) TIMING 43, 44, 11 and 12 should be lit; if not lit, replace item 21.  
b) TIMING 42 should not be lit; if lit, replace item 22.
- Step 38. Set RESTART/START STEP to START STEP once.
- Step 39. Observe TIMING indicators.  
a) TIMING 44, 11, 12 and 13 should be lit; if not lit, replace item 23.  
b) TIMING 43 should not be lit; if lit, replace item 24.
- Step 40. Set RESTART/START STEP to START STEP once.
- Step 41. Observe TIMING indicators.  
a) TIMING 11, 12, 13 and 14 should be lit, if not lit, replace item 25.  
b) TIMING 44 should not be lit; if lit, replace item 26.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1	9-8	10T11	3	2G28	H	If H scope item 2 If L replace 3J18G 3J15D 3J14D
2	9-8	11T11	3	2F28	L	If L replace 3J15B 3J19D 3J33E If H replace 3J20G

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
3						Replace 3J20G 3J15F 3J10E 3J31E
4						Replace 3J15C 3J15B 3J15A 3J32D
5						Replace 3J15D 3J13E 3J32D 3J15C
6						Replace 3J19D 3J32E 3J15E 3J15D
7						Replace 3J15B 3J15E 3J15C
8						Replace 3J15C 3J15B 3J15D
9						Replace 3J15C 3J15D 3J15E
10						Replace 3J15E 3J15B 3J15D
11						Replace 3J15B 3J14B 3J15E
12						Replace 3J14B 3J14C 3J15C
13						Replace 3J14C 3J14D 3J15D
14						Replace 3J15E 3J14E 3J14D



<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
15						Replace 3J15E 3J14E 3J14B
16						Replace 3J14B 3J14C 3J14D
17						Replace 3J14D 3J14C
18						Replace 3J14E 3J14D
19						Replace 3J14B 3J14E
20	9-8	10T11	3	2G28	H	If H replace 3J20G 3J15B If L replace 3J18G 3J15D 3J14D
21						Replace 3J15B 3J14E 3J15C 3J14D
22						Replace 3J15B 3J14C
23						Replace 3J15C 3J15B 3J14E 3J14D
24						Replace 3J15D 3J15C 3J15B 3J14E 3J15C 3J14D
25						Replace 3J15E 3J15D 3J15C 3J15B
26						Replace 3J15D 3J14E

The following procedure checks that the MODE is correctly selected and operates properly.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Observe MODE indicators.
- If only OP STEP MODE is lit, do step 3.
  - If RUN MODE is lit, replace item 1.
  - If OP STEP MODE is not lit or any indicator other than RUN MODE or OP STEP MODE is lit, replace item 2.
- Step 3. Observe P register indicators.
- If none are lit, do step 4.
  - If any indicators are lit, refer to test 3.1.9.
- Step 4. Press PHASE STEP MODE and observe MODE indicators.
- If only PHASE STEP MODE is lit, do step 5.
  - If PHASE STEP MODE is not lit or any other MODE indicator is lit, replace item 3.
- Step 5. Press LOAD MODE and observe MODE indicators.
- If PHASE STEP MODE is lit, replace item 4.
  - If LOAD MODE is lit, do step 8; if not lit, replace item 1.
- Step 6. Press RUN MODE and observe MODE indicators.
- If LOAD MODE is not lit and RUN MODE is lit, do step 7.
  - If not, replace item 5.
- Step 7. Observe P register indicators.
- If none are lit, do step 8.
  - If any are lit, refer to test 3.1.8.
- Step 8. Press OP STEP MODE and master clear computer; then do one of the following:
- Observe that TIMING 11 is lit; if not, refer to test 3.1.2.
  - Observe that none of the registers are cycling; if any are cycling, refer to test 3.1.9.
  - Observe that no other indicators are lit. If any registers fail to clear, refer to test 3.1.8.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 3J24A 3J31E 3J32F 3J33B
2						Replace 3J02C 3J32B 3J32F 3J33B

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
3						Replace 3J30G 3J32B 3J32F 3J33B
4						Replace 3J30G 3J32B 3J32F 3J33B
5						Replace 3J32B 3J33B 3J32C

3. 1. 4

SEQUENCE DESIGNATOR

3. 1. 4

The following procedure determines that each of the SEQ DES indicators are operating properly; that is, indicators can be set and cleared.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Press all SEQ DES indicators.
- Step 3. Observe SEQ DES indicators.
  - a) If none are lit, replace item 1.
  - b) If all are lit, do step 4.
  - c) If any one is not lit, replace the items corresponding to indicator(s) not lit.
- Step 4. Set I/O CLEAR/MASTER CLEAR to MASTER CLEAR, then observe SEQ DES indicators.
  - a) If all are lit, replace item 1.
  - b) If none are lit, do step 5.
  - c) If any one is lit, replace the items corresponding to indicator(s) that are lit.
- Step 5. Press SEQ DES I and W.
- Step 6. Clear SEQ DES register, then observe SEQ DES indicators.
  - a) If I and W are lit, replace item 12.
  - b) If neither is lit, do step 7.
- Step 7. Clear PHASE register, then set PHASE STEP MODE.
- Step 8. Press SEQ DES, I/OII and BI indicators.
- Step 9. Set PHASE REPEAT up.

3.1.4  
(Cont)  
Step 10.

3.1.4  
(Cont)

Press PHASE 1 and observe SEQ DES indicators.  
a) If I/OII and BI are not lit, replace item 13.  
b) If I/OII and BI are lit, do step 11.

Step 11. Press TIMING 42 and observe SEQ DES indicators. If I/OII and BI are lit, replace item 13.

<u>IND</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	1						Replace 7J32E 3J10D 3J27E 3J29D
I/OI	2						Replace 3J27A 3J27D 3J28B
I/OII	3						Replace 3J27D 3J28B 3J30A
BII	4						Replace 3J27D 3J28F 3J30E
INT	5						Replace 3J26G 3J27D 3J28C
I	6						Replace 3J27F 3J27G 3J28C
WAIT	7						Replace 3J26F 3J27F 3J28E
BI	8						Replace 3J27F 3J28F 3J29F
W	9						Replace 3J27F 3J28E 3J29G
RI	10						Replace 3J27F 3J27G 3J28D
RII	11						Replace 3J27F 3J28D 3J28G
	12						Replace 3J27E

<u>IND</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	13						Replace 3J29E 3J12C

3.1.5 S<sub>1</sub> EQUALS 500 3.1.5

The following procedure checks the S<sub>1</sub> register circuitry for proper operation.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Press all indicators in S<sub>1</sub> register and observe that each indicator will remain lit when indicator is released.
- a) If all remain lit, do step 3.
  - b) If none remain lit, scope item 1.
  - c) Bits cleared in S<sub>1</sub> are error bit(s). Replace cards listed under item 6 corresponding to error bit(s).
- Step 3. Master clear computer and observe S<sub>1</sub> indicators.
- a) If none are lit, do step 4.
  - b) If all are lit, replace item 7.
  - c) Bits not cleared in S<sub>1</sub> are error bits. Replace cards listed under item 6 corresponding to error bit(s).
- Step 4. Press LOAD MODE and observe S<sub>1</sub> register.
- a) If any indicators are lit, replace item 8. *EXCEPT S<sub>1</sub> = 500*
  - b) If none are lit, replace item 9.

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	1	9-22	00N12	7	1G7	L	If L scope item 2 If H replace 7J02A 7J25D 7J31E 7J32E
	2	9-22	20N12	3	2F16	L	If L scope item 3 If H replace 3J08D 3J26C
	3	9-22	10N12	3	2G16	L	If L scope item 4 If H replace 3J08C
	4	9-22	70N12	3	2E16	L	If L scope item 5 If H replace 3J07D

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	5	9-22	50N12	3	2B16	L	If L replace 3J08D 3J08E 7J02A 7J10D If H replace 3J07F
0	6						Replace 7J10G
1							Replace 7J11G
2							Replace 7J12G
3							Replace 7J10F
4							Replace 7J11F
5							Replace 7J12F
6							Replace 7J10E
7							Replace 7J11E
8							Replace 7J12E
9							Replace 7J10C
10							Replace 7J11C
11							Replace 7J12C
12							Replace 7J10B
13							Replace 7J11B
14							Replace 7J10A
15							Replace 7J11A
	7						Replace 7J02A 7J03D 7J10D
	8						Replace 3J08D 3J30G 7J02G 7J03B
	9	9-22					Replace 3J30G 7J02A 7J10D

## 3.1.6

## I/O TRANSLATOR FUNCTION

## 3.1.6

The following procedure is used to check the operation of the I/O TRANSLATOR FUNCTION circuitry and indicators.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Press LOAD MODE.
- Step 3. Observe I/O TRANSLATOR CHANNEL and FUNCTION indicators.
  - a) If none are lit, replace item 1.
  - b) If any are lit, do step 4.

- Step 4. Observe FUNCTION PRIORITY indicators.  
 a) If none are lit, do step 5.  
 b) If any are lit, refer to test 3.1.8.14.
- Step 5. Press RUN MODE, then observe I/O TRANSLATOR FUNCTION indicators.  
 a) If neither is lit, do step 9.  
 b) If only bit 0 is lit, replace item 2.  
 c) If only bit 1 is lit, replace item 3.  
 d) If neither bit is lit, do step 8.
- Step 6. Press OP STEP MODE and master clear computer.
- Step 7. Observe I/O TRANSLATOR FUNCTION indicators.  
 a) If neither is lit, do step 9.  
 b) If only bit 0 is not lit, replace item 7.  
 c) If only bit 1 is not lit, replace item 8.  
 d) If both are lit, replace items 7 and 8.
- Step 8. Press PHASE STEP MODE, then press I/O TRANSLATOR FUNCTION indicators.  
 a) If both remain lit, replace item 4.  
 b) If either one or both do not remain lit, replace item 5.
- Step 9. Press PHASE STEP MODE, then clear PHASE register.
- Step 10. Set PHASE REPEAT up.
- Step 11. Press TIMING 22 and PHASE 2.
- Step 12. Observe I/O TRANSLATOR FUNCTION indicators.  
 a) If both are lit, replace item 9.  
 b) If neither is lit, scope item 6.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 7J17G 7J02B 7J16D 7J16F
2						Replace 7J13C gJ09A gJ14C
3						Replace gJ09A 7J14E 7J13E gJ07B

"g" refers to chassis containing channel under test.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
4						Replace 7J16D 7J16E 7J02D
5						Replace 7J16F 7J02B 7J17G 7J31E
6	9-51	11G05	7	2G28	L	If L replace 7J14D 7J15D 7J03D 7J16F If H replace 7J13D 7J03E 7J13C 7J13E
7						Replace 7J14C
8						Replace 7J14E
9						Replace 7J14C 7J14E 7J13C 7J13E

## 3.1.7

## I/O TRANSLATOR CHANNEL

## 3.1.7

The following procedure is used to check the operation of the I/O TRANSLATOR CHANNEL circuitry and indicators.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Press LOAD MODE and observe I/O TRANSLATOR CHANNEL indicators.  
a) If none are lit, do step 3.  
b) If any are lit, do step 7.
- Step 3. Press OP STEP MODE.
- Step 4. Press I/O TRANSLATOR CHANNEL indicators.
- Step 5. Master clear computer, then observe I/O TRANSLATOR CHANNEL indicators.  
a) If none are lit, replace item 1.  
b) If any are lit, replace item 2.  
c) If all are lit, do step 6.



3.1.7  
(Cont)

3.1.7  
(Cont)

- Step 6. Clear I/O TRANSLATOR, then observe I/O TRANSLATOR CHANNEL indicators.  
a) If none are lit, replace item 3.  
b) If any are lit, replace item 4.
- Step 7. Press OP STEP MODE and master clear computer
- Step 8. Press I/O TRANSLATOR CHANNEL indicators.  
a) If all light and remain lit, replace item 5.  
b) If any do not remain lit, replace item 2.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 7J16E 7J16D 7J16F 7J17G
2						Replace 7J14F 7J14G 7J12A 7J14A
3						Replace 7J31E 7J30E 7J32E
4						Replace 7J15C 7J16D 7J16F 7J02D
5						Replace 7J13G 7J13F gJ02A gJ21B gJ31D gJ12A

"g" refers to chassis containing channel under test.

3.1.8

### MASTER CLEAR TESTS

3.1.8

The following procedure checks for the proper clearing of computer registers and flip-flops when I/O CLEAR/MASTER CLEAR is set to MASTER CLEAR.

- Step 1. At computer power control panel, set POWER ON/OFF to OFF.
- Step 2. Set POWER ON/OFF to ON.
- Step 3. At Control Panel 2, press OP STEP MODE and master clear computer.
- Step 4. An audible alarm indicates an abnormal condition.  
a) If alarm does not sound, do step 5.  
b) If alarm sounds, observe ABNORMAL CONDITION indicators.

- 1) If either is lit, refer to following notes defining abnormal conditions.

NOTE

A loss of voltage or a temperature fault may cause an abnormal condition that cannot be corrected by a master clear condition. At Control Panel 2, observe ABNORMAL CONDITION indicators. If neither is lit, scope item 2. If either is lit, refer to the following:

- a) TEMP (loss of air) - when power is applied to the computer, a temperature malfunction is indicated by an increase of blower fan noise and air suction at top air intake.
  - b) VOLTAGE FAULT - Voltages should be in accordance with table 2-5 of UNIVAC 1219B Digital Data Computer Technical Manual (PX 4682-1-1).
- 2) If neither is lit, set DISC ALARM/RESET ALARM to DISC ALARM. Alarm should go off; if it continues to sound, replace item 1.

Step 5. Observe LOCAL CONTROL.

- a) If lit, do step 6.
- b) If not lit, replace item 4.

Step 6. Observe PROGRAM FAULT indicator.

- a) If not lit, do step 8.
- b) If lit, do step 7.

Step 7. Observe INTERRUPT INST FAULT indicator.

- a) If lit, refer to test 3. 1. 8. 13.
- b) If not lit, replace item 3.

Step 8. Press each of the following indicators.

- a) At Control Panel 1, press A<sub>U</sub>, A<sub>L</sub>, ICR, SR, SEQ DES, FII, FUNCTION CODE, and P.
- b) At Control Panel 2, press INTERRUPT and RTC.
- c) At I/O Panel, press C<sub>E</sub>, C<sub>O</sub>, and I/O CHANNEL and status grid (except CHAN PRI).

NOTE

When pressing the indicators in the I/O CHANNEL and status grid, press all EI MON indicators first, then press all EF MON indicators, then press all OD MON, ID MON, EF ACT, OD ACT, ID ACT, EF/OD ACT, and ID ACK indicators, in that order.

Step 9. Master clear computer, then observe that none of the following indicators are lit: A<sub>U</sub>, A<sub>L</sub>, ICR, SR, FII, FUNCTION CODE, P, S<sub>1</sub>, Z<sub>1</sub>, K, ADV P SEQ, INTERRUPT, RTC, C<sub>E</sub>, C<sub>O</sub>, and I/O CHANNEL and status grid.

- a) If correct, do step 10.
- b) If incorrect, do step 16.

Step 10. Press RUN MODE.

Step 11. Observe MULT/DIV SEQ register.  
 a) If none of the indicators are lit, do step 12.  
 b) If any are lit, refer to test 3.1.8.12.

Step 12. Observe B register.  
 a) If none of the indicators are lit, do step 14.  
 b) If any are lit, do step 13.

Step 13. Observe maintenance panel. Observe that none of the indicators are lit in I/O CHANNEL and status grid (A1 or A8), neither SEQ DES I/OI or I/OII (A2) is lit, and I/O TRANSLATOR ACTIVE (A4) is not lit.  
 a) If correct, refer to test 3.1.8.8.  
 b) If incorrect, refer to test 3.1.8.20.

Step 14. Observe I/O TRANSLATOR indicators. I/O TRANSLATOR FUNCTION should equal 3 and I/O TRANSLATOR CHANNEL should equal 06. No other I/O TRANSLATOR indicators should be lit.  
 a) If correct, do step 16.  
 b) If incorrect, do step 15.

Step 15. Observe maintenance panel. Observe that none of the indicators are lit in I/O CHANNEL and status grid (A1 or A8), neither SEQ DES I/OI or I/OII is lit, and I/O TRANSLATOR ACTIVE (A4) is not lit.  
 a) If correct, refer to test 3.1.8.17.  
 b) If incorrect, refer to test 3.1.8.20.

Step 16. Observe the following.  
 a) If indicators are improperly lit in more than one register, refer to test 3.1.8.16.  
 b) If improperly lit indicator(s) are in only one register, do step 17.

Step 17. Observe the register which contains indicator(s) that are lit, then refer to test specified in the following list:

<u>REGISTER</u>	<u>TEST NO.</u>
A <sub>U</sub>	3.1.8.1
A <sub>L</sub>	3.1.8.2
ICR	3.1.8.3
SR	3.1.8.4
FUNCTION	3.1.8.5
P	3.1.8.6
S <sub>1</sub>	3.1.8.18
Z <sub>1</sub>	3.1.8.7
K	3.1.8.9
ADV P	3.1.8.10
INTERRUPT	3.1.8.13
RTC	3.1.8.19
CE or C <sub>O</sub>	3.1.8.11

REGISTERTEST NO.I/O CHANNEL  
and status  
SEQ DES3.1.8.15  
3.1.4

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 8J02G 8J04A 8J05C
2	9-121	93G91	8	1B31	H	If H replace 8J04A 8J02G 8J05E 8J05D If L replace 8J02G 8J05C
3						Replace 7J26F 8J05D 8J04C
4						Replace 8J04C 3J03C 3J04D 7J28B 7J33A

## 3.1.8.1

A<sub>U</sub> REGISTER

## 3.1.8.1

The following procedure checks the operation of the A<sub>U</sub> register circuitry.

- Step 1. Press OP STEP MODE and then master clear computer.
- Step 2. Press RUN MODE.
- Step 3. Set A<sub>U</sub> register to 777777, then observe A<sub>U</sub> register.  
 a) If all indicators light and remain lit, do step 4.  
 b) If any will not remain lit, replace card(s) listed under item 1 corresponding to bit(s) that are not lit.
- Step 4. Set I/O CLEAR/MASTER CLEAR to MASTER CLEAR, then observe A<sub>U</sub> register.  
 a) If none of the indicators are lit, replace item 3.  
 b) If all are lit, replace item 2.  
 c) If any are lit, replace cards listed under item 1 corresponding to bit(s) that are lit.

<u>BITS</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
0	1						Replace 4J28C
1							Replace 4J28C
2							Replace 4J29C
3							Replace 4J29C
4							Replace 4J30C
5							Replace 4J30C
6							Replace 4J28C
7							Replace 4J28C
8							Replace 4J29B
9							Replace 4J29B
10							Replace 4J30B
11							Replace 4J30B
12							Replace 4J28A
13							Replace 4J28A
14							Replace 4J29A
15							Replace 4J29A
16							Replace 4J30A
17							Replace 4J30A
	2						Replace 4J28D 4J29D 4J31D 3J04E
	3						Replace 3J10D 4J13D 7J31E 7J32E



The following procedure checks the operation of the A<sub>L</sub> register circuitry.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Press PHASE STEP MODE, then clear PHASE register.
- Step 3. Set the A<sub>L</sub> register to 777777, then observe A<sub>L</sub> register.  
 a) If all indicators light and remain lit, do step 4.  
 b) If any will not light or remain lit, replace the cards listed under item 1 corresponding to bit(s) that are not lit.
- Step 4. Set I/O CLEAR/MASTER CLEAR to MASTER CLEAR, then observe A<sub>L</sub> register.  
 a) If none of the indicators are lit, do step 5.  
 b) If all are lit, replace item 3.  
 c) If any are lit, replace cards listed under item 1 corresponding to bit(s) that are lit.
- Step 5. Press RUN MODE and observe A<sub>L</sub> register.  
 a) If none of the indicators are lit, replace item 2.  
 b) If any are lit, replace item 4.

<u>BITS</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
0	1						Replace 4J30G
1							Replace 4J30G
2							Replace 4J29G
3							Replace 4J29G
4							Replace 4J28G
5							Replace 4J28G
6							Replace 4J30F
7							Replace 4J30F
8							Replace 4J29F
9							Replace 4J29F
10							Replace 4J28G
11							Replace 4J28G
12							Replace 4J30E
13							Replace 4J30E

<u>BPTS</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
14							Replace 4J29E
15							Replace 4J29E
16							Replace 4J28E
17							Replace 4J28E
	2						Replace 3J10D 4J13D 7J31E 7J32E
	3						Replace 4J28D 4J31D 4J29D
	4						Replace 4J29D 3J04E 3J13C 4J03D

3.1.8.3

ICR REGISTER

3.1.8.3

The following procedure checks the operation of the ICR register circuitry.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Observe K register.
  - a) If none of the indicators are lit, do step 3.
  - b) If any are lit, refer to test 3.1.8.9.
- Step 3. Press PHASE STEP MODE, then clear PHASE register.
- Step 4. Set ICR register to 7, then observe ICR indicators.
  - a) If all light and remain lit, do step 5.
  - b) If any will not light or remain lit, replace item 1.
- Step 5. Press OP STEP MODE, then observe ICR indicators.
  - a) If all are lit, do step 6.
  - b) If any are lit, replace item 2.
- Step 6. Set I/O CLEAR/MASTER CLEAR to MASTER CLEAR, then observe ICR indicators.
  - a) If none are lit, replace item 3.
  - b) If all are lit, replace item 4.
  - c) If any are lit, replace item 1.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 4J02B 4J02C 4J04C
2						Replace 4J04C 3J05D 3J05D 3J10D
3						Replace 3J10D 7J32E
4						Replace 4J04C 3J05D 3J10D 4J04D

3.1.8.4

SR REGISTER

3.1.8.4

An unsuccessful attempt to master clear the computer indicates that a malfunction has occurred in the SR register circuitry.

- Step 1. Ensure that computer is in OP STEP mode.
- Step 2. Master clear computer.
- Step 3. Press all SR register bits.
- Step 4. Master clear computer, then observe SR register. If any indicators are lit, refer to the following list and replace item as directed.

<u>SR INDICATORS LIT</u>	<u>REPLACE ITEM</u>
0	1
1	2
2	3
3	4
ACT	5
ALL	6

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 4J02G
2						Replace 4J02G
3						Replace 4J02F



<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
4						Replace 4J02E
5						Replace 4J02F
6						Replace 4J04C 3J05D

3.1.8.5

FUNCTION CODE REGISTER

3.1.8.5

The following procedure checks the Function Code register indicators for proper functional operation.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Set PHASE REPEAT up.
- Step 3. Press PHASE 4.
- Step 4. Set FUNCTION CODE register to 50:77.
- Step 5. Set I/O CLEAR/MASTER CLEAR to MASTER CLEAR, then observe FUNCTION CODE register.
  - a) If all the indicators are lit, do step 6.
  - b) If only FII is lit, scope item 3.
  - c) If any others are lit, replace item 2.
  - d) If none are lit, replace item 1.
- Step 6. Clear FUNCTION CODE, then observe FUNCTION CODE register.
  - a) If none of the indicators are lit, scope item 5.
  - b) If any remain lit, replace item 6.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 3J23D
2						Replace 3J24D 3J24G 3J24F 3J24E
3	9-40	29N16	3	1F11	H	If H replace 3J24D If L scope item 4
4	9-40	10N16	3	1B11	L	If L replace 3J23D 3J29E 3J27E

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
						If H replace 8J04G 3J24C 3J23E 3J32D
5	9-14	44G20	3	1B4	L	If L replace 3J23D 3J32D 3J10D If H replace 3J27E 3J29E
6						Replace 3J23F

3.1.8.6

P REGISTER

3.1.8.6

An unsuccessful attempt to master clear the computer indicates that a malfunction has occurred in the P register circuitry.

- Step 1. Ensure that computer is in LOAD mode.
- Step 2. Master clear computer.
- Step 3. Observe P register, then do one of the following:
  - a) If P equals 000500, replace item 1.
  - b) If P equals any other value, do step 4.
- Step 4. Press OP STEP MODE.
- Step 5. Press all P register bits.
- Step 6. Master clear computer.
- Step 7. Observe P register, then do one of the following:
  - a) If all bits in P are set, replace item 2.
  - b) If one or more bits in P are set, do step 8.
- Step 8. Scope test point 1D24 on chassis 4. Test level is H.
  - a) If H, refer to the following list and replace the card that corresponds to bit set in P.
  - b) If L, replace item 3.

<u>BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	1						Replace 3J04B 3J03C 4J34D

<u>BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	2						Replace 4J32D 4J12A
	3						Replace 4J33D 3J02C 3J02A
0							Replace 4J33A
1							Replace 4J33A
2							Replace 4J32B
3							Replace 4J32B
4							Replace 4J34B
5							Replace 4J34B
6							Replace 4J33C
7							Replace 4J33C
8							Replace 4J32E
9							Replace 4J32E
10							Replace 4J34E
11							Replace 4J34E
12							Replace 4J33F
13							Replace 4J33F
14							Replace 4J32G
15							Replace 4J32G

3.1.8.7

Z<sub>1</sub> REGISTER

3.1.8.7

The following procedure checks the Z<sub>1</sub> register for indicator malfunctions and for constant enables which would allow the transfer of bits at an improper time.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Set Z<sub>1</sub> register to 777777.
- Step 3. Press PHASE STEP MODE, then clear PHASE register.

- Step 4. Set PHASE REPEAT up.
- Step 5. Press PHASE 3 and TIMING 14 indicators.
- Step 6. Observe Z<sub>1</sub> register.  
 a) If all indicators remain lit, do step 7.  
 b) If none are lit, do step 8.  
 c) If any are lit, do step 9.
- Step 7. Set I/O CLEAR/MASTER CLEAR to MASTER CLEAR, then observe Z<sub>1</sub> register.  
 a) If none of the indicators are lit, replace item 1.  
 b) If all are lit, replace item 2.
- Step 8. Press PHASE 4, then observe Z<sub>1</sub> register.  
 a) If none of the indicators are lit, replace item 3.  
 b) If any are lit, scope item 4.
- Step 9. Clear PHASE register, then set PHASE REPEAT up.
- Step 10. Press OP STEP MODE.
- Step 11. Press S<sub>1</sub> register bit which corresponds to Z<sub>1</sub> register bit that is cleared.
- Step 12. Observe if that bit is now set in Z<sub>1</sub> register. If lit, replace item 6; if not lit, replace card(s) listed under item 7 corresponding to Z<sub>1</sub> bits that are lit.

<u>BITS</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	1						Replace 3J14A 7J02C 7J03C
	2						Replace 7J02C 7J06D 7J02D 7J19D
	3						Replace 7J04D 7J07D 7J08D
	4	9-23	39N13	7	1C3	H	If H scope item 5 If L replace 7J07D 7J03D
	5	9-23	29N13	7	1D3	H	If H replace 7J02B 7J07D If L replace 3J07A 3J08A 7J03C 7J06D

<u>BITS</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	6						Replace 7J04D 7J07D 7J08D
0	7						Replace 8J03A 7J07G
1							Replace 8J04B 7J08G
2							Replace 8J04B 7J08G
3							Replace 8J01B 7J06F
4							Replace 8J03B 7J07F
5							Replace 8J03B 7J08F
6							Replace 8J03C 7J06E
7							Replace 8J03C 7J07E
8							Replace 8J04E 7J08E
9							Replace 8J04E 7J06C
10							Replace 8J03E 7J07C
11							Replace 8J03E 7J08C
12							Replace 8J04F 7J06B
13							Replace 8J04F 7J07B
14							Replace 8J03F 7J08B
15							Replace 8J03F 7J06A

<u>BITS</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
16							Replace 8J03G 7J07A
17							Replace 8J03G 7J08A

3.1.8.8

B REGISTER

3.1.8.8

An unsuccessful attempt to master clear the computer indicates that a malfunction has occurred in the B register circuitry.

Step 1. Press RUN MODE.

Step 2. Manually clear B register, then observe B indicators.  
 a) If none are lit, replace item 1 of table A.  
 b) If any are lit, do step 3.

Step 3. Scope item 2 of table A.

Step 4. Press OP STEP MODE.

Step 5. Press all B register bits.

Step 6. Manually clear B register, then observe B indicators.  
 a) If all bits are set, replace item 12 of table A.  
 b) If any bits are not set, bit set in B is the error bit. Replace cards listed in table B that correspond to the error bit.

TABLE A

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 8J02A 8J03D 3J13D
2	9-25	00N11	8	1A25	L	If L scope item 3 If not L scope item 7
3	9-25	09N11	8	1C25	T	If T scope item 5 If not T replace item 4
4						Replace 8J17D 8J02D
5	9-21	19N08	8	1E24	H	If H do step 4 If not H replace item 6

TABLE A (CONT)

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
6						Replace 8J08D 8J02G 3J02B
7	9-34	11E28	7	2D11	H	If H replace item 8 If not H scope item 9
8						Replace 7J26B 7J23D 8J02A
9	9-34	0XG28	7	2C10	L	If L replace item 10 If not L replace item 11
10						Replace 7J20E 7J30F 7J29E
11						Replace 7J20E 8J06D
12						Replace 8J09D

TABLE B

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
0							Replace 8J17A 8J08A
1							Replace 8J18A 8J08A
2							Replace 8J19A 8J09A
3							Replace 8J17B 8J09A
4							Replace 8J18B 8J08B
5							Replace 8J19B 8J08B
6							Replace 8J17C 8J08C
7							Replace 8J18C 8J08C

TABLE B (CONT)

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
8							Replace 8J19C 8J09C
9							Replace 8J17E 8J09C
10							Replace 8J18E 8J08E
11							Replace 8J19E 8J08E
12							Replace 8J17F 8J08F
13							Replace 8J18F 8J08F
14							Replace 8J19F 8J09F
15							Replace 8J17G 8J09F
16							Replace 8J18G 8J08G
17							Replace 8J19G 8J08G

## 3.1.8.9

## K REGISTER

## 3.1.8.9

The following procedure checks the K register for indicator malfunctions and constant enables.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Set K register to 77.
- Step 3. Set I/O CLEAR/MASTER CLEAR to MASTER CLEAR, then observe K indicators.
  - a) If none are lit, replace item 1.
  - b) If K is equal to 22, replace item 2.
  - c) If K is equal to 77, replace item 3.
  - d) If K is equal to any other value, do step 4.
- Step 4. Press PHASE STEP MODE and clear PHASE register.



3.1.8.9  
(Cont)

3.1.8.9  
(Cont)

- Step 5. Set PHASE REPEAT up.
- Step 6. Set I/O CLEAR/MASTER CLEAR to MASTER CLEAR, then observe K register indicators.  
 a) If any are lit, scope item 4.  
 b) If all are extinguished, do step 7.
- Step 7. Press PHASE 1 and 4, then observe K register indicators.  
 a) If all are extinguished, replace item 1.  
 b) If any are lit, replace item 6.
- Step 8. Replace cards listed under item 7 corresponding to bit(s) in K that are lit.

<u>BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	1						Replace 8J05D 9-121 8J05A 9-179 7J22B 9-37 7J24D 7-37
	2						Replace 3J25E 7J20D
	3						Replace 7J03D 7J19A 7J20D 7J31E
	4	9-37	29N14	7	1G27	H	If H scope item 5 If L replace 7J21D
	5	9-37	19N14	7	1F27	H	If H do step 8 If L replace 7J21D
	6						Replace 3J24B 3J27B 7J21D
0	7						Replace 7J20C 7J22B 7J24C 8J05A
1							Replace 7J21C 7J22B 7J25C 8J05A
2							Replace 7J20B 7J22B 7J24B 8J05A

<u>BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
3							Replace 7J21B 7J22B 7J25B 8J05A
4							Replace 7J20A 7J22B 7J24A 8J05A
5							Replace 7J21A 7J22B 7J25A 8J06B

3.1.8.10

ADV P SEQ REGISTER

3.1.8.10

An unsuccessful attempt to master clear the computer indicates a malfunction has occurred in the ADV P SEQ register circuitry.

- Step 1. Press OP STEP MODE, then master clear the computer.
- Step 2. Press PHASE STEP MODE.
- Step 3. Press all ADV P SEQ bit indicators.
- Step 4. Press OP STEP MODE, then observe ADV P SEQ indicators.
- Step 5. If any are lit, refer to the following list and replace item as directed.

<u>INDICATORS LIT</u>	<u>REPLACE ITEM</u>
2	1
0 and 2	2
1 and 2	3
0, 1, and 2	4

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 7J23E 7J20F 7J19D 7J02D

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
2						Replace 3J13G 7J19E 7J20G 7J18D 7J02D
3						Replace 7J20E 7J19E 7J23F
4						Replace 7J18D 7J02D

3.1.8.11

$C_E$  AND  $C_O$  REGISTERS

3.1.8.11

An unsuccessful attempt to master clear the computer indicates that a malfunction has occurred in one of C registers.

NOTE

In the following procedure, the C register in error is referred to as the concerned register.

- Step 1. Press OP STEP MODE.
- Step 2. Set concerned register to 777777.
- Step 3. Master clear computer, then observe the following:
  - a) If concerned register is equal to 777777, replace gJ13F.
  - b) If any other condition, do step 4.
- Step 4. The bit set in concerned register is the error bit. Replace the card in the following table that corresponds to the error bit.

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
0							Replace gJ03E
1							Replace gJ03E
2							Replace gJ06E
3							Replace gJ06E
4							Replace gJ09E
5							Replace gJ09E
6							Replace gJ12E

"g" refers to chassis containing concerned register

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
7							Replace gJ12E
8							Replace gJ15E
9							Replace gJ15E
10							Replace gJ18E
11							Replace gJ18E
12							Replace gJ21E
13							Replace gJ21E
14							Replace gJ24E
15							Replace gJ24E
16							Replace gJ27E
17							Replace gJ27E

"g" refers to chassis containing concerned register.

3.1.8.12

MULT/DIV SEQ REGISTER

3.1.8.12

The following procedure checks the MULT/DIV SEQ indicators.

Step 1. Press OP STEP MODE and master clear computer.

Step 2. Scope item 1.

Step 3. Observe MULT/DIV SEQ indicators, then refer to the following list and replace item as directed.

<u>INDICATORS LIT</u>	<u>REPLACE ITEM</u>
0	2
0-4	2
1-4	3
2, 3, and 4	4
3	5
4	5
5 and 6	6
5	6
6	6

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1	9-36	13L00	7	2E1	L	If L do step 3 If H replace 7J19A 7J21A 7J22B 7J22C
2						Replace 7J19E 7J21G 7J22G 7J23F
3						Replace 3J07G 7J19E 7J21F 7J23F
4						Replace 7J21E 7J22E
5						Replace 7J22E
6						Replace 7J22F 7J23G 8J02E

3. 1. 8. 13

INTERRUPT REGISTER

3. 1. 8. 13

An unsuccessful attempt to master clear the computer indicates that a malfunction has occurred in the Interrupt register circuitry.

- Step 1. Ensure that computer is in OP STEP mode, then master clear computer.
- Step 2. Press all INTERRUPT indicators.
- Step 3. Master clear computer.
- Step 4. Observe INTERRUPT indicators.
  - a) If none are lit, replace item 6.
  - b) If any are lit, refer to the following list and replace item as directed.

<u>INDICATOR LIT</u>	<u>REPLACE ITEM</u>
INST FAULT	1
RESUME FAULT	2
RTC MON	3
RTC OVERFLOW	4
SYNC	5

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 7J26F 3J24A
2						Replace 7J26E 7J26G
3						Replace 7J24E 7J25F 7J24F
4						Replace 7J24E 7J25F
5						Replace 7J25E 7J24G
6						Replace 3J24A 3J25A

3. 1. 8. 14

FUNCTION PRIORITY REGISTER

3. 1. 8. 14

An unsuccessful attempt to master clear the computer indicates a malfunction has occurred in the Function Priority register circuitry.

- Step 1. Ensure that computer is in PHASE STEP mode, then press PHASE 4.
- Step 2. Press all FUNCTION PRIORITY indicators.
- Step 3. Set PHASE REPEAT up, then master clear computer.
- Step 4. Observe FUNCTION PRIORITY indicators.
  - a) If all FUNCTION PRIORITY indicators remain lit, replace item 1.
  - b) If all of one FUNCTION PRIORITY group of indicators remain lit, replace item 6.
  - c) If EF indicator is lit for EVEN and/or ODD, replace item 2.
  - d) If EI indicator is lit for EVEN and/or ODD, replace item 3.
  - e) If OD indicator is lit for EVEN and/or ODD, replace item 4.
  - f) If ID indicator is lit for EVEN and/or ODD, replace item 5.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 7J23E
2						Replace gJ08B
3						Replace gJ09B

"g" refers to chassis containing concerned register.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
4						Replace gJ09B
5						Replace gJ08B
6						Replace gJ14C gJ02A

"g" refers to chassis containing concerned register.

3.1.8.15

I/O CHANNEL AND STATUS GRID

3.1.8.15

The following procedure checks for a defective indicator in the I/O CHANNEL and status grid and also checks the MASTER CLEAR signal to the flip-flops.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Press all indicators in I/O CHANNEL and status grid(s) except CHAN PRI.
- Step 3. Momentarily set I/O CLEAR/MASTER CLEAR to I/O CLEAR.
- Step 4. Observe EI MON indicators.  
 a) If all EI MON indicators remain lit, do step 5.  
 b) If none remain lit, replace item 1.  
 c) If any are cleared, replace card(s) listed under item 2 corresponding to channel(s) that are lit.
- Step 5. Observe ID MON indicators.  
 a) If all ID MON indicators are cleared, do step 6.  
 b) If none are lit, do step 7.  
 c) If any are lit, do step 8.
- Step 6. Observe EF MON indicators.  
 a) If all EF MON indicators are cleared, do step 9.  
 b) If none are cleared, replace item 8.  
 c) If any are cleared, replace the cards listed under item 9 corresponding to EF MON channel(s) that are lit.
- Step 7. Observe remaining indicators in I/O CHANNEL and status grid.  
 a) If any other indicators are cleared, replace item 3.  
 b) If none of the other indicators are cleared, scope item 4.
- Step 8. Observe if any other indicators are lit in same channel as ID MON indicator that is lit.  
 a) If other indicators are lit, replace cards listed under item 7 corresponding to channel containing the indicator that is lit.  
 b) If all other indicators for that channel are cleared, replace the cards listed under item 10 corresponding to the channel containing ID MON indicator that is lit.

- Step 9. Observe OD MON indicators.
- a) If all OD MON indicators are cleared, do step 10.
  - b) If none are cleared, replace item 11.
  - c) If any are cleared, replace item 12.
- Step 10. Observe EF ACT indicators.
- a) If all EF ACT indicators are cleared, do step 11.
  - b) If none are cleared, replace item 13.
  - c) If any are cleared, replace the cards listed under item 14 corresponding to the channel containing the EF ACT indicator(s) that are lit.
- Step 11. Observe OD ACT indicators.
- a) If all OD indicators are cleared, do step 12.
  - b) If none are cleared, replace item 15.
  - c) If any are lit, replace the cards listed under item 16 corresponding to the channel containing the OD ACT indicator(s) that are lit.
- Step 12. Observe ID ACT indicators.
- a) If all ID ACT indicators are cleared, do step 13.
  - b) If none are cleared, replace item 17.
  - c) If any are lit, replace the card(s) listed under item 18 corresponding to the channel containing the indicator(s) that are lit.
- Step 13. Observe EF/OD ACK indicators.
- a) If all EF/OD ACK indicators are cleared, do step 14.
  - b) If none are cleared, replace item 19.
  - c) If any are lit, replace the card(s) listed under item 20 corresponding to the channel containing the indicator(s) that are lit.
- Step 14. Observe ID ACK indicators.
- a) If all ID ACK indicators are cleared, do step 15.
  - b) If all are lit, replace item 21.
  - c) If any are lit, replace the card(s) listed under item 22 corresponding to channel(s) that are lit.
- Step 15. Set I/O CLEAR/MASTER CLEAR to MASTER CLEAR, then observe EI MON indicators.
- a) If all of EI MON indicators are cleared, set I/O CLEAR/MASTER CLEAR to MASTER CLEAR, and while holding it at MASTER CLEAR, scope item 23.
  - b) If any are lit, replace the card(s) listed under item 24 corresponding to the channel(s) that are lit.
- Step 16. Press PHASE STEP MODE and PHASE 1.
- Step 17. Repeatedly set RESTART/START STEP to START STEP until timing 11 is not lit.
- Step 18. Press each CHAN PRI indicator in both CHANNEL and status grid.
- Step 19. Momentarily set I/O CLEAR/MASTER CLEAR to I/O CLEAR.



Step 20. Observe CHAN PRI indicators.

- a) If all CHAN PRI indicators are cleared, replace item 25.
- b) If any are cleared for only one chassis, replace item 26 for the chassis containing indicators that are lit.
- c) If none are cleared, replace item 27.
- d) If any are lit, replace the cards listed under item 28 corresponding to the channel(s) that are lit.

<u>CHAN</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	1						Replace 3J10D 3J11B 3J16A
0&1	2						Replace gJ35D
2&3							Replace gJ35D
4&5							Replace gJ35B
6&7							Replace gJ35B
	3						Replace gJ27A
	4	9-60	8gJ12	g	2D24	H	If H scope item 5 If L replace gJ27A
	5	9-60	7gJ12	g	1D13	L	If L scope item 6 If H replace gJ16F
	6	9-60	9gJ12	g	2E1	L	If L replace gJ19C If H replace gJ27D
0&1	7						Replace gJ27D gJ18C
2&3							Replace gJ27C gJ18C
4&5							Replace gJ27B gJ18C
6&7							Replace gJ27A gJ18A
	8						Replace gJ16C
0&1	9						Replace gJ16D gJ27D gJ16C gJ18C

"g" refers to chassis containing concerned channel.

<u>CHAN</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
2&3							Replace gJ16C gJ16D gJ18C gJ27C
4&5							Replace gJ16B gJ16C gJ18C gJ27B
6&7							Replace gJ16B gJ16C gJ18A gJ27A
0&1	10						Replace gJ19D
2&3							Replace gJ19D
3&4							Replace gJ19B
4&5							Replace gJ19B
	11						Replace gJ12F gJ19A gJ20A gJ29C
	12						Replace gJ28B gJ29D
	13						Replace gJ11A gJ12F 7J02F gJ27C
0&1	14						Replace gJ33E gJ11A gJ27D
2&3							Replace gJ33D gJ27C gJ11A
4&5							Replace gJ33C gJ15F gJ11A
6&7							Replace gJ33B gJ27A gJ11A

"g" refers to chassis containing concerned channel.

<u>CHAN</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	15						Replace gJ20A
0&1	16						Replace gJ28D gJ29E
2&3							Replace gJ28D gJ29E
4&5							Replace gJ28B gJ29E
6&7							Replace gJ28A gJ29E
	17						Replace gJ17C
0&1	18						Replace gJ17D
2&3							Replace gJ17D
4&5							Replace gJ17B
6&7							Replace gJ17B
	19						Replace gJ03A gJ27A
0&1	20						Replace gJ11D
2&3							Replace gJ11D
4&5							Replace gJ07D
6&7							Replace gJ07D
	21						Replace gJ03A
0&1	22						Replace gJ06D
2&3							Replace gJ06D
4&5							Replace gJ05D
6&7							Replace gJ05D
	23	9-28	01E70	3	2A10	L	If L do step 16 If H replace 3J10D 3J16A 7J32E

"g" refers to chassis containing concerned channel.

<u>CHAN</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
0&1	24						Replace gJ31D
2&3							Replace gJ31D
4&5							Replace gJ31B
6&7							Replace gJ31B
	25						Replace gJ14B
	26						Replace gJ04A gJ14C
	27						Replace 7J23E gJ14C
0&1	28						Replace gJ08A
2&3							Replace gJ08A
4&5							Replace gJ06A
6&7							Replace gJ06A

"g" refers to chassis containing concerned channel.

3.1.8.16

MASTER CLEAR ERROR INDICATOR  
COMBINATIONS

3.1.8.16

The following procedure is used after an unsuccessful attempt to master clear the computer, and a malfunction is indicated in the master clear circuitry.

Observe improperly lit registers, then refer to the following list and replace corresponding item as directed.

<u>REGISTERS IMPROPERLY LIT</u>	<u>REPLACE ITEM</u>
All initially set	1
ID ACK, EF/OD ACK, EF MODE, C, ID MON, OD MON, EF MON, ID ACT, OD ACT, EF ACT	2
ID ACK, EF/OD ACK, EF MODE, C	3
ID MON, OD MON, EF MON, ID ACT, OD ACT, EF ACT	4

<u>REGISTERS IMPROPERLY LIT</u>	<u>REPLACE ITEM</u>
ID, OD, EF MON	5
ID, OD, EF ACT	6
P, A <sub>U</sub> , A <sub>L</sub>	7
SEQ DES, EI MON, FUNCTION CODE, ICR, SR	8
K, Z <sub>1</sub>	9
INTERRUPT, S <sub>1</sub> , ADV P	10
A <sub>L</sub> , A <sub>U</sub> , P, INTERRUPT, S <sub>1</sub> , ADV P, K, Z <sub>1</sub>	11
FUNCTION PRIORITY, CHAN PRI	12

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 3J12A 7J27B 7J28B 7J32E 3J31B
2						Replace 7J30E
3						Replace gJ27A
4						Replace 7J31E
5						Replace 7J02F gJ12F
6						Replace 7J2F gJ12F
7						Replace 3J10D
8						Replace 3J10D
9						Replace 7J31E
10						Replace 7J25D
11						Replace 7J31E
12						Replace 7J32E gJ14C

"g" refers to chassis on which indicator is improperly lit.

An unsuccessful attempt to master clear the computer indicates that a malfunction has occurred in the I/O Translator circuitry.

- Step 1. Observe I/O TRANSLATOR indicators.
- If I/O TRANSLATOR FUNCTION is not equal to 3, refer to test 3.1.6.
  - If I/O TRANSLATOR CHANNEL is not equal to 06, refer to test 3.1.7.
  - If any one of I/O TRANSLATOR ACTIVE, ESA, DUAL, or ESI is lit, do step 2.
- Step 2. Press OP STEP MODE, then master clear computer.
- Step 3. Press I/O TRANSLATOR ACTIVE, ESA, DUAL, and ESI.
- Step 4. Master clear computer.
- Step 5. Observe I/O TRANSLATOR indicators. Only DUAL should be lit.
- If lit, do step 7.
  - If not lit, do step 6.
- Step 6. Observe I/O TRANSLATOR ACTIVE, ESA, and ESI indicators.
- If all indicators are lit, replace item 1.
  - If any other condition, refer to the following list, find the indicator that is not lit, and replace corresponding items as directed.
- | <u>INDICATOR NOT LIT</u> | <u>REPLACE</u> |
|--------------------------|----------------|
| ACTIVE                   | Item 2         |
| ESA                      | Item 3         |
| ESI                      | Item 4         |
- Step 7. Press RUN MODE.
- Step 8. Observe I/O TRANSLATOR DUAL. DUAL should not be lit.
- If not lit, I/O Translator circuitry has been verified.
  - If lit, replace item 5.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 7J15C 7J16D 7J02D 7J16F
2						Replace 7J12A 7J15D 7J16D 7J16G 7J02B

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
3						Replace 7J14A 7J13A
4						Replace 7J14B 7J13B
5						Replace 7J17B 7J16D 3J12C

3.1.8.18

S<sub>1</sub> REGISTER

3.1.8.18

An unsuccessful attempt to master clear the computer indicates that a malfunction has occurred in the S<sub>1</sub> register.

Step 1. Press OP STEP MODE, then master clear computer.

Step 2. Press all S<sub>1</sub> register bits.

Step 3. Master clear computer, then manually clear B.

Step 4. Observe S<sub>1</sub> indicators.

- a) If S<sub>1</sub> equals 177777, scope item 1.
- b) If S<sub>1</sub> equals any other value, do step 5.

Step 5. Press random bits of B register while observing S<sub>1</sub> indicators.

- a) If corresponding bits of S<sub>1</sub> and B are set, replace item 2.
- b) If corresponding indicators are not lit, scope item 3.

Step 6. Observe S<sub>1</sub> indicators. Refer to the following list, find value in S<sub>1</sub> and do as directed.

<u>S<sub>1</sub> EQUAL TO</u>	<u>DO THE FOLLOWING</u>
000500	Replace item 9
000100	Replace item 10
000400	Replace item 11
000001	Replace item 12
Any other value	Do step 7

Step 7. The bit set in S<sub>1</sub> is the error bit. Refer to paragraph 3.1.5 and replace the card(s) that correspond to error bit.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1	9-22	19N12	7	1F4	H	If H replace 7J10D 7J02A 7J03D If not H replace 7J10D 7J03C 3J08C
2						Replace 7J12D 7J03B 3J08D
3	9-22	37N12	7	1C4	H	If H scope item 6 If not H scope item 4
4	9-22	70N12	3	2E16	L	If L scope item 5 If not L replace 3J07D
5	9-22	30N12	3	2D16	L	If L replace 7J02B 7J11D If not L replace 3J08E
6	9-22	79N12	7	1D4	L	If L scope item 7 If not L replace 7J03B
7	9-22	39N12	7	1B4	H	If H scope item 8 If not H replace 7J12D 7J03C
8	9-22	19N12	7	1F4	H	If H do step 6 If not H replace 7J10D 7J03C
9						Replace 3J08B
10						Replace 7J02G 7J10E
11						Replace 7J03B 7J12E
12						Replace 7J02G 7J10G



The following procedure is used after an unsuccessful attempt to master clear the computer and the RTC SEQ indicator is improperly lit.

- Step 1. Set RTC DISC down.
- Step 2. Press OP STEP MODE.
- Step 3. Press RTC SEQ indicator.
- Step 4. Press RUN MODE.
- Step 5. Observe RTC SEQ indicator.  
a) If not lit, do step 6.  
b) If lit, scope item 1.
- Step 6. Press OP STEP MODE.
- Step 7. Press RTC SEQ indicator.
- Step 8. Master clear computer. Observe RTC SEQ indicator.  
a) If not lit, do step 9.  
b) If lit, replace 7J26B.
- Step 9. Press RUN MODE.
- Step 10. Scope item 2.
- Step 11. This step indicates that either the RTC DISC switch or the RTC oscillator is malfunctioning.
- Step 12. Set RTC DISC down. If RTC SEQ indicator is lit, RTC oscillator is not toggling at correct frequency.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1	9-49	41E00	7	2A17	H	If H replace 7J26B 3J15F 7J18D If not H replace 7J16E 7J17F
2	9-49	40E00	7	2B17	L	If L do step 12 If not L scope item 3
3	9-34	03G29	7	2A10	H	If H replace 7J29D 7J17F If TOG do step 11 If L replace 7J29F 7J30F

An unsuccessful attempt to master clear the computer indicates that a malfunction has occurred in the I/O Section.

- Step 1. Ensure that computer is in RUN Mode.
- Step 2. Master clear computer.
- Step 3. Observe I/O TRANSLATOR FUNCTION, then refer to the following list for corresponding value and do as directed.

<u>I/O TRANSLATOR FUNCTION VALUE</u>	<u>DO STEP</u>
00	4
01	13
10	22
11	31

- Step 4. Observe I/O TRANSLATOR CHANNEL, then refer to the following list for corresponding value and do as directed.

<u>I/O TRANSLATOR CHANNEL VALUE</u>	<u>DO STEP</u>
0, 1, 10, 11	5
2, 3, 12, 13	7
4, 5, 14, 15	9
6, 7, 16, 17	11

- Step 5. Observe EI MON indicator on channel indicated.  
a) If lit, replace item 1.  
b) If not lit, do step 6.
- Step 6. Observe CHAN PRI indicator on channel indicated.  
a) If lit, scope item 2.  
b) If not lit, replace item 4.
- Step 7. Observe EI MON indicator on channel indicated.  
a) If lit, replace item 5.  
b) If not lit, do step 8.
- Step 8. Observe CHAN PRI indicator on channel indicated.  
a) If lit, scope item 6.  
b) If not lit, replace item 4.
- Step 9. Observe EI MON indicator on channel indicated.  
a) If lit, replace item 8.  
b) If not lit, do step 10.
- Step 10. Observe CHAN PRI indicator on channel indicated.  
a) If lit, scope item 9.  
b) If not lit, replace item 4.

- Step 11. Observe EI MON indicator on channel indicated.
  - a) If lit, replace item 11.
  - b) If not lit, do step 12.
- Step 12. Observe CHAN PRI indicator on channel indicated.
  - a) If lit, scope item 12.
  - b) If not lit, replace item 4.
- Step 13. Observe I/O TRANSLATOR CHANNEL, then refer to the following list for corresponding value and do as directed.

<u>I/O TRANSLATOR CHANNEL VALUE</u>	<u>DO STEP</u>
0, 1, 10, 11	14
2, 3, 12, 13	16
4, 5, 14, 15	18
6, 7, 16, 17	20

- Step 14. Observe EF MON on channel indicated.
  - a) If lit, replace item 14.
  - b) If not lit, do step 15.
- Step 15. Observe CHAN PRI on channel indicated.
  - a) If lit, scope item 15.
  - b) If not lit, replace item 17.
- Step 16. Observe EF MON on channel indicated.
  - a) If lit, replace item 18.
  - b) If not lit, do step 17.
- Step 17. Observe CHAN PRI on channel indicated.
  - a) If lit, scope item 19.
  - b) If not lit, replace item 17.
- Step 18. Observe EF MON on channel indicated.
  - a) If lit, replace item 21.
  - b) If not lit, do step 19.
- Step 19. Observe CHAN PRI on channel indicated.
  - a) If lit, scope item 22.
  - b) If not lit, replace item 17.
- Step 20. Observe EF MON on channel indicated.
  - a) If lit, replace item 24.
  - b) If not lit, do step 21.
- Step 21. Observe CHAN PRI on channel indicated.
  - a) If lit, scope item 25.
  - b) If not lit, replace item 17.
- Step 22. Observe I/O TRANSLATOR CHANNEL, then refer to the following list for corresponding value and do as directed.

<u>I/O TRANSLATOR CHANNEL VALUE</u>	<u>DO STEP</u>
0, 1, 10, 11	23
2, 3, 12, 13	25
4, 5, 14, 15	27
6, 7, 16, 17	29

- Step 23. Observe OD MON on channel indicated.  
 a) If lit, replace item 27.  
 b) If not lit, do step 24.
- Step 24. Observe CHAN PRI on channel indicated.  
 a) If lit, scope item 28.  
 b) If not lit, replace item 29.
- Step 25. Observe OD MON on channel indicated.  
 a) If lit, replace item 30.  
 b) If not lit, do step 26.
- Step 26. Observe CHAN PRI on channel indicated.  
 a) If lit, scope item 31.  
 b) If not lit, replace item 29.
- Step 27. Observe OD MON on channel indicated.  
 a) If lit, replace item 32.  
 b) If not lit, do step 28.
- Step 28. Observe CHAN PRI on channel indicated.  
 a) If lit, scope item 33.  
 b) If not lit, replace item 29.
- Step 29. Observe OD MON on channel indicated.  
 a) If lit, replace item 34.  
 b) If not lit, do step 30.
- Step 30. Observe CHAN PRI on register indicated.  
 a) If lit, scope item 35.  
 b) If not lit, replace item 29.
- Step 31. Observe I/O TRANSLATOR CHANNEL, then refer to the following list for corresponding value and do as directed.

<u>I/O TRANSLATOR CHANNEL VALUE</u>	<u>DO STEP</u>
0, 1, 10, 11	32
2, 3, 12, 13	34
4, 5, 14, 15	36
6, 7, 16, 17	38

- Step 32. Observe ID MON on channel indicated.  
 a) If lit, replace item 36.  
 b) If not lit, do step 33.

- Step 33. Observe CHAN PRI on channel indicated.  
a) If lit, scope item 37.  
b) If not lit, replace item 38.
- Step 34. Observe ID MON on channel indicated.  
a) If lit, replace item 39.  
b) If not lit, do step 35.
- Step 35. Observe CHAN PRI on channel indicated.  
a) If lit, scope item 40.  
b) If not lit, replace item 38.
- Step 36. Observe ID MON on channel indicated.  
a) If lit, replace item 41.  
b) If not lit, do step 37.
- Step 37. Observe CHAN PRI on channel indicated.  
a) If lit, scope item 42.  
b) If not lit, replace item 38.
- Step 38. Observe I/O TRANSLATOR CHANNEL.  
a) If equal to 06, do step 41.  
b) If equal to any other value, do step 39.
- Step 39. Observe ID MON on channel indicated.  
a) If lit, replace item 43.  
b) If not lit, do step 40.
- Step 40. Observe CHAN PRI on channel indicated.  
a) If lit, scope item 44.  
b) If not lit, replace item 38.
- Step 41. Scope test point 1G14 on chassis 2. Test level is L.  
a) If L, do step 45.  
b) If not L, do step 42.
- Step 42. Observe ID MON on channel 6.  
a) If lit, replace item 43.  
b) If not lit, do step 43.
- Step 43. Observe CHAN PRI on channel 6.  
a) If lit, scope item 44.  
b) If not lit, do step 44.
- Step 44. Observe FUNCTION PRIORITY ID EVEN indicator.  
a) If lit, replace item 38.  
b) If not lit, replace item 45.
- Step 45. Scope item 46.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace gJ31B gJ31C gJ12F 7J03G 7J19G
2	9-65	80Rg0	g	1D2	H	If H replace item 3 If not H replace gJ31A gJ22D gJ24D
3						Replace gJ32A gJ26D gJ31D
4						Replace gJ10B gJ09B
5						Replace gJ31D gJ31C gJ12F 7J03G 7J19G
6	9-65	80Rg1	g	1E2	H	If H replace item 7 If not H replace gJ31A gJ22C gJ24D
7						Replace gJ32A gJ26C gJ31D
8						Replace gJ31B gJ31C gJ12F 7J03G 7J19G
9	9-65	80Rg2	g	1F2	H	If H replace item 10 If not H replace gJ33A gJ22B gJ24A
10						Replace gJ34A gJ26B gJ31B

"g" refers to chassis containing failing bootstrap channel.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
11						Replace gJ31B gJ31C gJ12F 7J03G 7J19G
12	9-65	80Rg3	g	1G2	H	If H replace item 13 If not H replace gJ33A gJ22A gJ24A
13						Replace gJ34A gJ26A gJ31B
14						Replace gJ16D gJ16C
15	9-65	80Rg0	g	1D2	H	If H replace item 16 If not H replace gJ31A gJ34E
16						Replace gJ32A gJ21D gJ16D
17						Replace gJ12A gJ08B
18						Replace gJ16D gJ16C
19	9-65	80Rg1	g	1E2	H	If H replace item 20 If not H replace gJ31A gJ34D
20						Replace gJ32A gJ21C gJ16D
21						Replace gJ16B gJ16C
22	9-65	80Rg2	g	1F2	H	If H replace item 23 If not H replace gJ33A gJ34C
23						Replace gJ34A gJ21B gJ16B

"g" refers to chassis containing failing bootstrap channel.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
24						Replace gJ16B gJ16C
25	9-65	80Rg3	g	1G2	H	If H replace item 26 If not H replace gJ33A gJ34B
26						Replace gJ34A gJ21A gJ16B
27						Replace gJ29D gJ29C gJ12F 7J03G 7J19G
28	9-65	80Rg0	g	1D2	H	If H replace gJ32A gJ26D gJ29D If not H replace gJ31A gJ34E
29						Replace gJ11B gJ09B
30						Replace gJ29D gJ29C gJ12F 7J03G 7J19G
31	9-65	80Rg1	g	1E2	H	If H replace gJ32A gJ26C gJ29D If not H replace gJ31A gJ34D
32						Replace gJ29B gJ29C gJ12F 7J03G 7J19G
33	9-65	80Rg2	g	1F2	H	If H replace gJ34A gJ26B gJ29B If not H replace gJ33A gJ34C

"g" refers to chassis containing failing bootstrap channel.



<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
34						Replace gJ29B gJ29C gJ12F 7J03G 7J19G
35	9-65	80Rg3	g	1G2	H	If H replace gJ34A gJ26A gJ29B If not H replace gJ33A gJ34B
36						Replace gJ19D gJ19C gJ12F 7J03G 7J19G
37	9-65	80Rg0	g	1D2	H	If H replace gJ32A gJ21D gJ19D If not H replace gJ31A gJ22D
38						Replace gJ12B gJ08B
39						Replace gJ19D gJ19C gJ12F 7J03G 7J19G
40	9-65	80Rg1	g	1E2	H	If H replace gJ32A gJ21C gJ19D If not H replace gJ31A gJ20C
41						Replace gJ19B gJ19C gJ12F 7J03G 7J19G
42	9-65	80Rg2	g	1F2	H	If H replace gJ34A gJ21B gJ19B If not H replace gJ33A gJ22B

"g" refers to chassis containing failing bootstrap channel.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
43						Replace gJ19B gJ19C gJ12F 7J03G 7J19G
44	9-65	80Rg3	g	1G2	H	If H replace gJ34A gJ21A gJ19B If not H replace gJ33A gJ22A
45						Replace gJ07B gJ14A
46	9-49	20E00	7	2D17	L	If L scope item 47 If not L replace 7J16G 7J05B 7J09D
47	9-49	40E00	7	2B17	L	If L replace 7J02E gJ21C If not L replace 7J17F 7J29D

"g" refers to chassis containing failing bootstrap channel.

3.1.9 CHANGES IN STATUS WHEN OP STEP MODE IS SET 3.1.9

The following procedure is used for changes in status when OP STEP MODE is set while in RUN Mode condition.

- Step 1. Observe SEQ DES indicators.
  - a) If BI or BII is lit, replace item 1.
  - b) If neither BI nor BII is lit, do step 2.
- Step 2. Master clear computer and scope item 2.
- Step 3. Observe FUNCTION PRIORITY indicators.
  - a) If none are lit, do step 4.
  - b) If all are lit, replace item 3.
- Step 4. Observe Z<sub>1</sub> indicators.
  - a) If indicators are cycling, replace item 4.
  - b) If indicators are not cycling, do step 5.
- Step 5. Observe ADV P SEQ indicators.
  - a) If equal to 5, replace item 5.
  - b) If equal to any other value, do step 6.

3.1.9  
(Cont)

3.1.9  
(Cont)

- Step 6. Press SEQ DES I/OI, then clear SEQ DES.
- Step 7. Observe SEQ DES indicators.  
a) If I/OI is not lit, do step 8.  
b) If I/OI is lit, replace item 6.
- Step 8. Press PHASE STEP MODE and clear PHASE register.
- Step 9. Set PHASE REPEAT up.
- Step 10. Press PHASE 2, master clear computer, and scope item 7.
- Step 11. Set FUNCTION REPEAT up and set FUNCTION CODE to 50:40.
- Step 12. Press TIMING 42 and scope item 8.
- Step 13. Clear PHASE register, and press PHASE 3.
- Step 14. Press TIMING 14 and scope item 9.
- Step 15. Set FUNCTION CODE to 50:44.
- Step 16. Set DISC ADV P up.
- Step 17. Set FUNCTION REPEAT up.
- Step 18. Press RUN MODE and scope item 12.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 3J27F 3J28F 3J29F 3J30E
2	9-14	11E20	3	1G7	H	If H scope item 14 If not H replace 3J26B 3J15A 3J31F
3						Replace gJ08B gJ12A gJ09A
4						Replace gJ11B 3J20C 3J27A 3J31F
5						Replace 7J20E 7J20F 7J20G

"g" refers to chassis containing channel under test.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
6						Replace 3J27E 3J27G 3J29F 3J31E
7	9-28	0XG38	7	2B20	L	If L do step 11 If H replace 7J05E
8	9-28	1XG38	7	1A22	L	If L do step 13 If H replace 7J05C
9	9-28	2XG38	7	1A23	L	If L scope item 10 If H replace 7J04C 7J05B 7J05C
10	9-14	3J29E	3	1F7	L	If L scope item 11 If H replace 3J29E 3J30F
11	9-14	03J10	3	2D31	L	If L do step 15 If H replace 3J32C
12	9-28	1XG38	7	1A22	T	If T scope item 13 If not T replace 7J05C
13	9-28	2XG38	7	1A23	T	If T replace 3J15F 3J27G 3J29F 3J31E If not T replace 7J04C 7J05B 7J05C 3J29D
14	9-12	09E20	3	1G4	L	If L do step 3 If H replace 3J29D
15						Replace 3J30B 3J28C

3.1.10

CHANGES IN STATUS WHEN RUN MODE IS SET

3.1.10

The following procedure is used for changes in status when the RUN MODE indicator is pressed.

- Step 1. Observe SEQ DES indicators.
- a) If W is not lit, do step 2.
  - b) If W is lit, replace item 1.

3.1.10  
(Cont)

3.1.10  
(Cont)

- Step 2. Observe FUNCTION CODE register indicators.  
 a) If none are lit, do step 3.  
 b) If any are lit, replace item 2.
- Step 3. Observe FUNCTION PRIORITY indicators.  
 a) If none are lit, do step 4.  
 b) If any are lit, replace item 3.
- Step 4. Press OP STEP MODE and master clear computer.
- Step 5. Press PHASE STEP MODE, then press SEQ DES INT.
- Step 6. Press TIMING 42.
- Step 7. Observe ADV P SEQ indicators.  
 a) If none are lit, scope item 4.  
 b) If bit 0 or 2 is lit, replace item 5.  
 c) If bit 1 is lit, replace item 6.
- Step 8. Press RUN MODE.
- Step 9. Set FUNCTION CODE to 50:40.
- Step 10. Scope item 9.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 3J29G
2						Replace 3J24G 8J06E
3						Replace gJ12A gJ08B 7J16G
4	9-47	20F54	3	1B28	L	If L scope item 7 If H replace 3J18F
5						Replace 7J20F 7J20G 7J19E 3J13G
6						Replace 7J20E 7J19E 7J23F
7	9-34	2XG28	7	2A21	L	If L scope item 8 If not L replace 7J23D 7J26B 7J29E 7J30F

"g" refers to chassis containing indicator that is lit.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
8	9-14	41E20	3	1F7	H	If H do step 7 If L replace 3J29E 3J30F 7J05C
9	9-14	3J10	3	2D31	H	If H replace 3J31E 4J16A 8J17E 7J04C If L replace 3J32C 3J30F 7J05C

3.1.11

FUNCTION CODE EQUAL TO 40 OR 44

3.1.11

The following procedure is used when an error is detected while setting the FUNCTION CODE register to 40 or 44.

- Step 1. Ensure that computer is in RUN Mode.
- Step 2. Ensure that FUNCTION REPEAT is up.
- Step 3. Press all FUNCTION CODE register bits.
- Step 4. Observe FUNCTION CODE indicators, then find corresponding value in the following list and replace items as directed.

<u>FUNCTION CODE EQUAL TO</u>	<u>REPLACE ITEM</u>
00	1
37	2
73	3

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 3J23D 3J23F 3J29E
2						Replace 3J24E
3						Replace 3J24F

The following procedure is used when an error is detected while attempting to clear memory.

- Step 1. Observe PROGRAM FAULT indicator.
- a) If lit, replace 4J20B  
3J03C  
3J02C  
4J09B  
4J08B.
  - b) If not lit, do step 2.
- Step 2. Observe P register indicators.
- a) If none are lit, do step 66.
  - b) If any are lit, do step 3.
- Step 3. Observe P indicators, find highest value in P, refer to the following list and do as directed.

<u>P</u>	<u>DO THE FOLLOWING</u>
000001	Step 4
000002	Replace item 1
000003	Replace item 2
000004	Replace 4J21G
000006	Replace 4J20G
000007	Replace item 3
000017	Replace item 4
000037	Replace item 5
000057	Replace 4J26G
000067	Replace 4J21G
000070	Replace 4J21G
000077	Replace item 6
000100	Replace 4J18D
000107	Replace 4J14A
000177	Replace item 7
000266	Replace 4J30G
000377	Replace item 8
000500	Replace item 9
000503	Replace 3J14B
000505	Replace 4J20B
000537	Replace 4J15B
000554	Replace 4J19B
000707	Replace 4J15D
000777	Replace item 10
001266	Replace 4J16E
001777	Replace item 11
003777	Replace item 12
006777	Replace 4J21D
007703	Replace 4J17C
007777	Step 47
017777	Replace item 13
030000	Replace 3J18D
037777	Replace item 14
060000	Replace 7J20G
060505	Replace 4J21A

<u>P</u>	<u>DO THE FOLLOWING</u>
070001	Replace 4J20B
077776	Replace 3J15F
077777	Replace item 15
100017	Replace 4J16A
100777	Replace item 16
103037	Replace 3J13G
117777	Replace 4J33D
137777	Replace 4J17F
157777	Replace item 17
167777	Replace item 18
170001	Replace 3J24E
171237	Replace 4J14B
176077	Replace 4J25F
177700	Replace item 19
177737	Replace 4J23F
177773	Replace 4J32B
177776	Replace 4J22G

- Step 4. Press OP STEP MODE, set FUNCTION REPEAT down, then master clear computer.
- Step 5. Scope item 20. *1F32 3T 2F32 .34*
- Step 6. Press RUN MODE. *1B27 3H 2C33 3F 1G8 7L →*
- Step 7. Scope item 27. *2E32 - 3L*
- Step 8. Press OP STEP MODE, press PHASE STEP MODE, clear PHASE register and then press PHASE 2.
- Step 9. Set RESTART/START STEP to START STEP four times.
- Step 10. Observe TIMING indicators. TIMING 14 should be lit and 21 should not be lit.  
 a) If correct, do step 11.  
 b) If incorrect, replace 3J33E.
- Step 11. Press OP STEP MODE, then master clear computer.
- Step 12. Press P register bit 0.
- Step 13. Ground test point 2A24 on chassis 3.
- Step 14. Scope item 28. *2A15 4T*
- Step 15. Remove ground from test point 2A24 on chassis 3.
- Step 16. Press OP STEP MODE, then master clear computer.
- Step 17. Press SEQ DES I, then ground test point 1E6 on chassis 3.
- Step 18. Manually clear SEQ DES.  
 a) If SEQ DES I remains lit, replace 3J28C.  
 b) If any other condition, do step 19.



3. 1. 12  
(Cont)

3. 1. 12  
(Cont)

- Step 19. Remove ground from test point 1E6 on chassis 3.
- Step 20. Ground test point 1D20 on chassis 8.
- Step 21. Ground test point 1D22 on chassis 8.
- Step 22. Observe FUNCTION CODE bit 3.  
a) If lit, replace 3J24F.  
b) If not lit, do step 23.
- Step 23. Remove grounds from test points 1D20 and 1D22 on chassis 8.
- Step 24. Ground test point 1B7 on chassis 4.
- Step 25. Ground test point 1B18 on chassis 4.
- Step 26. Scope item 29. *1B4 4L*
- Step 27. Remove grounds from test points 1B7 and 1B18 on chassis 4.
- Step 28. Press OP STEP MODE, then master clear computer.
- Step 29. Press and hold ADV P SEQ bit 2 while scoping item 30, then do step 30.
- Step 30. Master clear computer.
- Step 31. Press SEQ DES I.
- Step 32. Press PHASE STEP MODE, clear PHASE register, then press PHASE 2.
- Step 33. Press TIMING 42, 43, and 44.
- Step 34. Repeatedly set RESTART/START STEP to START STEP until TIMING 23 and PHASE 1 are lit.
- Step 35. Set PHASE REPEAT up.
- Step 36. Scope item 31. *1F3 3T*
- Step 37. Press PHASE 2.
- Step 38. Scope item 32. *1C1 3L*
- Step 39. Set PHASE REPEAT down.
- Step 40. Press OP STEP MODE, then master clear computer.
- Step 41. Set FUNCTION CODE to 12.
- Step 42. Clear SEQ DES, then press SEQ DES RI.
- Step 43. Press PHASE STEP MODE, clear PHASE register, then press PHASE 2.
- Step 44. Repeatedly set RESTART/START STEP to START STEP until TIMING 42 is lit.

**Step 45.** Scope item 33.

**Step 46.** Press OP STEP MODE, then master clear computer.

**Step 47.** Momentarily ground test point 2A24 on chassis 3.

**Step 48.** Momentarily ground test point 2E22 on chassis 3.

**Step 49.** Press PHASE STEP MODE, clear PHASE register, then press PHASE 4.

**Step 50.** Press P register bit 12.

**Step 51.** Press ADV P SEQ bit 0.

**Step 52.** Set RESTART/START STEP to START STEP once.

**Step 53.** Scope test point 2F14 on chassis 4. Test level is H.

a) If H, do step 54.

b) If L, replace 4J16F(0XD12, 9-87)

3J02E(37N02, 9-18).

**Step 54.** Scope test point 1F14 on chassis 4. Test level is H.

a) If H, do step 55.

b) If L, replace 4J21A(10A12, 9-96).

**Step 55.** Scope test point 1D11 on chassis 4. Test level is H.

a) If H, do step 56.

b) If L, replace 4J26C(21A09, 9-92).

**Step 56.** Scope test point 1F11 on chassis 4. Test level is L.

a) If L, do step 57.

b) If H, replace 4J27D(22A06, 9-92).

**Step 57.** Ground test point 1F9 on chassis 4.

**Step 58.** Scope test point 1F3 on chassis 4. Test level is L.

a) If L, do step 59.

b) If H, replace 4J22B(14A12, 9-96).

**Step 59.** Remove ground from test point 1F9 on chassis 4.

**Step 60.** Ground test points 1F17 and 1F6 on chassis 4.

**Step 61.** Scope test point 1F3 on chassis 4. Test level is L.

a) If L, do step 62.

b) If H, replace 4J22B(14A12, 9-96).

**Step 62.** Remove grounds from test points 1F17 and 1F6 on chassis 4.

**Step 63.** Momentarily ground test point 2D14 on chassis 4.

**Step 64.** Scope test point 1D17 on chassis 4. Test level is L.

a) If L, do step 65.

b) If H, replace 4J26D(10A10, 9-95).

3. 1. 12  
(Cont)

3. 1. 12  
(Cont)

- Step 65. Replace item 35.
- Step 66. Set FUNCTION REPEAT down, then press OP STEP MODE and master clear computer.
- Step 67. Press SEQ DES I.
- Step 68. Press PHASE STEP MODE, clear PHASE register, then press PHASE 1.
- Step 69. Set RESTART/START STEP to START STEP, and while holding it at START STEP, scope test point 2A31 (23J10,9-3) on chassis 3. Test level is H.  
a) If L, do step 70.  
b) If H, replace item 36.
- Step 70. Press OP STEP MODE, then scope item 37.
- Step 71. Press and hold TIMING 12. TIMING 12 through 44 should be lit.  
a) If lit, do step 72.  
b) If not lit, refer to paragraph 3. 1. 2.
- Step 72. Press PHASE STEP MODE, clear PHASE register, then press PHASE 2.
- Step 73. Press TIMING 42.
- Step 74. Set RESTART/START STEP to START STEP once.
- Step 75. Press TIMING 13.
- Step 76. Clear PHASE register, then press PHASE 2.
- Step 77. Set RESTART/START STEP to START STEP once.
- Step 78. Scope item 38.
- Step 79. Press OP STEP MODE, then master clear computer.
- Step 80. Scope item 39.
- Step 81. Press RUN MODE.
- Step 82. Observe SEQ DES indicators. SEQ DES I should be lit.  
a) If lit, do step 83.  
b) If not lit, scope item 59.
- Step 83. Momentarily ground test point 2F25 on chassis 7, then scope item 62.
- Step 84. Press OP STEP MODE, then master clear computer.
- Step 85. Press PHASE STEP MODE, clear PHASE register, then press PHASE 3.
- Step 86. Press TIMING 43.
- Step 87. Set RESTART/START STEP to START STEP once.
- Step 88. Scope item 64.
- Step 89. Press OP STEP MODE, then master clear computer.

- Step 90. Press PHASE STEP MODE, clear PHASE register, then press PHASE 3.
- Step 91. Press ADV P SEQ bit 0.
- Step 92. Set PHASE REPEAT up.
- Step 93. Observe ADV P SEQ bit 2, which should be lit.
  - a) If lit, do step 94.
  - b) If not lit, replace item 65.
- Step 94. Set PHASE REPEAT down, then press OP STEP MODE.
- Step 95. Press and hold ADV P SEQ bit 0 while scoping item 66, and item 67, if necessary.
- Step 96. Press OP STEP MODE, then master clear computer.
- Step 97. Press PHASE STEP MODE, clear PHASE register, then press PHASE 2.
- Step 98. Press TIMING 42, 43, and 44.
- Step 99. Press SEQ DES I.
- Step 100. Repeatedly set RESTART/START STEP to START STEP until TIMING 14 and PHASE 2 are lit. If TIMING does not advance, replace item 69.
- Step 101. Observe ADV P SEQ bit 0 which should be lit.
  - a) If lit, do step 102.
  - b) If not lit, replace item 68.
- Step 102. Set RESTART/START STEP to START STEP once. Observe ADV P SEQ bit 0 which should be lit.
  - a) If lit, do step 103.
  - b) If not lit, replace 2J20G.
- Step 103. Repeatedly set RESTART/START STEP to START STEP until TIMING 31 and PHASE 3 are lit.
- Step 104. Scope item 70.
- Step 105. Repeatedly set RESTART/START STEP to START STEP until TIMING 42 and PHASE 4 are lit.
- Step 106. Scope item 72.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 4J21G 4J15A

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
2						Replace 4J23G 4J21F 4J22F 4J32B 4J15A 4J14A
3						Replace 4J21F 4J16B 4J32B
4						Replace 4J34B 4J26F 4J25G 4J24G 4J15B
5						Replace 4J34B 4J26F 4J26G 4J27G 4J14B
6						Replace 4J33C 4J20C 4J26E 4J15C
7						Replace 4J33C 4J23D 4J18B 4J17B 4J15C
8						Replace 4J22C 4J21D 4J23D 7J18D
9						Replace 7J20G 4J27B
10						Replace 4J14D 4J16E 3J25A 4J24E 4J25C 4J25D 4J24C 4J32C

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
11						Replace 4J15E 4J25D
12						Replace 4J14E 4J17E 4J26C 4J26D 4J27D 4J34E
13						Replace 4J22B 4J23B 4J15F 4J21A
14						Replace 4J21A 4J21B 4J14F
15						Replace 4J16G 4J21B 4J23B
16						Replace 4J26C 4J27C
17						Replace 4J22E 4J18F
18						Replace 4J19F 4J16F
19						Replace 4J16D 4J18D
20	9-4	71C02	3	1F32	T	If T, scope item 21 If not T, replace 3J33E
21	9-47	21F54	3	1B27	H	If H scope item 22 If L replace 3J18D
22	9-3	90Y10	3	2C33	H	If H scope item 23 If L replace 3J31A
23	9-31	11G60	7	1G8	L	If L scope item 26 If H scope item 24
24	9-31	10G60	7	1G9	H	If H replace 7J05B If L replace item 25

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
25						Replace 7J33B 7J30C 7J31C 7J32C 7J31B 7J32B 7J31A
26	9-3	01J03	3	2G32	H	If H do step 6 If L replace 3J30G
27	9-3	24J10	3	2E32	L	If L do step 8 If H replace 3J34A
28	9-85	0XD00	4	2A15	T	If T do step 15 If not T replace 4J16A
29	9-94	14A01	4	1B4	L	If L do step 27 If H replace 4J23G
30	9-21	08N07	4	1E24	T	If T do step 30 If not T replace 4J31D
31	9-13	31E20	3	1F3	T	If T do step 37 If not T replace 3J29C 3J27A
32	9-13	1XG27	3	1C1	L	If L do step 39 If H replace 3J30D 3J28E
33	9-21	10N07	3	2D27	L	If L replace item 34 If H replace 3J02A 3-27-84
3-19-84 34						Replace 3J30B 3J34A 3J31E
35						Replace 4J20A 4J23E 4J25C 4J27D
36						Replace 3J31D ✓ 3J31C 3J33C 3J32C 3J31B ✓
37	9-3	03J02	3	2G31	H	If H do step 71 If L replace 3J30GA

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
38	9-3	1XJ10	3	2B31	H	If H do step 79 If L replace 3J31F 3J14A 3J31E 3J12C
39	9-27	20E32	3	2D9	L	If L scope item 40 If H replace 3J11A
40	9-5	84C04	4	2D32	T	If T scope item 41 If not T replace 4J04D
41	9-34	02G28	7	2B9	L	If L scope item 42 If H replace 7J27B 7J20E 8J06D
42	9-34	15G28	3	2G9	H	If H scope item 43 If L replace 3J09G 7J26B
43	9-34	2XG28	7	2A21	L	If L scope item 44 If H replace 7J23D
44	9-21	09N07	4	1G24	L	If L scope item 45 If not L replace 4J32D 4J31D 3J04B 4J12A
45	9-12	12E20	3	1G5	H	If H scope item 46 If not H replace 3J27D 3J12C
46	9-12	20G23	3	1C6	L	If L scope item 47 If H replace 3J29G 3J29B 3J30B 3J29C
47	9-7	05J11	3	1A19	H	If H scope item 48 If L replace 3J10D 7J31E 7J32E 7J28B 7J27B 3J12A
48	9-18	29N02	4	2D12	H	If H scope item 49 If not H replace 4J16D 3J04D



<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
49	9-45	37F21	3	1G22	H	If H scope item 50. If L replace 3J19E
50	9-14	04G25	3	1A8	L	If L scope item 51 If H replace 3J27B 3J27C
51	9-45	97F21	3	1G20	H	If H scope item 52 If L replace 3J20C 3J20B 3J20A
52	9-14	14G25	3	1D8	L	If L scope item 53 If H replace 3J26F 3J27C
53	9-7	04J11	3	1B19	L	If L scope item 54 If H replace 3J10D
54	9-5	84C03	4	2E32	T	If T scope item 55 If not T replace 4J04D
55	9-6	95C01	7	1G31	T	If T scope item 56 If not T replace 7J18D
56	9-18	01N02	3	2F22	L	If L scope item 57 If H replace 3J02E
57	9-15	03G21	3	2F30	H	If H scope item 58 If L replace 3J27B 3J26E
58	9-49	41E00	7	2A17	H	If H do step 81 If L replace 7J16E
59	9-12	00E20	3	1F6	T	If T scope item 60 If not T replace 3J29E
60	9-12	09E20	3	1G4	T	If T replace item 61 If not T replace 3J29D 3J27E
61						Replace 3J28C 3J27G 3J28G
62	9-134	1XG81	7	2F24	H	If H scope item 63 If L replace 7J32F 7J33F

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
63	9-3	01J01	3	2F31	H	If H do step 84 If L replace 3J32C
64	9-134	2F24	7	2F24	L	If L do step 89 If H replace 7J32F 7J33F
65						Replace 7J23E 3J13G 7J20G 7J20F
66	9-21	09N07	4	1G24	T	If T scope item 67 If not T replace 4J31D 3J02B 4J32D
67	9-18	30N02	3	2A24	H	If H do step 96 If L replace 3J02G
68						Replace 3J25B 3J13G 3J28C 7J19E
69						Replace 3J10E
70	9-18	19N02	4	2E12	H	If H scope item 71 If L replace 4J15D
71	9-14	40E20	3	1F8	H	If H do step 105 If L replace 3J30F
72	9-21	10N07	3	2D27	L	If L scope item 73 If H replace 3J02A
73	9-27	11E32	3	2E8	H	If H scope item 74 If L replace 3J28A
74	9-27	21E32	3	2D8	H	If H scope item 75 If L replace 3J13A 3J11A
75	9-27	0XG32	4	1C25	L	If L replace item 76 If H replace 4J04B
76						Replace 4J26D 3J10E 4J23G 4J25A 4J20F 3J32C



Perform the following procedure when the diagnostic portion of the loader routine (EZLOAD) detected an error and thereby caused a program stop to occur.

Observe P register, then find the value of P in the following list and do as directed.

<u>P</u>	<u>DO THE FOLLOWING</u>
000441	Replace item 1
000501	Replace item 2
000505	Replace item 3
000522	Replace item 4
000541	Test 3.2.1
000542	Test 3.2.2
000543	Replace item 5
000546	Test 3.2.3
000547	Replace item 6
000552	Test 3.2.4
000556	Replace item 7
000560	Test 3.2.5
000561	Replace item 8
000567	Test 3.2.6
000575	Test 3.2.7
000601	Test 3.2.8
000603	Test 3.2.9
000641	Test 3.2.10
000646	Replace item 9
000661	Replace item 10
010641	Replace item 11

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 4J23D 4J24C
2						Replace 4J26G 4J14B 4J17B
3						Replace 4J14G
4						Replace 3J20B 3J19E 3J09C

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
5						Replace 7J30C 7J31D 7J33D 7J33B
6						Replace 4J24G 3J06C 3J05D 3J16D 4J02D 4J23F
7						Replace 3J29F 3J16G 3J19B 3J22C 3J29G
8						Replace 3J18F 3J18D 3J17G 3J02A
9						Replace 4J22F 4J20G 4J24F
10						Replace 4J18B 4J26F 4J23F
11						Replace 4J25E 4J20A 4J20C 4J20F

3.2.1

STOP, P = 000541

3.2.1

Step 1. Interchange 8J17A with 8J18A. Refer to paragraph 2.2 and attempt to load the program; then do step 2.

Step 2. Observe error indications.

- a) If same error indications occur, do test 3.2.2.
- b) If different error indications occur, replace 8J18A.

- Step 1. Observe P register.  
 a) If P equals 000541, do step 2.  
 b) If P equals 000542, do step 3.

- Step 2. Observe STOP indicator that is lit. Find that indicator in the following list and replace card as directed.

<u>INDICATOR</u>	<u>REPLACE</u>
STOP 5	7J30C
STOP 4	7J31C
STOP 3	7J32C
STOP 2	7J31B
STOP 1	7J32B
STOP 0	7J31A

- Step 3. Observe STOP indicator that is not lit. Find that indicator in the following list and replace item as directed.

<u>INDICATOR</u>	<u>REPLACE</u>
STOP 5	Item 1
STOP 4	Item 2
STOP 3	Item 3
STOP 2	Item 4
STOP 1	Item 5
STOP 0	Item 6

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 7J30C 7J33D 7J31D
2						Replace 7J31C 7J33D 7J29B and/or Select Stop Switch S5
3						Replace 7J32C 7J34D 7J29B and/or Select Stop Switch S4

3.2.2  
(Cont)

3.2.2  
(Cont)

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
4						Replace 7J31B 7J34D 7J29B and/or Select Stop Switch S3
5						Replace 7J32B 7J32D 7J29C and/or Select Stop Switch S2
6						Replace 7J31A 7J32D 7J29C and/or Select Stop Switch S1

3.2.3

STOP, P = 000546

3.2.3

A stop at this address if  $A_U$  is cleared indicates a malfunction in the JPAUZ instruction (60); if  $A_U$  contains any indicators that are lit, it indicates that a bit was picked up.

- Step 1. Observe  $A_U$  register.
- If  $A_U$  is cleared, do step 2.
  - If  $A_U$  equals 000040, replace item 1.
  - If  $A_U$  equals 000060, replace item 2.
  - If  $A_U$  equals 000177, replace item 3.
  - If  $A_U$  equals any other value, replace item 4.

- Step 2. Observe  $A_L$  register.
- If  $A_L$  equals 674170, replace item 6.
  - If  $A_L$  equals any other value, replace item 5.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 4J14B 4J14D
2						Replace 4J30C

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
3						Replace 4J31D 4J28D 4J03D 3J03F
4						Replace 3J26D 3J25D 7J19A
5						Replace 4J34F 3J03F 3J26D
6						Replace 4J28E 4J11C 4J09A 4J06A

3.2.4

STOP, P = 000552

3.2.4

Step 1. Observe AU register. Find value of AU in the following list and do as directed.

<u>AU</u>	<u>DO THE FOLLOWING</u>
000001	Replace item 1
000002	Replace item 2
000004	Replace item 3
000010	Replace item 4
000020	Replace item 5
000040	Replace item 6
000100	Replace item 7
000200	Replace item 8
000400	Replace item 9
001000	Replace item 10
002000	Replace item 11
004000	Replace item 12
010000	Step 2
020000	Step 9
040000	Replace item 21
100000	Replace item 22
200000	Replace item 23
400000	Replace item 24
771577	Replace item 25
775777	Replace item 26
777777	Step 16
Any other value	Step 16

Step 2. Press OP STEP MODE and master clear computer.



- Step 3. Press  $Z_1$  register bit 12 and observe that bit 12 remains lit; if not, replace item 13.
- Step 4. Press  $A_L$  register bit 12 and observe that bit 12 remains lit; if not, replace item 14.
- Step 5. Master clear computer.
- Step 6. Ground test point 2F20 on chassis 3 and scope item 15.
- Step 7. Remove ground on test point 2F20 on chassis 3 and ground test points 2D20 and 2G20 on chassis 3.
- Step 8. Scope item 17.
- Step 9. Press OP STEP MODE and master clear computer.
- Step 10. Press  $A_L$  register bit 13 and observe that bit 13 remains lit; if not, replace item 18.
- Step 11. Clear  $A_L$  register.
- Step 12. Ground test points 2G20 and 2F20 on chassis 3.
- Step 13. Scope item 19.
- Step 14. Remove ground on test point 2G20 on chassis 3 and ground test point 2D20 on chassis 3.
- Step 15. Scope item 20.
- Step 16. Press OP STEP MODE and master clear computer.
- Step 17. Clear PHASE register.
- Step 18. Press PHASE STEP MODE.
- Step 19. Set PHASE REPEAT up.
- Step 20. Press PHASE 1.
- Step 21. Set  $A_U$  to 000007.
- Step 22. Temporarily ground test point 2F26 on chassis 3.
- Step 23. Observe  $A_U$  register indicators.
  - a) If none are lit, do step 24.
  - b) If any are lit, replace item 27.
- Step 24. Clear PHASE register.
- Step 25. Set PHASE REPEAT down.
- Step 26. Set FUNCTION CODE to 12.
- Step 27. Set FUNCTION REPEAT up.
- Step 28. Set P to 000500.

- Step 29. Press OP STEP MODE.
- Step 30. Set RESTART/START STEP to START STEP twice.
- Step 31. Observe  $A_L$  register.
  - a) If  $A_L$  equals 5073XX (where X equals 0 through 7), do step 32.
  - b) If  $A_L$  equals any other value, replace item 28.
- Step 32. Set FUNCTION REPEAT down.
- Step 33. Master clear computer.
- Step 34. Press PHASE STEP MODE.
- Step 35. Press TIMING 42, 43, and 44.
- Step 36. Press PHASE 1 and repeatedly set RESTART/START STEP to START STEP until TIMING 21 lights.
- Step 37. Observe P register indicators.
  - a) If none are lit, do step 38.
  - b) If any are lit, replace item 29.
- Step 38. Press ADV P SEQ bit 1 and set RESTART/START STEP to START STEP.
- Step 39. Scope item 30.
- Step 40. Set RESTART/START STEP to START STEP and scope item 40.
- Step 41. Press OP STEP MODE and master clear computer.
- Step 42. Press PHASE STEP MODE and clear PHASE register.
- Step 43. Press PHASE 1.
- Step 44. Set FUNCTION CODE to 14.
- Step 45. Press TIMING 42, 43, and 44.
- Step 46. Press SEQ DES clear pushbutton and while holding SEQ DES clear, repeatedly set RESTART/START STEP to START STEP until TIMING 14 is lit, then release SEQ DES clear pushbutton.
- Step 47. Set  $A_L$  to 703000.
- Step 48. Set  $S_1$  register to 010000.
- Step 49. Press SEQ DES RI.
- Step 50. Press ADV P SEQ bit 0.
- Step 51. Press  $Z_1$  clear pushbutton and while holding  $Z_1$  clear, repeatedly set RESTART/START STEP to START STEP until TIMING 32 is lit, then release  $Z_1$  clear pushbutton.

3.2.4  
(Cont)

3.2.4  
(Cont)

Step 52. Set Z<sub>1</sub> to 703000.

Step 53. Set RESTART/START STEP to START STEP and scope item 42.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 4J16A 4J11E 4J10G
2						Replace 4J11E 4J09G 4J15A
3						Replace 4J08G 4J10D 4J14A
4						Replace 4J11E 4J10F 4J16B
5						Replace 4J09F 4J11E 4J15B
6						Replace 4J08F 4J10D 4J14B
7						Replace 4J10E 4J11D 4J16C
8						Replace 4J09E 4J11D 4J15C
9						Replace 4J08E 4J11E 4J14C
10						Replace 4J10C 4J11D 4J16E
11						Replace 4J09C 4J11D 4J15E
12						Replace 4J08C 4J11C 4J14E 4J23C

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
13						Replace 7J06B
14						Replace 4J30E
15	9-110	64Z12	4	2F3	H	If H scope item 16 If L replace 4J07B
16	9-84	14X12	4	2F6	L	If L do step 7 If H replace 4J11C 4J10B
17	9-84	13X12	4	2F9	H	If H replace 4J07B 4J10B 4J16F If L replace 4J10B
18						Replace 4J30E
19	9-84	14X13	4	2G6	L	If L do step 14 If H replace 4J11C 4J09B
20	9-84	13X13	4	2G9	H	If H replace 4J15F 4J22B 4J06B If L replace 4J09B
21						Replace 4J08B 4J10D 4J14F 4J22A
22						Replace 4J10A 4J11C 4J16G
23						Replace 4J09A 4J11C 4J15G 4J24B
24						Replace 4J08A 4J10D 4J14G 4J23A
25						Replace 3J04A 3J17E 3J16E

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
26						Replace 4J11D 4J09C 4J06C
27						Replace 4J28D 4J31D 3J03F
28						Replace 4J28F
29						Replace 4J34B 7J21F
30	9-86	0XD13	4	2G14	L	If L scope item 31 If H replace 4J15F
31	9-88	0XX13	4	2G20	L	If L scope item 32 If H replace 4J18F
32	9-96	14A13	4	1G3	H	If H scope item 33 If L replace 4J23B 4J20B 4J27A
33	9-88	0XX12	4	2F20	L	If L scope item 34 If H replace 4J19F
34	9-86	0XD12	4	2F14	L	If L scope item 35 If H replace 4J16F
35	9-96	10A12	4	1F17	H	If H scope item 36 If L replace 4J22B
36	9-86	0XD14	4	2A13	L	If L scope item 37 If H replace 4J14F
37	9-88	0XX14	4	2A19	L	If L scope item 38 If H replace 4J17F
38	9-96	11A14	4	1A13	L	If L scope item 39 If H replace 4J21A 4J21B
39	9-96	14A14	4	1A2	H	If H do step 40 If L replace 4J23B
40	9-88	0XX17	4	2D19	H	If H scope item 41 If L replace 4J08A 4J10D 4J17G

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
41	9-88	0XX10	4	2D20	H	If H do step 41 If L replace 4J09C 4J11D 4J18E
42	9-96	10A17	4	1D16	H	If H scope item 43 If L replace 4J26B
43	9-96	12A17	4	1D8	L	If L scope item 44 If H replace 4J23A
44	9-96	13A17	4	1D5	H	If H scope item 45 If L replace 4J24A
45	9-96	14A17	4	1D2	L	If L scope item 46 If H replace 4J27B
46	9-96	10A16	4	1C16	H	If H scope item 47 If L replace 4J26B
47	9-96	12A16	4	1C8	L	If L scope item 48 If H replace 4J24B
48	9-96	13A16	4	1C5	H	If H scope item 49 If L replace 4J24A
49	9-96	14A16	4	1C2	L	If L scope item 50 If H replace 4J25B
50	9-86	0XD09	4	2C14	H	If H scope item 51 If L replace 4J10C 4J16E
51	9-86	0XD10	4	2D14	H	If H scope item 52 If L replace 4J09C
52	9-95	10A10	4	1D17	H	If H scope item 53 If L replace 4J26D
53	9-95	13A10	4	1D6	H	If H scope item 54 If L replace 4J24C
54	9-95	14A10	4	1D3	L	If L replace 3J04A 4J16D 3J17E If H replace 4J25D 4J28F

3.2.5

STOP, P = 000560

3.2.5

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Scope item 1.
- Step 3. Ground test point 1F22 on chassis 8.
- Step 4. Scope item 3.
- Step 5. Remove ground on test point 1F22 on chassis 8.
- Step 6. Ground test point 2G20 on chassis 3.
- Step 7. Scope item 5.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1	9-20	09N04	4	1C20	L	If L scope item 2 If H replace 4J28D 4J13D
2	9-18	20N02	3	2F24	L	If L do step 3 If H replace 3J04F
3	9-81	11X17	8	1F23	L	If L scope item 4 If H replace 8J06G
4	9-81	1G23	8	1G23	L	If L do step 5 If H replace 8J06G
5	9-84	14X17	4	2D5	L	If L scope item 6 If H replace 4J10D 4J08A
6	9-84	14X16	4	2C5	L	If L scope item 7 If H replace 4J11C 4J09A
7	8-84	14X15	4	2B5	L	If L scope item 8 If H replace 4J11C 4J10A
8	8-84	14X14	4	2A5	L	If L replace 4J28A 4J29A 4J30A 4J29C 4J30C If H replace 4J10D 4J08B

3.2.6

STOP, P = 000567

3.2.6

Step 1. Observe AU register. Find the value of AU in the following list and do as directed.

<u>AU</u>	<u>DO THE FOLLOWING</u>
000002	Replace 7J07G
000004	Replace 7J08G
000010	Replace 7J06F
000400	Replace 7J08E
000561	Replace item 1
001000	Replace 7J06C
002000	Replace 7J07C
010000	Replace 7J06B
040000	Replace 7J08B
100000	Replace 7J06A
400000	Replace 7J08A
574170	Replace item 2
777777	Replace item 3

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 4J03A 4J04A 4J02A 3J04A
2						Replace 3J03B 3J21C
3						Replace 3J18C 3J19B 3J06F 4J05D 3J06G

3.2.7

STOP, P = 000575

3.2.7

A stop at this address indicates that the ENTAL instruction (12) does not change the AL register. Replace 3J19A  
3J21D  
3J04E.

3.2.8

STOP, P = 000601

3.2.8

A stop at this address indicates that the CL instruction (40) failed to clear a specific address.



Step 1. Observe  $A_L$  register. Find value of  $A_L$  in the following list and do as directed.

<u><math>A_L</math></u>	<u>DO THE FOLLOWING</u>
000000	Replace item 1
000001	Replace item 2
000002	Replace item 3
000004	Replace item 4
000007	Replace item 5
000020	Replace item 6
000040	Replace item 7
000056	Replace item 7
007777	Step 2
770000	Step 6
777777	Step 14

- Step 2. Press OP STEP MODE and master clear computer.
- Step 3. Set FUNCTION CODE to 72.
- Step 4. Scope item 8.
- Step 5. Ground test point 2B20 on chassis 3 and scope item 10.
- Step 6. Press OP STEP MODE and master clear computer.
- Step 7. Press PHASE STEP MODE.
- Step 8. Clear PHASE register.
- Step 9. Press MULT/DIV SEQ bit 1.
- Step 10. Press K register bit 4.
- Step 11. Set PHASE REPEAT up.
- Step 12. Press PHASE 4.
- Step 13. Scope item 11.
- Step 14. Press OP STEP MODE and master clear computer.
- Step 15. Press ICR bit 0 and press PHASE STEP MODE.
- Step 16. Press MULT/DIV SEQ bit 1.
- Step 17. Scope item 13.
- Step 18. Set FUNCTION CODE to 40 and scope item 16.
- Step 19. Clear FUNCTION CODE register, then set FUNCTION CODE to 72.
- Step 20. Ground test point 2C20 on chassis 3 and scope item 18.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 3J16D 3J17C 3J16B
2						Replace 4J03G 4J03C 4J02C
3						Replace 4J02C 4J03C 4J04F
4						Replace 4J03C 4J03E
5						Replace 4J12D 4J03C 4J04E
6						Replace 4J04G 4J09F 4J11E
7						Replace 4J03C 3J09G
8	9-48	11F72	3	2D1	L	If L scope item 9 If H replace 3J16D 3J17C
9	9-48	41F40	3	2B3	L	If L do step 5 If H replace 3J16B
10	9-17	59N01	4	2A24	L	If L replace 7J07D 3J06B 3J07B If H replace 4J09D 3J06F
11	9-89	0XW01	4	2B18	L	If L scope item 12 If H replace 4J32A
12	9-39	12X04	4	2E26	L	If L replace 3J06B 4J30G 4J32A If H replace 4J04G
13	9-47	20F40	3	1G29	L	If L scope item 14 If H replace 3J18A

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
14	9-81	12X15	8	1G22	H	If H scope item 15 If L replace 8J06G 8J07F
15	9-39	12X00	4	2A26	L	If L do step 18 If H replace 4J03G 3J16D
16	9-19	30N03	3	2B22	H	If H scope item 17 If L replace 3J07B 3J17G 3J18A
17	9-48	41F40	3	2B3	L	If L do step 19 If H replace 3J16B 3J18A
18	9-17	59N01	4	2A24	L	If L replace 3J06B 7J07D 3J07B 4J09D 3J06F If H replace 4J09D 3J06F 3J05G 3J06B

3.2.9

STOP, P = 000603

3.2.9

Step 1. Observe A<sub>U</sub> register. Find value of A<sub>U</sub> in the following list and do as directed.

<u>A<sub>U</sub></u>	<u>DO THE FOLLOWING</u>
000000	Replace 4J17B
000010	Replace 3J17C
000147	Replace 3J22D
000414	Replace 3J16A
000455	Replace item 1
000515	Replace item 2
000545	Replace item 3
000551	Replace item 4
000554	Replace item 5
000555	Step 2
000556	Replace 3J04B
000557	Replace 4J34D
777777	Replace 3J06B

Step 2. Interchange 4J16F with 4J19A.

3.2.9  
(Cont)

3.2.9  
(Cont)

- Step 3. Interchange 4J16E with 4J18A.
- Step 4. Interchange 4J15E with 4J17A.
- Step 5. Interchange 4J14E with 4J19B.
- Step 6. Interchange 3J17B with 3J18F.
- Step 7. Refer to paragraph 2.2 and attempt to load the program; then do step 8.
- Step 8. Observe error indications.  
a) If same error indications occur, replace item 6.  
b) If different error indications occur, replace item 7.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 4J10E 4J33C
2						Replace 4J08F 4J34B
3						Replace 4J10F 4J32B
4						Replace 4J08G 4J32B
5						Replace 4J10G 4J33A
6						Replace 3J21A 3J20A 3J21F 3J24B 3J22F
7						Replace 4J19A 4J18A 4J17A 4J19B 3J18F

3.2.10

STOP, P = 000641

3.2.10

- Step 1. Observe  $A_U$  register. Find value of  $A_U$  in the following list and do as directed.

<u>A<sub>U</sub></u>	<u>DO THE FOLLOWING</u>
000000 through 03XXXX	Step 2
040000 through 16XXXX	Replace item 5
170000 through 2XXXXX	Step 3
3XXXXX	Replace item 6
4XXXXX	Replace item 5
50XXXX through 53XXXX	Step 4
54XXXX	Replace item 10
55XXXX	Replace item 10
56XXXX	Step 5
571XXX	Replace item 12
572XXX through 573415	Replace item 13
573416 through 5737XX	Step 6
574XXX through 70XXXX	Replace item 97
71XXXX	Replace item 98
72XXXX	Replace item 98
73XXXX through 743XXX	Replace item 99
744XXX	Replace item 100
7451XX through 76XXXX	Replace item 101
77XXXX	Replace item 102

Step 2. Observe A<sub>L</sub> register. Find value of A<sub>L</sub> in the following list and replace item as directed.

<u>A<sub>L</sub></u>	<u>REPLACE</u>
000000 through 4XXXXX	Item 1
50XXXX through 56XXXX	Item 2
57XXXX	Item 3
6XXXXX	Item 3
7XXXXX	Item 4

Step 3. Observe A<sub>L</sub> register.  
 a) If value in A<sub>L</sub> is less than 573377, replace item 21.  
 b) If value in A<sub>L</sub> is greater than 573377, replace item 6.

Step 4. Observe A<sub>L</sub> register.  
 a) If value in A<sub>L</sub> is less than 300000, replace item 9.  
 b) If value in A<sub>L</sub> is greater than 300000, replace item 10.

Step 5. Observe A<sub>L</sub> register.  
 a) If value in A<sub>L</sub> is less than 200000, replace item 10.  
 b) If value in A<sub>L</sub> is greater than 200000, replace item 11.

Step 6. Observe A<sub>L</sub> register. Find the value of A<sub>L</sub> in the following list and do as directed.

<u>A<sub>L</sub></u>	<u>DO THE FOLLOWING</u>
000000 through 02XXXX	Replace item 14
03XXXX	Replace item 15
04XXXX	Replace item 16
05XXXX	Replace item 16

A<sub>L</sub>

DO THE FOLLOWING

06XXXX through 16XXXX  
17XXXX through 1733XX  
1734XX through 173412  
173413 through 173417  
173420 through 173426  
173427 through 25XXXX  
26XXXX  
27XXXX through 273415  
273416 through 277XXX  
30XXXX through 367XXX  
370XXX through 373415  
373416 through 373417  
373420 through 373421  
373422 through 373423  
373424 through 37XXXX  
40XXXX  
41XXXX  
42XXXX  
43XXXX  
44XXXX  
45XXXX  
46XXXX  
470XXX through 473416  
473417 through 477XXX  
5050XX through 5055XX  
5056XX  
5057XX  
506XXX  
507XXX  
51XXXX  
52XXXX  
530XXX through 532XXX  
533000 through 523414  
533415 through 527XXX  
540000 through 543XXX  
544000 through 547XXX  
550500 through 5505XX  
5506XX  
5507XX  
551XXX  
522XXX  
523XXX  
524XXX  
525XXX  
526XXX  
557XXX  
56XXXX  
570XXX  
571XXX  
5720XX  
5721XX

Replace item 17  
Replace item 18  
Replace item 20  
Replace item 22  
Replace item 23  
Replace item 19  
Replace item 24  
Replace item 25  
Replace item 26  
Test 3.2.1.12  
Replace item 27  
Replace item 28  
Replace item 29  
Replace item 30  
Replace item 31  
Replace item 32  
Replace item 32  
Replace item 32  
Replace item 33  
Replace item 34  
Replace item 35  
Replace item 35  
Replace item 36  
Replace item 37  
Replace item 38  
Replace item 39  
Replace item 39  
Replace item 39  
Replace item 40  
Replace item 41  
Replace item 42  
Replace item 43  
Replace item 44  
Replace item 45  
Replace item 46  
Replace item 47  
Replace item 42  
Replace item 48  
Replace item 48  
Replace item 49  
Replace item 49  
Replace item 50  
Replace item 51  
Replace item 51  
Replace item 52  
Replace item 52  
Replace item 53  
Replace item 42  
Replace item 54  
Replace item 54  
Replace item 55

AL

DO THE FOLLOWING

572200 through 572XXX	Replace item 56
573000 through 573345	Replace item 57
573346 through 573373	Replace item 58
573374 through 573407	Replace item 59
573410	Replace item 60
573411	Replace item 60
573412	Replace item 61
573413	Replace item 61
573414	Replace item 62
573415	Replace item 63
573416	Replace item 64
573417	Replace item 65
573420	Replace item 66
573421	Replace item 66
573422	Replace item 67
573423	Replace item 67
573424	Replace item 68
573425	Replace item 68
573426	Replace item 69
573427	Replace item 70
573430	Replace item 70
573431	Replace item 71
573432	Replace item 71
573433	Replace item 72
573434	Replace item 72
573435	Replace item 73
573436	Replace item 73
573437	Replace item 73
573440 through 57347X	Replace item 74
5735XX through 5737XX	Replace item 75
574XXX	Replace item 76
5750XX through 5753XX	Replace item 77
5754XX through 5773XX	Replace item 78
5774XX through 6003XX	Replace item 79
6004XX through 6027XX	Replace item 80
6030XX through 612XXX	Replace item 81
613XXX	Replace item 82
614XXX through 62XXXX	Replace item 83
63XXXX	Replace item 84
64XXXX	Replace item 85
65XXXX	Replace item 86
66XXXX through 673414	Replace item 87
673415	Replace item 88
673416	Replace item 89
673417	Replace item 90
673420 through 730XXX	Replace item 90
731XXX	Replace item 91
732XXX	Replace item 91
7330XX through 733414	Replace item 92
733415 through 75XXXX	Replace item 45
76XXXX through 773414	Replace item 93
773415	Replace item 93

A<sub>L</sub>

DO THE FOLLOWING

773416  
773417  
773420 through 777XXX

Replace item 94  
Replace item 95  
Replace item 96

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 4J08D 4J05F
2						Replace 4J09F 4J06F 4J34B
3						Replace 3J24G 4J09F 4J27F
4						Replace 4J27F 4J24G 4J26F 8J15E
5						Replace 3J16F 4J21E 4J19G 4J16G
6						Replace 4J27B 4J26A 4J26B
7						Replace 4J26B 4J14C 4J26A
8						Replace 4J27B 4J23A
9						Replace 4J14F 4J17F 4J18F 4J18G
10						Replace 4J20B 4J23B 4J15F



<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
11						Replace 4J22B 4J16F 4J19F
12						Replace 4J25D 4J24C 4J18E 4J15E
13						Replace 4J25D 4J19E 4J16E
14						Replace 3J21D 3J20B 3J10F
15						Replace 4J23E 3J12B 4J25E
16						Replace 4J26E 4J25E
17						Replace 4J23E 3J29F 4J26E
18						Replace 4J26A 4J27B 4J23A
19						Replace 4J17G 4J08A 4J14G
20						Replace 4J25B 4J10D 4J15G
21						Replace 4J17G 4J14G
22						Replace 4J18G 4J15G
23						Replace 4J21E 4J24B
24						Replace 4J22B 4J21A 4J20A

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
25						Replace 4J21E 4J23E 4J25F 4J26A
26						Replace 4J24B 4J22A 4J27A 4J17F
27						Replace 4J15G 3J04D 4J21A 4J26B
28						Replace 4J24B 4J26A 4J21E
29						Replace 4J24B 4J34G 4J04A
30						Replace 4J25B 4J18G 4J24A 4J26B
31						Replace 4J18G 4J25B 4J15G 4J24B
32						Replace 4J23E 4J25E 7J32F
33						Replace 4J27D
34						Replace 4J22B 4J21A
35						Replace 4J27D 4J20A 4J26C
36						Replace 4J27D 4J21E 4J22B 4J26C 4J22A

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
37						Replace 4J24B 4J22E 4J24A
38						Replace 4J25D 4J24D 4J26C
39						Replace 4J33A 3J21A 3J22B
40						Replace 4J27D 4J24C 4J14E 4J08C
41						Replace 4J23E 4J25A 4J24B 4J26E
42						Replace 4J23E 4J21E 4J24E
43						Replace 4J27C 4J26C 4J24D 4J23E
44						Replace 4J23B 4J22A 4J21A
45						Replace 4J20A 4J27G 4J25F 4J22A
46						Replace 4J23E 4J25C 4J26C
47						Replace 4J17E 4J14E 4J08C 4J27D
48						Replace 3J17C 3J19F 8J06D

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
49						Replace 4J24E 4J23E 4J27D
50						Replace 4J22C 4J23E 3J07G
51						Replace 3J07G 4J22C 4J24E 4J25D
52						Replace 4J25D 4J24C 4J32E
53						Replace 4J24E 4J23C 3J02G
54						Replace 4J24E 4J25F
55						Replace 4J25F 4J15B
56						Replace 4J26E 4J14B
57						Replace 4J22C 4J14C 4J17C 4J21C 4J23D
58						Replace 4J27E 3J02E 4J23G
59						Replace 4J20E 4J14G 4J26B
60						Replace 4J25B 4J20E 4J15G 4J25A
61						Replace 4J27A 4J20E

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
62						Replace 4J23A 4J24A 4J27B 4J13B
63						Replace 4J23A 4J20F 4J27D
64						Replace 4J16C 4J16D
65						Replace 4J27A 4J23A 4J17G
66						Replace 4J25A 4J22E 4J26A
67						Replace 4J25A 4J19G
68						Replace 4J26A 4J20E 4J22E 4J27B
69						Replace 4J25A 4J17G 4J24B 4J26E
70						Replace 4J20E 4J25A 4J22E
71						Replace 4J25A 4J15G
72						Replace 4J20E 4J25A 4J16G 4J19G
73						Replace 4J26A 4J24A 4J20E 4J25A

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
74						Replace 4J22E 4J04B 4J13G
75						Replace 3J13A 3J16B 3J19C
76						Replace 4J22C 4J24D 4J22A 4J22F
77						Replace 4J17C 4J21C 4J23D 4J14C
78						Replace 4J24D 4J21D 4J24C
79						Replace 4J27C 4J23C 4J26C 4J24D
80						Replace 4J27C 4J26C 4J24D
81						Replace 4J25C 4J25E 4J27C
82						Replace 4J27D 4J22B 4J20A
83						Replace 4J21C 4J24C 4J23D
84						Replace 4J26C 4J25C 4J25E 4J27D
85						Replace 3J07A 3J18E 3J11D

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
86						Replace 4J23B 4J21A 4J22B
87						Replace 4J26A 4J27A 4J24B 4J27B
88						Replace 4J21E 4J23E 4J24E
89						Replace 4J27A 4J19F
90						Replace 4J24B 4J27A 4J21E
91						Replace 4J25F 4J16B
92						Replace 4J21A 4J23B 4J21B
93						Replace 4J27F 4J14A 4J26F
94						Replace 4J24B 4J21A 4J21B
95						Replace 4J21E 4J27A 4J14F
96						Replace 4J26A 4J26B 4J25B
97						Replace 3J23C 4J15C 4J16E
98						Replace 4J19G 4J18G 4J30A 4J29A

3.2.10  
(Cont)

3.2.10  
(Cont)

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
99						Replace 7J11E 7J18C 6J32E 3J11E
100						Replace 3J03F 3J04C
101						Replace 4J23F 4J26G 4J24F
102						Replace 4J33D 3J06C 4J04D





Perform the following procedures when the bootstrap program was successfully executed but the loader routine (EZLOAD) has failed to load the logic test (CONTBASI).

- Step 1. Observe PROGRAM FAULT indicator.  
 a) If lit, do test 3.3.1.  
 b) If not lit, do step 2.
- Step 2. Press OP STEP MODE.
- Step 3. Set SEQ STEP/STOP to SEQ STEP.
- Step 4. Observe SEQ DES register while repeatedly setting RESTART/  
 START STEP to START STEP.  
 a) If no sequencing of SEQ DES is occurring, set SEQ STEP/STOP  
 to STOP and do test 3.3.3.  
 b) If sequencing is occurring, set SEQ STEP/STOP to STOP and  
 repeatedly set RESTART/START STEP to START STEP until  
 the highest value in P register is attained, then do test 3.3.2.

## 3.3.1

## FAULTS

## 3.3.1

- Step 1. Observe P register. Find value of P in the following list and do as directed.

<u>P</u>	<u>DO THE FOLLOWING</u>
000100	Replace item 1
000101	Step 2
000105	Replace item 5
000123	Replace item 6
000402	Replace item 6
000403	Replace item 7
000444	Step 12
000446	Replace item 11
000542	Replace item 12
000543	Replace item 13
000544	Step 14
000547	Replace item 16
000550	Replace item 17
000554	Step 16
000555	Replace item 31
000557	Step 32
000571	Replace item 31
000600	Replace item 35
000604	Replace item 36
000607	Replace item 37
000640	Step 34
000642	Replace item 41
000677	Replace item 42
000700	Step 40

<u>P</u>	<u>DO THE FOLLOWING</u>
000701	Replace item 51
000704	Replace item 52
000705	Replace item 53
000710	Replace item 54
000743	Replace item 51
000751	Replace item 55
000764	Replace item 56
001151	Step 56
001174	Replace item 60
001501	Replace item 61
001551	Step 61
002375	Replace item 63
002551	Replace item 64
002605	Replace item 65
002737	Step 65
004551	Replace item 68
040551	Replace item 69
100174	Replace item 70
100554	Step 68
101311	Replace item 73
105615	Replace item 73
1X4201	Step 69
Any other value	Step 75

- Step 2. Press OP STEP MODE and master clear computer.
- Step 3. Set PROGRAM SKIP 0 and 3 up.
- Step 4. Press K register bit 0.
- Step 5. Scope item 2.
- Step 6. Set PROGRAM SKIP 0 and 3 down.
- Step 7. Press PHASE STEP MODE.
- Step 8. Clear PHASE register and press PHASE 2.
- Step 9. Press ADV P SEQ bit 0.
- Step 10. Set RESTART/START STEP to START STEP.
- Step 11. Scope item 4.
- Step 12. Observe AU register bit 5.
  - a) If not lit, replace item 8.
  - b) If lit, do step 13.
- Step 13. Observe AU register bit 6.
  - a) If not lit, replace item 9.
  - b) If lit, replace item 10.
- Step 14. Press OP STEP MODE and master clear computer.

- Step 15. Scope item 14.
- Step 16. Press OP STEP MODE and master clear computer.
- Step 17. Scope item 19.
- Step 18. Ground test point 2G24 on chassis 3 and scope item 20.
- Step 19. Remove ground on test point 2G24 on chassis 3.
- Step 20. Set FUNCTION CODE to 40.
- Step 21. Press RUN MODE.
- Step 22. Set FUNCTION REPEAT up.
- Step 23. Set RESTART/START STEP to START STEP.
- Step 24. Press OP STEP MODE.
- Step 25. Set FUNCTION REPEAT down and master clear computer.
- Step 26. Press PHASE STEP MODE.
- Step 27. Ground test point 2F20 on chassis 3.
- Step 28. Clear PHASE register.
- Step 29. Set PHASE REPEAT up.
- Step 30. Ground test point 2F24 on chassis 3.
- Step 31. Press PHASE 3 and scope item 21.
- Step 32. Press OP STEP MODE and master clear computer.
- Step 33. Set FUNCTION CODE to 76 and scope item 32.
- Step 34. Press OP STEP MODE and master clear computer.
- Step 35. Set FUNCTION CODE to 42.
- Step 36. Ground test point 2B22 on chassis 3.
- Step 37. Press A<sub>L</sub> register bit 17 and scope item 38.
- Step 38. Clear FUNCTION CODE register.
- Step 39. Set FUNCTION CODE to 43 and scope item 40.
- Step 40. Press OP STEP MODE and master clear computer.
- Step 41. Ground test point 1F13 on chassis 4.
- Step 42. Ground test point 1B12 on chassis 4 and scope item 43.

3. 3. 1  
(Cont)

3. 3. 1  
(Cont)

- Step 43. Remove grounds on test points 1B12 and 1F13 on chassis 4.
- Step 44. Ground test point 1G13 on chassis 4.
- Step 45. Scope item 44.
- Step 46. Remove ground on test point 1G13 on chassis 4.
- Step 47. Press OP STEP MODE and master clear computer.
- Step 48. Ground test point 1A14 on chassis 4 and scope item 45.
- Step 49. Remove ground on test point 1A14 on chassis 4.
- Step 50. Ground test point 1D14 on chassis 4 and scope item 46.
- Step 51. Remove ground on test point 1D14 on chassis 4 and ground test point 1E15 on chassis 4.
- Step 52. Press PHASE STEP MODE and scope item 47.
- Step 53. Remove ground on test point 1E15 on chassis 4.
- Step 54. Press PHASE 1 and observe MULT/DIV SEQ register bit 1.
  - a) If not lit, do step 55.
  - b) If lit, replace item 48.
- Step 55. Set FUNCTION CODE to 24 and scope item 49.
- Step 56. Press OP STEP MODE and master clear computer.
- Step 57. Press SR register bit 2 and observe that bit 2 remains lit; if not lit, replace item 57.
- Step 58. Set FUNCTION CODE to 50:62 and scope item 58.
- Step 59. Clear FUNCTION CODE, then set FUNCTION CODE to 05.
- Step 60. Scope item 59.
- Step 61. Press OP STEP MODE and master clear computer.
- Step 62. Clear B register, then set B to 31.
- Step 63. On chassis 8, momentarily ground the following test points: 1A3, 1D3, and 1E3.
- Step 64. Scope item 62.
- Step 65. Press OP STEP MODE and master clear computer.
- Step 66. Press PHASE STEP MODE and MULT/DIV SEQ bit 3.
- Step 67. Set FUNCTION CODE to 26 and scope item 66.

- Step 68. Observe A<sub>L</sub> register bit 14.  
 a) If not lit, replace item 71.  
 b) If lit, replace item 72.
- Step 69. Press OP STEP MODE and master clear computer.
- Step 70. Press PHASE STEP MODE and clear PHASE register.
- Step 71. Ground test point 1G17 on chassis 8.
- Step 72. Ground test point 1B11 on chassis 3.
- Step 73. Set FUNCTION CODE to 35.
- Step 74. Scope item 74.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 4J26E 4J15B
2	9-32	14G50	7	1C11	L	If L scope item 3 If H replace 7J30B
3	9-31	17G50	7	1E10	L	If L do step 6 If H replace 7J23A 7J33C
4	9-85	0XD06	4	2G15	L	If L replace 6J35E 6J19C 6J31E 4J07C If H replace 4J16C
5						Replace 4J21C 4J20D 4J16C 4J19C
6						Replace 4J33C 4J22D 4J15C
7						Replace 4J15C 4J33C 4J23D
8						Replace 4J11D 4J10E
9						Replace 7J06E 4J07E

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
10						Replace 4J32A 4J30G 4J10E 4J30F
11						Replace 4J33C 4J09E 4J06E
12						Replace 7J20A 7J21A 4J03C
13						Replace 4J18A 4J09G
14	9-98	02A35	4	1E30	L	If L scope item 15 If H replace 4J26A
15	9-19	39N06	4	2C22	H	If H replace 4J32A 3J03F 4J34G If L replace 4J33D 3J6C
16						Replace 4J25E 4J26E
17						Replace 8J15E 4J26F 4J27F 4J24G
18						Replace 3J04C 3J17B 3J21D 4J10C
19	9-48	11F71	3	2D2	H	If H do step 18 If L replace 3J16C 3J17C
20	9-18	18N02	3	2G23	L	If L do step 19 If H replace 3J05G
21	9-86	0XD09	4	2C14	L	If L scope item 22 If H replace 4J10C 4J11D 4J16E

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
22	9-85	0XD08	4	2B14	L	If L scope item 23 If H replace 4J08E 4J11E 4J14C
23	9-85	0XD07	4	2A14	L	If L scope item 24 If H replace 4J09E 4J11D 4J15C
24	9-85	0XD06	4	2G15	L	If L scope item 25 If H replace 4J10E 4J11D 4J14B
25	9-85	0XD05	4	2F15	L	If L scope item 26 If H replace 4J08F 4J10D 4J14B
26	9-85	0XD04	4	2E15	L	If L scope item 27 If H replace 4J09F 4J11E 4J15B
27	9-85	0XD03	4	2D15	L	If L scope item 28 If H replace 4J10F 4J11E 4J16B
28	9-85	0XD02	4	2C15	L	If L scope item 29 If H replace 4J08G 4J10D 4J14A
29	9-85	0XD01	4	2B15	L	If L scope item 30 If H replace 4J09G 4J11E 4J15A
30	9-85	0XD00	4	2A15	L	If L replace 3J05F If H replace 4J10G 4J11E 4J16A
31						Replace 3J18B 3J22G
32	9-22	50N12	3	2B16	L	If L scope item 33 If H replace 3J07F



<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
33	9-44	20F06	3	1F19	L	If L scope item 34 If H replace 3J21F
34	9-46	41F30	3	1G26	L	If L replace 3J16A 3J20B 4J33A If H replace 3J19F 3J19B
35						Replace 4J22A 4J25F 4J27G 4J20A
36						Replace 7J32F 4J24E 7J15E
37						Replace 3J25A 3J05D 4J26F 4J25F
38	9-19	08N03	3	2E21	L	If L scope item 39 If H replace 3J05B
39	9-33	31W17	4	2B23	L	If L do step 38 If H replace 4J34G 4J04A 3J18A
40	9-47	11F42	4	1G25	H	If H replace 3J33B 3J34A 4J34F If L replace 4J04A 3J18A
41						Replace 7J15E 4J10D 4J23E 4J27D
42						Replace 3J17D 3J16A 3J22D 3J22C
43	9-91	22A00	4	1F12	H	If H do step 43 If L replace 4J27G 4J26F

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
44	9-92	22A06	4	1F11	H	If H do step 46 If L replace 4J27D 4J26C
45	9-95	13A08	4	1B6	H	If H do step 49 If L replace 4J24C 4J22C
46	9-15	13A11	4	1E6	H	If H do step 51 If L replace 4J24C 4J23C
47	9-94	13A05	4	1F7	H	If H do step 53 If L replace 4J24F 4J23F
48						Replace 7J21F
49	9-45	31F24	3	1D21	L	If L scope item 50 If H replace 3J19E 3J20E 3J20D
50	9-93	21A15	4	1E1	H	If H replace 4J20A 4J22E 4J23E 4J24E If L replace 4J26A 4J27A
51						Replace 4J33C
52						Replace 3J03B 3J19B 3J21E
53						Replace 4J19C 4J20D 4J22D 4J16C
54						Replace 3J19B 3J23C 3J17C
55						Replace 4J18C 4J19C
56						Replace 4J25F 4J17B 4J18B

3.3.1  
(Cont)

3.3.1  
(Cont)

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
57						Replace 4J02F 4J03F
58	9-18	20N02	3	2F24	L	If L do step 62 If H replace 3J03G
59	9-19	18N03	3	2D21	H	If H replace 4J17C 3J19B 3J06B If L replace 3J05A 3J05B
60						Replace 4J25F 4J26F 4J25E
61						Replace 7J22B 7J24B 7J22C
62	9-106	21B00	8	1B29	H	If H replace 4J19E 1J33C 3J08E If L replace 8J10D 8J10B
63						Replace 7J21B 7J24B 7J25B
64						Replace 4J18E 4J29B 4J30B
65						Replace 4J26C 4J27C 4J24D
66	9-19	39N06	4	2C22	H	If H scope item 67 If L replace 4J33D 3J06C 3J07B
67	9-33	83A00	4	2A23	H	If H replace 4J26A 4J32A 3J03F If L replace 4J13G 4J32A
68						Replace 4J33F 4J17E

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
69						Replace 4J18F 4J32G
70						Replace 4J26F 4J25F
71						Replace 4J29E 9J06G 9J05G
72						Replace 4J10D 4J08B 4J05B
73						Replace 3J24C 3J23D 3J27B
74	9-40	29N16	3	1F11	H	If H scope item 75 If L replace 3J23E
75	9-47	11F45	4	1F25	H	If H replace 8J19G 8J15G 8J08G If L replace 4J04A 3J17B

3.3.2

LOOPS

3.3.2

- Step 1. Observe P register.  
a) If P is less than 000700, replace item 1.  
b) If P is greater than 000700, do step 2.
- Step 2. Observe A<sub>U</sub> register indicators.  
a) If none are lit, do step 3.  
b) If any are lit, do step 85.
- Step 3. Observe A<sub>L</sub> register indicators.  
a) If none are lit, do step 4.  
b) If any are lit, do step 74.
- Step 4. Observe C register indicators for input channel.  
a) If none are lit, do step 5.  
b) If any are lit, do step 59.
- Step 5. Observe CHANNEL and status grid for the input channel.  
a) If ID MON is not lit, replace item 2.  
b) If ID MON is lit, do step 6.

- Step 6. Press OP STEP MODE and master clear computer.
- Step 7. Set FUNCTION REPEAT up.
- Step 8. Set FUNCTION CODE to 40.
- Step 9. Press RUN MODE.
- Step 10. Set RESTART/START STEP to START STEP and scope item 16.
- Step 11. Press OP STEP MODE.
- Step 12. Set FUNCTION REPEAT down.
- Step 13. Master clear computer.
- Step 14. Press PHASE STEP MODE and scope item 18.
- Step 15. Clear PHASE register and set PHASE REPEAT up.
- Step 16. Press PHASE 4.
- Step 17. Ground test point 2C16 on chassis 3 and scope item 3.
- Step 18. Observe I/O TRANSLATOR ESA indicator.
  - a) If ESA is not lit, do step 19.
  - b) If ESA is lit, replace item 5.
- Step 19. Remove ground on test point 2C16 on chassis 3.
- Step 20. Ground test point 2F13 on chassis 7.
- Step 21. Ground test point 2A14 on chassis 7.
- Step 22. Press I/O TRANSLATOR CHANNEL for the input channel.
- Step 23. Press PHASE 3 and scope item 6 on the input channel chassis.
- Step 24. Remove grounds on test points 2F13 and 2A14 on chassis 7.
- Step 25. Ground test point 2E13 on chassis 7 and press I/O TRANSLATOR/  
FUNCTION bits 0 and 1.
- Step 26. Ground test point 2B5 on the input channel chassis and scope item 8.
- Step 29. Ground test point 2E16 on chassis 7 and test point 2D2 on input  
channel chassis.
- Step 30. Observe ID indicator on the input channel.
  - a) If ID is not lit, replace item 10 on the input channel chassis.
  - b) If ID is lit, scope item 11 on the input channel chassis.
- Step 31. Remove grounds on test point 2E16 on chassis 7 and test point 2D2  
on input channel chassis.
- Step 32. Ground test point 2A3 on chassis 7.

- Step 33. Momentarily ground test point 1E2 on chassis 3.
- Step 34. Ground test point 1B7 on the input channel chassis and scope item 12.
- Step 35. Remove ground on test point 1B7 and ground test point 1B8 on the input channel chassis.
- Step 36. Remove ground on test point 1B8 on the input chassis.
- Step 37. Ground test point 1A11 on the input channel chassis and scope item 13.
- Step 38. Remove ground on test point 1A11 on the input chassis.
- Step 39. Ground test point 1C8 on the input channel chassis and scope item 15.
- Step 40. Remove grounds on test point 1C8 on the input chassis and test point 2A3 on chassis 7.
- Step 41. Ground test point 2C15 on chassis 3.
- Step 42. Observe Z<sub>1</sub> register indicators.  
a) If none are lit, do step 43.  
b) If any are lit, replace the cards in item 38 that correspond to the indicators that are lit.
- Step 43. Remove ground on test point 2C15 on chassis 3.
- Step 44. Ground test point 2D15 on chassis 3.
- Step 45. Observe Z<sub>1</sub> register indicators.  
a) If none are lit, do step 46.  
b) If any are lit, replace the cards in item 38 that correspond to the indicator that is lit.
- Step 46. Remove ground on test point 2D15 on chassis 3.
- Step 47. Clear PHASE register.
- Step 48. Press OP STEP MODE and master clear computer.
- Step 49. Press PHASE STEP MODE and clear PHASE register.
- Step 50. Ground test point 2C16 on chassis 3.
- Step 51. Press PHASE 1 and observe S<sub>1</sub> register indicators.  
a) If none are lit, clear PHASE register and do step 52.  
b) If any are lit, replace the card in item 30 that corresponds to the indicator that is lit.
- Step 52. Remove ground on test point 2C16 on chassis 3.
- Step 53. Ground test point 2C5 on chassis 3.
- Step 54. Ground test point 1D1 on chassis 8 and set PHASE REPEAT down.

- Step 55. Press PHASE STEP MODE and scope item 31.
- Step 56. Set  $Z_1$  to 177777. If any of the indicators do not light, replace cards in item 38 that correspond to the error bit.
- Step 57. Set B to 177777 and scope item 32.
- Step 58. Clear  $Z_1$  register, then observe  $Z_1$  indicators.
  - a) If none are lit, replace item 39.
  - b) If any are lit, replace cards in item 38 that correspond to the bit that is lit.
- Step 59. Observe C register indicators that are lit for the input channel.
  - a) If all the indicators are lit, refer to test 3.1.2.
  - b) If any indicators are not lit, do step 60.
- Step 60. Press OP STEP MODE and master clear computer.
- Step 61. Set FUNCTION CODE to 47.
- Step 62. Set FUNCTION REPEAT up.
- Step 63. Set DISC ADV P up.
- Step 64. Set P to 001000.
- Step 65. Press RUN MODE.
- Step 66. Set RESTART/START STEP to START STEP and scope item 40.
- Step 67. Set SEQ STEP/STOP to STOP.
- Step 68. Ground test point 1E2 on chassis 3.
- Step 69. Press OP STEP MODE and scope item 43.
- Step 70. Clear FUNCTION CODE register.
- Step 71. Set FUNCTION CODE to 42.
- Step 72. Press  $A_L$  register bit 17 and scope item 46.
- Step 73. Refer to test 3.4.1.4.
- Step 74. Observe  $A_L$  register.
  - a) If upper 6 bits of  $A_L$  (12 through 17) are cleared, do step 75.
  - b) If only upper 3 bits of  $A_L$  (15 through 17) are cleared, refer to test 3.4.1.4
  - c) If any of upper 3 bits of  $A_L$  (15 through 17) are lit, replace item 52.
- Step 75. Press OP STEP MODE and master clear computer.
- Step 76. Set  $A_U$  to 400000.

- Step 77. Set  $A_L$  to 400000.
- Step 78. Ground test point 2E20 on chassis 3 and scope item 48.
- Step 79. Remove ground on test point 2E20 on chassis 3.
- Step 80. Press I/O TRANSLATOR/CHANNEL bit 3.
- Step 81. Ground test point 2A3 on chassis 7.
- Step 82. Press SEQ DES I/OI and I/OII and scope item 50.
- Step 83. Remove ground on test point 2A3 in chassis 3 and clear I/O TRANSLATOR/CHANNEL register.
- Step 84. Ground test point 1A6 on the input channel chassis and scope item 51.
- Step 85. Observe  $A_U$  register.  
a) If only  $A_U$  bit 0 is lit, refer to test 3.3.2.1.  
b) If  $A_U$  bits 1 or 2 are the only indicators that are lit, refer to test 3.4.1.4.  
c) If value of  $A_U$  is between 7 and 777, do step 86.  
d) If value of  $A_U$  is between 777 and 77777, replace item 55.  
e) If value of  $A_U$  is less than 177777 but greater than 77777, replace item 56.  
f) If value of  $A_U$  is between 177777 and 377777, replace item 57.  
g) If  $A_U$  equals any other value, do step 99.
- Step 86. Press OP STEP MODE and master clear computer.
- Step 87. Set FUNCTION CODE to 40.
- Step 88. Set FUNCTION REPEAT up.
- Step 89. Press RUN MODE and set RESTART/START STEP to START STEP.
- Step 90. Press OP STEP MODE.
- Step 91. Set FUNCTION REPEAT down.
- Step 92. Master clear computer.
- Step 93. Press PHASE STEP MODE.
- Step 94. Clear PHASE register.
- Step 95. Set PHASE REPEAT up.
- Step 96. Press PHASE 4.
- Step 97. Ground test point 2B15 on chassis 3.
- Step 98. Observe  $Z_1$  register indicators.  
a) If none are lit, replace item 54.  
b) If any are lit, replace card in item 53 that corresponds to the indicators that are lit.



3.3.2  
(Cont)

3.3.2  
(Cont)

- Step 99. Press OP STEP MODE and master clear computer.
- Step 100. Press PHASE STEP MODE and clear PHASE register.
- Step 101. Set PHASE REPEAT up and press PHASE 3.
- Step 102. Momentarily ground test point 2E22 on chassis 3.
- Step 103. Clear PHASE register.
- Step 104. Press PHASE 4.
- Step 105. Momentarily ground test point 2A22 on chassis 3.
- Step 106. Clear PHASE register.
- Step 107. Press PHASE 2.
- Step 108. Momentarily ground test point 2G25 on chassis 3.
- Step 109. Observe AU register indicators.
  - a) If none are lit, replace item 59.
  - b) If any are lit, replace cards in item 58 that correspond to the indicators that are lit.

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	1						Replace 3J08B 3J02D 3J17C
	2						Replace 4J18B
	3	9-21	29N08	8	1F24	H	If H scope item 4 If L replace 8J08D
	4	9-22	09N12	7	1G5	T	If T do step 18 If not T replace 7J10D 7J02A
	5						Replace 7J14A 3J02B
	6	9-70	63Lg1	g	2D25	L	If L scope item 7 If H replace gJ04D gJ03D 7J09G gJ02D

"g" refers to input channel chassis.

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	7	9-70	63Lg1	g	2D23	L	If L do step 24 If H replace gJ29G gJ28G gJ30G
	8	9-56	4gN43	g	1E11	L	If L scope item 9 If H replace gJ17C gJ12F 7J02F
	9	9-62	02Rg1	g	2C5	L	If L do step 27 If H replace gJ25C
	10						Replace gJ08B gJ12B gJ22C
	11	9-66	12Vg4	g	1G14	H	If H do step 31 If L replace gJ14A gJ07B
	12	9-109	64Z07	4	2A3	H	If H do step 35 If L replace 4J06E gJ19G
	13	9-75	6gZ07	g	1B10	L	If L scope item 14 If H replace gJ19G
	14	9-108	64Z02	4	2C4	H	If H do step 38 If L replace 4J05G 6J14G
	15	9-110	64Z13	4	2G3	H	If H do step 40 If L replace 4J06B gJ09F
	16	9-82	14X06	4	2G7	T	If T scope item 17 If not T replace 4J11D 4J10E
	17	9-85	0XD06	4	2G15	T	If T do step 11 If not T replace 4J16C
	18	9-120	10B17	8	1E15	H	If H scope item 19 If L replace 8J13G
	19	9-119	10B11	8	1E12	H	If H scope item 21 If L scope item 20

"g" refers to input channel chassis.

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	20	9-119	12B11	8	1F14	H	If H replace 8J13E If L replace 8J14E 8J12F
	21	9-119	12B10	8	1E14	H	If H scope item 22 If L replace 8J14D 8J11E 8J13D
	22	9-119	12B09	8	1D14	H	If H scope item 23 If L replace 8J14D 8J12B 8J12E
	23	9-119	12B08	8	1C14	H	If H scope item 24 If L replace 8J14C 8J11E 8J13D
	24	9-119	12B07	8	1B14	H	If H scope item 25 If L replace 8J14C 8J12B 8J11D
	25	9-119	12B06	8	1A14	H	If H scope item 26 If L replace 8J13C 8J11B 8J11C
	26	9-118	12B05	8	1E11	H	If H scope item 27 If L replace 8J13C 8J12B 8J12C
	27	9-118	12B04	8	1D11	H	If H scope item 28 If L replace 8J13B 8J11B 8J11C
	28	9-118	12B03	8	1C11	H	If H scope item 29 If L replace 8J13B 8J12B 8J12A
	29	9-119	12B13	8	1B17	H	If H do step 15 If L replace 8J14F 8J12F 8J13F
0	30						Replace 7J10G

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1							Replace 7J11G
2							Replace 7J12G
3							Replace 7J10F
4							Replace 7J11F
5							Replace 7J12F
6							Replace 7J10E
7							Replace 7J11E
8							Replace 7J12E
9							Replace 7J10C
10							Replace 7J11C
11							Replace 7J12C
12							Replace 7J10B
13							Replace 7J11B
14							Replace 7J10A
15							Replace 7J11A
	31	9-34	03G28	8	1G20	L	If L do step 56 If H replace 8J06D 8J05G 8J10C 8J10F
	32	9-106	21B00	8	1B29	H	If H do step 58 If L scope item 33
	33	9-106	20B15	8	1G28	L	If L scope item 34 If H replace 8J09G
	34	9-106	20B13	8	1F28	L	If L scope item 35 If H replace 8J10F
	35	9-106	20B10	8	1E28	L	If L scope item 36 If H replace 8J10E
	36	9-106	20B08	8	1D28	L	If L scope item 37 If H replace 8J10D

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	37	9-106	20B05	8	1C28	L	If L replace 8J10B 8J10A 8J05G If H replace 8J10C
0	38						Replace 7J06G 8J03A 4J07G
1							Replace 4J06G 7J07G 8J03A
2							Replace 4J05B 7J08G 8J04B
3							Replace 4J07F 7J06F 8J04B
4							Replace 4J06F 7J07F 8J03B
5							Replace 4J05F 7J08F 8J03B
6							Replace 4J07E 7J06E 8J03C
7							Replace 4J06E 7J07E 8J03C
8							Replace 4J05E 7J08E 8J04E
9							Replace 4J07C 7J06C 8J04E
10							Replace 4J06C 7J07C 8J03E

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
11							Replace 4J05C 7J08C 8J03E
12							Replace 4J07B 7J06B 8J04F
13							Replace 4J06B 7J07B 8J04F
14							Replace 4J05B 7J08B 8J03F
15							Replace 4J07A 7J06A 8J03F
16							Replace 4J06A 7J07A 8J03G
17							Replace 4J05A 7J08A 8J03G
	39						Replace gJ20G gJ21G 7J18B gJ22C
	40	9-20	00N04	3	2D26	L	If L scope item 41 If H replace 3J04C 3J20D
	41	9-5	94C04	4	2C32	T	If T scope item 42 If not T replace 4J03B 4J04D
	42	9-23	10N13	3	2E15	T	If T do step 67 If not T replace 3J09A 3J10A
	43	9-24	10N10	4	2E17	L	If L scope item 44 If H replace 3J07C 3J06E
	44	9-47	10F45	3	1F29	L	If L scope item 45 If H replace 3J17B

"g" refers to chassis containing channel under test.

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	45	9-47	10F46	3	1F30	L	If L do step 70 If H replace 3J17B
	46	9-47	31F42	3	1E26	L	If L scope item 47 If H replace 3J17G 3J17B
	47	9-100	02A17	4	1D31	H	If H do step 73 If L replace 4J26F
	48	9-33	31X00	4	2D23	L	If L scope item 49 If H replace 4J13A 4J02A
	49	9-82	14X01	4	2B7	L	If L do step 79 If H replace 4J11E 4J09G
	50	9-108	64Z01	4	2B4	L	If L do step 83 If H replace 4J06G
	51	9-111	65Z01	8	1B6	H	If H do step 73 If L replace 8J03A 4J06G
	52						Replace 4J17B 4J19C
0	53						Replace 7J06G
1							Replace 7J07G
2							Replace 7J08G
3							Replace 7J06F
4							Replace 7J07F
5							Replace 7J08F
6							Replace 7J06E
7							Replace 7J07E
8							Replace 7J08E
9							Replace 7J06C
10							Replace 7J07C

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
11							Replace 7J08C
12							Replace 7J06B
13							Replace 7J07B
14							Replace 7J08B
15							Replace 7J06A
16							Replace 7J07A
17							Replace 7J08A
	54						Replace 3J03C 3J17F 3J19G 3J26D
	55						Replace 7J15E
	56						Replace 4J19A 4J28C 4J02A 4J13A
	57						Replace 4J18A 4J28C 4J17A 4J19B
0	58						Replace 4J28C 4J19A
1							Replace 4J18A 4J28C
2							Replace 4J17A 4J29C
3							Replace 4J19B 4J29C
4							Replace 4J18B 4J30C
5							Replace 4J17B 4J30C



<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
6							Replace 4J19C 4J28B
7							Replace 4J18C 4J28B
8							Replace 4J17C 4J29B
9							Replace 4J19E 4J29B
10							Replace 4J18E 4J30B
11							Replace 4J17E 4J30B
12							Replace 4J19F 4J28A
13							Replace 4J18F 4J28A
14							Replace 4J17F 4J29A
15							Replace 4J19G 4J29A
16							Replace 4J18G 4J20A
17							Replace 4J17G 4J30A
	59						Replace 3J03B 3J08B 4J17E 4J30B

3.3.2.1      LOOP, P = 000702, A<sub>U</sub> = 000001, AND A<sub>L</sub> = 000000      3.3.2.1

A loop with P = 000702, A<sub>U</sub> = 000001, and A<sub>L</sub> = 000000 indicates a malfunction in the K register. Perform the following steps in sequence unless otherwise indicated.

Step 1.      Press OP STEP MODE and master clear computer.

Step 2. Press RUN MODE and observe K register.  
 a) If none of the indicators are lit, do step 3.  
 b) If all the indicators are lit, replace item 1.  
 c) If any indicators are lit, replace cards in item 2 that correspond to the indicators that are lit.

Step 3. Press all indicators in K register.  
 a) If all the indicators in K are lit, do step 4.  
 b) If any indicators will not remain lit, replace cards in item 2 that correspond to the error bits not lit.

Step 4. Master clear computer and observe K register.  
 a) If none of the indicators in K are lit, replace item 4.  
 b) If any indicators are lit, replace item 3.

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	1						Replace 7J20D 7J19A
0	2						Replace 7J20C 7J22B 7J24C
1							Replace 7J21C 7J22B 7J25C
2							Replace 7J20B 7J22B 7J24B
3							Replace 7J21B 7J22B 7J25B
4							Replace 7J20A 7J22B 7J24A
5							Replace 7J21A 7J25A 7J22B
	3						Replace 7J20D 7J21D
	4						Replace 7J23B 7J22C 7J22B 7J19A

Inspect P register.

- a) If none of the indicators are lit, do test 3.3.3.1.
- b) If any indicators are lit, do test 3.3.3.2.

## 3.3.3.1

## HALT, P = 000000

3.3.3.1

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Observe S<sub>1</sub> register.
  - a) If none of the indicators are lit, do step 2.
  - b) If any indicators are lit, do test 3.1.8.18.
- Step 3. Press PHASE STEP MODE.
- Step 4. Press PHASE 4.
- Step 5. Repeatedly set RESTART/START STEP to START STEP until TIMING 21 is lit.
- Step 6. Observe TIMING 11.
  - a) If not lit, do step 7.
  - b) If lit, replace item 1.
- Step 7. Press OP STEP MODE and master clear computer.
- Step 8. Scope item 2.
- Step 9. Press PHASE STEP MODE and clear PHASE register.
- Step 10. Press MULT/DIV SEQ bit 1.
- Step 11. Press ADV P SEQ bit 1.
- Step 12. Scope item 6.
- Step 13. Set PHASE REPEAT up.
- Step 14. Press PHASE 1.
- Step 15. Press SEQ DES I.
- Step 16. Ground test point 1F8 on chassis 3.
- Step 17. Scope item 8.
- Step 18. Ground test point 2B20 on chassis 3 and remove ground on test point 1F8 on chassis 3.
- Step 19. Scope item 10.
- Step 20. Clear PHASE register.

3.3.3.1  
(Cont)

3.3.3.1  
(Cont)

- Step 21. Press PHASE 3.
- Step 22. Clear PHASE register.
- Step 23. Ground test point 2G24 on chassis 3.
- Step 24. Set AU to 000220.
- Step 25. Press PHASE 4 and scope item 11.
- Step 26. Remove ground on test point 2G24 on chassis 3.
- Step 27. Momentarily ground test point 2C22 on chassis 3.
- Step 28. Scope item 13.
- Step 29. Remove ground on test point 2B20 on chassis 3.
- Step 30. Clear PHASE register.
- Step 31. Ground test points 2E22 and 2G24 on chassis 3.
- Step 32. Set PHASE REPEAT down.
- Step 33. Press PHASE 3.
- Step 34. Set RESTART/START STEP to START STEP.
- Step 35. Scope item 15.
- Step 36. Set P to 114440.
- Step 37. Remove grounds on test points 2E22 and 2G24 on chassis 3.
- Step 38. Clear PHASE register.
- Step 39. Ground test point 2G17 on chassis 3.
- Step 40. Set PHASE REPEAT up.
- Step 41. Press PHASE 1.
- Step 42. Observe  $S_1$  register.  
a) If  $S_1$  equals 114440, replace item 25.  
b) If  $S_1$  equals any other value, replace card in item 24 that corresponds to the error bit.

ERROR  
BIT

ITEM

FIG.

TERM

C

TP

TL

REMARKS

1

Replace 3J15B

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	2	9-79	11X05	8	1F19	H	If H scope item 3 If L replace 8J06B 8J07B
	3	9-22	48N12	7	1D6	H	If H scope item 4 If L replace 7J03B 3J08D
	4	9-20	29N05	4	1A21	H	If H scope item 5 If not H replace 4J30D 3J04D 3J04C
	5	9-20	29N04	4	1A20	H	If H do step 9 If L replace 4J30D
	6	9-19	29N03	4	2E22	H	If H scope item 7 If L replace 4J18D
	7	9-19	49N06	4	2A22	H	If H do step 13 If L replace 4J34D
	8	9-22	49N12	7	1E6	H	If H scope item 9 If L replace 7J12D 7J03B 3J08D
	9	9-22	29N12	7	1E4	T	If T do step 18 If not T replace 7J11D 7J03C 3J08D
	10	9-82	14X05	4	2F7	L	If L do step 20 If H replace 4J10D 4J08F
	11	9-85	0XD05	4	2F15	H	If H scope item 12 If L replace 4J14B
	12	9-87	0XX01	4	2B21	L	If L do step 26 If H replace 4J18A 4J19D
	13	9-87	0XX07	4	2A20	H	If H scope item 14 If L replace 4J18C 4J11D 4J09E
	14	9-88	0XX15	4	2B19	H	If H do step 29 If L replace 4J19G 4J11C 4J10A

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	15	9-94	11A04	4	1E15	L	If L scope item 16 If H replace 4J26F 4J26G
	16	9-94	13A05	4	1F7	L	If L scope item 17 If H replace 4J24F 4J23F
	17	9-94	14A05	4	1F4	H	If H scope item 18 If L replace 4J27G 4J26F 4J26G
	18	9-94	11A00	4	1A15	L	If L scope item 19 If H replace 4J21F 4J20G
	19	9-95	11A07	4	1A14	L	If L scope item 20 If H replace 4J21C 4J20D
	20	9-95	13A07	4	1A6	L	If L scope item 21 If H replace 4J24C 4J22D
	21	9-95	14A08	4	1B3	H	If H scope item 22 If L replace 4J23D 4J24C 4J22C 4J21C
	22	9-96	13A13	4	1G6	L	If L scope item 23 If H replace 4J24A 4J22B
	23	9-96	13A14	4	1A5	L	If L do step 36 If H replace 4J24A 4J22A
0	24						Replace 7J10G
1							Replace 7J11G
2							Replace 7J12G
3							Replace 7J10F
4							Replace 7J11F
5							Replace 7J12F

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
6							Replace 7J10E
7							Replace 7J11E
8							Replace 7J12E
9							Replace 7J10C
10							Replace 7J11C
11							Replace 7J12C
12							Replace 7J10B
13							Replace 7J11B
14							Replace 7J10A
15							Replace 7J11A
	25						Replace 8J19B 6J33C 8J07B

3.3.3.2

HALT, P = XXXXXX

3.3.3.2

- Step 1. Observe  $A_U$  and  $A_L$  registers.  
a) If none of the indicators in  $A_U$  and  $A_L$  are lit, do step 19.  
b) If any indicators are lit, do step 2.
- Step 2. Press OP STEP MODE and master clear computer.
- Step 3. Press PHASE STEP MODE and clear PHASE register.
- Step 4. Set PHASE REPEAT up.
- Step 5. Press MULT/DIV SEQ bits 1 and 3.
- Step 6. Press PHASE 4.
- Step 7. Set FUNCTION CODE to 40 and scope item 1.
- Step 8. Set FUNCTION CODE to 46.
- Step 9. Clear PHASE register.
- Step 10. Press PHASE 2.

3.3.3.2  
(Cont)

3.3.3.2  
(Cont)

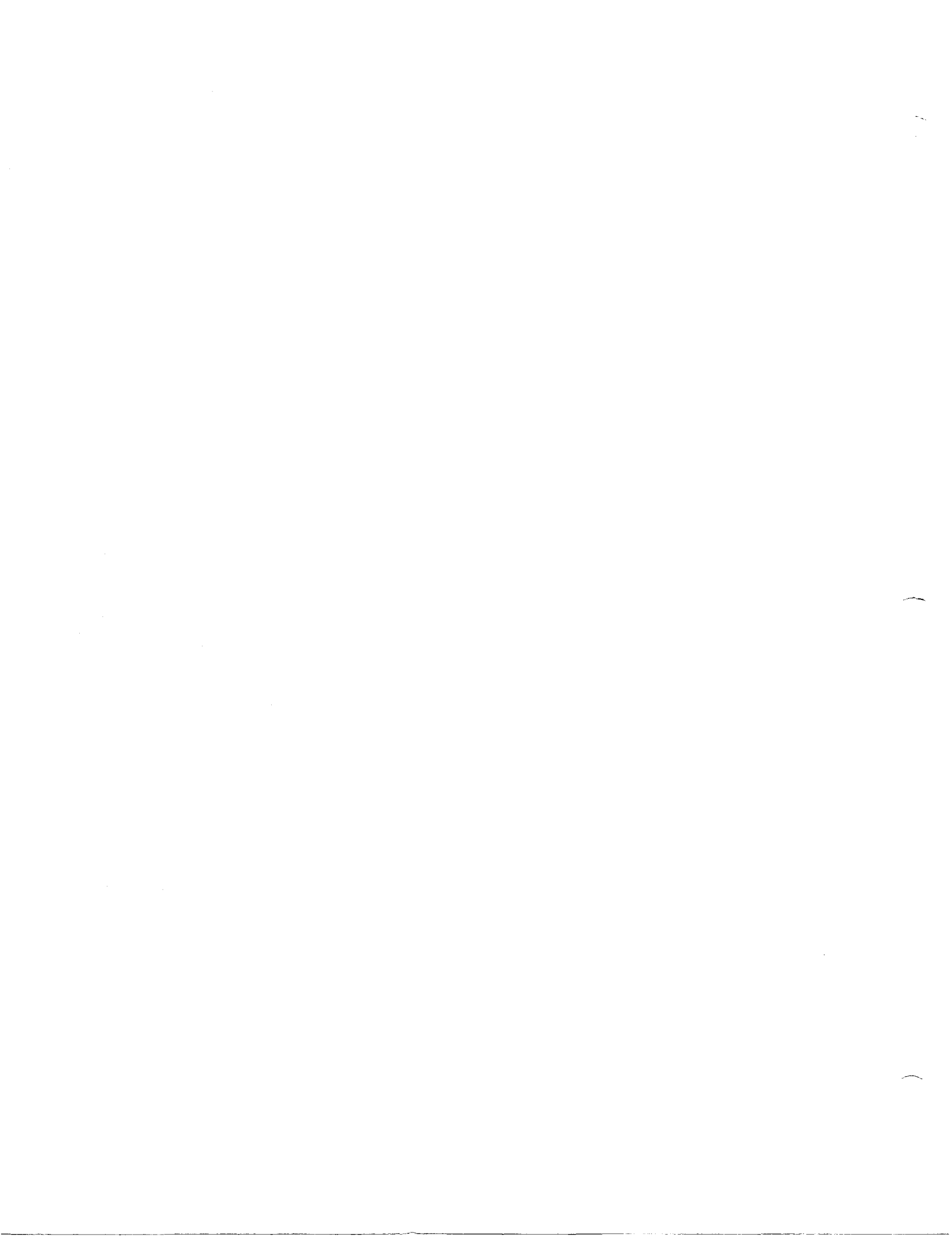
- Step 11. Set  $A_L$  to 412000 and scope item 2.
- Step 12. Press FII and scope item 4.
- Step 13. Clear FUNCTION CODE register.
- Step 14. Set FUNCTION CODE to 26.
- Step 15. Ground test point 1A7 on chassis 4 and scope item 11.
- Step 16. Clear PHASE register.
- Step 17. Press PHASE 3.
- Step 18. Clear PHASE register and scope item 12.
- Step 19. Press OP STEP MODE and master clear computer.
- Step 20. Press PHASE STEP MODE and clear PHASE register.
- Step 21. Press PHASE 4.
- Step 22. Repeatedly set RESTART/START STEP to START STEP and observe that PHASE register executes one complete cycle in sequence; if not, replace item 15.
- Step 23. Press OP STEP MODE and master clear computer.
- Step 24. Press PHASE STEP MODE and clear PHASE register.
- Step 25. Press PHASE 2.
- Step 26. Press MULT/DIV SEQ bit 1.
- Step 27. Set RESTART/START STEP to START STEP twice and scope item 16.
- Step 28. Clear PHASE register.
- Step 29. Set K register to 77.
- Step 30. Scope item 22.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1	9-19	39N06	4	2C22	T	If T do step 8 If not T replace 3J06C 3J07B 4J33D
2	9-20	29N05	4	1A21	T	If T scope item 3 If not T replace 3J04C 3J04D 4J30D



<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
3	9-33	31W00	4	2C23	L	If L do step 12 If H replace 3J17B 4J34G
4	9-28	05G38	7	1A29	H	If H do step 13 If L scope item 5
5	9-37	1XK00	7	1B24	L	If L scope item 6 If H replace 7J24C
6	9-37	1XK01	7	1D24	L	If L scope item 7 If H replace 7J25C
7	9-37	1XK02	7	1F24	L	If L scope item 8 If H replace 7J24B
8	9-37	1XK03	7	1A25	L	If L scope item 9 If H replace 7J25B
9	9-37	1KK04	7	1C25	L	If L scope item 10 If H replace 7J24A
10	9-37	1XK05	7	1C25	L	If L replace 7J16G 7J28C If H replace 7J25A
11	9-33	83A00	4	2A23	L	If L do step 16 If H replace 4J13G
12	9-90	0XW10	4	2D17	L	If L scope item 13 If H replace 4J33E
13	9-90	0XW12	4	2F17	L	If L scope item 14 If H replace 4J32F
14	9-90	0XW17	4	2D16	L	If L replace 7J12C 4J30F 4J29G 4J29E If H replace 4J33G
15						Replace 3J35E 3J34E 3J33E 3J32E
16	9-37	1XK00	4	1B24	H	If H scope item 17 If L replace 7J24C 7J22B

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
17	9-37	1XK01	4	1D24	H	If H scope item 18 If L replace 7J25C 7J22B
18	9-37	1XK02	4	1F24	H	If H scope item 19 If L replace 7J24B 7J22B 7J22C
19	9-37	1XK03	7	1A25	H	If H scope item 20 If L replace 7J25B 7J22B 7J23B
20	9-37	1XK04	7	1C25	H	If H scope item 21 If L replace 7J24A 7J22B 7J22C
21	9-37	1XK05	7	1E25	H	If H do step 27 If L replace 7J25A 7J22B 7J19A
22	9-37	02K00	7	1A26	H	If H scope item 23 If L replace 7J22B
23	9-37	07K02	7	1B26	H	If H scope item 24 If L replace 7J22B 7J22C
24	9-37	07K03	7	1C26	L	If L scope item 25 If H replace 7J22B 7J23B
25	9-37	07K04	7	1D26	H	If H scope item 26 If L replace 7J22B 7J22C
26	9-37	07K05	7	1E26	H	If H replace 7J21A 7J20A 7J05C If L replace 7J22B 7J19A



The following procedure is used to isolate malfunctions which do not inhibit the bootstrap-controlled loading of the diagnostic programs.

- Step 1. Observe PROGRAM FAULT indicator.  
 a) If lit, do test 3.4.2.  
 b) If not lit, do step 2.
- Step 2. Observe PROGRAM STOP indicators.  
 a) If any are lit, do test 3.4.1.  
 b) If none are lit, do step 3.
- Step 3. Press OP STEP MODE, then set SEQ STEP/STOP to SEQ STEP.
- Step 4. Observe SEQ DES indicators while repeatedly setting RESTART/START STEP to START STEP.  
 a) If SEQ DES varies indicating a loop condition, do test 3.4.3.  
 b) If SEQ DES does not change indicating a halt condition, do test 3.4.4.

## 3.4.1

## 5 STOPS

## 3.4.1

The following procedure is used to aid in program control error isolation.

- Step 1. Find P register value under P column. (P values are sequential.)
- Step 2. Find A<sub>U</sub>, A<sub>L</sub>, and C register values, then do one of the following:  
 a) Replace the card(s) in the CARD LOC column that corresponds to P, A<sub>U</sub>, A<sub>L</sub>, and C register values, or  
 b) Follow the instructions that correspond to P, A<sub>U</sub>, A<sub>L</sub>, and C register values.

## NOTE

Unless specified otherwise, "g" in the CARD LOC column is the chassis containing the failing channel.

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
000217	000274	464300	000000				3J21F
000520	000000	000000	000000				7J22B
000710	000000	000000	000000				3J31E 7J29B 7J30C 7J31C
000712	000000	000000	000000				7J31D
001003	000000	000000	000000				6J38E
001010	000000	000000	000000				3J12D 3J12F 3J13E

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
							3J25F 4J18A 7J33B
001015	000000	000000	000000				7J32B
001055	000000	505640	000000				3J22F
001077	000000	000000	201061				8J04G
001107	000000	000000	000000				4J07C 4J16C 6J19C 6J31E 6J35E 7J30B 7J33C
001200	000000	000000	000000				7J10E
001202	000000	000000	000000				8J17C
001217	000000	000000	000000				3J23C
001217	000000	174626	000000				4J15C
001217	000000	505640	000000				4J16E
001220	000000	000000	000000				3J11E 3J12G
001220	000000	174426	000000				7J11E
001220	000000	177677	000000				6J32E
001220	000000	777777	000000				3J02E
001225	000000	000000	000000				3J20A 3J21A 3J11E 3J12F 3J14G
001225	000000	707070	000000				3J23B
001225	000001	707071	000000				3J23B
001225	424242	424242	000000				4J08F
001231	000000	424242	000000				3J21A 3J24B 3J12E 3J13E

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
							3J13F 3J22E 3J21F 3J22F
001232	000000	424242	000000				3J05A 3J12E 3J12F 3J21F 3J14G
001232	070707	424242	000000				3J23C
001235	000000	676763	000000				6J36E
001235	000000	707070	000000				7J10C
001236	000000	000000	000000				8J19E
001236	000000	707070	000000				3J11F 3J12G 4J35B
001236	707070	000000	000000				6J25E
001240	000000	000000	000000				3J19B 3J28E 3J27F 3J29F 3J16G 3J25G 3J29G
001244	060000	000000	000000				3J19G
001245	000000	000000	000000				3J16A 3J20B 3J07F 3J21F 4J33A
001245	000000	000010	000000				3J17C
001245	000000	000237	000000				4J07C 4J10C
001245	000000	001037	000000				4J06E 4J09E
001245	000000	001200	000000				4J08D
001245	000000	001217	000000				4J06F 4J09F

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
001245	000000	001227	000000				4J07F 4J10F
001245	000000	001233	000000				4J05G 4J08G
001245	000000	001235	000000				4J08G 4J09G
001245	000000	001236	000000				4J07G 4J10G
001245	000000	001237	000000				3J11E 3J12E
001245	000000	001240	000000				3J04B
001245	000000	001277	000000				4J14B 4J34D 4J05F
001245	000000	001337	000000				4J07E
001245	000000	001637	000000				4J05E
001245	000000	003237	000000				4J06C
001245	000000	005237	000000				4J05C
001245	000000	101237	000000				4J07A
001245	000000	201237	000000				4J06A
001245	000000	345637	000000				3J18E 3J19F
001245	000000	401237	000000				4J05A
001245	000000	777777	000000				3J06B 3J06C
001246	000000	000000	000000				3J11A 3J16G
001300	000000	000000	000000				4J33C
001302	000000	000000	000000				7J29C 7J31C
001317	000000	000000	000000				3J04E
001325	121212	000000	000000				3J21C

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
001333	000000	000000	000000				4J30A
001333	000000	777777	000000				3J04C 3J18C 3J06F 3J06G
001333	000001	000001	000000				4J28C
001333	000003	000003	000000				4J28C
001333	000014	000014	000000				4J29C
001333	000020	000020	000000				4J29C 4J30C
001333	000040	000040	000000				4J29C 4J30C
001333	000060	000020	000000				4J29C 4J30C
001333	000060	000060	000000				4J29C 4J30C
001333	000100	000100	000000				4J28B 4J29B
001333	000200	000200	000000				4J28B
001333	000300	000300	000000				4J28B
001333	000400	000400	000000				4J29B
001333	001000	001000	000000				4J29B
001333	001400	001400	000000				4J29B
001333	002000	002000	000000				4J30B
001333	004000	004000	000000				4J30B
001333	005640	004631	000000				3J04A 3J03B
001333	005640	004661	000000				3J04A
001333	006000	006000	000000				4J30B
001333	010000	010000	000000				4J28A



3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
001333	020000	020000	000000				4J28A
001333	030000	030000	000000				4J28A
001333	040000	040000	000000				4J29A
001333	100000	100000	000000				4J29A
001333	140000	140000	000000				4J29A
001333	200000	200000	000000				4J30A
001333	353536	777777	000000				3J19B
001333	373740	777775	000000				3J19F
001333	400000	400000	000000				4J30A 4J17G
001333	577777	567777	000000				4J29D
001333	600000	600000	000000				4J30A
001333	750004	750004	000000				7J12F
001333	777600	777600	000000				4J06E
001333	777740	777775	000000				7J07D
001333	777774	777774	000000				4J05G
001333	777777	171703	000000				4J30D
001333	777777	777777	000000				3J04D 3J03F 4J07G 4J28D 4J30D 4J31D
001341	000000	000000	000000			Do test 3.4.1.1	
001341	000100	000000	000000				4J07E
001341	004000	000000	000000				4J05C
001341	050505	000001	000000				3J18A
001341	353535	000000	000000				3J29G

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
001341	400000	000000	000000				4J05A
001343	000000	000000	000000				4J33C
001344	353535	707070	000000				3J06G
001345	353537	707072	000000				4J18A
001363	424242	607777	000000				3J02B
001366	000000	000000	000000				3J03D
001366	424242	000000	000000				8J04G
001366	424242	007777	000000				3J02E
001366	424242	177777	000000				3J04D
001366	424242	424242	000000				3J17C 3J28G
001366	424242	607777	000000				4J16D
001366	424242	677777	000000				4J03C
001366	424242	737777	000000				4J03F
001366	424242	757777	000000				4J03F
001366	424242	767777	000000				4J03F
001372	424242	000000	000000				4J17A
001377	424242	003535	000000				3J16C 3J05F
001377	424242	007272	000000				3J03D
001377	424242	353536	000000				3J20F
001377	424242	357272	000000				4J29D
001403	070707	777700	000000				4J32E
001403	424242	000000	000000				3J11E 3J12E
001447	000000	000000	000000				4J28E
001512	000001	000000	000000				4J34B 4J34E

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
001512	000001	677777	000000				3J14G
001512	000001	774000	000000				3J11F
001512	000001	774140	000000				3J11F 3J12G
001512	000002	000006	000000				3J11F 3J12G
001512	070707	000000	000000				3J11E
001512	070707	000001	000000				4J14C
001512	070707	000002	000000				3J11F
001512	070707	000006	000000				3J11F
001512	070707	000011	000000				4J31B 4J35B 4J31C
001512	070707	000140	000000				3J11F
001512	070707	000220	000000				3J11F
001524	777777	777777	000000				4J17C
001530	000002	350006	000000				4J19B
001530	070707	353535	000000				3J19A 3J18C
001530	070707	424242	000000				3J17A 3J04E 4J31D
001530	343435	656564	000000				8J04G
001534	070707	777775	000000				3J18F
001541	070707	070707	000000				3J18D
001541	070707	616161	000000				3J05F
001541	070707	707070	000000				3J19A 3J17D
001541	343437	434340	000000				8J04G

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
001552	070707	353535	000000				3J20A 4J19C
001552	070707	424242	000000				3J05A 3J19A 3J21A 3J12C 3J23C 3J17D 3J18D 3J02E
001552	070707	424352	000000				3J20F
001552	070707	424652	000000				3J03G 3J20G
001557	000377	070017	000000				7J10A 7J04E
001560	000017	070021	000000				6J33C
001560	000017	070037	000000				6J35C
001560	000377	070017	000000				6J31C 6J33C 6J35C
001560	000377	070017	070017				6J19C
001565	000000	353535	000000				3J04C
001565	004412	357127	000000				4J03A
001565	363302	357127	000000				7J04A
001565	363602	357127	000000				3J04A 4J02A 4J03A
001565	707070	050505	000000				3J18A 3J25F
001565	707070	353535	000000				3J19A 3J05F 3J21F 3J25F
001565	707070	404040	000000				3J25F

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
001565	707070	424242	000000				3J19A 3J06G
001565	707070	454545	000000				4J18G
001565	707070	653535	000000				3J21F
001565	707070	707070	000000				3J06G
001565	707070	757575	000000				3J25F
001565	737070	444545	000000				4J28A
001565	747070	414515	000000				4J29A
001565	747070	414545	000000				4J29A
001600	070707	000000	000000				3J15A 3J13C 3J32D 3J04E
001600	070707	001576	000000				3J14D
001600	070707	353535	000000				3J13C 3J25C 3J14E 3J16E 3J16F
001600	070707	420242	000000				3J13C
001600	070707	707070	000000				3J16F
001600	070707	774272	000000				4J16D
001600	070707	777777	000000				3J03F
001610	070707	777777	000000				3J05C 3J16D 3J11G
001617	000000	000000	000000				3J04E 3J16E
001617	353535	353535	000000				3J04A 3J16E 3J17E
001617	420042	420042	000000				3J04A

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
001617	777777	777777	000000				3J03F 3J16F
001625	353535	373535	000000				7J07B
001625	424242	000000	000000				3J03B
001631	777777	353535	000000				3J16D 3J11G
001633	005000	000010	000000				4J04E
001637	353535	353535	000000				3J17E
001637	424242	353535	000000				3J16E
001637	424242	777777	000000				3J06G
001644	000000	000000	000000				3J16E 4J32E
001644	353535	353535	000000				3J16E
001650	040125	000377	000000				6J15C
001651	777777	777777	000000				3J19E 3J14G
001653	000000	001651	000000				3J16F
001674	000000	000010	000000				3J18B
001702	000000	000010	000000				3J09A 3J18E
001702	000000	770010	000000				3J07B
001702	000000	777700	000000				3J16D 4J02C 4J03C 4J04E 4J10F 4J12D
001702	000000	777701	000000				4J02C 4J20C 7J23C
001702	000000	777702	000000				4J02C 4J04C 7J23C

3.4.1  
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3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
001702	000000	777703	000000				4J03E 4J02F 7J20B 7J23C
001702	000000	777705	000000				4J02C 4J04F
001702	000000	777706	000000				4J02C 4J03G 4J10G
001702	000000	777707	000000				4J02C
001702	000000	777710	000000				3J06C 4J04C 3J05D
001702	000000	777711	000000				4J02C 4J03C 4J03G
001702	000000	777712	000000				4J02C 4J03C 4J04F
001702	000000	777714	000000				4J03C 4J03E
001702	000000	777717	000000				4J03C 4J12D 4J04E
001702	000000	777730	000000				4J04G
001702	000000	777750	000000				3J09G 4J03C
001702	000000	777776	000000				7J04D
001702	000000	777777	000000				3J06B 3J07B 3J16B 3J17C 4J09D 7J07D
001733	000000	000000	000000				4J29E

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
001733	000000	000377	000000				4J32A 4J26F 4J13G 4J30G 4J34G
001733	000000	000416	000000				4J03E
001733	000000	000462	000000				4J04F
001733	000000	000524	000000				4J03G
001733	000000	000776	000000				4J32A 3J06B 4J04G 4J30G
001733	000000	000777	000000				4J32A
001733	000000	001774	000000				4J34A 4J29G 4J30G
001733	000000	003770	000000				4J34A 4J29G
001733	000000	003774	000000				4J34A
001733	000000	003777	000000				4J34A
001733	000000	007760	000000				4J33B 4J28F 4J29G
001733	000000	017060	000000				4J33B
001733	000000	017400	000000				4J28G
001733	000000	017740	000000				4J33B 4J28F
001733	000000	017760	000000				4J33B
001733	000000	037700	000000				4J32C 4J30F 4J28G
001733	000000	077600	000000				4J32C 4J30F



3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
001733	000000	177400	000000				4J34C 4J29F 4J30F
001733	000000	377000	000000				4J34C 4J29E 4J29F
001733	000000	377400	000000				4J34C
001733	000000	400177	000000				4J28E 4J33G
001733	000000	600077	000000				4J29E 4J33G
001733	000000	600177	000000				4J33G
001733	000000	700037	000000				4J29E 4J34F
001733	000000	740017	000000				4J29E 4J30E 4J34F
001733	000000	740037	000000				4J34F
001733	000000	760007	000000				4J30E 4J32F
001733	000000	770003	000000				4J30E 4J32F 4J28F
001733	000000	770007	000000				4J32F
001733	000000	774001	000000				4J33E 4J28F
001733	000000	776000	000000				4J29E 4J33E 4J28F
001733	000000	776001	000000				4J33E
001733	000000	777777	000000				4J32D 4J31G
001733	001733	000000	600077				4J28E

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
001733	037767	020021	000000				6J29C
001733	070777	040000	000000				6J29D
001733	071777	040000	000000				6J29D
001733	071777	041000	000000				6J29D
001733	072000	040000	000000				6J29D
001733	072777	042000	000000				6J29D
001733	073777	041000	000000				6J29D
001733	073777	042000	000000				6J29D
001733	073777	043000	000000				6J29D
001733	074777	040000	000000				6J29D
001733	074777	044000	000000				6J29D
001733	075777	041000	000000				6J29D
001733	075777	044000	000000				6J29D
001733	075777	045000	000000				6J29D
001733	076777	040000	000000				6J19C
001733	076777	044000	000000				6J29D
001733	076777	046000	000000				6J34D
001733	077077	040000	000000				6J31B
001733	077177	040000	000000				6J31B
001733	077177	040100	000000				6J31B
001733	077223	041020	000000				6J31C
001733	077277	040000	000000				6J31B
001733	077277	040200	000000				6J31B
001733	077377	040000	000000				6J19C
001733	077377	040100	000000				6J31B

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
001733	077377	040200	000000				6J31B
001733	077377	040300	000000				6J31B
001733	077477	040000	000000				6J31B
001733	077577	040000	000000				6J17C
001733	077677	040000	000000				6J17C
001733	077707	040000	000000				6J34D
001733	077717	040010	000000				6J34D
001733	077727	040020	000000				6J34D
001733	077737	040000	000000				6J15C 6J34D
001733	077737	040020	000000				6J34D
001733	077737	040030	000000				6J34D
001733	077747	040000	000000				6J32D
001733	077747	040040	000000				6J32D 6J34D
001733	077757	040000	000000				6J15C
001733	077757	040040	000000				6J32D
001733	077757	040050	000000				6J32D
001733	077767	000020	000000				6J25C
001733	077767	040000	000000				6J15C
001733	077767	040060	000000				6J32D
001733	077772	040000	000000				6J27D
001733	077772	040002	000000				6J27D
001733	077773	040001	000000				6J27D
001733	077773	040002	000000				6J27D
001733	077773	040003	000000				6J27D

3.4.1  
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3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
001733	077774	040000	000000				6J27D
001733	077776	040000	000000				6J13C
001733	077776	040002	000000				6J27D
001733	077776	040004	000000				6J27D
001733	077776	040006	000000				6J27D
001733	077777	000200	000000				6J35C
001733	077777	040003	000000				6J27D
001733	077777	040005	000000				6J27D
001733	077777	040006	000000				6J27D
001733	077777	040007	000000				6J27D
001733	077777	040030	000000				6J32D 6J34D
001733	077777	040040	000000				6J32D
001733	077777	040060	000000				6J32D
001733	077777	040070	000000				6J32D
001733	077777	040300	000000				6J31B
001733	077777	043000	000000				6J29D
001733	077777	045000	000000				6J29D 6J34D
001733	077777	046000	000000				6J34D
001733	077777	047000	000000				6J34D
001742	000000	777777	000000				3J06F
001752	000000	000000	000000				8J15B 8J15E 8J16E
001752	000000	377777	000000				8J33A 8J19G

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
001752	000000	577777	000000				8J34A 8J18G
001752	000000	677777	000000				8J35A 8J17G
001752	000000	737777	000000				8J31B 8J19F
001752	000000	757777	000000				8J32B
001752	000000	773777	000000				8J19E
001752	000000	777777	000000				8J19F
001762	000000	000001	000000				8J17A
001762	000000	000004	000000				8J19A
001762	000000	000040	000000				8J19B
001762	000000	000200	000000				8J18C
001762	000000	020000	000000				8J18F
001762	000000	040000	000000				8J19F
001762	000000	100000	000000				8J35A
001762	000000	400000	000000				8J33A
002001	000000	400000	000000				3J35B
002005	000000	400000	000000				3J02A 7J02C
002011	000000	400000	000000				4J35E
002016	000000	400000	000000				3J06D 3J31D 7J11C
002023	000000	400000	000000	Do test 3.4.1.2			
002043	000000	000000	000000				3J18C 8J07E 8J06F
002043	125155	125155	000000				8J07C

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002043	777777	777777	000000				8J07D 8J07F 8J12F
002053	377777	000000	000000				8J06F
002062	377777	000000	000000				3J17D
002073	377777	040002	000000				8J07F
002073	377777	200002	000000				8J07G
002075	070001	000001	000000				6J38E
002075	070001	000002	000000				6J37E
002075	070001	000004	000000				6J36E
002075	070001	000010	000000				6J35E
002075	070001	000020	000000				6J34E
002075	070001	000040	000000				6J33E
002075	070001	000100	000000				6J32E
002075	070001	000200	000000				6J31E
002075	070001	000400	000000				6J30E
002075	070001	001000	000000				6J29E
002075	070001	002000	000000				6J28E
002075	070001	004000	000000				6J27E
002075	070001	010000	000000				6J26E
002075	070001	020000	000000				6J25E
002075	070001	040000	000000				6J24E
002075	070001	100000	000000				6J23E
002075	070001	200000	000000				6J22E
002075	070001	400000	000000				6J21E
002075	070002	000001	000000				6J38E

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002075	070002	000002	000000				6J37E
002075	070002	000004	000000				6J36E
002075	070002	000010	000000				6J35E
002075	070002	000020	000000				6J34E
002075	070002	000100	000000				6J32E
002075	070002	000200	000000				6J31E
002075	070002	000400	000000				6J30E
002075	070002	001000	000000				6J29E
002075	070002	002000	000000				6J28E
002075	070002	004000	000000				6J27E
002075	070002	010000	000000				6J26E
002075	070002	020000	000000				6J25E
002075	070002	040000	000000				6J24E
002075	070002	100000	000000				6J23E
002075	070002	200000	000000				6J22E
002075	070002	400000	000000				6J21E
002075	070004	000001	000000				6J38E
002075	070004	000002	000000				6J37E
002075	070004	000004	000000				6J36E
002075	070004	000010	000000				6J35E
002075	070004	000020	000000				6J34E
002075	070004	000040	000000				6J33E
002075	070004	000100	000000				6J32E
002075	070004	000200	000000				6J31E
002075	070004	000400	000000				6J30E

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002075	070004	001000	000000				6J29E
002075	070004	002000	000000				6J28E
002075	070004	004000	000000				6J27E
002075	070004	010000	000000				6J26E
002075	070004	020000	000000				6J25E
002075	070004	040000	000000				6J24E
002075	070004	100000	000000				6J23E
002075	070004	200000	000000				6J22E
002075	070004	400000	000000				6J21E
002075	070006	002000	000000				6J28E
002075	070007	000001	000000				6J38E
002075	070007	000002	000000				6J37E
002075	070007	000004	000000				6J36E
002075	070007	000020	000000				6J34E
002075	070007	000100	000000				6J32E
002075	070007	000400	000000				6J30E
002075	070007	002000	000000				6J28E
002075	070007	010000	000000				6J26E
002075	070007	020000	000000				6J25E
002075	070007	040000	000000				6J24E
002075	070007	400000	000000				6J21E
002075	070010	000001	000000				6J38E
002075	070010	000004	000000				6J36E
002075	070010	000020	000000				6J34E
002075	070010	000100	000000				6J32E
002075	070010	000200	000000				6J31E



3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002075	070010	000400	000000				6J30E
002075	070010	002000	000000				6J28E
002075	070010	010000	000000				6J26E
002075	070010	020000	000000				6J25E
002075	070010	040000	000000				6J24E
002075	070016	000020	000000				6J34E
002075	070016	010000	000000				6J26E
002075	070017	000001	000000				6J13C 6J17C 6J38E
002075	070017	000002	000000				6J13C 6J37E
002075	070017	000004	000000				6J13C 6J36E
002075	070017	000014	000000				6J36E
002075	070017	000020	000000				6J15C 6J34E
002075	070017	000100	000000				6J17C 6J32E
002075	070017	000200	000000				6J17C 6J31E
002075	070017	000400	000000				6J17C 6J30E
002075	070017	001000	000000				6J29E
002075	070017	002000	000000				6J28E
002075	070017	010000	000000				6J26E
002075	070017	020000	000000				6J25E
002075	070017	040000	000000				6J24E
002075	070017	400000	000000				6J36D 6J21E

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002075	070040	000002	000000				6J37E
002075	070040	400000	000000				6J21E
002110	377777	353535	000000				8J06G
002111	377777	000001	000000				4J03G
002111	377777	777777	000000				3J16B
002111	677777	777777	000000				3J18A
002112	377777	353535	000000				3J07B 8J04G 8J06G
002121	070017	006000	000000				6J29E
002121	070017	377777	000000				6J19C 6J21E
002121	070017	577777	000000				6J22E
002121	070017	677777	000000				6J23E
002121	070017	757777	000000				6J25E
002121	070017	767777	000000				6J26E
002121	070017	772777	000000				6J28E
002121	070017	773777	000000				6J27E
002121	070017	775777	000000				6J28E
002121	070017	776777	000000				6J29E
002121	070017	777737	000000				6J33E
002121	070017	777757	000000				6J34E
002121	070017	777767	000000				6J35E
002123	000000	400000	000000				3J13G
002135	377773	430001	000000				3J09A
002135	377777	000000	000000				3J17B
002135	377777	777777	000000				3J17B

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002135	677777	777777	000000				3J17G
002172	000002	000000	000000				3J08A 3J16A
002172	000027	777770	000000				3J16A
002174	000002	077777	000000				3J08A 3J17A
002204	000002	777700	000000				3J07B 7J08D
002204	000002	777777	000000				3J21A
002214	000000	777617	000000				4J26E
002215	000002	100000	000000				8J07B
002222	077777	677777	000000				3J18C 3J21F 3J23G
002232	000000	001776	000000				3J20F
002233	077777	505640	000000				3J19B
002237	077777	505640	000000				3J28E
002243	077777	000243	000000				4J09C
002243	077777	004642	000000				3J04B
002246	070001	000000	000000				6J21D 6J38D 6J40D
002246	070002	000000	000000				6J19D 6J21D 6J38D 6J40D
002246	070004	000000	000000				6J33C 6J35C 6J19D 6J21D 6J38D 6J40D
002246	070006	000000	000000				6J34D

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002246	070010	000000	000000				6J31C 6J19D 6J21D
002246	070012	000000	000000				6J32D
002246	070014	000000	000000				6J33C
002246	070040	000000	000000				6J19D 6J21D 6J38D
002252	070020	000000	000000				6J19B 6J21B 6J38B 6J40B
002265	070017	000000	000000				6J23D 6J17C 6J31C 6J33C 6J35C
002312	707070	000000	000000				3J06A 3J17A 3J06C 4J04C 4J04E 4J02F
002312	707070	000011	000000				7J20C 4J02G 4J03G
002312	707070	000012	000000				4J04F 4J02G
002312	707070	000014	000000				4J03E 4J02F
002312	707070	000030	000000				4J02E 4J04G
002312	707070	777777	000000				3J16B
002322	707070	777777	000000				3J16A
002323	000000	777717	000000				4J07F
002323	707070	770000	000000				3J16A

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002323	707070	777703	000000				4J02F
002323	707070	777704	000000				4J02G
002323	707070	777705	000000				4J04F 4J02G
002323	707070	777706	000000				4J02G 4J03G
002323	707070	777717	000000				4J02F
002333	707070	000000	000000				3J03E
002333	707070	000010	000000				4J02E 4J09F 4J04G
002333	707070	000033	000000				4J02G
002334	000000	000016	000000				3J03B
002357	000010	000000	000000				4J13G
002376	000007	000000	000000				3J28C 4J08D
002411	707070	100000	000000				7J11A
002412	000000	000001	000000				7J10B
002412	000007	000001	000000				3J16C 7J15F
002412	070707	040000	000000				6J36E
002412	707070	020000	000000				7J11B
002412	707070	040000	000000	Do test 3.4.1.3			
002412	707070	040040	000000				6J36E
002412	707070	070000	000000				8J07C 4J04F
002412	707070	100000	000000				7J11A 7J04E 3J12F
002412	707070	777777	000000				3J06A 4J04C

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002421	070017	677777	000000				6J23E
002423	707070	000000	000000				3J02B 3J03E 3J19G 4J02F 4J03F 4J14F 4J02G 6J15C 6J35E
002423	707070	070007	000000				3J05D
002423	707070	557775	000000				3J07A 3J03C
002423	707070	777777	000000				4J03C 4J02E 4J16G
002433	000000	070007	000000				3J04C
002433	777777	070007	000000				4J17G 7J22G
002445	000000	341051	000000				4J17C
002447	000000	000000	000000	Do test 3.4.1.4			
002447	000000	000002	000000				7J03D 7J20D 7J21D 7J24D 7J21G
002447	000000	001000	000000				3J17B
002447	000000	002000	000000				7J21C
002447	000000	004000	000000				3J33D
002447	000000	020000	000000	Do test 3.4.1.5			
002447	000000	040000	000000				7J20C 7J24C
002447	000000	071707	000000				4J32C
002447	000000	100000	000000				7J25C

3.4.1  
(Cont)

3.4.1  
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<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002447	000000	400000	000000				7J22B
002447	000013	001000	000000				3J18B 7J22G
002447	000020	020000	000000				7J20A
002447	000034	400000	000000				4J31A
002447	000035	000000	000000				3J07D 4J30A
002447	000035	200000	000000				4J33G
002447	000035	250000	000000				4J32F
002447	000035	252520	000000				4J33B
002447	000035	252524	000000				4J34A
002447	000035	252525	000000				4J33D
002447	000035	377777	000000				3J03F
002447	000035	740000	000000				4J34F
002447	000035	776000	000000				4J33E
002447	000035	777700	000000				4J32C
002447	000035	777776	000000				3J053
002447	000035	777777	000000				3J03F 4J26A 4J32A 4J33D 4J34G
002447	000036	000002	000000				7J19A
002447	000036	100000	000000				7J22G
002447	000036	200036	000000				7J28C
002447	000036	300000	000000				4J34C 4J28E 4J29E 4J30E 4J28F

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002447	000036	600000	000000				4J30E 4J28G
002447	000037	040000	000000				7J22B
002447	000037	777400	000000				4J34C
002447	000040	020000	000000				7J21A 7J22C
002447	000045	377400	000000				4J30D 4J34D
002447	000045	677400	000000				4J34D
002447	000056	400000	000000				4J02A 4J13A 4J19A 4J28C
002447	000057	200000	000000				4J18A 4J28C
002447	000060	100000	000000				4J17A
002447	000061	040000	000000				4J19B
002447	000062	020000	000000				4J18B 4J29C 4J30C 3J25D
002447	000063	010000	000000				4J17B 4J29C 4J30C
002447	000064	004000	000000				4J28B 4J30C
002447	000064	400000	000000				4J19C
002447	000065	002000	000000				4J28B 4J18C
002447	000065	777777	000000				4J30A
002447	000066	001000	000000				4J28B 4J29B 4J17C
002447	000067	000400	000000				4J29B



3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002447	000067	040000	000000				7J22C
002447	000067	377000	000000				4J19E
002447	000070	000200	000000				4J29B 4J30B 4J18E
002447	000071	000100	000000				3J03B 4J17E 4J30B
002447	000072	000040	000000				4J30B 4J19F
002447	000073	000020	000000				4J28A 4J18F
002447	000074	000010	000000				4J28A 4J29A 4J17F
002447	000075	000004	000000				4J29A 4J30A 4J18G 4J19G
002447	000076	000002	000000				4J29A 4J30A 4J31A 7J19G 7J22G
002447	503000	342374	000000				6J33E
002452	000077	000000	000000				3J21G
002452	000077	000001	000000				4J31A 7J22C 7J23F
002454	000077	000001	000000				7J23F
002465	200000	000000	000000				3J05G 4J06D 7J19E
002465	200000	000001	000000				7J22B 7J24B

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002465	200000	000005	000000				7J25B
002465	200000	000015	000000				7J24A 7J22B
002465	200000	000036	000000				7J21F
002465	200000	000037	000000				4J04F
002465	200000	000075	000000				4J03C 7J20A 7J21A
002465	200000	000077	000000				7J20C
002465	200000	007777	000000				3J06F
002465	200000	770035	000000				3J06B
002465	707070	342374	000000				6J15C
002470	200000	000035	000000				7J11D
002475	200000	000035	000000	Do test 3.4.1.6			
002477	200000	000000	000000				3J07D 3J27A 7J02B 7J21B 7J10D
002512	000000	000075	000000				3J23E
002512	000000	001237	000000				3J17B
002512	000400	000000	000000				8J08G
002512	001000	000076	000000				8J08G 8J15G 8J19G
002512	100000	000076	000000				8J09F 8J14G 8J17G
002512	100000	000077	000000				7J22G
002512	200000	000000	000000				3J07F
002512	200000	000035	000000				7J10D

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002512	200000	000036	000000				4J03C 4J08F
002512	200000	000037	000000				3J23E
002512	200000	000057	000000				8J12C
002512	200000	000076	000000				3J32D
002512	200000	000077	000000				4J03E 4J04E 4J03G 4J04G
002536	777777	000001	000000				4J32A 4J13G 4J30G 4J34G
002551	777776	000001	000000				3J17B
002554	000001	000000	000000				3J04C
002554	773177	000000	000000				3J03B
002561	000000	070000	000000				4J13G 4J34G
002561	000000	070551	000000				7J12C
002561	000000	070707	000000				7J24B 7J24C 7J25C 7J28C
002561	000000	071707	000000				4J30F
002561	000000	071717	000000				4J29G
002561	000000	170707	000000				4J33E 4J32F
002561	000000	171707	000000				4J29E 4J29F
002561	000000	171717	000000				4J30D
002561	000000	677777	000000				4J33D
002561	000007	070700	000000				7J25B 7J28C

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002567	777777	000000	000000				4J33E 4J34G
002567	777777	000001	000000				4J32A
002567	777777	000002	000000				4J32A
002567	777777	000004	000000				4J34A
002567	777777	000010	000000				4J34A
002567	777777	000020	000000				4J33B
002567	777777	000040	000000				4J33B
002567	777777	000100	000000				4J32C
002567	777777	000200	000000				4J32C
002567	777777	000400	000000				4J34C
002567	777777	001000	000000				4J34C
002567	777777	004000	000000				4J33E
002567	777777	010000	000000				4J32F
002567	777777	020000	000000				4J32F
002567	777777	040000	000000				4J34F
002567	777777	200000	000000				4J33G
002567	777777	400000	000000				4J33G 4J34G
002574	000000	000001	000000				4J32A
002574	000000	000002	000000				4J32A
002574	000000	000004	000000				4J34A
002574	000000	000010	000000				4J34A
002574	000000	000020	000000				4J33B
002574	000000	000040	000000				4J33B
002574	000000	000100	000000				4J32C
002574	000000	000200	000000				4J32C

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002574	000000	000400	000000				4J34C
002574	000000	001000	000000				4J34C
002574	000000	002000	000000				4J33E
002574	000000	004000	000000				4J33E
002574	000000	010000	000000				4J32F
002574	000000	020000	000000				4J32F
002574	000000	040000	000000				4J34F
002574	000000	100000	000000				4J34F
002574	000000	200000	000000				4J33G
002574	000000	400000	000000				4J33G 4J34G
002600	777777	000001	000000				3J07B 3J08B 3J17G 4J32A 4J34D
002600	777777	400000	000000				3J18A
002605	040040	000070	000000				6J23D
002605	040177	000377	000000				6J29D
002605	040344	000377	000000				6J34D
002605	040367	000377	000000				6J29D
002605	040373	000377	000000				6J29D
002605	707070	342374	000000				6J31E
002605	777777	000000	000000				3J06C
002605	777777	777776	000000				4J33D
002612	000001	770000	000000				4J13A
002612	000001	777000	000000				4J26A 4J30A

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002612	400000	777000	000000				4J30A
002615	000001	777000	000000				4J13A
002624	434343	434343	000000				3J18A 7J22G
002627	040063	000377	000000				6J17C
002627	040125	000377	000000				6J17C
002627	040172	000177	000000				6J31B
002631	000001	070707	000000				3J17G
002631	400000	070707	000000				4J13G
002634	000001	070707	000000				4J19A
002634	000002	070707	000000				4J18A
002634	000004	070707	000000				4J17A
002634	000010	070707	000000				4J19B
002634	000020	070707	000000				4J18B
002634	000040	070707	000000				4J17B
002634	000100	070707	000000				4J19C
002634	000200	070707	000000				4J18C
002634	000400	070707	000000				4J17C
002634	001000	070707	000000				4J19E
002634	004000	070707	000000				4J17E
002634	010000	070707	000000				4J19F
002634	020000	070707	000000				4J18F
002634	040000	070707	000000				4J17F
002634	100000	070707	000000				4J19G
002634	200000	070707	000000				4J18G
002634	400000	070707	000000				4J13G 4J17G

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002650	040017	000377	000000				6J15C
002650	040063	000377	000000				6J15C
002650	040100	000177	000000				6J34D
002650	776001	776000	000000				4J34G
002650	776001	776003	000000				4J30G
002655	777000	777000	000000				3J17B
002663	707070	707370	000000				4J30F
002670	707070	707070	000000				4J33G
002670	707071	707071	000000				4J33G
002672	040020	000060	000000				6J27D
002672	040063	000363	000000				6J13C
002672	040337	000377	000000				6J27D
002672	040357	000377	000000				6J27D
002672	040367	000377	000000				6J27D
002674	707070	770707	000000				3J18A
002674	770707	070717	000000				4J34A
002674	770707	070777	000000				4J33B
002674	770707	170707	000000				4J34F
002674	770707	770707	000000				4J34G
002674	773737	373737	000000				3J053
002732	177777	200000	002713				4J35D
002740	000000	020000	002713				8J12F 8J14F 8J18F
002740	000000	040000	002713				8J14F 8J19F
002740	000000	100000	002713				8J12F 8J14G

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002740	000000	200000	002015				3J23G 8J08G 8J09G 8J11G 8J14G 8J18G
002740	000002	000001	002713				3J31D
002740	002725	100000	002713				3J17E
002740	040000	100000	002713				3J04C
002740	060000	020000	002713				8J11F 8J11G
002740	077776	100000	000000				3J17E
002740	100000	200000	002713				8J09F 8J12G 8J11G
002740	100000	640000	002713				3J04C
002740	140000	040000	002713				8J12G
002740	140000	200000	002713				8J08F 8J09F 8J11F
002740	160000	200000	002713				8J08F 8J13F
002740	200000	100000	002015				3J05E
002740	200020	200000	002015				8J18B
002740	204000	200000	002713				8J14E
002740	210000	200000	002713				8J14E
002740	220000	200000	002713				8J08F 8J14F
002740	240000	200000	002713				8J09F 8J14F
002740	300000	100000	002713				8J09G 8J11G



3.4.1  
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3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002740	300000	200000	002713				8J09F
002740	600000	200000	002004				8J13G 8J18G
002743	000777	001000	002713				8J09E
002743	001777	002000	002713				8J09E
002743	003777	004000	002713				8J09E
002743	007777	010000	002713				8J09E
002743	017777	020000	002713				8J09E
002743	037777	040000	002713				8J09E
002743	077777	100000	002713				8J09E
002743	177777	200000	002000				3J17C 8J06D
002743	177777	200000	002713				8J09E 8J08G
002756	000000	777776	002713				7J04C
002764	177777	577777	002004				8J13G
002764	377777	400000	002713				3J17E
002764	377777	577777	002713				8J08G
002764	400777	377777	002713				8J12E
002764	401777	377777	002713				8J13D
002764	403777	377777	002713				8J13E
002764	407777	377777	002713				8J11F
002764	417777	377777	002713				8J13F
002764	437777	377777	002713				8J11F
002764	477777	377777	002713				8J12G
002764	477777	677777	002713				8J09G 8J14G

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002764	577777	177777	002713				4J34G 7J04A
002764	577777	377777	002713				8J09G
002764	717777	757777	002713				8J11F 8J14F
002764	747777	767777	002713				8J13F 8J14F
002764	763777	773777	002713				8J11F
002764	774777	776777	002713				8J13D
002764	777777	377777	002713				8J07G 8J13G 8J15G
002764	777777	577777	002713				8J14G
002777	000000	777776	002713				3J11A 3J12B 8J14F 8J14G
002777	000001	777776	002713				4J31C
002777	000017	777776	002713				4J35B 4J31C
002777	000777	777776	002713				4J35B
002777	017777	777776	002713				4J35B
003007	000000	400000	002713				3J13G 4J35D 8J12F 8J13G 8J15G
003054	777777	000017	000000				7J28C
003054	777777	000043	000000				4J31A
003054	777777	000044	000000				4J31A
003060	777777	000000	000000				3J21A 3J12E

3.4.1  
(Cont)

3.4.1  
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<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
003100	434343	000020	000000				4J34G 7J04A
003100	577777	000021	000000				4J24B
003124	353535	000000	000000				3J30C
003126	000000	353535	000000				3J30C
003126	000000	424242	000000				3J21A 3J22E
003126	424243	353535	000000				3J19A 3J21E
003126	530152	353535	000000				3J28G
003126	777777	777777	000000				3J28A
003130	060137	000000	000000				3J08C
003130	153535	000000	000000				3J20E
003130	353535	000000	000000				3J21C 3J20E 3J21E
003130	424242	000000	000000				3J03B 3J19B
003130	424243	000000	000000				3J21E
003130	504402	000000	000000				3J28D
003130	777777	000000	000000				3J28A 3J09B 4J31G
003135	000000	000000	000000		Do test 3.4.1.7		
003137	000000	000000	000000				3J09B 3J09D
003146	377777	200000	000000				3J19B
003152	077777	200000	000000				3J07F
003152	077777	377777	000000				3J13A 3J16B 3J09C 3J09G

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
003154	000000	000503	000000				3J18C
003154	077776	400000	000000				3J09D
003154	077777	000000	000000				3J10F
003154	077777	400000	000000	Do test 3.4.1.8			
003156	077777	400000	000000				3J18C 3J17D
003161	077777	400000	000000				3J09B 3J09C 3J09G 4J31G
003206	000000	677777	000000				3J30C
003206	000000	777777	000000				3J28A
003206	400000	077777	000000				3J19C
003206	777777	277777	000000				3J20A
003212	700000	000001	000000				3J28A 3J30C 4J22E 4J31G
003232	000010	242776	000000				8J28B
003232	000100	503400	000000				7J18C
003232	000400	503400	000000				7J18C
003232	000540	503400	000000				7J18C
003232	005002	000000	000000				3J17E
003232	025665	737777	000000				6J29C
003232	040001	777775	000000				6J36D
003232	040004	000000	000000				6J13C
003232	040030	673705	000000				6J34D
003232	040220	377777	000000				6J19C

3.4.1  
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3.4.1  
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<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
003232	042527	777737	000000				3J32E 7J27G 7J28G
003232	046137	000000	000000				7J11D
003232	060000	216013	000000				6J35C
003232	063020	577777	000000				6J19C
003232	070000	256003	000000				6J35C
003334	000000	000000	000000				4J23F
003334	000000	000002	000000				4J03A 3J03B
003334	000000	000006	000000				3J05C 4J03A 7J21E
003334	000000	000016	000000				3J21B 3J03D 3J06G 4J13A 4J26C 4J23G 8J28A
003334	000000	000036	000000				3J04A 3J16B 3J04F 3J06F 4J03A 7J04A
003334	000000	000076	000000	Do test 3.4.1.9			
003334	000000	000176	000000				3J20E 3J04F 3J20F 3J05G 4J15D 8J02F
003334	000000	000376	000000	Do test 3.4.1.10			
003334	000000	000776	000000				3J27A 3J04F 4J23C

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
							7J22F 8J02F 8J03D
003334	000000	001176	000000				3J17G
003334	000000	001776	000000	Do test 3.4.1.11			
003334	000000	001777	000000				3J05C
003334	000000	003776	000000				3J03F 3J07G 7J23G 7J21E 7J22E 7J22F 7J23G 8J02E
003334	000000	005640	000000				3J03D
003334	000400	000176	000000				4J29D
003334	004537	000176	000000				3J20F 3J20G
003334	004537	003776	000000				3J20F
003334	004607	000376	000000				4J02A
003334	007203	000376	000000				3J04A
003334	641464	000006	000000				3J21G 7J09D
003334	777777	000176	000000				4J02A
003334	777777	000376	000000				4J02A 4J03A
003334	777777	160016	000000				4J03A
003343	000002	000001	000000				3J13A 3J28A 4J04G
003343	700002	000070	000000				3J28G
003343	700002	006000	000000				3J18E
003343	700002	077776	000000				3J16F

3.4.1  
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3.4.1  
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<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
003343	700002	700002	000000				3J13A 3J28A 3J17F 3J05C 4J04G
003343	700002	700003	000000				3J11G
003343	777776	777776	000000				3J17E
003345	000000	777602	000000				8J15G
003345	000015	000000	000000				4J06A 4J17A 7J29C 7J13E
				<i>IS RTC DISC ?</i>			
003345	000015	000001	000000				gJ20B 7J29C
003345	000062	000010	000000				8J32D
003351	000000	000000	000000				7J18D 7J21G
003351	773112	436603	000000				3J07G
003354	000004	000000	000000				8J21A
003372	000377	000377	000000				8J34A 8J35A 8J31B
003430	000000	000002	000000				4J11G
003430	000000	000010	000000				4J11G
003430	000000	000020	000000				4J11G
003430	000000	000040	000000				4J11G
003430	000000	000100	000000				4J11G
003430	000000	000110	000000				4J12E
003430	000000	000200	000000				4J11G
003430	000000	000220	000000				4J12C
003430	000000	000330	000000				4J12G

3.4.1  
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3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
003430	000000	000400	000000				4J11G
003430	000000	000440	000000				4J12C 4J12E
003430	000000	000550	000000				4J12G
003430	000000	000660	000000				4J12A
003430	000000	016002	000000				4J12E
003430	000000	025002	000000				4J12E
003430	000000	034004	000000				4J12C
003430	000000	043002	000000				4J12C
003430	000000	052004	000000				4J12E
003430	000000	061004	000000				4J12E
003430	000000	077776	000000				3J09F 3J10G 4J12C 4J12E 4J11G
003430	000002	000000	000000				4J12C
003430	000004	000400	000000				4J11A 4J12A
003430	000012	000020	000000				4J11A
003430	000016	000420	000000				4J10D
003430	000020	000040	000000				4J11A 4J12A
003430	000032	000060	000000				4J12D
003430	000040	000200	000000				4J11A 4J12A
003430	000052	000220	000000				4J11D
003430	000074	000000	000000				4J12C
003430	000076	000660	000000				4J11A 4J12A



3.4.1  
(Cont)

3.4.1  
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<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
003430	000100	000100	000000				4J11B 4J12G
003430	000200	000010	000000				4J11B
003430	000220	041004	000000				4J11F
003430	000300	000110	000000				4J12D
003430	000402	000400	000000				4J11B 4J12G
003430	000410	004040	000000				4J12B
003430	000414	010104	000000				4J13C
003430	000442	002010	000000				4J13E
003430	000544	000000	000000				4J12G
003430	000544	016042	000000				4J11G
003430	000564	017042	000000				4J13D
003430	000602	000410	000000				4J12D
003430	000744	056046	000000				4J13D
003430	001000	000040	000000				4J11B 4J12G
003430	001030	021400	000000				4J11F
003430	001040	040210	000000				4J13E
003430	001200	000050	000000				4J12D
003430	001210	060404	000000				4J11F
003430	001230	000000	000000				4J12G
003430	001230	061404	000000				4J11F
003430	001554	036442	000000				4J13D
003430	001700	000000	000000				4J12C 4J12E
003430	001702	000550	000000				4J11B 4J12G

3.4.1  
(Cont)

3.4.1  
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<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
003430	001774	000000	000000				4J12G
003430	002000	000200	000000				4J11F 4J11G
003430	002000	000204	000000				4J11F
003430	002020	001100	000000				4J12F
003430	002122	005042	000000				4J13F
003430	002240	044212	000000				4J12F
003430	002420	021110	000000				4J12B
003430	002422	024422	000000				4J13F
003430	004000	000100	000000				4J11F
003430	004022	020120	000000				4J12B
003430	004022	020420	000000				4J12F
003430	004042	004020	000000				4J12B
003430	004100	040210	000000				4J13F
003430	004200	010044	000000				4J13E
003430	004200	010440	000000				4J13E
003430	004200	040204	000000				4J12F
003430	004200	040410	000000				4J13F
003430	004240	050214	000000				4J11B
003430	004432	024160	000000				4J12B
003430	005020	021120	000000				4J13E
003430	005040	042210	000000				4J13C
003430	005226	136466	000000				6J29E
003430	005226	724155	000000				6J19C 6J29E
003430	005226	724213	000000				6J29E

3.4.1  
(Cont)

3.4.1  
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<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
003430	005240	050254	000000				4J13E
003430	006000	000300	000000				4J13D
003430	006220	041304	000000				4J12F
003430	010000	000010	000000				4J11F 4J11G
003430	010000	010000	000000				4J11F
003430	010202	020420	000000				4J13C
003430	010210	010204	000000				4J12B
003430	010424	002420	000000				4J13E
003430	010444	012050	000000				4J12F
003430	010504	012044	000000				4J12F
003430	010600	030104	000000				4J11A
003430	010616	030524	000000				4J13C
003430	011010	020104	000000				4J13F
003430	011044	011044	000000				4J13F
003430	012024	000000	000000				4J12G
003430	012024	025022	000000				4J12G
003430	012064	035026	000000				4J12D
003430	012104	044242	000000				4J13E
003430	012744	056256	000000				4J12F
003430	013466	035466	000000				4J13F
003430	014000	000110	000000				4J13D
003430	014252	014224	000000				4J12B
003430	014600	000000	000000				4J12A
003430	014600	034104	000000				4J11A
003430	015210	060514	000000				4J13F
003430	016204	065222	000000				4J12D

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
003430	017124	065362	000000				4J13E
003430	020002	000020	000000				4J11F 4J11G
003430	020210	002100	000000				4J13F
003430	020210	010404	000000				4J13E
003430	020444	012220	000000				4J13F
003430	020652	012414	000000				4J13E
003430	021010	001100	000000				4J12F
003430	021104	042442	000000				4J12B
003430	021112	024422	000000				4J12F
003430	022112	005102	000000				4J13E
003430	022120	005042	000000				4J13C
003430	022240	011204	000000				4J12B
003430	022566	017262	000000				4J13F
003430	023100	000000	000000				4J12A
003430	023100	043012	000000				4J12A
003430	023500	063112	000000				4J11D
003430	023524	063552	000000				4J12B
003430	024002	000120	000000				4J13D
003430	024010	042200	000000				4J11B
003430	024050	000000	000000				4J12G
003430	024050	052204	000000				4J11B
003430	024310	042310	000000				4J13F
003430	025032	021520	000000				4J12F
003430	027100	047012	000000				4J10D
003430	027160	047252	000000				4J13C

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
003430	031556	036472	000000				4J12F
003430	032034	027022	000000				4J12D
003430	032536	027522	000000				4J13E
003430	033300	053016	000000				4J12D
003430	033344	053616	000000				4J12B
003430	036000	000000	000000				4J12C 4J12E
003430	036002	000330	000000				4J11F 4J11G
003430	036074	000000	000000				4J12G
003430	037700	000000	000000				4J12A
003430	037776	000000	000000				3J27B 3J06F 3J09F 3J10G 4J12C
003612	000377	000000	000000				4J03F 4J16F
003705	773777	000000	000000				8J19E
003724	000500	503400	000000				4J35B
003724	000507	000540	000000				4J31F
003724	000533	600000	000000				4J31E
004150	070177	000177	000000				7J12B
004150	070360	000360	000000				7J04E
004164	030003	000003	000000				3J06G
004164	050000	000000	000000				4J35E
004363	000000	000000	000000				3J19F
004374	000000	004164	347775				4J17C
004374	000000	777776	762266				4J02F

3.4.1  
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3.4.1  
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<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
004374	124637	102327	762266				3J03E 4J16G
004374	764362	000000	347775				3J02E 8J06C
004464	070377	000377	000000				4J08C 4J13C
005511	000000	000000	000000				4J08C
005511	000000	100000	000000	Do test 3.4.1.12			
006003	000000	555555	000000	Do test 3.4.1.13			
006003	010010	111111	000000				4J23A 4J35B 4J35D 4J35E
006003	044000	222222	000000				7J19B
006003	054010	222222	000000				7J17D
006003	054011	222222	000000				gJ23E gJ24E
006003	054014	222222	000000				3J08A 3J09A
006003	054051	222222	000000				gJ24E gJ25E
006373	577700	000000	000000				gJ15B
006760	000000	000503	000000				3J08B
006761	000007	547235	000000				gJ06A gJ07A gJ11B gJ25C
010015	012005	000017	000000				7J31F
010061	000000	000252	000000				gJ29E
010063	000000	000000	016445	Do test 3.4.1.14			
010121	000000	000002	000000				gJ28D

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
010130	000000	000002	000000				gJ28D
010131	000000	000000	000000	Do test 3.4.1.15			
010131	000000	000001	000000				gJ15D gJ28D
010131	000000	000002	000000				gJ15D gJ28D
010131	000000	000010	000000				gJ15C gJ27C gJ28C
010131	000000	000020	000000				gJ15B gJ28B
010131	000000	000040	000000				gJ15B gJ28B
010131	000000	000100	000000				gJ15A gJ28A
010131	000000	000200	000000				gJ15A gJ28A
010131	000000	000400	000000				gJ15D gJ28D
010131	000000	001000	000000				gJ15D gJ28D
010131	000000	001000	001000				gJ27D
010131	000000	002000	000000				gJ15C gJ28C
010131	000000	004000	000000				gJ15C gJ28C
010131	000000	004030	000000				3J16C
010131	000000	010000	000000				gJ15B gJ28B
010131	000000	020000	000000				gJ15B gJ28B
010131	000000	040000	000000				gJ15A gJ28A

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
010131	000000	100000	000000				gJ15A gJ27A gJ28A
010131	000000	125000	000000				gJ29E
010131	000000	177777	000000				3J20C 3J19E
010131	000000	177777	177777				3J20B
010131	000001	000000	000000				gJ15D gJ17D
010131	000001	000001	000001				gJ15D
010131	000002	000000	000000				gJ15D gJ17D
010131	000002	000002	000002				gJ15D gJ18C
010131	000004	000000	000000				gJ17D
010131	000010	000000	000000				gJ17D
010131	000010	000010	000010				gJ15C gJ18C
010131	000012	000000	000000				gJ17D
010131	000020	000000	000000				gJ15B gJ17B
010131	000020	000020	000020				gJ15B
010131	000025	000025	000025				gJ13B
010131	000040	000000	000000				gJ15B gJ17B
010131	000040	000040	000040				gJ15B gJ18C
010131	000100	000000	000000				gJ15A gJ17B
010131	000100	000100	000100				gJ15A
010131	000105	000105	000105				gJ13B



<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
010131	000124	000124	000124				gJ13B
010131	000125	000125	000125				gJ13B 7J18A
010131	000200	000000	000000				gJ15A gJ17B
010131	000200	000200	000200				gJ15A gJ18A
010131	000212	000212	000212				gJ13B
010131	000240	000000	000000				gJ17B
010131	000242	000242	000242				gJ13B
010131	000250	000250	000250				gJ13B
010131	000252	000000	000000				gJ17C
010131	000252	000252	000252				7J18A gJ13B
010131	000400	000000	000000				gJ17D gJ15D
010131	000400	000400	000400				gJ18C gJ15D
010131	001000	000000	000000				gJ15D gJ17D
010131	001000	001000	001000				gJ18C gJ15D
010131	002000	000000	000000				gJ15C gJ17D
010131	002000	002000	002000				gJ15C gJ18C
010131	002400	000000	000000				gJ17D
010131	010000	000000	000000				gJ15B
010131	010000	010000	010000				gJ18C
010131	012400	012400	012400				gJ13B

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
010131	020000	000000	000000				gJ15B gJ17B
010131	020000	020000	020000				gJ15B gJ18C
010131	030060	030060	030060				7J15G
010131	040000	000000	000000				gJ15A gJ17B
010131	040000	040000	040000				gJ15A
010131	042400	042400	042400				gJ13B
010131	052000	052000	052000				gJ13B
010131	052400	000000	000000				gJ20A
010131	052400	052400	052400				gJ13B 7J16A 7J18A
010131	100000	000000	000000				gJ15A gJ17B
010131	100000	100000	100000				gJ15A gJ18A
010131	121000	121000	121000				gJ13B
010131	140300	140300	140300				7J15F
010131	170360	170360	170360				7J14F
010151	000010	500117	000000				gJ17D
010153	000000	000002	000000				gJ16A 3J15G 7J27F
010153	000000	000003	000000				gJ16A gJ26D
010251	000000	000100	000000				gJ28A
010261	000000	000000	000002	Do test 3.4. 1. 16			
010261	000000	000001	000000				gJ28D
010261	000000	000001	000001				gJ15D

3.4.1  
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3.4.1  
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<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
010261	000000	000002	000000				gJ15D
010261	000000	000002	000002				gJ28D
010261	000000	000010	000000				gJ15C
010261	000000	000010	000010				gJ28C
010261	000000	000020	000000				gJ15B
010261	000000	000020	000020				gJ28B
010261	000000	000040	000000				gJ15B
010261	000000	000040	000040				gJ28B
010261	000000	000100	000000				gJ28A
010261	000000	000125	000000				gJ19A gJ20A
010261	000000	000200	000000				gJ15A
010261	000000	000200	000200				gJ28A
010261	000000	000252	000000				gJ19A gJ20A gJ14C gJ27C
010261	000000	000400	000000				gJ15D
010261	000000	000400	000400				gJ28D
010261	000000	001000	000000				gJ15D
010261	000000	001000	001000				gJ28D
010261	000000	002000	000000				gJ15C
010261	000000	002000	002000				gJ28C
010261	000000	004000	000000				gJ28C
010261	000000	004000	004000				gJ15C
010261	000000	010000	000000				gJ28B
010261	000000	010000	010000				gJ15B

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
010261	000000	020000	000000				gJ15B
010261	000000	020000	020000				gJ28B
010261	000000	040000	000000				gJ28A
010261	000000	040000	040000				gJ15A
010261	000000	052400	000000				gJ19A gJ20A gJ14C gJ27C
010261	000000	100000	000000				gJ28A
010261	000000	100000	100000				gJ15A
010261	000000	125000	000000				gJ19A gJ20A gJ27C gJ29E
010261	000000	177777	000000				3J21B 3J21C 7J14E 7J15F
010261	000000	177777	177777				7J26D
010261	000001	000000	000000				gJ17D
010261	000001	000000	000001				gJ15D
010261	000001	000001	000000				gJ13B gJ15D gJ27D
010261	000002	000000	000000				gJ17D
010261	000002	000002	000000				gJ15D
010261	000002	000002	000002				gJ13B gJ15D gJ27D
010261	000004	000000	000000				gJ17D
010261	000004	000004	000004				gJ13B
010261	000005	000000	000000				gJ17D

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
010261	000010	000000	000000				gJ15C gJ17D
010261	000010	000000	000010				gJ15C
010261	000010	000010	000000				gJ15C
010261	000010	000010	000010				gJ13B gJ15C
010261	000012	000000	000000				gJ17D
010261	000020	000000	000000				gJ17B
010261	000020	000000	000020				gJ15B
010261	000020	000020	000000				gJ15B
010261	000020	000020	000020				gJ13B gJ15B
010261	000025	000025	000025				gJ13B
010261	000040	000000	000000				gJ17B
010261	000040	000000	000040				gJ15B
010261	000040	000040	000000				gJ15B
010261	000040	000040	000040				gJ13B gJ15B gJ27B
010261	000052	000052	000052				gJ13B
010261	000100	000000	000000				gJ17B
010261	000100	000000	000100				gJ15A
010261	000100	000100	000000				gJ15A
010261	000100	000100	000100				gJ15A gJ13B
010261	000105	000105	000105				gJ13B
010261	000120	000000	000000				gJ17B
010261	000121	000121	000121				gJ13B

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
010261	000124	000124	000124				gJ13B
010261	000125	000000	000000				gJ19A gJ20A
010261	000125	000125	000125				gJ13B gJ12F 7J15B 7J16B
010261	000200	000000	000000				gJ17B
010261	000200	000000	000200				gJ15A
010261	000200	000200	000000				gJ15A
010261	000200	000200	000200				gJ15A gJ13B
010261	000212	000212	000212				gJ13B
010261	000240	000000	000000				gJ17B
010261	000242	000242	000242				gJ13B
010261	000250	000250	000250				gJ13B
010261	000252	000000	000000				gJ19A gJ20A gJ14C gJ17C
010261	000252	000252	000252				gJ13B gJ27B gJ01C gJ12F 7J16A 7J15B
010261	000400	000000	000000				gJ17D
010261	000400	000000	000400				gJ15D
010261	000400	000400	000000				gJ15D
010261	000400	000400	000400				gJ13B gJ15D gJ27D
010261	001000	000000	000000				gJ17D

3.4.1  
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3.4.1  
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<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
010261	001000	000000	001000				gJ15D
010261	001000	000100	000000				gJ15D
010261	001000	001000	001000				gJ13B gJ15D
010261	002000	000000	000000				gJ17D
010261	002000	000000	002000				gJ15C
010261	002000	002000	000000				gJ15C
010261	002000	002000	002000				gJ13B gJ15C gJ27C
010261	002400	000000	000000				gJ17D
010261	010000	000000	000000				gJ17B
010261	010000	010000	010000				gJ13B gJ27B
010261	020000	000000	000000				gJ17B
010261	020000	000000	020000				gJ15B
010261	020000	020000	000000				gJ15B
010261	020000	020000	020000				gJ13B gJ15B
010261	040000	000000	000000				gJ17B
010261	040000	000000	040000				gJ15A
010261	040000	040000	000000				gJ15A
010261	040000	040000	040000				gJ15A
010261	050000	000000	000000				gJ17B
010261	050400	050400	050400				gJ13B
010261	052000	052000	052000				gJ13B
010261	052400	000000	000000				gJ19A gJ14C gJ17C

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
010261	052400	052400	052400				7J15A 7J16A gJ13B gJ27B gJ12F
010261	052777	052777	052777				7J18A
010261	100000	000000	000000				gJ17B
010261	100000	000000	100000				gJ15A
010261	100000	100000	000000				gJ15A
010261	100000	100000	100000				gJ15A gJ13B
010261	120000	000000	000000				gJ17B
010261	121000	121000	121000				gJ13B
010261	125000	125000	125000				gJ13B
010261	177777	000000	000000				3J21C
010261	177777	177777	177777				3J20B 3J21C 3J09C 3J16C 7J02F
010277	010214	000000	000000				gJ22C
010277	010214	016445	000000		Do test 3.4.1.17		
010277	010214	016446	000000				gJ23A
010277	010223	016446	016445				gJ21B
010277	010226	000000	000000				gJ35A
010277	010226	016445	000000				gJ23D
010277	010226	016446	000000		Do test 3.4.1.18		
010277	010226	765546	000000				3J21E
010277	010240	016446	000000		Do test 3.4.1.19		



3.4.1  
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3.4.1  
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<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
010303	010000	000000	016445				gJ19A gJ20A gJ07B gJ09B gJ19B gJ19C gJ19D
010322	777700	502707	000000				gJ04B
010332	777700	502706	000000				gJ03B gJ04B
010332	777700	502716	000000				gJ03B gJ04B gJ05B
010344	000125	000000	016445				gJ04B gJ12B
010344	000252	000000	000000				gJ04B gJ12D
010344	052400	000000	000000				gJ04B gJ12D
010344	125000	000000	000000				gJ04B gJ12D
010344	177777	000000	016445				7J19B 7J09C
010431	010000	000000	000000				gJ17B
010447	000000	500117	000000				7J14A 7J15A 7J16A gJ27A gJ17B gJ27B 7J14A
010447	000000	500217	000000				gJ28A
010447	040000	500117	000000				7J14A
010447	040300	500117	000000				7J15C

3.4.1  
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3.4.1  
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<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
010451	000001	500117	000000				gJ25A gJ17D gJ27D
010451	000001	500217	000000				gJ28D
010451	000002	500117	000000				gJ17D gJ27D
010451	000002	500217	000000				gJ28D
010451	000002	500317	000000				gJ33E
010451	000004	500117	000000				gJ17D
010451	000004	500317	000000				gJ33D
010451	000010	500117	000000				gJ27C
010451	000010	500217	000000				gJ28C
010451	000010	500317	000000				gJ33D
010451	000020	500117	000000				gJ17B gJ27B
010451	000020	500217	000000				gJ28B
010451	000020	500317	000000				3J34C
010451	000040	500117	000000				gJ17B gJ27B
010451	000040	500217	000000				gJ28B
010451	000040	500317	000000				gJ33C
010451	000100	500117	000000				gJ27A gJ17B gJ27B 7J15B 7J16B
010451	000100	500217	000000				gJ28A
010451	000100	500317	000000				gJ33B
010451	000200	500117	000000				gJ27A gJ17B gJ27B

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
							7J12A 7J16A 7J15B
010451	000200	500217	000000				gJ28A
010451	000200	500317	000000				gJ33B
010451	000400	500117	000000				gJ17D
010451	000400	500217	000000				gJ28D
010451	000400	500317	000000				gJ33E
010451	001000	500117	000000				gJ27D
010451	001000	500217	000000				gJ28D
010451	001000	500317	000000				gJ33E
010451	002000	500117	000000				gJ27C gJ17D
010451	002000	500217	000000				gJ28C
010451	002000	500317	000000				gJ33D
010451	004000	500117	000000				7J14F gJ27C gJ17D
010451	004000	500217	000000				gJ28C
010451	004000	500317	000000				gJ33D
010451	010000	500117	000000				gJ17B gJ27B
010451	010000	500217	000000				gJ28B
010451	010000	500317	000000				gJ33C
010451	020000	500117	000000				7J15F 7J14G 7J15G gJ27B
010451	020000	500217	000000				gJ28B

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
010451	020000	500317	000000				gJ33C
010451	025000	500117	000000				7J15G gJ18C
010451	040000	500117	000000				7J15A 7J16A gJ27A gJ17B gJ27B
010451	040000	500217	000000				gJ27A gJ28A
010451	040000	500317	000000				gJ33B
010451	340450	040567	000000				3J27G
010551	000040	501717	000000				gJ33C
010552	000000	501517	000000				7J18A gJ17B
010552	000000	501617	000000				gJ28A
010552	000000	501717	000000				gJ33B
010554	000001	501517	000000				gJ17D
010554	000001	501617	000000				gJ28D
010554	000002	501517	000000				gJ17D
010554	000002	501617	000000				gJ28D
010554	000002	501717	000000				gJ33E
010554	000004	501517	000000				gJ17D
010554	000004	501717	000000				gJ33D
010554	000010	501517	000000				gJ17D
010554	000010	501717	000000				gJ33D
010554	000020	501517	000000				gJ17B
010554	000020	501617	000000				gJ28B
010554	000020	501717	000000				3J34C

3.4.1  
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3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
010610	000252	000252	000000				gJ27A gJ14C
010610	000400	000000	000000				gJ28D
010610	000400	000400	000000				gJ15D
010610	001000	001000	000000				gJ15D
010610	002000	000000	000000				gJ28C
010610	002000	002000	000000				gJ15C
010610	004000	000000	000000				gJ28C
010610	010000	000000	000000				gJ28B
010610	010000	010000	000000				gJ15B
010610	020000	000000	000000				gJ28B
010610	020000	020000	000000				gJ15B
010610	040000	000000	000000				gJ28A
010610	040000	040000	000000				gJ15A
010610	052400	000000	000000				gJ19A gJ27C
010610	052400	052400	000000				gJ27A gJ14C
010610	100000	000000	000000				gJ28A
010610	100000	100000	000000				gJ15A
010610	125000	000000	000000				gJ19A gJ27C
010610	177777	000000	000000				3J20C
011014	000000	100000	000000				3J11D
011117	016445	000237	010757				3J23D
011117	016445	000277	000000				7J16C
011117	016445	000277	010707				4J31F 8J16E

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
010554	040000	501517	000000				gJ17B
010554	040000	501617	000000				gJ28A
010554	040000	501717	000000				gJ33B
010554	040300	501517	000000				7J18A
010610	000000	000125	000000				gJ19A gJ20A
010610	000000	000252	000000				gJ19A gJ20A gJ17C
010610	000000	052400	000000				gJ19A gJ20A
010610	000001	000000	000000				gJ28D
010610	000001	000001	000000				gJ15D
010610	000002	000000	000000				gJ28D
010610	000002	000002	000000				gJ15D
010610	000010	000000	000000				gJ28C
010610	000010	000010	000000				gJ15C
010610	000020	000000	000000				gJ28B
010610	000020	000020	000000				gJ15B
010610	000040	000000	000000				gJ28B
010610	000040	000040	000000				gJ15B
010610	000100	000000	000000				gJ28A
010610	000100	000100	000000				gJ15A
010610	000125	000000	000000				gJ19A
010610	000200	000000	000000				gJ28A
010610	000200	000200	000000				gJ15A
010610	000252	000000	000000				gJ19A gJ27C

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
010554	000040	501517	000000				gJ17B
010554	000040	501617	000000				gJ28B
010554	000100	501517	000000				gJ17B
010554	000100	501617	000000				gJ28A
010554	000100	501717	000000				gJ33B
010554	000200	501517	000000				gJ17B 7J12A 7J15A
010554	000200	501617	000000				gJ28A
010554	000200	501717	000000				gJ33B
010554	000400	501617	000000				gJ28D
010554	000400	501717	000000				gJ33E
010554	001000	501517	000000				gJ17D
010554	001000	501617	000000				gJ28D
010554	001000	501717	000000				gJ33E
010554	002000	501517	000000				gJ17D
010554	002000	501617	000000				gJ28C
010554	002000	501717	000000				gJ33D
010554	004000	501517	000000				gJ17D
010554	004000	501617	000000				gJ28C
010554	004000	501717	000000				gJ33D
010554	010000	501517	000000				gJ17B
010554	010000	501617	000000				gJ28B
010554	010000	501717	000000				gJ33C
010554	020000	501517	000000				gJ17B
010554	020000	501617	000000				gJ28B
010554	020000	501717	000000				gJ33C

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
011117	016445	000277	010757				7J15E
011221	777700	502006	000000				gj03B
011221	777700	502016	000000				gJ03B
011231	000000	502305	000000				gJ02B
011231	000000	502306	000000				gJ02B
011231	000000	502307	000000				gJ02B gJ29E gJ30F
011231	000000	502307	503400				gJ30F
011231	000000	502314	000000				gJ02B
011231	000000	502316	000000				gJ02B
011231	000000	502317	000000				7J03G gJ02B gJ30F
011266	400000	016446	000000				gJ02D gJ01E gJ04B
011300	000000	505717	000000				gJ30E
011321	100000	016446	000000				gJ15A
011321	400000	016446	XXXXXX	Do test 3.4.1.39			
011327	100000	016446	000000				gJ15A gJ15A
011327	400000	016446	XXXXXX	Do test 3.4.1.40			
011351	000016	400000	777777				gJ03B gJ04B gJ16F
011361	000016	011305	000000				8J09G 8J10D 8J10F
011452	501205	016445	016446				gJ22B
011452	501212	016445	000000				gJ22C 7J15F



<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
011456	400000	502217	000000				7J15E
011503	400000	016446	000000				7J04F
011504	400000	016446	000000	445	446	446	gJ12D
				445	446	446	gJ30E
				445	446	446	gJ16F
				446	445	446	gJ03B
				446	445	446	gJ04B
				446	445	446	gJ05B
				446	445	446	gJ06B
				446	446	446	gJ12D
011504	400000	016446	016446	445	446	446	gJ30E
011516	016446	016446	000000	Do test 3.4.1.20			
011544	400000	406453	015510				3J11A 3J12B
011567	400000	406451	000670				8J06D
011570	400000	406445	000674				7J26B
011602	406450	406445	000674				8J06D
011602	406451	406445	000674				7J20E 8J06D 3J15G
011602	406451	406451	000674				7J20E
011602	406451	777777	000674				3J26A
011647	024414	307712	000374	Do test 3.4.1.21			
011647	024414	406451	000674				7J17G
011647	000000	307712	000000				7J12G
011712	000000	502617	000674				7J26G
011714	000000	502600	607707				gJ29D
011714	000000	502602	607707				gJ29D
011714	000000	502603	607707				gJ29B
011714	000000	502604	607707				gJ29B
011714	000000	502605	607707				gJ29B gJ12F

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
011714	000000	502606	000674				gJ29B gJ29C gJ12F
011714	000000	502607	000674				gJ29D gJ16D
011714	000000	502610	000674				gJ29D
011714	000000	502611	000674				gJ29D
011714	000000	502612	000674				gJ29D
011714	000000	502613	000674				gJ29B
011714	000000	502614	000674				gJ29B
011714	000000	502615	000374				gJ12F
011714	000000	502615	000674				gJ29B gJ29C gJ12F
011714	000000	502616	000674	Do test 3.4.1.22			
011714	000000	502617	000674				gJ16C gJ29E 3J11D 3J23G 7J19G
011720	000000	502606	777777				gJ17A gJ09B
011720	000000	502607	307610				gJ16F
011720	000000	502616	000674				gJ16F
011720	000000	502617	000674				7J22D
011721	000000	000000	000674				gJ11A
011721	000000	020000	000674				gJ29B
011721	000000	040000	000674	Do test 3.4.1.23			
011721	000000	502616	000674				gJ14C
011721	000004	040000	607707				gJ27G
011721	000010	040000	607707				gJ27G

3.4.1  
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3.4.1  
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<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
011721	000020	040000	607707				gJ27G
011721	000040	040000	607707				gJ27G
011721	000100	010000	607707				gJ27G
011721	000200	040000	607707				gJ27G
011721	002000	040000	000674				gJ27G
011721	004000	040000	000674				gJ27G
011721	010000	010000	000674				gJ27G
011721	020000	040000	000674				gJ27G
011721	040000	040000	000674				gJ27G
011721	100000	040000	000674				gJ27G
011731	000000	040000	000674				7J14D
011742	000000	557767	607707	Do test 3.4.1.24			
011742	000001	557767	607707				gJ26B
011742	000002	557767	607707				gJ26B
011742	000400	557767	607707				gJ26B
011742	001000	557767	607707				gJ26B
011756	000000	000000	607707				gJ17A
011757	000000	000000	607707				gJ07B 7J13C 7J14C 7J13E gJ16B
011757	000377	000000	607707				gJ02A
011757	077400	000000	607707				gJ02A
011757	177400	000000	607707				gJ02A

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
011770	000000	000001	607707				gJ32A gJ11B gJ26D gJ29D
011770	000000	000002	607707				gJ32A gJ26D gJ29D
011770	000000	000004	607707				gJ32A gJ29D
011770	000000	000005	607707				gJ29D
011770	000000	000010	607707				gJ32A gJ26C gJ29D
011770	000000	000012	607707				gJ29D
011770	000000	000020	607707				gJ34A gJ26B gJ29B
011770	000000	000040	607707				gJ34A gJ26B gJ29B
011770	000000	000100	607707				gJ26A gJ34A gJ29B
011770	000000	000120	607707				gJ29B
011770	000000	000125	607707				gJ20A gJ29C gJ30C
011770	000000	000200	607707				gJ26A gJ34A gJ29B
011770	000000	000240	607707				gJ29B
011770	000000	000252	607707				gJ20A gJ29C
011770	000000	000400	607707				gJ32A gJ11B gJ26D gJ29D

3.4.1  
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<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
011770	000000	001000	607707				gJ32A gJ26D gJ29D
011770	000000	002000	607707				gJ32A gJ26C gJ29D
011770	000000	002400	607707				gJ29D
011770	000000	004000	607707				gJ32A gJ26C gJ29D
011770	000000	005000	607707				gJ29D
011770	000000	010000	607707				gJ34A gJ26B gJ29B
011770	000000	020000	607707				gJ34A gJ26B gJ29B
011770	000000	040000	000000				gJ34A
011770	000000	040000	607707				gJ26A gJ29B
011770	000000	050000	607707				gJ29B
011770	000000	052400	607707				gJ20A gJ29C gJ30C
011770	000000	100000	000000				3J08E
011770	000000	100000	607707				gJ26A gJ34A gJ29B
011770	000000	120000	607707				gJ29B
011770	000000	125000	607707				gJ29C
011770	000001	000000	607707				gJ08A gJ12A gJ32A gJ16D gJ21D

3.4.1  
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3.4.1  
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<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
011770	000001	000001	607707				gJ32A gJ05A gJ07A gJ08A gJ32A gJ26B gJ21D
011770	000001	000003	607707				gJ11B
011770	000002	000000	607707				gJ32A gJ16D gJ21D
011770	000002	000002	607707				gJ07A gJ08A gJ32A gJ26B
011770	000003	000000	607707				gJ12A
011770	000003	000003	607707				gJ05A gJ07A gJ08A gJ32A
011770	000003	000007	607707				gJ11B
011770	000004	000000	607707				gJ32A gJ16D
011770	000004	000004	607707				gJ07A gJ08A gJ32A gJ27G
011770	000005	000000	607707				gJ16D
011770	000007	000000	607707				gJ12A
011770	000007	000007	605707				gJ08A
011770	000007	000007	607707				gJ08A gJ32A gJ04A gJ07A gJ08A gJ10A gJ14A

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
011770	000007	000017	607707				gJ11B
011770	000010	000000	607707				gJ32A gJ31C gJ16D
011770	000010	000010	607707				gJ07A gJ08A gJ32A gJ27G
011770	000012	000000	607707				gJ16D
011770	000017	000017	607707				gJ04A gJ07A gJ08A gJ10A gJ14A gJ06A gJ34A
011770	000017	000037	607707				gJ11B
011770	000020	000000	607707				gJ34A gJ16B gJ21B
011770	000020	000020	607707				gJ06A gJ07A gJ27G
011770	000037	000000	607707				gJ12A
011770	000037	000037	607707				gJ06A gJ34A gJ05A gJ07A gJ10A gJ02D
011770	000037	000077	607707				gJ11B
011770	000040	000000	607707				gJ34A gJ31B
011770	000040	000040	607707				gJ06A gJ07A gJ34A gJ27G
011770	000077	000000	607707				gJ12A

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
011770	000077	000077	607707				gJ05A gJ06A gJ07A gJ10A gJ02D gJ06A gJ34A
011770	000077	000177	607707				gJ07B gJ09B gJ11B
011770	000100	000000	607707				gJ21A gJ34A
011770	000100	000100	607707				gJ06A gJ09A gJ27G gJ32A
011770	000120	000000	607707				gJ16B
011770	000125	000000	607707				gJ11A
011770	000125	000125	607707				gJ04A gJ17A gJ12F gJ16F
011770	000177	000000	607707				gJ09A gJ11A gJ12A gJ07B gJ08B
011770	000177	000177	607707		Do test 3.4.1.25		
011770	000177	000377	607707				gJ09B gJ11B
011770	000200	000000	607707				gJ21A gJ34A gJ16B
011770	000200	000200	607707				gJ06A gJ09A gJ34A gJ27G
011770	000240	000000	607707				gJ16B



3.4.1  
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<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
011770	000252	000000	607707				gJ11A gJ16C
011770	000252	000252	607707				gJ04A gJ17A gJ14C gJ12F gJ16F
011770	000377	000000	607707				gJ09A gJ11A gJ12A gJ07B gJ08B
011770	000377	000377	607707				gJ06A gJ09A gJ10A gJ14A gJ17A gJ07B gJ02E
011770	000400	000000	607707				gJ12A gJ32A gJ16D gJ21D
011770	000400	000400	607707				gJ08A gJ05A gJ07A gJ08A gJ32A gJ26B gJ21D
011770	001000	000000	607707				gJ32A gJ16D gJ21D
011770	001000	001000	607707				gJ26B
011770	001400	000000	607707				gJ12A
011770	001400	000400	607707				gJ08A
011770	001400	001400	607707				gJ05A gJ07A gJ08A gJ32A

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
011770	001400	003400	607707				gJ11B
011770	002000	000000	607707				gJ32A gJ21C gJ16D
011770	002000	002000	607707				gJ07A gJ08A gJ32A gJ27G
011770	002400	000000	607707				gJ16D
011770	003400	000000	607707				gJ12A
011770	003400	003400	607707				gJ04A gJ07A gJ08A gJ10A gJ14A gJ08A gJ32A
011770	003400	007400	607707				gJ11B
011770	003777	003777	607707				gJ16F
011770	004000	000000	607707				gJ32A gJ31C gJ16D
011770	004000	004000	607707				gJ27G
011770	005000	000000	607707				gJ16D
011770	007400	000000	607707				gJ12A
011770	007400	017400	607707				gJ11B
011770	010000	000000	607707				gJ34A gJ16B gJ21B
011770	010000	001000	607707				gJ34A
011770	010000	010000	607707				gJ06A gJ07A gJ27G
011770	017400	000000	607707				gJ12A

3.4.1  
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3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C R EGISTERS</u>		<u>C R EGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
011770	017400	017400	607707				gJ05A gJ06A gJ07A gJ10A gJ02D
011770	017400	037400	607707				gJ11B
011770	020000	000000	607707				gJ34A gJ16B gJ21B
011770	020000	020000	607707				gJ07A gJ34A gJ27G
011770	037400	037400	607707				gJ06A gJ05A gJ07A
011770	037400	077400	607707				gJ07B gJ09B gJ11B
011770	040000	000000	607707				gJ21A gJ34A
011770	040000	040000	607707				gJ06A gJ09A gJ34A gJ27G
011770	050000	000000	607707				gJ16B
011770	052400	000000	607707				gJ11A gJ16C
011770	052400	052400	607707				gJ04A gJ17A gJ14C gJ12F gJ16F
011770	077400	000000	607707				gJ09A gJ11A gJ12A gJ07B gJ08B

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
011770	077400	077400	607707				gJ04A gJ06A gJ16F gJ09A gJ10A gJ14A gJ07B
011770	077400	177400	607707				gJ07B gJ09B gJ11B
011770	1000000	000000	607707				gJ21A gJ16B
011770	1000000	1000000	607707				gJ09A gJ34A gJ27G
011770	120000	000000	607707				gJ16B
011770	125000	000000	607707				gJ11A gJ16C
011770	125000	125000	607707				gJ12F
011770	177400	000000	607707				gJ09A gJ12A gJ08B
011770	177400	177400	607707				gJ09A gJ10A
011770	177777	177777	607707				7J19B 7J02F
012033	012020	001760	406451				3J04C
012044	012037	000077	016445				3J11B
012054	400000	000000	016445				gJ16D
012071	053767	010000	000000				3J03E 3J18E
012225	000000	177776	000000				3J10C 3J18E
012316	000000	557724	002120				gJ07A
012316	000000	557724	307707				gJ07A

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
012316	000000	557725	002120				gJ07A
012317	000000	040000	016445	Do test 3.4.1.26			
012347	000000	040000	016446				gJ06A
012363	000001	002000	016446				gJ05A
012363	000001	004000	016446				gJ05A
012363	000001	006000	016446				gJ05A
012363	000002	002000	016446				gJ05A
012363	000002	003000	016446				gJ05A
012363	000002	004000	016446				gJ05A
012363	000002	006000	016446				gJ05A
012363	000002	007000	016446				gJ05A
012363	000004	006000	016446				gJ04A
012363	000010	004000	016445				gJ04A
012363	000010	006000	016445				gJ04A
012363	000010	007000	016445				gJ04A
012363	000012	006000	016446				gJ10A gJ14A
012363	000020	006000	016446				gJ05A
012363	000025	006000	016446				gJ10A gJ02D
012363	000040	006000	016446				gJ05A
012363	000040	007000	016446				gJ05A
012363	000052	007000	016446				gJ06A gJ10A gJ02D
012363	000077	006000	016446				gJ06A
012363	000400	012000	016446				gJ05A
012363	000400	014000	016446				gJ05A

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
012363	000400	016000	016446				gJ05A
012363	001000	013000	016446				gJ08A
012363	001000	017000	016446				gJ05A
012363	002000	016000	016446				gJ04A
012363	004000	014000	016446				gJ04A
012363	004000	016000	016446				gJ04A
012363	004000	017000	016446				gJ04A
012363	005000	016000	016446				gJ10A gJ14A
012363	010000	016000	016446				gJ05A
012363	012400	016000	016446				gJ10A gJ02D
012363	020000	016000	016446				gJ05A
012363	020000	017000	016446				gJ05A
012363	025000	017000	016446				gJ06A gJ10A gJ02D
012363	037400	016000	016446				gJ06A
012477	000000	040000	016446				gJ07B gJ07B gJ07B
012537	000000	557730	010043				3J30B 3J28C 3J30D 3J28E 3J26F 3J28G
012537	000000	557730	010103				3J27F
012540	000000	557730	010043				3J26F
012611	000400	505640	016445				Do test 3.4.1.27

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
012660	000000	000000	016445				gJ31B gJ31D gJ31B
012702	000000	016450	016445				gJ34D
012705	000000	016446	016445				6J37C gJ09D gJ12D gJ33C
012741	000000	162401	000000				gJ10D
012766	000000	000000	016445				gJ31D
013010	000000	016450	016445				gJ34C
013041	000000	000003	000000				gJ30E
013041	000000	000060	000000				gJ30E
013041	000000	000100	016445				7J15A
013041	000000	000200	000000				gJ17C
013041	000000	100100	016445				gJ29E gJ29F
013041	000000	110100	557752				gJ02D gJ29E gJ28F 7J13A
013041	000006	004002	000000	Do test 3.4.1.28			
013041	000007	000001	000000				gJ32A gJ09B gJ10B gJ26C
013041	000007	000003	000000	Do test 3.4.1.29			
013041	000007	004403	000000	Do test 3.4.1.30			
013041	000007	064403	000000				gJ12D
013041	000011	000001	000000				gJ19A gJ20A gJ31C gJ31D

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
013041	000140	100040	XXXXXX	Do test	3.4.1.41		
013041	000146	000042	000000				3J08E
013041	000160	000020	000000				gJ34A gJ09B gJ10B gJ26B
013041	000160	000060	000000	Do test	3.4.1.31		
013041	000160	110060	000000	Do test	3.4.1.32		
013041	000167	000001	000000				gJ10B
013041	000220	000020	000000				gJ19A gJ20A gJ31B gJ31C
013055	000000	000000	016445				gJ31B gJ31D
013340	400000	000004	016445				7J14A
013340	400000	000007	016445				gJ10C gJ25C gJ03D gJ04D gJ26D gJ30D gJ29G gJ30G
013340	400000	000010	016445				gJ22C gJ35E
013340	400000	000160	016445				gJ25B gJ30B gJ03D gJ04D gJ09D gJ29G
013340	400000	000160	016446				gJ05B
013340	400000	000200	016445				gJ22B gJ35C
013620	000000	000000	016445				7J22D



3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
013624	000000	000000	016445				gJ13D
013664	242424	242420	000001				3J16C
013741	000000	000001	000000				gJ20B gJ20C
013741	000000	000103	000000				gJ12D
013741	000000	162400	000000				gJ05B gJ31G
013741	000000	162401	000000	Do test 3.4.1.33			
013741	000000	163400	000000				gJ18B gJ25B
013741	000000	163407	000000				gJ33A gJ07B gJ08B gJ12B gJ18B gJ22B gJ24B
013741	000000	163447	000000				gJ22B
013741	000001	000001	000000				gJ20C gJ20D
013741	000103	000103	000000				gJ12D
013741	162400	162400	000000				gJ05B gJ11C gJ31G
013741	162401	162401	000000	Do test 3.4.1.34			
013741	162401	164201	000000				gJ35A
013741	163400	163400	000000				gJ25C gJ18D
013741	163407	163407	000000				gJ31A gJ07B gJ08B gJ12B gJ11C gJ22C gJ24C gJ18D

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
013776	000000	557560	016445				gJ19B
013776	000000	557756	016445	Do test 3.4.1.35			
013777	000000	557756	016445				gJ19D
014221	000012	005000	016445				gJ24G
014224	000000	000023	016445				7J19F 7J03G gJ10D gJ13F gJ14F
014224	000000	023000	016445				gJ10D gJ13F gJ15F 7J16C
014224	000001	000005	016445				gJ04G
014224	000001	000025	016445				gJ02E gJ03E gJ02G gJ04G
014224	000001	000240	016445				4J07G gJ02E gJ02G gJ03G gJ04G
014224	000001	000244	016445				gJ02G
014224	000001	025000	016445				gJ02E gJ03E gJ03G gJ04G
014224	000001	240000	016445				gJ02E gJ03E gJ02G gJ03G gJ04G
014224	000002	000005	016445				7J26F
014224	000002	000005	016445				gJ03E gJ04E gJ04G gJ05G

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
014224	000002	000245	016445				gJ03E
014224	000002	000260	016445				4J06G gJ03E gJ04G gJ05G gJ06G
014224	000002	005000	016445				gJ03E gJ04E gJ04G gJ06G
014224	000002	240000	016445				gJ03E
014224	000002	260000	016445				gJ03E gJ04E gJ04G gJ05G gJ06G
014224	000003	000025	016445				gJ05E gJ06E gJ07G gJ09G
014224	000003	000031	016445				gJ03E
014224	000003	000240	016445				4J05G gJ05E gJ06E gJ07G gJ08G gJ09G
014224	000003	025000	016445				gJ05E gJ06E gJ08G gJ09G
014224	000003	031000	016445				gJ03E
014224	000003	240000	016445				gJ05E gJ06E gJ07G gJ08G gJ09G 4J05G
014224	000004	000005	016445				gJ06E gJ07E gJ09G gJ10G

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
014224	000004	000260	016445				4J07F 8J06E 8J07E 8J09G 8J10G 8J11G
014224	000004	005000	016445				8J06E 8J07E 8J09G 8J11G
014224	000004	260000	016445				8J06E 8J07E 8J09G 8J10G 8J11G 4J07F
014224	000005	000025	016445				8J08E 8J09E 8J12G 8J14G
014224	000005	000240	016445				4J06F 8J09E 8J12G 8J13G 8J14G
014224	000005	025000	016445				8J08E 8J09E 8J13G 8J14G
014224	000005	240000	016445				8J09E 8J08E 8J12G 8J13G 8J14G 4J06F
014224	000006	000005	016445				8J09E 8J10E 8J14G 8J15G

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
014224	000006	000260	016445				4J05F gJ09E gJ10E gJ14G gJ15G gJ16G
014224	000006	005000	016445				gJ09E gJ10E gJ14G gJ16G
014224	000006	260000	016445				gJ14G gJ15G gJ16G 4J05F
014224	000007	000025	016445				gJ11E gJ12E gJ17G gJ19G
014224	000007	000240	016445				gJ11E gJ12E gJ17G gJ18G gJ19G 4J07E
014224	000007	025000	016445				gJ11E gJ12E gJ18G gJ19G
014224	000007	240000	016445				gJ11E gJ12E gJ17G gJ18G gJ19G 4J07E
014224	000010	000005	016445				gJ12E gJ13E gJ19G gJ20G
014224	000010	000260	016445				4J06E gJ12E gJ13E gJ19G gJ20G gJ21G

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
014224	000010	005000	016445				gJ12E gJ13E gJ19G gJ21G
014224	000010	260000	016445				gJ12E gJ13E gJ19G gJ20G gJ21G 4J06E
014224	000011	000025	016445				gJ14E gJ15E gJ24G
014224	000011	000240	016445				gJ14E gJ15E gJ22G gJ23G
014224	000011	025000	016445				gJ14E gJ15E gJ23G gJ24G
014224	000011	240000	016445				gJ14E gJ15E gJ22G gJ23G gJ24G 4J05E
014224	000012	000005	016445				gJ15E gJ16E gJ24G gJ25G
014224	000012	000260	016445				4J07C gJ15E gJ16E gJ24G gJ25G gJ26G
014224	000012	005000	016445				gJ15E gJ16E gJ24G gJ26G

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
014224	000012	260000	016445				gJ15E gJ16E gJ24G gJ25G gJ26G 4J07C
014224	000013	000025	016445				gJ17E gJ18E gJ02F gJ04F
014224	000013	000240	016445				4J06C gJ17E gJ18E gJ02F gJ03F gJ04F
014224	000013	025000	016445				gJ17E gJ18E gJ03F gJ04F
014224	000013	240000	016445				gJ17E gJ18E gJ02F gJ03F gJ04F
014224	000014	000005	016445				gJ18E gJ19E gJ04F gJ05F
014224	000014	000031	016445				gJ06E
014224	000014	000260	016445				4J05C gJ18E gJ19E gJ04F gJ05F gJ06F
014224	000014	005000	016445				gJ18E gJ19E gJ04F gJ06F
014224	000014	031000	016445				gJ06E

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
014224	000014	260000	016445				gJ18E gJ19E gJ04F gJ05F gJ06F 4J05C
014224	000015	000025	016445				gJ20E gJ21E gJ07F gJ09F
014224	000015	000240	006445				gJ18E gJ21E gJ08F gJ09F
014224	000015	000260	016445				gJ07F gJ08F
014224	000015	025000	016445				gJ20E gJ21E gJ08F gJ09F
014224	000015	240000	016445				gJ20E gJ21E gJ07F gJ08F gJ09F
014224	000016	000005	000000				gJ21E gJ22E gJ09F gJ10F
014224	000016	000260	016445				gJ21E gJ22E gJ09F gJ10F gJ11F
014224	000016	005000	016445				gJ21E gJ22E gJ09F gJ11F
014224	000016	240000	016445				gJ02F gJ03F



3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
014224	000016	260000	016445				gJ21E gJ22E gJ09F gJ10F gJ11F
014224	000017	000025	016445				gJ23E gJ24E gJ19F gJ17F
014224	000017	000240	016445				gJ23E gJ24E gJ17F gJ18F gJ19F
014224	000017	025000	016445				gJ23E gJ24E gJ18F gJ19F
014224	000017	240000	016445				gJ24E gJ17F gJ18F gJ19F
014224	000020	000005	016445				gJ24E gJ25E gJ19F gJ20F
014224	000020	000260	016445				4J07A gJ24E gJ25E gJ19F gJ20F gJ21F
014224	000020	005000	016445				gJ24E gJ25E gJ19F gJ21F
014224	000020	260000	016445				gJ24E gJ25E gJ19F gJ20F gJ21F 4J07A

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
014224	000021	000025	016445				gJ26E gJ22F gJ24F
014224	000021	000240	016445				4J06A gJ26E gJ22F gJ23F gJ24F
014224	000021	005000	016445				gJ28E
014224	000021	025000	016445				gJ26E gJ27E gJ23F gJ24F
014224	000021	240000	016445				gJ26E gJ27E gJ22F gJ23F gJ24F 4J06A
014224	000021	260000	016445				gJ28E
014224	000022	000005	016445				gJ27E gJ28E gJ25F
014224	000022	000260	016445				4J05A gJ27E gJ28E gJ25F gJ26F
014224	000022	005000	016445				gJ24F gJ26F gJ27E
014224	000022	260000	016445				gJ27E gJ24F gJ25F gJ26F 4J05A
014224	000060	000031	016445				gJ09E
014224	000060	031000	016445				gJ09E

3.4.1  
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3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
014224	000300	000031	016445				gJ12E
014224	000300	031000	016445				gJ12E
014224	001400	000031	016445				gJ15E
014224	001400	031000	016445				gJ15E
014224	006000	000011	016445				gJ18E
014224	006000	000031	016445				gJ18E
014224	006000	011000	016445				gJ18E
014224	006000	031000	016445				gJ18E
014224	016445	460000	016445				4J05D
014224	030000	000031	016445				gJ21E
014224	030000	031000	016445				gJ21E
014224	044000	000460	016445				7J22A 7J03F 7J19F
014224	044000	000471	000000				7J17A 7J18E
014224	044000	000471	607707				7J18E
014224	140000	000031	016445				gJ24E
014224	140000	031000	016445				gJ24E
014224	177777	000460	016445				gJ27E
014224	177777	460000	016445				gJ27E
014224	477777	000460	016445				gJ27E
014224	577774	260000	016445				gJ03E
014224	600000	000031	016445				gJ27E
014224	600000	031000	016445				gJ27E
014224	637777	000460	016445				gJ24E

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
014224	637777	460000	016445				gJ24E
014224	741774	000460	016445				gJ15F
014224	747777	000460	016445				gJ21E
014224	747777	460000	016445				gJ21E
014224	766743	000031	016445				gJ13F
014224	766753	031000	016445				gJ13F
014224	771777	000460	016445				gJ18E
014224	771777	460000	016445				gJ18E
014224	776377	000460	016445				gJ15E
014224	776377	460000	016445				gJ15E
014224	777477	000260	016445				gJ12E
014224	777477	000460	016445				gJ12E
014224	777477	460000	016445				gJ12E
014224	777717	000260	016445				gJ09E
014224	777717	460000	016445				gJ09E
014224	777763	000460	016445				gJ06E
014224	777763	460000	016445				gJ06E
014224	777774	000460	016445				gJ03E
014337	010000	000001	016445				gJ19C gJ19D
014337	400000	000004	016445				gJ34A gJ08B gJ12B gJ19B gJ21B gJ19C
014377	012005	000001	016445				gJ26C gJ18D
014377	012005	000020	016445				7J22A 7J23A gJ13A gJ18A

3.4.1  
(Cont)

3.4.1  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
014377	012005	000040	016445				gJ18B gJ20C gJ26C
014377	012005	000100	016445				gJ16A gJ08B gJ16F
014377	012005	001000	016445				gJ13A gJ18A 7J22A 7J23A
014377	012005	001020	016445				3J09C 7J02C 7J22A 7J23A
014377	012775	000020	016445				7J28B
014722	000001	000000	000000				8J08G
014722	000002	000000	000000				8J08G
015152	000000	000000	016445				gJ08D
015152	000000	000002	016445				gJ06B gJ07B gJ08B gJ08D
015152	000000	000040	016445				gJ06B gJ08D
015152	000000	000335	016445				gJ31B gJ35B gJ31C
015152	000002	000000	016445				gJ06B gJ07B gJ08B gJ08D
015152	000002	000002	016445				3J07B
015152	000040	000000	016445				gJ06B gJ08D
015152	000040	000040	016445				7J19C
015152	000335	000000	016445				gJ31C gJ31D gJ35D

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
015413	126462	005640	014735				7J25E
015413	503000	000000	000000				8J16F
015413	503400	000000	000000	Do test 3.4.1.36			
015413	504200	013451	013341				gJ13D
015413	504622	013572	013341				gJ07A
015413	504622	013574	013341				gJ13D
015610	000000	000000	000000				<del>7J33B</del> <del>7J33C</del> gJ03E
015610	577700	000000	000000				gJ15B gJ16B gJ18B gJ20B
015610	777700	000000	000000	Do test 3.4.1.37			
015610	777700	000013	000000				gJ13G
015610	777700	000015	000000				3J28A
015610	777700	000033	000000				gJ10D
015610	777700	000036	000000				gJ09F
015710	577700	000000	000000				gJ16B
016041	000007	004403	000000				4J05G
016345	000000	505640	607707				gJ02A
016346	000000	505640	002120	Do test 3.4.1.38			
016346	777700	505640	016445				gJ19C gJ19D
016366	505640	503000	016445				7J25D
016377	012005	000001	016445				gJ02C
016634	000000	000000	016445				3J14C 3J14D 7J26B 7J29D 7J16E

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
							gJ06B gJ20C gJ26G
016636	000000	776634	016445				7J31B
016657	777700	505640	016445				7J26C 7J27C 7J28D 7J29D 7J25G
016660	777700	003622	016445				7J24F
016660	777700	003706	016445				7J24F
016660	777700	003725	016445				7J24F
016661	777700	003451	016445				3J24C
016661	777700	003702	016445				3J21C
016672	777777	557764	016445				3J15G
016673	777777	003460	016445				7J19B
016673	777777	003504	016445				7J28G
016673	777777	003566	016445				3J14L
016673	777777	003636	016445				7J28E
016673	777777	003640	016445				7J28F
016673	777777	003650	016445				7J28B
016673	777777	003657	016445				7J28G
016673	777777	003660	016445				3J15G
016673	777777	003672	016445				7J28F
016673	777777	003673	016445				7J28G
016673	777777	003707	016445				3J08E
016673	777777	003711	016445				7J27D
016673	777777	003726	016445				7J25D
016673	777777	003743	016445				7J27F

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
016674	777777	003440	016445				7J27F
016674	777777	003455	016445				7J25D
016674	777777	003526	016445				7J29F
016674	777777	003554	016445				7J25E
016674	777777	003562	016445				7J27F
016674	777777	003571	016445				7J28G
016674	777777	003612	016445				7J27D
016674	777777	003616	016445				7J26E
016674	777777	003644	016445				7J26E
016674	777777	003647	016445				7J24E
016674	777777	003653	016445				7J24E
016674	777777	003655	016445				3J07D
016674	777777	003711	016445				7J27F
016674	777777	003743	016445				7J24E
016674	777777	003746	016445				7J26E
016764	000000	003024	016445				7J27F
016764	000000	003025	016445				7J27E
016764	000000	003030	016445				3J07F
016765	000000	003024	016445				7J27F 7J28F
017171	505643	002347	016445				7J29D
017171	505643	003346	016445				7J18C
017171	505643	074307	016445				7J26B
017174	505640	010500	016445				3J15G
017174	505644	074100	016445				7J24E
017174	505646	000003	016445				7J25F
017174	505646	000010	016445				8J31B



<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
017174	505646	001000	016445				7J24F
017174	505646	002000	016445				8J10G
017174	505646	002140	016445				8J10G
017174	505646	004000	016445				8J10G
017174	505646	010000	016445				8J10G
017174	505646	020000	016445				8J10G 8J18G
017174	505646	040000	016445				8J10G
017174	505646	044000	016445				7J23E
017174	505646	074000	016445				7J03A 8J05G 8J10G
017174	505661	002143	016445				7J24E
017174	505662	000140	016445				8J10G
017174	505662	002140	016445				3J24C 7J03A 7J04D 7J28D 7J24E 7J24F 7J25F 8J05G 8J10G
017174	505662	002143	016445				7J24E
017230	400000	000047	016445				3J11A
017414	000000	777773	000000				gJ09B
017415	000000	777772	000000				gJ09B
017471	000000	031207	000000				7J29F
017471	000000	031302	000000				7J28F
017471	000000	031464	000000				7J26E
017472	000000	031276	000000				7J28F

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>C REGISTERS</u>		<u>C REGISTERS</u>		<u>CARD LOC</u>
			<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
017535	000000	000000	000000				7J27C
017535	000000	000100	000000				gJ18A gJ20B gJ21B gJ20C gJ27D gJ12F 7J28D
017535	000000	000302	000000				7J26E
017535	000000	000336	000000				gJ09D
017535	000000	000400	000000				7J26C
017535	000000	001720	000000				8J17C 8J19C
017535	000000	002000	000000				gJ03B
017535	000100	000000	000100				gJ18A gJ20C gJ21C gJ25C gJ20D gJ27D
017535	000336	000000	000336				gJ09D
017535	000336	000336	016445				7J23D
017535	000400	000000	000400				7J26C 7J27C
017535	000400	000400	000400				7J28D 7J26E 7J28E 7J26G
017535	001720	000000	001720				gJ08A
017535	002000	001002	002000				gJ03B 7J02F
017535	004000	000000	000400				7J27C
023041	000160	100060	000000				7J03F
023340	000000	000016	000000				4J13G
046204	001000	000000	000000				gJ28D

A 5 STOP with P = 001341, A<sub>U</sub> = 000000, and A<sub>L</sub> = 000000 indicates that an Enter A or Store A instruction failed.

- Step 1. Press OP STEP MODE, then master clear computer.
- Step 2. Press all indicators in A<sub>U</sub> register.
- Step 3. Observe A<sub>U</sub> register. A<sub>U</sub> should equal 777777.
  - a) If A<sub>U</sub> equals 777777, do step 5.
  - b) If A<sub>U</sub> equals any other value, do step 4.
- Step 4. Observe the following:
  - a) If single bit in A<sub>U</sub> is not lit, bit not lit is error bit. Refer to table B and replace card that corresponds to the error bit.
  - b) If A<sub>U</sub> is clear, replace item 1 of table A.
- Step 5. Press OP STEP MODE, then master clear computer.
- Step 6. Set P to 002530.
- Step 7. Set RESTART/START STEP to START STEP twice.
- Step 8. Observe A<sub>U</sub> register. A<sub>U</sub> should equal 777777.
  - a) If A<sub>U</sub> equals 777777, do step 12.
  - b) If A<sub>U</sub> equals any other value, do step 9.
- Step 9. Observe the following.
  - a) If single bit in A<sub>U</sub> is not lit, do step 11.
  - b) If any other condition, do step 10.
- Step 10. A<sub>U</sub> in any condition other than a single bit not lit indicates that function code 10 has failed. The malfunction is most likely concerned with the A<sub>U</sub> register control circuitry. Replace item 2 of table A.
- Step 11. The bit clear in A<sub>U</sub> register is the error bit. Refer to tables B and C and replace the card that corresponds to the error bit in each table.
- Step 12. Observe A<sub>L</sub> register. A<sub>L</sub> should be clear.
  - a) If A<sub>L</sub> is clear, do step 13.
  - b) If A<sub>L</sub> is in any other condition, replace 3J03D  
3J21D.
- Step 13. A<sub>L</sub> in any condition other than clear indicates that the malfunction probably affects a function code 46. Do step 14.
- Step 14. Master clear computer.
- Step 15. Set A<sub>U</sub> to 777777.
- Step 16. Set P to 001334.
- Step 17. Set SEQ STEP/STOP to SEQ STEP.

- Step 18. Set RESTART/START STEP to START STEP three times.
- Step 19. Observe Z<sub>1</sub> register. Z<sub>1</sub> should equal 777777.  
 a) If Z<sub>1</sub> equals 777777, do step 21.  
 b) If Z<sub>1</sub> equals any other value, do step 20.
- Step 20. Observe the following:  
 a) If Z<sub>1</sub> has a single bit not lit, bit not lit is error bit. Refer to table A and replace card that corresponds to the error bit.  
 b) If Z<sub>1</sub> has more than a single bit not lit, replace 3J04C.
- Step 21. Replace item 3 in table A.

TABLE A

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 4J13D 4J28D 3J04C 4J31D
2						Replace 3J04E 3J03B 4J31D 3J21C
3						Replace 4J05E 8J06G 8J04G

TABLE B

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
0							Replace 4J28C
1							Replace 4J28C
2							Replace 4J29C
3							Replace 4J29C
4							Replace 4J30C
5							Replace 4J30C
6							Replace 4J28B
7							Replace 4J28B
8							Replace 4J29B
9							Replace 4J29B

TABLE B (CONT)

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
10							Replace 4J30B
11							Replace 4J30B
12							Replace 4J28A
13							Replace 4J28A
14							Replace 4J29A
15							Replace 4J29A
16							Replace 4J30A
17							Replace 4J30A

TABLE C

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
0							Replace 4J16A
1							Replace 4J15A
2							Replace 4J14A
3							Replace 4J16B
4							Replace 4J15B
5							Replace 4J14B
6							Replace 4J16C
7							Replace 4J15C
8							Replace 4J14C
9							Replace 4J16E
10							Replace 4J15E
11							Replace 4J14E
12							Replace 4J16F
13							Replace 4J15F
14							Replace 4J14F

TABLE C (CONT)

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
15							Replace 4J16G
16							Replace 4J15G
17							Replace 4J14G

TABLE D

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
0							Replace 4J10G
1							Replace 4J09G
2							Replace 4J08G
3							Replace 4J10F
4							Replace 4J09F
5							Replace 4J08F
6							Replace 4J10E
7							Replace 4J09E
8							Replace 4J08E
9							Replace 4J10C
10							Replace 4J09C
11							Replace 4J08C
12							Replace 4J10B
13							Replace 4J09B
14							Replace 4J08B
15							Replace 4J10A
16							Replace 4J09A
17							Replace 4J08A

A 5 STOP with P = 002030, A<sub>U</sub> = 000000, and A<sub>L</sub> = 400000 indicates a malfunction has been detected in the B ± 1 network.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Press PHASE STEP MODE and TIMING 42, 43, and 44.
- Step 3. Press PHASE 1, then set RESTART/START STEP to START STEP once.
- Step 4. Observe ADV P SEQ register.  
 a) If bit 1 is cleared, do step 5.  
 b) If bit 1 is lit, replace item 5.
- Step 5. Set FUNCTION CODE to 57.
- Step 6. Press SEQ DES W and set RESTART/START STEP to START STEP once, then scope item 6.
- Step 7. Repeatedly set RESTART/START STEP to START STEP until TIMING 24 is lit, then scope item 1.
- Step 8. Clear PHASE register, then set PHASE REPEAT up.
- Step 9. Press PHASE 4.
- Step 10. Press TIMING 14, then scope item 7.
- Step 11. Set FUNCTION CODE to 57, then scope item 8.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1	9-93	31A12	4	1G1	H	If H scope item 2 If L replace 4J22E 4J04B
2	9-47	10F56	3	1B29	L	If L scope item 3 If H replace 3J18F 3J25C
3	9-46	41F30	3	1G26	H	If H scope item 4 If L replace 3J19F 3J18F
4	9-44	20F16	3	1A18	L	If L do step 8 If H replace 3J21D 3J22F
5						Replace 7J20G 7J19E

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
6	9-27	21E32	3	2D8	L	If L do step 7 If H replace 3J13A 3J11A 3J25G
7	9-23	29N13	7	1D3	T	If T do step 11 If not T replace 7J06D 3J07A
8	9-19	00N03	3	2E22	L	If L replace 3J08C 3J13E 3J13A 3J11A If H replace 3J06A 3J18F

## 3.4.1.3

5 STOP, P = 002412

## 3.4.1.3

A 5 STOP with P = 002412, A<sub>U</sub> = 707070, and A<sub>L</sub> = 040000 indicates a malfunction exists in the memory logic that inhibits the correct storage of words.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Set FUNCTION CODE to 44.
- Step 3. Set FUNCTION REPEAT switch up.
- Step 4. Set A<sub>L</sub> to 777777.
- Step 5. Press RUN MODE, then set RESTART/START STEP to START STEP once.
- Step 6. Press OP STEP MODE and master clear computer.
- Step 7. Clear FUNCTION CODE register, then set FUNCTION CODE to 12.
- Step 8. Set P to 007775.
- Step 9. Set RESTART/START STEP to START STEP twice.
- Step 10. Observe A<sub>L</sub> register.
  - a) If all indicators are lit, do step 11.
  - b) If any are not lit, replace item 1.
- Step 11. Set RESTART/START STEP to START STEP twice.
- Step 12. Observe A<sub>L</sub> register.
  - a) If all indicators are set, replace item 8.
  - b) If all indicators are cleared, replace item 2.
  - c) If only bit(s) 2 and/or 3 are cleared, replace item 3.



- d) If only bit(s) 6 and/or 7 are cleared, replace item 4.
- e) If only bit(s) 8 and/or 9 are cleared, replace item 5.
- f) If only bit(s) 14 and/or 15 are cleared, replace item 6.
- g) If any other bits are cleared, replace item 7.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 6J13C 6J33C
2						Replace 7J10A 6J27D
3						Replace 6J36E 6J35E
4						Replace 6J32E 6J31E
5						Replace 6J30E 6J29E
6						Replace 6J24E 6J23E
7						Replace 6J13C 6J27D 6J10A
8						Replace 6J13C 6J27D 6J33C

3.4.1.4

5 STOP, P = 002447

3.4.1.4

A 5 STOP with P = 002447, A<sub>U</sub> = 000000, and A<sub>L</sub> = 000000 indicates a malfunction in the Scale Factor instruction.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Set FUNCTION CODE to 75, then scope item 1.
- Step 3. Set SR to 10g, then scope item 3.
- Step 4. Press PHASE STEP MODE.
- Step 5. Press MULT/DIV SEQ bit 1, then scope item 4.
- Step 6. Press OP STEP MODE and master clear computer.
- Step 7. Set P to 002440.

- Step 8. Set FUNCTION CODE to 50:44.
- Step 9. Set FUNCTION REPEAT up.
- Step 10. Set DISC ADV P up.
- Step 11. Press RUN MODE.
- Step 12. Set RESTART/START STEP to START STEP once, then scope item 5.
- Step 13. Set SEQ STEP/STOP to STOP.
- Step 14. Press OP STEP MODE.
- Step 15. Set FUNCTION REPEAT down.
- Step 16. Set DISC ADV P down and master clear computer.
- Step 17. Set P to 002436.
- Step 18. Set RESTART/START STEP to START STEP once.
- Step 19. Observe  $A_L$  register.
  - a) If  $A_L$  equals 000001, do step 20.
  - b) If  $A_L$  equals any other value, replace item 10.
- Step 20. Press PHASE STEP MODE, then press all four PHASE indicators.
- Step 21. Set RESTART/START STEP switch to START STEP 13 times, then do step 22.
- Step 22. Set RESTART/START STEP to START STEP 16 times, observing  $A_L$  register each time switch is operated.
  - a) Each time RESTART/START STEP is set to START STEP,  $A_L$  should advance one bit. If any  $A_L$  bit does not light after RESTART/START STEP is set to START STEP, replace card(s) listed under item 11 corresponding to the error bit that does not light.
  - b) If  $A_L$  advances through bit 17 correctly, do step 23.
- Step 23. Set RESTART/START STEP to START STEP 16 times and observe  $A_U$  register.
  - a)  $A_U$  should advance one bit. If any  $A_U$  bit does not light after RESTART/START STEP is set to START STEP, replace card(s) listed under item 11 corresponding to the first error bit that did not light.
  - b) If  $A_U$  advances through bit 17 correctly, replace item 13.

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	1	9-47	51F24	3	1G28	H	If H scope item 2 If L replace 3J17G 3J18A 3J17B

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	2	9-47	10F42	3	1G30	L	If L do step 3 If H replace 3J18A 3J22C
	3	9-39	12X04	4	2E26	H	If H do step 4 If L replace 4J04G 3J17A
	4	9-36	03L01	7	2B1	L	If L scope item 6 If H replace 7J09G
	5	9-19	49N06	4	2A22	T	If T scope item 7 If not T replace 3J06C 4J34D 3J08B 3J07B
	6	9-19	09N06	4	2F19	L	If L do step 6 If H replace 4J32D 4J31G
	7	9-20	28N04	3	2F25	H	If H scope item 8 If L replace 3J04D 3J04C
	8	9-20	29N05	4	1A21	H	If H scope item 9 If L replace 4J30D 3J04D 3J04C
	9	9-19	08N06	4	2G22	T	If T do step 13 If not T replace 4J31G 4J04D
	10						Replace 4J13G 4J30D 4J29D 4J30G
1	11						Replace 4J13A 4J32A 4J30G
2							Replace 4J29G 4J34A
3							Replace 4J29G 4J34A
4							Replace 4J28G 4J33B

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
5							Replace 4J28G 4J33B
6							Replace 4J30F 4J32C
7							Replace 4J30F 4J32C
8							Replace 4J29F 4J34C
9							Replace 4J29F 4J34C
10							Replace 4J28F 4J33E
11							Replace 4J28F 4J33E
12							Replace 4J30E 4J32F
13							Replace 4J30E 4J32F
14							Replace 4J29E 4J34F
15							Replace 4J29E 4J34F
16							Replace 4J28E 4J33G
17							Replace 4J28E 4J33G
0	12						Replace 4J19A 4J28C
1							Replace 4J18A 4J28C
2							Replace 4J17A 4J29C
3							Replace 4J17A 4J29C

<u>ERROR BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
4							Replace 4J18B 4J30C
5							Replace 4J17B 4J30C
6							Replace 4J19C 4J28B
7							Replace 4J18C 4J28B
8							Replace 4J17C 4J29B
9							Replace 4J19E 4J29B
10							Replace 4J18E 4J30B
11							Replace 4J17E 4J30B
12							Replace 4J19F 4J28A
13							Replace 4J18F 4J28A
14							Replace 4J17F 4J29A
15							Replace 4J19G 4J29A
16							Replace 4J18G 4J30A
17							Replace 4J17G 4J30A
	13						Replace 7J21B 7J22G 4J13A

A 5 STOP with P = 002447, A<sub>U</sub> = 000000, and A<sub>L</sub> = 020000 indicates a malfunction in the K<sub>0</sub> or K<sub>1</sub> register.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Press PHASE STEP, then press PHASE 1.
- Step 3. Press TIMING 42, 43, and 44.
- Step 4. Set RESTART/START STEP to START STEP five times, then set S<sub>1</sub> to 010000.
- Step 5. Clear Z<sub>1</sub> register and while holding Z<sub>1</sub> clear pushbutton, repeatedly set RESTART/START STEP to START STEP until TIMING 33 is lit.
- Step 6. Set FUNCTION CODE to 50:46.
- Step 7. Set RESTART/START STEP to START STEP five times.
- Step 8. Observe MULT/DIV SEQ register.  
 a) If bit 1 is lit, do step 9.  
 b) If bit 1 is not lit, replace item 1.
- Step 9. Press K register bits 0 and 5.
- Step 10. Set RESTART/START STEP to START STEP twice, then observe MULT/DIV SEQ register.  
 a) If bit 0 is lit, do step 11.  
 b) If bit 0 is not lit, replace item 2.
- Step 11. Set RESTART/START STEP to START STEP twice.
- Step 12. Observe K register. If K equals 40, do step 13; if K equals any other value, refer to the following list for K register value and replace items as directed.

<u>K</u>	<u>REPLACE ITEM</u>
70	3
60	4
50	5
44	6
42	7
41	8

- Step 13. Set RESTART/START STEP to START STEP four times, then observe K register. If K equals 37, do step 14; if not, replace item 9.
- Step 14. Set RESTART/START STEP to START STEP four times, then observe K register. If K equals 36, do step 15; if not, replace item 10.
- Step 15. Set RESTART/START STEP to START STEP four times, then observe K register. If K equals 35, do step 16; if not, replace item 11.

Step 16. Set RESTART/START STEP to START STEP eight times, then observe K register. If K equals 33, replace item 17; if not replace item 12.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 7J21F 3J07G 7J09E
2						Replace 7J19E
3						Replace 7J23B 7J22C 7J22B
4						Replace 7J20A 7J24A 7J22C
5						Replace 7J21B 7J25B 7J22B
6						Replace 7J20B 7J24B 7J22C
7						Replace 7J21C 7J25C 7J22C
8						Replace 7J20C 7J24C 7J24D
9						Replace 7J21A 7J25A 7J24C 7J20C
10						Replace 7J25A 7J20B
11						Replace 7J25C 7J21C
12						Replace 7J24B 7J23B 7J20B
13						Replace 7J19A 7J22B

A 5 STOP with P = 002475, A<sub>U</sub> = 200000, and A<sub>L</sub> = 000035 indicates that a function code of 50:44 failed to store the shift count in the correct address.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Set P to 002440.
- Step 3. Set A<sub>U</sub> to 040000.
- Step 4. Set SEQ STEP/STOP to SEQ STEP.
- Step 5. Set RESTART/START STEP to START STEP three times.
- Step 6. Press PHASE STEP MODE, clear PHASE register, then press PHASE 2.
- Step 7. Press TIMING 42, 43, and 44.
- Step 8. Repeatedly set RESTART/START STEP to START STEP until TIMING 14 and PHASE 2 are lit.
- Step 9. Repeatedly set RESTART/START STEP to START STEP until TIMING 14 and PHASE 2 light for second time.
- Step 10. Observe S<sub>1</sub> register. S<sub>1</sub> should equal 000017.  
 a) If S<sub>1</sub> equals 000017, replace 3J07D.  
 b) If S<sub>1</sub> equals any other value, find value of S<sub>1</sub> in the following list and replace item(s) as directed.

<u>S<sub>1</sub></u>	<u>REPLACE ITEM(S)</u>
000001	1 and 6
000007	2
000013	3
000015	4
000016	5

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 7J03B
2						Replace 7J26G 7J28G
3						Replace 7J27G 7J28G
4						Replace 7J27G 7J28F
5						Replace 7J02G 3J07F



<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
6						Replace 3J15G 3J14G 7J27D 3J30D 3J29D

3.4.1.7

5 STOP, P = 003135

3.4.1.7

A 5 STOP with P = 003135, A<sub>U</sub> = 000000, and A<sub>L</sub> = 000000 indicates that the overflow portion of a skip evaluation failed.

Step 1. Press OP STEP MODE and master clear computer.

Step 2. Set P to 003132, press SEQ DES I, then set RESTART/START STEP to START STEP once.

Step 3. Press PHASE STEP MODE, clear PHASE register, then press PHASE 2.

Step 4. Press TIMING 42, 43, and 44, then scope item 1.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1	9-30	31E52	3	2G12	L	If L scope item 3 If H scope item 2
2	9-47	27F52	3	1C27	L	If L replace 3J10E 3J11A If H replace 3J17D
3	9-30	0XG52	3	2G11	L	If L scope item 4 If H replace 3J09E 3J15A
4	9-47	11F50	3	1E28	H	If H scope item 5 If L replace 3J17A 3J18C
5	9-47	41F52	3	1B26	L	If L scope item 6 If H replace 3J17G
6	9-30	10G52	3	2F13	L	If L replace 3J09G 3J10G 3J09D If H replace 3J10G 3J09E

3.4.1.8

5 STOP, P = 003154

3.4.1.8

A 5 STOP with P = 003154, A<sub>U</sub> = 077777, and A<sub>L</sub> = 400000 indicates that overflow was not properly generated during an ADDA, or that the skip evaluation of overflow failed.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Set P to 003142.
- Step 3. Set A<sub>L</sub> to 677777.
- Step 4. Set RESTART/START STEP to START STEP three times.
- Step 5. Scope test point 2G11 on chassis 3. Test level is H.
  - a) If H, replace 3J09D  
3J10D  
3J09G  
7J29C.
  - b) If L, replace 3J09E  
3J02C  
3J10F  
4J13B  
3J11A  
3J10E.

3.4.1.9

5 STOP, P = 003334

3.4.1.9

A 5 STOP with P = 003334, A<sub>U</sub> = 000000, and A<sub>L</sub> = 000076 indicates a malfunction in the Multiply/Divide logic.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Press PHASE STEP MODE, then press PHASE 1.
- Step 3. Press TIMING 42, 43, and 44.
- Step 4. Set FUNCTION CODE to 25.
- Step 5. Press and hold SEQ DES clear pushbutton while repeatedly setting RESTART/START STEP to START STEP until TIMING 14 is lit.
- Step 6. Set A<sub>L</sub> to 006001.
- Step 7. Set S<sub>1</sub> to 010000.
- Step 8. Press SEQ DES RI.
- Step 9. Press and hold Z<sub>1</sub> clear pushbutton while repeatedly setting RESTART/START STEP to START STEP until TIMING 32 is lit.
- Step 10. Set Z<sub>1</sub> to 006000, set RESTART/START STEP to START STEP once, then scope item 1.
- Step 11. Press MULT/DIV SEQ bit 6, then scope item 6.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1	9-95	14A11	4	1E3	L	If L scope item 2 If H replace 4J24C 4J26D 4J27D 4J21D
2	9-44	93F02	3	1F16	L	If L scope item 3 If H replace 3J21A 3J20E
3	9-44	91F02	3	1E17	L	If L scope item 4 If H replace 3J20A 3J20E
4	9-33	01E30	4	1B29	H	If H scope item 5 If L replace 4J04A 4J03A 4J30A 4J28E
5	9-27	0XG39	3	2A9	H	If H do step 11 If L replace 3J13B 3J15A
6	9-20	18N05	3	2B25	L	If L scope item 7 If H replace 3J04E 7J22F
7	9-20	00N04	3	2D26	L	If L scope item 8 If H replace 3J04C 3J25E
8	9-19	08N03	3	2E21	L	If L scope item 9 If H replace 3J05B 7J22E
9	9-18	29N02	4	2D12	H	If H scope item 10 If L replace 3J04F 4J16D
10	9-17	28N01	3	2F19	L	If L replace 3J03B 3J05A 3J04A 7J20C If H replace 3J06F

A 5 STOP with P = 003334, A<sub>U</sub> = 000000, and A<sub>L</sub> = 000376 indicates that an error was detected in the arithmetic control circuitry.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Press PHASE STEP MODE.
- Step 3. Press TIMING 24, then scope item 1.
- Step 4. Press TIMING 42, 43, and 44.
- Step 5. Press PHASE 1.
- Step 6. Repeatedly set RESTART/START STEP to START STEP until TIMING 14 is lit.
- Step 7. Press SEQ DES RI.
- Step 8. Set A<sub>L</sub> to 777777.
- Step 9. Set FUNCTION CODE to 24.
- Step 10. Repeatedly set RESTART/START STEP to START STEP until TIMING 24 is lit, then scope item 2.
- Step 11. Press MULT/DIV SEQ bit 0.
- Step 12. Clear PHASE register, then set PHASE REPEAT up.
- Step 13. Press PHASE 2, then scope item 3.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1	9-17	40N01	3	2D20	L	If L do step 4 If H replace 3J05E 3J26D
2	9-18	27N02	3	2E24	L	If L do step 11 If H replace 3J04F
3	9-20	19N04	4	1G21	H	If H scope item 4 If not H replace 4J29D 3J04C 3J04E
4	9-20	29N04	4	1A20	T	If T scope item 5 If not T replace 4J30D 3J03B 3J04D

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
5	9-33	0XG30	4	1C29	H	If H scope item 6 If L replace 4J02A 4J04A 4J03A
6	9-45	20F20	3	1F23	L	If L replace 7J22E 7J23G 8J02F 8J02E If H replace 3J19C 3J22D

3.4.1.11

5 STOP, P = 003334

3.4.1.11

A 5 STOP with P = 003334,  $A_L = 000000$ , and  $A_U = 001776$  indicates a malfunction was detected in the Multiply/Divide sequence.

Step 1. Press OP STEP MODE and master clear computer.

Step 2. Press PHASE STEP MODE.

Step 3. Set PHASE REPEAT up.

Step 4. Press MULT/DIV SEQ bit 2.

Step 5. Press PHASE 1.

Step 6. Observe MULT/DIV SEQ register.  
a) If bit 3 is lit, do step 7.  
b) If bit 3 is not lit, replace item 1.

Step 7. Clear PHASE register.

Step 8. Press PHASE 3.

Step 9. Observe MULT/DIV SEQ register.  
a) If bit 4 is lit, do step 10.  
b) If bit 4 is not lit, replace item 2.

Step 10. Press MULT/DIV SEQ bit 5.

Step 11. Observe MULT/DIV SEQ bit 6.  
a) If bit 6 is lit, do step 12.  
b) If bit 6 is not lit, replace item 2.

Step 12. Set PHASE REPEAT down.

Step 13. Press OP STEP MODE and master clear computer.

Step 14. Set DISC ADV P up.

3.4.1.11  
(Cont)

3.4.1.11  
(Cont)

- Step 15. Set FUNCTION REPEAT up.
- Step 16. Set FUNCTION CODE to 12.
- Step 17. Set P to 001000.
- Step 18. Press RUN MODE.
- Step 19. Set RESTART/START STEP to START STEP, then scope item 3.
- Step 20. Set SEQ STEP/STOP to STOP.
- Step 21. Clear FUNCTION CODE register.
- Step 22. Set FUNCTION CODE to 50:62.
- Step 23. Set RESTART/START STEP to START STEP once.
- Step 24. Scope item 7.
- Step 25. Set SEQ STEP/STOP to STOP.
- Step 26. Press OP STEP MODE.
- Step 27. Set FUNCTION REPEAT down.
- Step 28. Master clear computer.
- Step 29. Set FUNCTION CODE to 24.
- Step 30. Scope item 8.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 7J18D 7J21E 7J22E
2						Replace 7J19D 7J22F
3	9-16	21T22	3	1G8	T	If T scope item 4 If not T replace 3J15C 3J25E
4	9-37	08N14	7	1G26	T	If T scope item 5 If not T replace 3J26D 7J19A
5	9-18	20N02	3	2F24	L	If L scope item 6 If H replace 3J04F 8J07G

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
6	9-20	11N04	3	2F26	L	If L do step 20 If H replace 3J04A 7J22F
7	9-20	07N04	3	2D25	T	If T do step 25 If not T replace 3J03F 3J04C
8	9-45	71F04	3	1A22	L	If L scope item 9 If H replace 3J20E 3J20F
9	9-47	51F24	3	1G28	L	If L scope item 10 If H replace 3J17G 3J20E
10	9-20	10N04	3	2E26	L	If L replace 3J05C 3J13B 8J02E 8J02F If H replace 3J03B 3J13B

3.4.1.12

5 STOP, P = 005511

3.4.1.12

A 5 STOP with P = 005511, A<sub>U</sub> = 000000, and A<sub>L</sub> = 100000 indicates that a malfunction in the control circuitry caused the program to erroneously stop at a parameter stop.

Step 1. Observe CHAN PRI indicators.  
 a) If none are lit, do step 2.  
 b) If any are lit, replace item 1 on the chassis containing indicator that is lit.

Step 2. Press SR register bit 1, then scope test point 2B27 on chassis 4.  
 Test level is L.  
 a) If L, do step 3.  
 b) If H, replace item 2.

Step 3. Replace item 3.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace gJ29D gJ16D gJ19D gJ24D gJ21D

"g" refers to chassis containing bootstrap channel.  
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<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
2						Replace 4J31F 4J02G
3						Replace 4J08C gJ14B 8J05G

"g" refers to chassis containing bootstrap channel.

3.4.1.13

5 STOP, P = 006003

3.4.1.13

A 5 STOP with P = 006003, A<sub>U</sub> = 000000 and A<sub>L</sub> = 555555 indicates that a malfunction has been detected in basic control circuitry.

- Step 1. Press OP STEP MODE, then master clear computer.
- Step 2. Scope item 1.
- Step 3. Set RESTART/START STEP to START STEP and while holding it to START STEP, scope test point 2C31 on chassis 3. Test level is H.  
a) If H, do step 4.  
b) If not H, replace 3J33C(31J10, 9-3).
- Step 4. Master clear computer.
- Step 5. Ground test point 2C31 on chassis 3.
- Step 6. Press PHASE STEP MODE.
- Step 7. Clear PHASE register, then press PHASE 4.
- Step 8. Set RESTART/START STEP to START STEP once.
- Step 9. Scope item 3.
- Step 10. Remove ground on test point 2C31 on chassis 3.
- Step 11. Press OP STEP MODE and master clear computer.
- Step 12. Press PHASE STEP MODE.
- Step 13. Set SEQ STEP/STOP to SEQ STEP, then scope item 6.
- Step 14. Press OP STEP MODE, and at Power Control Panel set DISC ALARM/RESET ALARM to DISC ALARM, then set POWER ON/OFF to OFF.
- Step 15. Set POWER ON/OFF to ON, then scope item 7.
- Step 16. Master clear computer, then set SEQ STEP/STOP to center.



- Step 17. Press PHASE STEP MODE.
- Step 18. Set A<sub>L</sub> to 000002.
- Step 19. Press TIMING 22.
- Step 20. Scope item 8.
- Step 21. Clear A<sub>L</sub> register.
- Step 22. Set A<sub>L</sub> to 000020.
- Step 23. Scope item 12.
- Step 24. Clear A<sub>L</sub> register.
- Step 25. Set A<sub>L</sub> to 002000.
- Step 26. Scope item 13.
- Step 27. Clear A<sub>L</sub> register.
- Step 28. Set A<sub>L</sub> to 020000.
- Step 29. Scope item 14.
- Step 30. Press OP STEP MODE, and master clear computer.
- Step 31. Ground test point 2D10 on chassis 7.
- Step 32. Press PHASE STEP MODE.
- Step 33. Press TIMING 31 and 41.
- Step 34. Scope item 15.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1	9-48	11F75	3	2A1	H	If H scope item 2 If L replace 3J17A
2	9-7	10J12	7	2E20	L	If L do step 3 If H replace 7J31E
3	9-3	2XJ10	3	2D32	L	If L do step 10 If not L replace 3J31C
4	9-3	23J10	3	2A31	H	If H scope item 5 If not H replace 3J31D
5	9-4	71C14	3	1A31	T	If T do step 12 If not T replace 3J35E

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
6	9-3	24J10	3	2E32	L	If L do step 14 If H replace 3J34A
7	8-135	0XG81	7	2F25	H	If H do step 16 If L replace 7J33F
8	9-99	90A00	4	1F31	L	If L scope item 9 If H replace 4J31F
9	9-25	31T42	3	2G10	L	If L scope item 10 If H replace 3J27A
10	9-29	91A00	4	1F23	H	If H do step 21 If L replace item 11
11						Replace 4J35B
12	9-29	91A00	4	1F23	H	If H do step 24 If L replace item 11
13	9-29	91A00	4	1F23	H	If H do step 27 If L replace item 11
14	9-29	91A00	4	1F23	H	If H do step 30 If L replace item 11
15	9-34	12G28	7	2E10	L	If L replace item 16 If H replace 7J30F
16						Replace 8J16B gJ16C 3J04B 4J35D 3J06A

---

"g" refers to chassis containing bootstrap channel.

3.4.1.14

5 STOP, P = 010063

3.4.1.14

A 5 STOP with P = 010063, A<sub>L</sub> = 000000, and A<sub>U</sub> = 000000 indicates a malfunction in the I/O channel request circuitry.

Step 1. Press OP STEP MODE and master clear computer.

Step 2. Ground test point 2E3 on chassis g.

Step 3. Scope test point 1E16 on chassis g. Test level is L.

a) If L, do step 4.

b) If H, replace gJ10B(16Mg7, 9-66).

- Step 4. Remove ground on test point 2E3 on chassis g.
- Step 5. Ground test points 1F6 and 2E23 on chassis g.
- Step 6. Scope test point 2F23 on chassis g. Test level is L.
  - a) If L, do step 7.
  - b) If H, replace gJ21B(12Mg2, 9-38).
- Step 7. Remove grounds on test points 1F6 and 2E23 on chassis g.
- Step 8. Press EF/MON indicators for all channels.
- Step 9. Ground test points 1G8 and 2B21 on chassis 7.
- Step 10. Observe the EF/OD ACK indicators.
  - a) If all indicators are lit, do step 11.
  - b) If one indicator clears, replace 7J29B.
- Step 11. Remove grounds on test points 1G8 and 2B21 on chassis 7.
- Step 12. Set PROGRAM STOP 2 down.
- Step 13. Scope test point 1G11 on chassis 7. Test level is H.
  - a) If H, do step 15.
  - b) If L, do step 14.
- Step 14. Scope test point 1D12 on chassis 7. Test level is L.
  - a) If L, replace 7J29B(20G62, 8-1-32).
  - b) If H, replace 7J26A(90Y62, 8-1-32).
- Step 15. Momentarily ground 2E22 on chassis 3.
- Step 16. Ground test point 2D21 on chassis 3.
- Step 17. Momentarily ground test point 2C22 on chassis 3.
- Step 18. Scope test point 2A20 on chassis 4. Test level is L.
  - a) If L, do step 19.
  - b) If H, replace 4J18C(0XX07, 9-87).
- Step 19. Remove ground on test point 2D21 on chassis 3.
- Step 20. Set all CHANNEL INTER-COMPUTER/CHANNEL NORMAL switches up.
- Step 21. Ground test points 1G5 and 2A32 on chassis g.
- Step 22. Press OD ACT on all channels.
- Step 23. Scope test point 2F7 on chassis g. Test level is L.
  - a) If L, do step 24.
  - b) If H, replace gJ34C(25Rg2, 9-63).
- Step 24. Remove grounds on test points 1G5 and 2A32 on chassis g.
- Step 25. Master clear computer.

"g" refers to chassis containing bootstrap channel.

- Step 26. Set all CHANNEL INTER-COMPUTER/CHANNEL NORMAL switches down.
- Step 27. Scope test point 1G25 on chassis 7. Test level is H.  
 a) If H, do step 28.  
 b) If T, replace 7J24D(19N15, 9-37).
- Step 28. Press SR register bit 3.  
 a) If bit 3 is lit, do step 29.  
 b) If bit 3 is not lit, replace 4J02F.
- Step 29. Replace gJ19A  
 gJ28B  
 gJ15C  
 gJ17C  
 7J31B

"g" refers to chassis containing bootstrap channel.

A 5 STOP with P = 010131, A<sub>U</sub> = 000000, and A<sub>L</sub> = 000000 indicates that an external function is improperly active. On panel A1, observe C register for nonjumpered channel. Find C register value in the following list and replace card as directed.

<u>C</u>	<u>REPLACE</u>
000000	gJ33B
000001	gJ15D
000002	gJ15D
000002	gJ33E
000004	gJ11A
000010	gJ33D
000010	gJ15C
000020	gJ15B
000020	3J34C
000040	gJ33C
000040	gJ15B
000100	gJ33B
000100	gJ15A
000125	gJ11A
000200	gJ15A
000200	gJ33B
000255	gJ11A
000400	gJ33E
000400	gJ15D
001000	gJ33E
001000	gJ15D
002000	gJ15C
002000	gJ33D
004000	gJ15C
004000	gJ33D
010000	gJ15B
010000	gJ33C
020000	gJ15B
020000	gJ33C

"g" refers to chassis for non-jumpered channel.

3.4.1.15  
(Cont)

3.4.1.15  
(Cont)

<u>C</u>	<u>REPLACE</u>
040000	gJ33B
040000	gJ15A
100000	gJ33B
100000	gJ15A
125000	gJ11A
177777	3J19E

3.4.1.16

5 STOP, P = 010261

3.4.1.16

A 5 STOP with P = 010261, A<sub>U</sub> = 000000, and A<sub>L</sub> = 000000 indicates that an EF active would not properly set or clear. On panel A1, observe C register for non-jumpered channel. Find C register value in the following list and replace card as directed.

<u>C</u>	<u>REPLACE</u>
000002	gJ33E
000004	gJ33D
000010	gJ33D
000020	3J34C
000020	3J35C
000040	gJ33C
000040	gJ33C
000100	gJ33B
000125	gJ33C
000125	gJ11A
000125	gJ26A
000200	gJ33B
000252	gJ26A
000252	gJ14C
000255	gJ11A
000255	gJ32C
000400	gJ33E
001000	gJ33E
002000	gJ33D
004000	gJ33D
010000	gJ33C
020000	gJ33C
040000	gJ33B
052400	gJ11A
052400	gJ26A
052400	gJ14C
052400	gJ32C
052400	gJ11A
100000	gJ33B
125000	gJ11A
125000	gJ14C

"g" refers to chassis for non-jumpered channel.

3.4.1.17

5 STOP, P = 010277

3.4.1.17

A 5 STOP with P = 010277, A<sub>U</sub> = 010214, and A<sub>L</sub> = 016445 indicates that a constant request is being honored.

- Step 1. Observe ID ACK indicators on all channels.
  - a) If none of the ID ACK indicators are lit, replace item 1.
  - b) If any other condition, do step 2.

- Step 2. Observe ID ACK indicators. Find channel which contains ID ACK indicator that is lit, refer to the following list and replace item as directed.

<u>CHANNEL</u>	<u>REPLACE ITEM</u>
0, 1, 10, or 11	2
2, 3, 12, or 13	3
4, 5, 14, or 15	4
6, 7, 16, or 17	5

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace gJ24B gJ22B
2						Replace gJ22D gJ23D
3						Replace gJ22C gJ24C
4						Replace gJ22B gJ24B
5						Replace gJ22A gJ23A

"g" refers to chassis containing test channel.

3.4.1.18

5 STOP, P = 010277

3.4.1.18

A 5 STOP with P = 010277, A<sub>U</sub> = 010226, and A<sub>L</sub> = 016446 indicates that an output has been improperly processed.

- Step 1. Observe EF/OD ACK indicators for all channels.
  - a) If none of the EF/OD ACK indicators are lit, replace item 1.
  - b) If any other condition, do step 2.

- Step 2. Observe OD ACT indicators.
  - a) If none of the OD ACT indicators are lit, do step 3.
  - b) If any other condition, do step 4.

Step 3. Observe EF/OD ACK indicators. Find channel which contains EF/OD ACK indicator that is lit, refer to the following list and replace item as directed.

<u>CHANNEL</u>	<u>REPLACE ITEM</u>
0, 1, 10, or 11	2
2, 3, 12, or 13	3
4, 5, 14, or 15	4
6, 7, 16, or 17	5

Step 4. Observe OD ACT indicators. Find channel which contains OD ACT indicator that is lit, refer to the following list and replace item as directed.

<u>CHANNEL</u>	<u>REPLACE ITEM</u>
0, 1, 10, or 11	6
2, 3, 12, or 13	7
4, 5, 14, or 15	8
6, 7, 16, or 17	9

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace gJ35A gJ16B gJ21B gJ28A
2						Replace gJ23D gJ21D gJ34E gJ35A
3						Replace gJ24C gJ21C gJ34D gJ35A
4						Replace gJ24B gJ21B gJ34C gJ35A
5						Replace gJ23A gJ21A gJ34B gJ35A
6						Replace gJ27D gJ16D gJ22D

"g" refers to chassis containing test channel.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
7						Replace gJ27C gJ16D gJ22C
8						Replace gJ27B gJ16B gJ22B
9						Replace gJ27A gJ16B gJ22A

3.4.1.19

5 STOP, P = 010277

3.4.1.19

A 5 STOP with P = 010277, AU = 010240, and AL = 016446 indicates that an EF request has been improperly processed. Observe EF/OD ACK indicators on all channels. Find channel which contains EF/OD ACK indicator that is lit, refer to the following list, and replace item as directed.

<u>CHANNEL</u>	<u>REPLACE ITEM</u>
0, 1, 10, or 11	1
2, 3, 12, or 13	2
4, 5, 14, or 15	3
6, 7, 16, or 17	4

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace gJ29A gJ34E
2						Replace gJ29A gJ34D
3						Replace gJ30A gJ34C
4						Replace gJ30A gJ34B

---

"g" refers to chassis containing test channel.



A 5 STOP with P = 011516, A<sub>U</sub> = 016446, and A<sub>L</sub> = 016446 indicates that a malfunction has been detected in the I/O circuitry. Observe OD ACT indicators on all channels. Find channel which contains the OD ACT indicator that is lit, refer to the following list and replace items as directed.

<u>CHANNEL</u>	<u>REPLACE ITEM</u>
0, 1, 10, or 11	1 and 5
2, 3, 12, or 13	2 and 5
4, 5, 14, or 15	3 and 5
6, 7, 16, or 17	4 and 5

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace gJ28D gJ33E
2						Replace gJ28C gJ33D
3						Replace gJ28B gJ33C
4						Replace gJ28A gJ33B
5						Replace gJ13D gJ6B gJ14A gJ26A gJ32C

"g" refers to chassis containing test channel.

A 5 STOP with P = 011647, A<sub>U</sub> = 024414, and A<sub>L</sub> = 307712 indicates a malfunction occurred in the I/O Control logic.

- Step 1. Observe lower bits of C<sub>E</sub> register.  
 a) If C<sub>E</sub> lower equals XXX446, do step 2.  
 b) If C<sub>E</sub> lower equals any other value, replace item 1.
- Step 2. Observe bootstrap channel in the CHANNEL and status grid.  
 a) If none of the indicators are lit, do step 3.  
 b) If any indicators are lit, replace item 3.
- Step 3. Press OP STEP MODE and master clear computer.
- Step 4. Press PHASE STEP MODE, then clear PHASE register.

- Step 5. Press TIMING 12, 22, 32, and 42, then observe that each indicator remains lit; if not, replace item 3.
- Step 6. Set PHASE REPEAT up, press PHASE 2, then scope item 4.
- Step 7. Press SR register bits 1 and 2, then scope item 6.
- Step 8. Clear PHASE register, then set PHASE REPEAT down.
- Step 9. Press OP STEP MODE and master clear computer.
- Step 10. Press PHASE STEP MODE and TIMING 42, 43, and 44.
- Step 11. Press PHASE 1, then repeatedly set RESTART/START STEP to START STEP until TIMING 22 is lit.
- Step 12. Observe TIMING indicators.  
a) If TIMING 12 is not lit, do step 13.  
b) If TIMING 12 is lit, replace item 3.
- Step 13. Set FUNCTION CODE to 30.
- Step 14. Press SEQ DES W and set  $S_1$  to 777777.
- Step 15. Press MULT/DIV SEQ bit 1 and set  $A_L$  to 777777.
- Step 16. Clear PHASE register.
- Step 17. Set PHASE REPEAT up.
- Step 18. Press PHASE 1 and 4.
- Step 19. Momentarily ground test point 1E24 on chassis 4 and test point 2A22 on chassis 3.
- Step 20. Observe P register.  
a) If P equals 777777, scope item 9.  
b) If P equals any other value, replace item 10.
- Step 21. Press SEQ DES I/OI, then ground test point 1F20 on chassis 7.
- Step 22. Press FUNCTION TRANSLATOR bit 1, then scope item 13.
- Step 23. Clear PHASE register, then press PHASE 2.
- Step 24. Remove ground from test point 1F20 on chassis 7, then momentarily ground test point 2C11 on chassis 7.
- Step 25. Scope item 15.
- Step 26. Ground test point 2D10 on chassis 7.
- Step 27. Clear PHASE register, then press PHASE 1 and TIMING 13.
- Step 28. Momentarily ground test point 2A21 on chassis 7.
- Step 29. Scope item 18.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 8J16C 8J02A
2						Replace 4J04E 4J14C 4J27B
3						Replace 3J14C 3J15C
4	9-39	12X03	4	2D26	L	If L scope item 5 If H replace 4J04E
5	9-6	95C02	7	1F31	T	If T do step 7 If not T replace 7J18D 7J03D
6	9-39	03G42	4	2C27	L	If L scope item 7 If H replace 4J03F 4J02F
7	9-39	03G41	4	2B27	L	If L scope item 8 If H replace 4J03F 4J02G
8	9-34	11E28	7	2D11	H	If H do step 9 If L replace 7J29E 7J30F
9	9-90	0XW12	4	2F17	H	If H scope item 11 If L replace 4J32F
10						Replace 4J33F
11	9-55	25G17	7	2E6	H	If H scope item 12 If L replace 7J27G 7J03B
12	9-34	0XG28	7	2C10	L	If L do step 21 If H replace 7J20E 7J27B 7J30F
13	9-34	02G28	7	2B9	H	If H scope item 14 If L replace 7J27B 7J28B
14	9-51	03G04	7	2F27	L	If L do step 23 If H replace 7J15E 7J30F

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
15	9-34	1XG28	7	2D10	H	If H scope item 16 If L replace 3J15F 7J26B
16	9-34	13G28	7	2F10	L	If L scope item 17 If H replace 7J30F 7J29F
17	9-34	15G28	3	2G9	L	If L do step 26 If H replace 3J09G 7J26B
18	9-34	2XG28	7	2A21	H	If H scope item 19 If L replace 7J23D 7J26B
19	9-22	35N12	7	1F6	H	If H scope item 20 If L replace 7J02G 7J23D
20	9-23	10N13	3	2E15	L	If L scope item 21 If H replace 3J09A 7J23D
21	9-25	09N11	8	1C25	H	If H scope item 22 If L replace 3J27A 7J23D 8J02A 8J17D
22	9-14	03G25	3	1B8	L	If L scope item 23 If H replace 3J27C 7J23D
23	9-50	02G00	7	1E16	L	If L replace 7J27G 7J11E 7J11G 3J27A If H replace 7J15B

A 5 STOP with P = 011714, A<sub>U</sub> = 000000, and A<sub>L</sub> = 502616 indicates that an output monitor interrupt was erroneously honored. Execution of the monitor interrupt entrance address caused a Program Stop. Observe S<sub>1</sub> register, then find value of S<sub>1</sub> in the following list and replace cards as directed.

<u>S<sub>1</sub></u>	<u>REPLACE</u>
000140	gJ29D
	gJ29C
000142	gJ29D
	gJ29C
000144	gJ29D
	gJ29C
000146	gJ29D
	gJ29C
000150	gJ29B
	gJ29C
000152	gJ29B
	gJ29C
000154	gJ29B
	gJ29C
000156	gJ29B
	gJ29C
000340	gJ29D
	gJ29C
000342	gJ29D
	gJ29C
000344	gJ29D
	gJ29C
000346	gJ29D
	gJ29C
000350	gJ29B
	gJ29C
000352	gJ29B
	gJ29C
000354	gJ29B
	gJ29C
000356	gJ29B
	gJ29C

"g" refers to chassis corresponding to Output Monitor interrupt channel displayed in S<sub>1</sub>.

3.4.1.23

5 STOP, P = 011721

3.4.1.23

A 5 STOP with P = 011721, A<sub>U</sub> = 000000, and A<sub>L</sub> = 040000 indicates that an interrupt was erroneously honored. Execution of the interrupt entrance address caused a Program Stop. Observe S<sub>1</sub> register, then find value of S<sub>1</sub> in the following list and replace the corresponding card(s) as directed.

<u>S<sub>1</sub></u>	<u>REPLACE</u>
000134	gJ11A
000136	gJ16C
000140	gJ5A
	gJ6A
000142	gJ5A
	gJ6A
	gJ27D
000144	gJ2A
	gJ4A
	7J13F

"g" refers to chassis containing channel on which interrupt was acknowledged.

<u>S<sub>1</sub></u>	<u>REPLACE</u>
000146	gJ02A gJ04A gJ18C gJ27C 7J13F
000150	gJ02A gJ05A gJ27B
000152	gJ02A gJ05A gJ18C gJ27B
000154	gJ02A gJ04A gJ27A 7J13F
000156	gJ02A gJ04A gJ18A gJ27A gJ14C 7J15B 7J13F 7J13G
000174	7J03E 7J02E gJ06B gJ07B gJ08B gJ09B
000176	gJ06B gJ07B gJ08B gJ09B gJ19C 7J13D 7J03E
000300	7J16C
000314	7J13C
000320	7J13G
000334	gJ11A gJ26A
000336	gJ11A
000340	gJ05A gJ06A gJ27D
000342	gJ05A gJ27D
000344	gJ02A gJ04A gJ27C gJ18C 7J13F

"g" refers to chassis containing channel on which interrupt was acknowledged.

<u>S<sub>1</sub></u>	<u>REPLACE</u>
000346	gJ02A gJ27C 7J13F 7J14F 7J26G
000350	gJ02A gJ05A gJ27B gJ18C 7J13G 7J14G
000352	gJ27B gJ02A 7J13G 7J15G
000354	gJ29B gJ02A gJ04A gJ14C 7J14F 7J13G 7J13F 7J15A
000356	gJ02A gJ27A 7J13G 7J14G 7J12A 7J03E
000374	gJ06B gJ07B gJ08B gJ09B 7J13E
000376	gJ06B gJ07B gJ08B gJ09B gJ19C 7J03E

"g" refers to chassis containing channel on which interrupt was acknowledged.

A 5 STOP with P = 011742, A<sub>U</sub> = 000000, and A<sub>L</sub> = 557767 indicates a malfunction was detected in the I/O Command or Monitor Control logic. On determining a malfunction, the program obtained a Program Stop from a central memory address which is displayed in the S<sub>1</sub> register. Observe S<sub>1</sub> register, then find value of S<sub>1</sub> in the following list, and replace card(s) corresponding to S<sub>1</sub> register value.

<u>S<sub>1</sub></u>	<u>REPLACE</u>
000120	gJ16D
000122	gJ16D
000124	gJ16D
000126	gJ16D
000130	gJ16B
000132	gJ16D
000134	gJ16B
000136	gJ16C
000140	gJ29D
000156	gJ29C
000320	gJ16D
000322	gJ16B
	gJ16D
000324	gJ16D
000326	gJ16D
000330	gJ16B
000332	gJ16B
	gJ16D
000334	gJ16C
000336	gJ16B
	gJ16C
000356	gJ29C

"g" refers to chassis containing channel receiving interrupt from the address listed in under S<sub>1</sub>.

3.4.1.25

5 STOP, P = 011770

3.4.1.25

A 5 STOP with P = 011770, A<sub>U</sub> = 000177, and A<sub>L</sub> = 000177 indicates a malfunction has been detected in the Channel or Function Priority circuitry. Observe CHAN PRI indicator on channel 7.

- a) If lit, replace gJ04A  
gJ06A  
gJ34A  
gJ11B
- b) If not lit, replace gJ06A  
gJ10A  
gJ14A  
gJ07B  
7J02E  
gJ16F  
gJ09A

"g" refers to chassis containing failing channels.

3.4.1.26

5 STOP, P = 012317

3.4.1.26

A 5 STOP with P = 012317, A<sub>U</sub> = 040000, and A<sub>L</sub> = 016446 indicates a malfunction has been detected in the Channel Priority or Request logic. Observe S<sub>1</sub> register, then find value of S<sub>1</sub> in the following list, and replace items as directed.

<u>S<sub>1</sub></u>	<u>REPLACE ITEM</u>
000140	1
000142	2
000156	3



<u>S<sub>1</sub></u>	<u>REPLACE ITEM</u>
000340	4
000342	5
000344	6
000346	6
000350	7
000352	7
000356	8

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace gJ04A gJ10A gJ14A
2						Replace gJ10A
3						Replace gJ26B gJ26C gJ26D
4						Replace gJ04A gJ10A gJ14A
5						Replace gJ06A gJ10A
6						Replace 7J13F
7						Replace 7J13G
8						Replace gJ26B gJ26C gJ26D

"g" refers to chassis containing failing channel determined by interrupt entrance address indicated in S<sub>1</sub>.

3.4.1.27

5 STOP, P = 012611

3.4.1.27

A 5 STOP with P = 012611, A<sub>U</sub> = 000400, and A<sub>L</sub> = 505640 indicates that a malfunction was detected causing an instruction word of 505640 to be executed from an interrupt entrance address.

Step 1. Observe S<sub>1</sub> register. Find value of S<sub>1</sub> in the following list and do as directed.

<u>S<sub>1</sub></u>	<u>DO THE FOLLOWING</u>
000100	Replace item 1
000106	Replace item 2
000110	Replace item 3
000112	Replace item 4
000114	Replace item 5
000116	Replace item 6
000300	Replace item 7
000302	Replace item 8
000304	Replace item 9
000306	Step 2
000310	Replace item 10
000312	Replace item 10
000314	Replace item 10
000316	Replace item 11

Step 2. Observe EF/OD ACK indicator for channel 5. (If computer contains 16 channels, observe channel 15.)

NOTE

In following steps, refer to following list for corresponding chassis and channels.

<u>CHASSIS</u>	<u>CHANNEL</u>
1	1, 3, 5, 7
2	0, 2, 4, 6
9	11, 13, 15, 17
10	10, 12, 14, 16

- a) If indicator is not lit, do step 3.
- b) If indicator is lit, replace item 12 in corresponding chassis.

Step 3. Press OP STEP MODE and master clear computer.

Step 4. Press ID MON and EF MON indicators for upper jumpered channel.

Step 5. Ground test point 2B15 on corresponding chassis.

Step 6. Momentarily set I/O CLEAR/MASTER CLEAR to I/O CLEAR.

Step 7. Observe ID MON and EF MON indicators set in step 4.

- a) If both are lit, do step 8.
- b) If either is not lit, replace item 15 in corresponding chassis.

Step 8. Press OD ACT indicator for lower jumpered channel.

Step 9. Remove ground on test point 2B15 and momentarily ground test point 2D31 on chassis corresponding to lower jumpered channel.

Step 10. Observe OD ACT indicator set in step 8.

- a) If lit, do step 11.
- b) If not lit, replace item 16 on corresponding chassis.

- Step 11. Press EI MON indicator for channels 6 and 7. (If 16 channels are used, press EI MON indicator for channels 16 and 17.) If indicators will not set, replace item 17 in corresponding chassis.
- Step 12. Set I/O CLEAR/MASTER CLEAR to MASTER CLEAR and observe indicators set in step 11.  
a) If all indicators cleared, do step 13.  
b) If any indicator remains lit, replace item 17 in corresponding chassis.
- Step 13. Ground test point 2D2 on chassis 10 if computer contains 16 channels; if not, ground test point 2D2 on chassis 2, then scope item 18 on same chassis.
- Step 14. Remove ground(s) on test point 2D2.
- Step 15. Ground test point 2F3 on chassis 10 if 16 channels are used; if not, ground test point 2F3 on chassis 2, then do step 16.
- Step 16. Scope item 19.
- Step 17. Remove ground on test point 2F3 and ground test point 2B13 on chassis 7; if 16 channels are used, also ground test point 2D13 on chassis 7.
- Step 18. Press PHASE STEP MODE, then set PHASE REPEAT up.
- Step 19. Press PHASE 4.
- Step 20. Momentarily ground test point 1A18 on chassis 8, then observe bit 0 of CE register(s).  
a) If indicator(s) are lit, do step 21.  
b) If indicator(s) are not lit, replace item 22 on chassis corresponding to malfunctioning bit.
- Step 21. Clear PHASE register, and remove ground(s) on test points 2B13 and 2D13 (if 16 channels are used) on chassis 7.
- Step 22. Press CHAN PRI indicator for channels 0 and 1. If computer contains 16 channels, press indicators in both CHANNEL and status grids.  
a) If indicators set, do step 23.  
b) If indicators will not set, replace item 23 in chassis corresponding to malfunctioning indicator.
- Step 23. Set DISC ADV P up.
- Step 24. Press SEQ DES I.
- Step 25. Press PHASE 1.
- Step 26. Observe ADV P SEQ bit 3 indicator.  
a) If not lit, scope items 25 through 27 on chassis corresponding to lower jumpered channel.  
b) If lit, replace item 24.
- Step 27. Clear PHASE register.
- Step 28. Set PHASE REPEAT down.
- Step 29. Press EF MON for channel 7.

3.4.1.27  
(Cont)

3.4.1.27  
(Cont)

- Step 30. Ground test point 2C19 on chassis g.
- Step 31. Press OP STEP MODE.
- Step 32. Master clear computer.
- Step 33. Observe EF MON indicator for channel 7.  
a) If lit, replace item 28.  
b) If cleared, replace item 29.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace gJ24D
2						Replace gJ24D gJ24D
3						Replace gJ24A
4						Replace gJ24A gJ14B gJ22B
5						Replace gJ24A
6						Replace gJ24A gJ31C
7						Replace gJ24D
8						Replace gJ24D
9						Replace gJ14B gJ22C gJ24D
10						Replace gJ24A gJ24A
11						Replace gJ24A gJ31C
12						Replace gJ07D
13	9-64	12Rg3	g	1D31	L	If L scope item 14 If H replace gJ25D gJ30A
14	9-56	71N41	g	1G11	H	If H do step 8 If L replace gJ31C gJ20A

"g" refers to chassis containing failing channel as indicated by interrupt address stored in S<sub>1</sub> register.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
15						Replace gJ19D gJ27C
16						Replace gJ16D gJ28B gJ14A
17						Replace gJ31B
18	9-66	16Rg4	g	1D15	L	If L do step 14 If H replace gJ12B
19	9-66	16Mg4	g	1D14	L	If L scope item 20 If H replace gJ12B
20	9-74	6gZ05	g	1A30	L	If L scope item 21 If H replace gJ14C
21	9-74	6gZ04	g	1A25	L	If L do step 17 If H replace gJ14G
22						Replace gJ03E
23						Replace gJ08A
24						Replace 7J20G
25	9-62	35Yg1	g	2B6	H	If H scope item 26 If L replace gJ24D
26	9-62	35Rg1	g	2D6	L	If L scope item 27 If H replace gJ22C gJ07A
27	9-64		g	2C12	L	If L do step 27 If H replace gJ25A gJ24A
28						Replace gJ02A gJ09A gJ16D gJ16B gJ04D
29						Replace gJ16B gJ27C

"g" refers to chassis containing test channel.

A 5 STOP with P = 013041, A<sub>U</sub> = 000006, and A<sub>L</sub> = 004002 indicates that a malfunction has been detected in the I/O Control circuitry.

- Step 1. Press OP STEP MODE, then master clear computer.
- Step 2. Scope test point 2D13 on chassis 7. Test level is L.  
 a) If L, do step 3.  
 b) If H, replace 7J18F(20N60, 9-53).
- Step 3. Ground test point 2D13 on chassis 7.
- Step 4. Scope item 1.
- Step 5. Remove ground from test point 2D13 on chassis 7.
- Step 6. Press CHANNEL TRANSLATOR bit 2.
- Step 7. Scope item 4.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1	9-58	23N60	g	1E20	T	If T scope item 2 If not T replace gJ13F gJ10D gJ12D gJ01C
2	9-58	24N60	g	1D21	T	If T scope item 3 If not T replace gJ13F
3	9-59	33G22	g	2B17	H	If H do step 5 If not H replace gJ15F
4	9-59	33G20	g	2C13	H	If H scope item 5 If not H replace gJ14F gJ18C
5	9-58	22N60	g	1E19	L	If L replace item 6 If not L replace gJ10D gJ12D
6						Replace 7J18F 4J08D 4J05D

"g" refers to chassis containing test channel.

A 5 STOP with P = 013041, A<sub>U</sub> = 000007, and A<sub>L</sub> = 000003 indicates a malfunction has been detected in the priority network.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Momentarily ground test point 1E24 on chassis g.
- Step 3. Scope test point 1E24 on chassis g. Test level is H.  
 a) If H, do step 4.  
 b) If L, replace gJ30D(3XRg1, 9-62).
- Step 4. Ground test point 2D6 on chassis g.
- Step 5. Scope test point 1E2 on chassis g. Test level is L.  
 a) If L, do step 6.  
 b) If H, replace gJ31A(80Rg1, 9-65).
- Step 6. Scope test point 1F16 on chassis g. Test level is L.  
 a) If L, do step 7.  
 b) If H, replace gJ10B(16Rg7, 9-66).
- Step 7. Ground test point 2E16 on chassis g.
- Step 8. Observe upper even function priority EF/OD indicator.  
 a) If lit, do step 9.  
 b) If not lit, replace gJ9B.
- Step 9. Scope test point 2F19 on chassis g. Test level is L.  
 a) If L, do step 10.  
 b) If H, replace gJ09A(11Vg7, 9-66).
- Step 10. Replace item 1.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace gJ14B gJ10C gJ24D gJ35E gJ10B

A 5 STOP with P = 013041, A<sub>U</sub> = 000007, and A<sub>L</sub> = 004403 indicates a malfunction was detected in the ID Acknowledge circuitry.

- Step 1. Observe CHAN PRI indicators on channel g.  
 a) If not lit, do step 2.  
 b) If lit, replace gJ08A.
- Step 2. Press OP STEP MODE and master clear computer.

"g" refers to chassis containing failing channel.

- Step 3. Ground test point 2D5 on chassis g and test point 2F16 on chassis 7.
- Step 4. Observe CHAN PRI indicator.  
a) If lit, do step 8.  
b) If not lit, do step 5.
- Step 5. Scope test point 1G16 on chassis g. Test level is L.  
a) If L, do step 6  
b) If H, replace gJ20A(8gN61, 9-58).
- Step 6. Scope test point 1G17 on chassis g. Test level is T.  
a) If T, do step 7.  
b) If not T, replace gJ16A(9gN61, 9-58).
- Step 7. Scope test point 1E2 on chassis g. Test level is L.  
a) If L, replace gJ08A(0XVg1, 9-65).  
b) If H, replace gJ31A(80Rg1, 9-65).
- Step 8. Remove grounds on test point 2D5 on chassis g and test point 2F16 on chassis 7.
- Step 9. Ground test point 2E7 on chassis g.
- Step 10. Scope test point 2C26 on chassis g. Test level is L.  
a) If L, do step 11.  
b) If H, replace gJ13A(62Lg0, 9-70).
- Step 11. Remove ground test point on 2E7 on chassis g.
- Step 12. Ground test point 2E16 on chassis 7.
- Step 13. Scope test point 1F20 on chassis g. Test level is T.  
a) If T, do step 15.  
b) If not T, do step 14.
- Step 14. Scope test point 1F19 on chassis g. Test level is L.  
a) If L, replace gJ16A(9gN62, 9-58).  
b) If H, replace gJ16F(8gN62, 9-58).
- Step 15. Remove ground on test point 2E16 on chassis 7.
- Step 16. Ground test point 2B23 on chassis g.
- Step 17. Scope test point 2C23 on chassis g. Test level is H.  
a) If H, do step 18.  
b) If L, replace gJ09D(2gN49, 9-58).
- Step 18. Remove ground on test point 2B23 on chassis g.
- Step 19. Exchange 2J03B with 7J20G.
- Step 20. Refer to paragraph 2.2 and attempt to load the program, then do step 21.

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"g" refers to chassis containing failing channel.



- Step 21. Observe error indication.  
a) If same error indication occurs, do step 22.  
b) If error indication is different from initial load failure, replace 7J20G.
- Step 22. Exchange gJ03B with 7J20G.
- Step 23. Refer to paragraph 2.2 and attempt to load the program, then do step 24.
- Step 24. Observe error indication.  
a) If same error indication occurs, do step 25.  
b) If error indication is different from initial load failure, replace 7J20G.
- Step 25. Exchange gJ18A with 3J08B.
- Step 26. Refer to paragraph 2.2 and attempt to load the program; then do step 27.
- Step 27. Observe error indication.  
a) If same error indication occurs, do step 28.  
b) If error indication is different from initial load failure, replace 3J08B.
- Step 28. Exchange gJ06B with 7J23F.
- Step 29. Refer to paragraph 2.2 and attempt to load the program; then do step 30.
- Step 30. Observe error indication.  
a) If same error indication occurs, do step 31.  
b) If error indication is different from initial load failure, replace 7J23F.
- Step 31. Exchange gJ04D with 7J21F.
- Step 32. Refer to paragraph 2.2 and attempt to load the program; then do step 33.
- Step 33. Observe error indication.  
a) If same error indication occurs, do step 34.  
b) If error indication is different from initial load failure, replace 7J21F.
- Step 34. Press OP STEP MODE and master clear computer.
- Step 35. Ground test point 2B29 on chassis g .
- Step 36. Scope test point 2D28 on chassis g . Test level is L.  
a) If L, do step 37.  
b) If H, replace gJ26D(53Lg2, 9-69).
- Step 37. Replace item 1.

"g" refers to chassis containing failing channel.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace gJ30E gJ28G gJ29G gJ30G

3.4.1.31

5 STOP, P = 013041

3.4.1.31

A 5 STOP with P = 013041, A<sub>U</sub> = 000160, and A<sub>L</sub> = 000060 indicates a malfunction was detected in the Channel Priority or Function Priority circuitry.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Scope test point 1E18 on chassis g. Test level is L.  
a) If L, press PHASE STEP MODE and do step 3.  
b) If H, replace gJ29E(3gG71, 9-58).
- Step 3. Press FUNCTION PRIORITY EI EVEN indicator and observe:  
a) If lit, do step 4.  
b) If not lit, replace gJ09B.
- Step 4. Momentarily ground test point 1F24 on chassis g.
- Step 5. Scope test point 1F24 on chassis g. Test level is H.  
a) If H, press OP STEP MODE and master clear computer, then do step 6.  
b) If L, replace gJ30B(3XRg2, 9-63).
- Step 6. Scope test point 2F19 on chassis g. Test level is L.  
a) If L, do step 7.  
b) If H, replace gJ09A(11Vg7, 9-66).
- Step 7. Ground test point 2D9 on chassis g.
- Step 8. Scope test point 1F2 on chassis g. Test level is L.  
a) If L, do step 9.  
b) If H, replace gJ33A(80Rg2, 9-65).
- Step 9. Scope test point 1F16 on chassis g. Test level is L.  
a) If L, do step 10.  
b) If H, replace gJ10B(16Rg7, 9-66).
- Step 10. Press OP STEP MODE and master clear computer, then press PHASE STEP MODE.
- Step 11. Ground test point 2E16 on chassis 7.

"g" refers to chassis containing lower jumpered channel.

- Step 12. Observe FUNCTION PRIORITY EI ODD indicator.  
 a) If lit, do step 13.  
 b) If not lit, replace gJ09B.
- Step 13. Remove grounds on test point 2D9 on chassis g and test point 2E16 on chassis 7.
- Step 14. Master clear computer.
- Step 15. Ground test point 2E7 on chassis g.
- Step 16. Scope test point 2D26 on chassis g. Test level is L.  
 a) If L, do step 17.  
 b) If H, replace gJ14B(63Lg0, 9-70).
- Step 17. Replace item 1.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace gJ24A gJ22B gJ35C

A 5 STOP with P = 013041, AU = 000160, and AL = 110060 indicates a malfunction was detected in the I/O TIMING circuitry.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Scope test point 2F16 on chassis 7. Test level is H.  
 a) If H, do step 43.  
 b) If L, replace 7J23C(00N61, 9-49).
- Step 3. Scope test point 1G16 on chassis g. Test level is L.  
 a) If L, do step 4.  
 b) If H, replace gJ20A(8gN61, 9-58).
- Step 4. Scope test point 1G17 on chassis g. Test level is T.  
 a) If T, do step 5.  
 b) If not T, replace gJ16A(9gN61, 9-58).
- Step 5. Ground test point 2D8 on chassis g and test point 2F16 on chassis 7.
- Step 6. Observe CHAN PRI 4, 5, 14, and 15 indicators.  
 a) If any are lit, do step 8.  
 b) If none are lit, do step 7.
- Step 7. Scope test point 1F2 on chassis g. Test level is L.  
 a) If L, replace gJ06A(0XVg3, 9-65).  
 b) If H, replace gJ33A(80Rg2, 9-65).

"g" refers to chassis containing lower jumpered channel.

- Step 8. Observe CHAN PRI 6, 7, 16, and 17 indicators.  
a) If none are lit, remove grounds on test point 2D8 on chassis g and test point 2F16 on chassis 7, then do step 9.  
b) If any are lit, replace gJ06A.
- Step 9. Press OP STEP MODE and master clear computer.
- Step 10. Ground test point 2E16 on chassis 7.
- Step 11. Scope test point 1F20 on chassis g. Test level is T.  
a) If T, do step 13.  
b) If not T, do step 12.
- Step 12. Scope test point 1F19 on chassis g. Test level is L.  
a) If L, replace gJ16A(9gN62, 9-58).  
b) If H, replace gJ16F(8gN62, 9-58).
- Step 13. Remove ground on test point 2E16 on chassis 7.
- Step 14. Master clear computer.
- Step 15. Ground test point 2E7 on chassis g.
- Step 16. Scope test point 2C26 on chassis g. Test level is L.  
a) If L, do step 17.  
b) If H, replace gJ13A(62Lg0, 9-70).
- Step 17. Momentarily ground test point 2D29 on chassis g.
- Step 18. Scope test point 2D29 on chassis g. Test level is H.  
a) If H, do step 19.  
b) If L, replace gJ23B(5XLg0, 9-69).
- Step 19. Ground test point 2C29 on chassis g.
- Step 20. Press PHASE STEP MODE and TIMING 21.
- Step 21. Scope test point 2D29 on chassis g. Test level is H.  
a) If H, do step 22.  
b) If L, replace gJ23B(5XLg0, 9-69).
- Step 22. Remove grounds on test points 2C29 and 2E7 on chassis g.
- Step 23. Ground test point 1E17 on chassis 7.
- Step 24. Scope test point 2D29 on chassis g. Test level is H.  
a) If H, press OP STEP MODE and do step 25.  
b) If L, replace gJ23B(5XLg0, 9-69).
- Step 25. Momentarily ground test point 2A14 on chassis 3.
- Step 26. Remove ground on test point 1E17 on chassis 7.
- Step 27. Scope test point 2D29 on chassis g. Test level is L.  
a) If L, do step 28.  
b) If not L, replace gJ23B(5XLg0, 9-69).

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"g" refers to chassis containing lower jumpered channel.

- Step 28. Momentarily ground test points 2A13 and 1E17 on chassis 7 simultaneously.
- Step 29. Scope test point 2D29 on chassis g. Test level is H.
  - a) If H, do step 30.
  - b) If L, replace gJ23B(5XLg0, 9-69).
- Step 30. Replace gJ30G and gJ05B, and gJ04B, if applicable.
- Step 31. Scope test point 2C28 on chassis g. Test level is L.
  - a) If L, do step 32.
  - b) If H, replace gJ06B(52Lg1, 9-69).
- Step 32. Replace gJ30G and gJ05B, and gJ04B if applicable.
- Step 33. Press PHASE STEP MODE.
- Step 34. Press TIMING 33 and PHASE 3.
- Step 35. Clear PHASE register.
- Step 36. Scope test point 2B25 on chassis g. Test level is L.
  - a) If L, do step 37.
  - b) If H, replace gJ03D(6XLg0, 9-70).
- Step 37. Press PHASE 2.
- Step 38. Clear PHASE register.
- Step 39. Scope test point 2C25 on chassis g. Test level is H.
  - a) If H, do step 40.
  - b) If L, replace gJ04D(6XLg1, 9-70).
- Step 40. Press OP STEP MODE and master clear computer.
- Step 41. Ground test point 2B23 on chassis g.
- Step 42. Scope test point 2C23 on chassis g. Test level is H.
  - a) If H, do step 44.
  - b) If L, replace gJ09D(2gN49, 9-58).
- Step 43. Scope test point 2C29 on chassis g. Test level is H.
  - a) If H, do step 3.
  - b) If L, replace gJ30E(53Lg0, 9-69).
- Step 44. Replace item 1.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace gJ18A gJ28G gJ29G gJ30G

"g" refers to chassis containing lower jumpered channel.

A 5 STOP with P = 013741,  $A_U = 000000$ , and  $A_L = 162401$  indicates that an error has been detected on the lower jumpered channel.

- Step 1. Observe ID ACK indicator in CHANNEL and status grid.
- If any indicators are lit, do step 2.
  - If none of the indicators are lit, replace item 1 on chassis corresponding to lower jumpered channel. Refer to the following list for correct chassis.

<u>LOW JUMPERED CHANNEL</u>	<u>CHASSIS</u>
1, 3, 5, 7	1
0, 2, 4, 6	2
11, 13, 15, 17	9
10, 12, 14, 16	10

- Step 2. Press OP STEP MODE and master clear computer.
- Step 3. Set CHANNEL INTER-COMPUTER/CHANNEL NORMAL switch to CHANNEL INTER-COMPUTER for lower jumpered channel.
- Step 4. Scope item 2 on chassis containing lower jumpered channel.
- Step 5. Set CHANNEL INTER-COMPUTER/CHANNEL NORMAL switch to CHANNEL NORMAL.
- Step 6. Press EF/OD ACK for lower channel.
- Step 7. Scope item 3.
- Step 8. Press ID ACK indicator for lower channel and observe:
- If indicator remained lit, do step 9.
  - If indicator did not remain lit, replace item 5.
- Step 9. Ground test point 2F7 on chassis g.
- Step 10. Scope item 6 on chassis g.
- Step 11. Remove ground from test point 2F7 on chassis g.
- Step 12. Ground test point 2D8 on chassis g.
- Step 13. Scope item 7 on chassis g.
- Step 14. Press PHASE STEP MODE and clear PHASE register.
- Step 15. Remove ground from test point 2D8 on chassis g.
- Step 16. Set PHASE REPEAT up.
- Step 17. Press PHASE 4.
- Step 18. Ground test point 1G19 on chassis g.

"g" refers to chassis containing lower jumpered channel.

Step 19. Ground test point 2E16 on chassis 7.

Step 20. Momentarily ground test point 2F7 on chassis g.

Step 21. On panel A1, observe FUNCTION PRIORITY ODD registers.

- a) If OD indicator is lit, replace item 13 on chassis for jumpered channel.
- b) If OD indicator is not lit, replace item 12 on chassis for jumpered channel.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace gJ03A gJ09A gJ10D
2	9-63	24Rg2	g	2E15	L	If L do step 5 If H replace gJ35A
3	9-63	22Rg2	g	2C7	L	If L scope item 4 If H replace gJ25B
4	9-69	55L10	g	2A32	L	If L do step 8 If H replace gJ32C
5						Replace gJ5D
6	9-66	16Rg6	g	1D16	L	If L do step 11 If H replace gJ11B
7	9-65	80Rg2	g	1F2	L	If L scope item 8 If H replace gJ33A
8	9-63	2XRg2	g	1F22	H	If H scope item 9 If L replace gJ20B
9	9-63	23Rg2	g	2D7	L	If L scope item 10 If H replace gJ21B
10	9-63	25Rg2	g	2F7	L	If L scope item 11 If H replace gJ21B
11	9-63	22Rg2	g	2C7	L	If L do step 15 If H replace gJ25B gJ24B
12						Replace gJ09B
13						Replace gJ05D gJ02D gJ03D gJ30G

"g" refers to chassis containing lower jumpered channel.

A 5 STOP with P = 013741, A<sub>U</sub> = 162401, and A<sub>L</sub> = 162401 indicates a malfunction has been detected in the I/O section of the upper jumpered channel.

- Step 1. Observe ID ACK indicator for upper channel.  
 a) If lit, do step 2.  
 b) If not lit, replace item 1 on chassis corresponding to upper channel. Refer to the following list for correct chassis.

<u>CHASSIS</u>	<u>UPPER JUMPERED CHANNEL</u>
1	1, 3, 5, 7
2	0, 2, 4, 6
9	11, 13, 15, 17
10	10, 12, 14, 16

- Step 2. Press OP STEP MODE and master clear computer.
- Step 3. Press PHASE STEP MODE.
- Step 4. Set CHANNEL INTER-COMPUTER/CHANNEL NORMAL switch to CHANNEL INTER-COMPUTER for upper channel.
- Step 5. Scope item 2 on the chassis containing upper jumpered channel.
- Step 6. Press OD ACT indicator for upper channel.
- Step 7. Scope item 9.
- Step 8. Clear PHASE register.
- Step 9. Set PHASE REPEAT up.
- Step 10. Press PHASE 4.
- Step 11. Momentarily ground test point 1F19 on chassis containing upper jumpered channel.
- Step 12. On panel A1, observe FUNCTION PRIORITY register on upper channel.  
 a) If OD indicator is lit for upper channel, replace item 15 on that chassis.  
 b) If OD indicator is not lit for upper channel, replace item 14 on that chassis.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace gJ03A gJ06D gJ09D gJ10D

"g" refers to chassis containing upper jumpered channel.



<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
2	9-69	55Lg0	g	2A32	L	If L scope item 3 If H replace gJ32C
3	9-62	24Rg1	g	2E14	L	If L scope item 4 If H replace gJ35A
4	9-62	2XRg1	g	1E22	H	If H scope item 5 If L replace gJ20D
5	9-70	6XLg0	g	2B25	L	If L and slow interface scope item 6 If L and fast interface scope item 8 If H replace gJ03D
6	9-70	6XLg1	g	2C25	H	If H scope item 7 If L replace gJ04D
7	9-70	6XLg3	g	2D23	H	If H do step 6 If L replace gJ30G
8	9-70	64Lg0	g	2E7	L	If L do step 6 If H replace gJ18A
9	9-62	gJ25C	g	2C4	L	If L scope item 10 If H replace gJ25C gJ24C
10	9-62	25Rg1	g	2F4	H	If H scope item 11 If L replace gJ21C
11	9-62	23Rg1	g	2D4	L	If L scope item 12 If H replace gJ21C gJ20D
12	9-65	80Rg1	g	1E2	L	If L scope item 13 If H replace gJ31A
13	9-66	16Rg6	g	1D16	L	If L do step 11 If H replace gJ11B
14						Replace gJ09B
15						Replace gJ04C gJ02D gJ03D gJ34D

"g" refers to chassis containing upper jumpered channel.

A 5 STOP with P = 013776,  $A_U = 000000$ , and  $A_L = 557756$  indicates a malfunction has been detected in the I/O Translation circuitry.

- Step 1. Press OP STEP MODE and master clear computer.
- Step 2. Press PHASE STEP MODE.
- Step 3. Scope test point 1F19 on chassis g. Test level is H.
  - a) If H, do step 4.
  - b) If L, replace gJ16F(8gN62, 9-58).
- Step 4. Scope test point 1F20 on chassis g. Test level is H.
  - a) If H, do step 5.
  - b) If L, replace 10J16A(9gN62, 9-58).
- Step 5. Press PHASE 4.
- Step 6. Scope test point 1F20 on chassis g. Test level is H.
  - a) If H, do step 7.
  - b) If L, replace gJ16A(9gN62, 9-58).
- Step 7. Clear PHASE register.
- Step 8. Ground test point 2F6 on chassis g.
- Step 9. Scope test point 1D14 on chassis g. Test level is L.
  - a) If L, do step 10.
  - b) If H, replace gJ12B(16Mg4, 9-66).
- Step 10. Remove ground on test point 2F6 on chassis g.
- Step 11. Scope test point 1F15 on chassis g. Test level is L.
  - a) If L, do step 12.
  - b) If H, replace gJ07B(11Vg6, 9-66).
- Step 12. Momentarily ground test point 2F4 on chassis g.
- Step 13. Observe FUNCTION PRIORITY EF and OD EVEN indicators.
  - a) If not lit, do step 14.
  - b) If lit, replace gJ09B.
- Step 14. Scope test point 2B21 on chassis g. Test level is H.
  - a) If H, do step 15.
  - b) If L, replace gJ19A(30Gg7, 9-60).
- Step 15. Scope test point 2C22 on chassis g. Test level is H.
  - a) If H, do step 16.
  - b) If L, replace gJ20A(31Gg7, 9-60).
- Step 16. Scope test point 2C18 on chassis g. Test level is L.
  - a) If L, do step 17.
  - b) If H, replace gJ20A(31Gg6, 9-60).
- Step 17. Ground test point 2F6 on chassis g.

"g" refers to the chassis containing higher jumpered channel.

- Step 18. Scope test point 1E1 on chassis g. Test level is L.  
 a) If L, do step 19.  
 b) If H, replace gJ32A(80Mg1, 9-65)

Step 19. Replace item 1.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace gJ19B gJ19C gJ21C

A 5 STOP with P = 015413, A<sub>U</sub> = 503400, and A<sub>L</sub> = 000000 indicates a malfunction has been detected in the channel translator circuitry.

Step 1. Press OP STEP MODE and master clear computer.

- Step 2. Observe I/O CHANNEL and status grid.  
 a) If cleared, do step 3.  
 b) If any indicators are lit, replace item 1 on chassis containing channel where indicator is lit. Refer to following list for correct chassis and channel.

<u>CHASSIS</u>	<u>CHANNEL</u>
1	1, 3, 5, 7
2	0, 2, 4, 6
9	11, 13, 15, 17
10	10, 12, 14, 16

- Step 3. Observe K register.  
 a) If K is cleared, do step 4.  
 b) If any indicators are lit, replace item 2.

Step 4. Press upper channel C register bit 2.

- Step 5. Observe C register bit 2 for upper channel.  
 a) If indicator is lit, scope item 4.  
 b) If indicator is not lit, replace item 3.

Step 6. Press PHASE STEP MODE.

Step 7. Press CHAN PRI indicator for upper channel.

- Step 8. Observe CHAN PRI indicator pressed in step 7.  
 a) If lit, do step 9.  
 b) If not lit, replace item 5 on corresponding chassis.

Step 9. Press I/O TRANSLATOR CHANNEL register bit 0, then scope item 6.  
 "g" refers to chassis containing higher jumpered channel.

- Step 10. Clear PHASE register.
- Step 11. Set PHASE REPEAT up.
- Step 12. Press PHASE 3.
- Step 13. Scope item 7.
- Step 14. Set FUNCTION PRIORITY EF and OD indicators for input channel, then scope item 8.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace gJ16B
2						Replace 7J24C 7J20C
3						Replace gJ06E
4	9-71	g4Y02	g	2A3	H	If H do step 6 If L replace gJ05E
5						Replace gJ06A
6	9-50	20G11	7	1E17	L	If L do step 10 If H replace 7J15B 7J12A
7	9-55	21E15	7	2G7	H	If H do step 14 If L replace 7J27D 3J12C
8	9-66	11Vg6	g	1F15	L	If L replace gJ05C (on input channel chassis) 7J32F gJ21A 7J23D If H replace gJ07B gJ06B (on MTU input channel chassis)

"g" refers to chassis containing test channel.

A 5 STOP with P = 015610, A<sub>U</sub> = 777700, and A<sub>L</sub> = 000000 indicates that parameters were incorrectly translated.

- Step 1. Press OP STEP MODE and master clear computer.

3.4.1.37  
(Cont)

3.4.1.37  
(Cont)

- Step 2. Ground test point 1F15 on chassis g.
- Step 3. Scope test point 1G15 on chassis g. Test level is L.  
a) If L, do step 4.  
b) If H, replace gJ7B(12Vg6, 9-66).
- Step 4. Press PHASE STEP MODE.
- Step 5. Ground test point 2C25 on chassis g.
- Step 6. Scope test point 2A30 on chassis g. Test level is L.  
a) If L, do step 7.  
b) If H, replace gJ02C(50Yg3, 9-68).
- Step 7. Press any OD ACT indicator, then release it.
- Step 8. Observe OD ACT indicator.  
a) If lit, do step 9.  
b) If not lit, replace gJ28C.
- Step 9. Remove ground on test point 2C25 on chassis g.
- Step 10. Press OP STEP MODE and master clear computer.
- Step 11. Press PHASE STEP MODE.
- Step 12. Ground test point 1A15 on chassis g.
- Step 13. Press SEQ DES I/OI.
- Step 14. Scope test point 2C4 on chassis 4. Test level is L.  
a) If L, do step 15.  
b) If H, replace 4J05G(64Z02, 9-108).
- Step 15. Remove ground on test point 1A15 on chassis g.
- Step 16. Press OP STEP MODE and master clear computer.
- Step 17. Scope test point 1F21 on chassis g. Test level is H.  
a) If H, do step 8.  
b) If T, replace gJ17A(9gN64, 9-58).
- Step 18. Replace item 1.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace gJ05A gJ34B gJ28C gJ19E

"g" refers to chassis containing test channel.

A 5 STOP with P = 016346, A<sub>U</sub> = 000000, and A<sub>L</sub> = 505640 indicates that an error was detected in the I/O circuitry causing an instruction word of 504650 to be executed from an interrupt entrance address.

Observe S<sub>1</sub> register, then do one of the following:

- a) If S<sub>1</sub> equals 000120, replace item 1 on chassis 2.
- b) If S<sub>1</sub> equals 000136, replace item 2 on chassis 1.
- c) If S<sub>1</sub> equals 000176, replace item 3 on upper jumpered channel chassis.
- d) If S<sub>1</sub> equals 000244, replace item 4 on chassis 9.
- e) If S<sub>1</sub> equals 000320, replace item 5 on chassis 10.
- f) If S<sub>1</sub> equals 000336, replace item 6 on input channel chassis.
- g) If S<sub>1</sub> equals 000376, replace item 7.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace gJ06A
2						Replace gJ21B gJ21C gJ21D
3						Replace gJ02A gJ14C
4						Replace gJ21C gJ7C
5						Replace gJ06A
6						Replace gJ07A gJ17A gJ21D
7						Replace 7J03E

"g" refers to chassis containing test channel.

A 5 STOP with P = 011321, A<sub>U</sub> = 400000, and A<sub>L</sub> = 016446 indicates that an error has been detected in the CDM circuitry. Replace the card(s) in CARD LOC column corresponding to C register value. Note that in three of C registers, only three least-significant octal digits are meaningful.

<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>C REGISTERS</u>		<u>CARD LOC</u>
		<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
000000	000	000	000	3J20C
000000	000	000	450	7J19C gJ09A gJ11A gJ33B gJ14C gJ09D gJ13D
000000	000	440	446	gJ33D
000000	000	444	446	gJ33C
000000	000	446	450	gJ15B gJ15C gJ33C gJ15D gJ33E gJ13D
000000	000	450	446	gJ09A gJ15A gJ15B gJ33B gJ14C gJ15C gJ13D gJ15D gJ33D gJ33E gJ16F
000000	450	446	446	gJ09A gJ11A gJ15A gJ33B gJ14C gJ13D gJ16F
016446	450	446	446	gJ15B gJ15C gJ33C gJ15D gJ33D gJ33E

"g" refers to chassis containing failing channel.

C REGISTERS

<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	<u>CARD LOC</u>
016450	446	446	446	gJ09A gJ15A gJ15B gJ33B gJ33C gJ13D gJ15D gJ16F

3.4.1.40

5 STOP, P = 011327

3.4.1.40

A 5 STOP with P = 011327, A<sub>U</sub> = 400000, and A<sub>L</sub> = 016446 indicates that an error has been detected in the CDM circuitry.

Replace the cards in the CARD LOC column that correspond to value in the C register. Note that for three of the C registers, only three least-significant octal digits are meaningful.

C REGISTERS

<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	<u>CARD LOC</u>
000000	000	000	000	gJ27A
000000	000	000	450	7J18A 7J03G gJ25A gJ02B gJ14C gJ07D gJ27G
000000	000	000	711	7J18A
000000	000	446	450	gJ15B gJ25B gJ26B gJ15C gJ25C gJ07D gJ11D gJ15D gJ25D gJ27G
000000	000	450	446	gJ03A gJ15A gJ25A gJ02B

"g" refers to chassis containing failing channel.



<u>C REGISTERS</u>				
<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	<u>CARD LOC</u>
				gJ15B gJ25B gJ26B gJ01C gJ14C gJ07D gJ09D gJ10D gJ11D gJ15D gJ25D gJ01E gJ27G
000000	000	451	446	gJ25C gJ27G
000000	450	446	446	gJ03A gJ15A gJ25A gJ02B gJ01C gJ14C gJ23C gJ07D gJ09D gJ10D gJ01E gJ27G
016446	450	446	446	gJ26B gJ15C gJ25C gJ07D gJ11D gJ15D gJ25D gJ27G
016446	451	446	446	gJ25B gJ27G
016450	446	446	446	gJ03A gJ15A gJ25A gJ02B gJ15B gJ25B gJ26B gJ07D

"g" refers to chassis containing failing channel.

3.4.1.40  
(Cont)

3.4.1.40  
(Cont)

<u>C REGISTERS</u>				
<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	<u>CARD LOC</u>
				gJ09D
				gJ10D
				gJ11D
				gJ15D
				gJ25D
				gJ01E
				gJ27G

3.4.1.41

5 STOP, P = 013041

3.4.1.41

A 5 STOP with P = 013041, AU = 000140, and AL = 100040 indicates that the I/O circuitry failed to input properly.

Replace cards in the CARD LOC column that correspond to value in the C register. Note that in three of the C registers, only three least-significant octal digits are meaningful.

<u>C REGISTERS</u>				
<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	<u>CARD LOC</u>
000000	000	000	000	7J17A
000000	000	000	711	7J17A
000000	000	447	446	7J17A gJ01C gJ10D gJ12D gJ13F 7J18G
000000	447	447	446	gJ18C gJ14F gJ15F 4J08D 7J15G

"g" refers to chassis containing failing channel.

- Step 1. Observe PROGRAM STOP indicators.  
 a) If any are lit, do step 7.  
 b) If none are lit, do step 2.
- Step 2. Press OP STEP MODE.
- Step 3. Set SEQ STEP/STOP to SEQ STEP.
- Step 4. Observe SEQ DES register while repeatedly setting RESTART/START STEP to START/STEP.  
 a) If sequencing occurs, do step 5.  
 b) If no sequencing occurs, do step 7.
- Step 5. Set SEQ STEP/STOP to center.
- Step 6. Repeatedly set RESTART/START STEP to START/STEP until P register contains highest value attainable.
- Step 7. Find value of P register under P column in the following pages. (Note that P is arranged in ascending numeric order.)
- Step 8. Find values of A<sub>U</sub>, A<sub>L</sub>, and C registers in the following pages. Then do one of the following:  
 a) Replace card(s) in CARD LOC column corresponding to values in P, A<sub>U</sub>, A<sub>L</sub>, and C registers, or  
 b) Follow the instructions that correspond to values in P, A<sub>U</sub>, A<sub>L</sub>, and C registers.

<u>C REGISTERS</u>							
<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>EVEN LOW</u>	<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	<u>CARD LOC</u>
000000	000000	000000	000000				8J29A
000000	000000	000006	000000				8J18A
000000	000000	001237	000000				3J18A 3J21A
000001	000000	000000	000000				3J20E 7 J10F
000001	000000	503000	000000				8J23A
000001	070707	000000	000000				7J12E
000002	000000	040000	000674				3J30B 3J03E 3J26E
000002	000001	045467	000000				3J19B
000005	000000	000000	000000				4J32E

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>EVEN LOW</u>	<u>C REGISTERS</u>			<u>CARD LOC</u>
				<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
000011	000000	000000	000000				4J16B
000036	005415	000000	000000				8J28B
000036	005415	777777	000000				8J18F
000036	005415	XXXXXX	000000				8J17F 8J19F
000101	000000	000000	000000				7J03B
000370	000000	000000	000000				8J07G
000401	070707	000000	000000				4J32E
000500	777000	053716	000000				4J10G
000501	000000	000000	000000				8J23A 8J29A
000502	000000	000000	000000				8J23A
000504	000000	000000	000000				8J29A
000507	000000	501113	000000				3J07F
000510	000000	103000	000000				8J07G
000512	000000	503000	000000				8J29A
000515	000000	000000	000000				8J23A
000520	000000	000000	000000				3J04E
000520	000000	000503	000000				3J08B 3J05F 3J17F 8J18C
000520	000000	503000	000000				3J28F
000521	176000	000360	000000				4J16B
000530	000000	XXXXXX	000000				8J32B
000542	000000	000000	000000				4J14B
000601	000000	000000	000000				4J08E
000705	000000	000000	000000				8J18C

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>EVEN LOW</u>	<u>C REGISTERS</u>			<u>CARD LOC</u>
				<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
000710	000000	000000	000000				4J15G
000710	000777	000000	000000				3J20C
001000	000000	000000	000000				3J18A 3J20A 3J09D 3J17G 7J30B 7J13C 7J21C 7J33C
001001	000000	000000	000000				3J11E 3J18F 3J22G 4J05E 4J25A 7J32A 7J27D
001004	000000	000000	000000				3J24G
001005	000000	000000	000000				8J18B
001024	XXXXXX	XXXXXX	XXXXXX				4J21G
001101	000000	000000	000000				4J10E
001107	713000	000000	000000				7J12G
001131	000540	000000	000000				4J10B
001225	000700	777777	000000				3J03E 3J19G 4J33F
001225	005000	777777	000000				7J04E
001237	000000	000000	000000				3J18B
001245	000000	000000	000000				3J04B
001341	000000	000000	000000				3J03B
001341	353535	000000	000000				3J22E
001374	000000	100000	000000				7J19B
001754	000000	000000	000000				7J11B

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>EVEN LOW</u>	<u>C REGISTERS</u>			<u>CARD LOC</u>
				<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
002153	000003	000005	000000				7J13F
002371	777777	777777	000000				7J05C
002412	000000	000000	000000				4J32G
002412	000007	000001	000000				3J16C gJ17C gJ22C
002412	107070	040000	000000				6J22E
002412	115071	040000	000000				6J22E
002412	245515	022756	000000				6J33C
002412	266655	000001	000000				7J22F
002412	707070	000000	000000				3J30B
002412	707070	000001	000000				8J15B
002412	707070	010000	000000				4J33F 6J19B 6J21B 6J38B 6J40B 6J33C 6J35C
002412	707070	020000	000000				4J33F 6J19B 6J21B 6J38B 6J40B 6J33C 6J35C 7J11B
002412	707070	032100	000000				7J21C
002412	707070	040000	000000			Do test 3.4.2.1	
002412	707070	070000	000000				3J02A 3J02E 3J03E 3J26E 3J18E 3J26E 4J15D 8J07C

P	A <sub>U</sub>	A <sub>L</sub>	EVEN LOW	C REGISTERS			CARD LOC
				ODD LOW	EVEN HIGH	ODD HIGH	
002412	707070	100000	000000				3J12D 3J13E
002412	707070	140000	000000				7J04E
002412	753557	000001	000000				7J22F
002433	000000	070007	000000				7J21A 7J09G
002433	777777	070007	000000				4J30A 4J30D
002512	200000	200017	000000				7J23E
002605	707070	000040	000000				6J31C
002675	770707	070707	000000				gJ15E
002701	536672	536272	000000				4J17C
003770	000000	000000	000000				8J23A
004155	000000	000000	000000				3J02C 3J13G
004155	XXXXXX	XXXXXX	XXXXXX				3J02C
004362	424242	424242	000000				4J33A
004363	653213	270760	000000				4J07A
004363	707512	707600	000000				4J16G
004364	353535	707070	000000				4J19G
004367	000000	004766	000000				3J18B
004372	007073	006742	000000				4J32B
004373	000000	777776	000000				3J13G
004374	000000	000007	347775				3J19B
004374	000000	004251	347775				3J23C
004374	000000	004637	347775				3J17C
004374	000000	004640	347775				3J19B
004374	000000	005623	347775				3J05A

"g" refers to chassis containing channel under test.

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>EVEN LOW</u>	<u>C REGISTERS</u>			<u>CARD LOC</u>
				<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
004374	000000	177773	347775				3J03G
004374	000706	000263	000706				4J32E
004374	001264	001311	347775				4J33A
004374	002235	004643	347775				3J28G
004374	004000	004164	347775				4J14E
004374	024440	001220	000706				3J18B
004374	120017	072457	347775				3J05A
004374	124637	012317	762266				4J16F
004374	124637	022317	762266				4J15F
004374	124637	042317	762266				4J14F
004374	124637	072317	762266				3J03E 4J16D
004374	137776	102346	762266				4J32G
004374	341260	157776	347775				3J17C
004374	444634	111325	000706				3J22C
004374	501313	016730	000706				3J22E
004374	503313	016730	000706				3J23B
004374	612600	132576	347775				3J05C
004374	777776	004416	347775				3J20A
004404	XXXXXX	XXXXXX	XXXXXX				3J17D
004406	000000	000000	000000				3J04B
004424	353535	707070	000000				4J18B
004464	353535	707070	000000				4J17B
004665	503000	000000	000000				3J13G
004764	353535	707070	000000				4J18C
005511	000000	000000	000000				1J12A



<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>EVEN LOW</u>	<u>C REGISTERS</u>			<u>CARD LOC</u>
				<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
005511	000000	000100	000000				gJ19B
005511	000000	100000	000000	Do test 3.4.2.2			
005511	000000	400000	000000				gJ31D 7J23C
006371	002000	545233	000000				4J15E
006450	XXXXXX	XXXXXX	XXXXXX				3J07G
006450	353535	474311	000000				3J07G
006450	353535	474311	000000				3J24B
006760	000007	547235	000000				3J10C
007370	000000	000000	000000				8J23A
007705	000000	503000	000000				8J23A
007776	000000	347775	000000				3J16A
007777	000000	000000	000000				8J35A
010000	XXXXXX	XXXXXX	XXXXXX				8J07E
010131	015375	000000	000000				gJ22F
010505	000000	010000	000000				4J10B
011126	000540	005000	000000				6J19B 6J21B
011225	000700	777777	000000				3J03E 7J10B
012375	707070	342374	000000				4J16F
013573	000000	000000	000000				3J30A
014364	353535	707070	XXXXXX				4J17E
015406	XXXXXX	XXXXXX	XXXXXX				3J28F
015406	016603	015405	000000				3J27F
015406	016603	015405	016447				3J19E
015413	000000	017174	016634				3J30A

"g" refers to chassis containing channel under test.

P	A <sub>U</sub>	A <sub>L</sub>	EVEN LOW	C REGISTERS			CARD LOC
				ODD LOW	EVEN HIGH	ODD HIGH	
015413	000000	017747	014735				3J08A
015413	016446	010643	000615				3J21C
015413	017464	015413	016634				3J31B
015413	126462	005640	014735				7J24E gJ14E
015413	503000	000077	014625				gJ19B gJ19C 7J19C gJ09D
015413	504622	013572	013341				gJ16A gJ22C
015413	504622	013574	013341				gJ10C
015413	617234	017232	016634				7J11D
015413	717776	016673	016634				7J26G
015413	717776	017471	016634				7J27E
015413	777700	016455	014735				3J31A
017472	003777	777777	016445				3J07D
022375	707070	342374	000000				4J15F
040504	000000	040000	000000				4J08B
042375	707070	342374	000000				3J02E 3J03E 4J15D 4J14F 4J32G
044364	353535	707070	000000				4J18F
060001	000000	503000	000000				3J29F
104364	424242	353535	000000				4J17F
140504	000000	443000	000000				4J08B
140504	000000	677777	000000				4J08B
160504	000000	737777	000000				4J09B

"g" refers to chassis containing channel under test.

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>EVEN LOW</u>	<u>C REGISTERS</u>			<u>CARD LOC</u>
				<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
164421	000000	000000	000000				3J28F
177776	557772	777776	000000				7J23F
177777	XXXXXX	XXXXXX	XXXXXX				4J06A

3.4.2.1

FAULT, P = 002412

3.4.2.1

A program control fault with P = 002412, A<sub>U</sub> = 707070, and A<sub>L</sub> = 040000 indicates that a malfunction has occurred in the Memory Bank 1 inhibits or sense amplifiers.

Step 1. Press OP STEP MODE and master clear computer.

Step 2. Press P register bit 14.  
a) If lit, do step 3.  
b) If not lit, replace 4J32G.

Step 3. Ground test point 1B1 on panel A3.

Step 4. Scope test point 2A3 on panel A3. Test level is L.  
a) If L, do step 5.  
b) If not L, replace 6J31C(51MT00, 9-136).

Step 5. Remove ground on test point 1B1 on panel A3.

Step 6. Interchange cards in column A with cards in column B, then do step 7.

<u>A</u>	<u>B</u>
6J32E	6J37E
6J38E	6J35E
6J22E	6J21E

Step 7. Refer to paragraph 2.2 and attempt to load the program. One of the following error conditions should occur. Find P register value in the following list and do as directed.

<u>P</u>	<u>DO THE FOLLOWING</u>
002412	Step 8
047775	Replace 6J37E
002121	Replace 6J35E
002075	Replace 6J21E

Step 8. Interchange cards in A with cards in column B, then do step 9.

<u>A</u>	<u>B</u>
6J31E	6J37E
6J24E	6J35E
6J23E	6J21E

3.4.2.1  
(Cont)

3.4.2.1  
(Cont)

Step 9. Refer to paragraph 2.2 and attempt to load the program. One of the following error conditions should occur. Find P register value in the following list and replace card(s) as directed.

<u>P</u>	<u>REPLACE</u>
047775	6J37E
002121	6J35E
002075	6J21E
002412	6J13C
	6J27D
	6J40D

3.4.2.2

FAULT, P = 005511

3.4.2.2

A program control fault with P = 005511, A<sub>U</sub> = 000000, and A<sub>L</sub> = 100000 indicates that a malfunction occurred in the I/O request logic.

Step 1. Observe I/O CHANNEL and status grid corresponding to bootstrap channel. Find corresponding display below and do as directed.

<u>CHAN</u> <u>PRI</u>	<u>EI</u> <u>MON</u>	<u>EF</u> <u>MON</u>	<u>OD</u> <u>MON</u>	<u>ID</u> <u>MON</u>	<u>EF</u> <u>ACT</u>	<u>OD</u> <u>ACT</u>	<u>ID</u> <u>ACT</u>	<u>EF/OD</u> <u>ACK</u>	<u>ID</u> <u>ACK</u>	<u>DO THE</u> <u>FOLLOWING</u>
								X	X	Replace gJ22B
					X			X		Replace gJ22D
					X			X	X	Step 6
X	X				X			X	X	Replace 7J17G
X			X			X		X	X	Replace 7J14E
X			X				X	X	X	Replace gJ29C
X	X				X			X	X	Replace gJ29D
X	X	X						X	X	Step 2
X	X							X	X	Replace item 1
X					X			X	X	Replace item 2

X denotes indicator is lit

Step 2. Observe I/O CHANNEL and status grid, channel 14.  
 a) If none of the indicators are lit, do step 3.  
 b) If both CHAN PRI and OD MON are lit, replace gJ29B.  
 c) If both CHAN PRI and ID MON are lit, replace gJ19B.  
 d) If only CHAN PRI is lit, replace item 3.

Step 3. Observe I/O CHANNEL and status grid, channel 15.  
 a) If none of the indicators are lit, do step 4.  
 b) If both CHAN PRI and EI MON are lit, replace gJ31C.  
 c) If only CHAN PRI is lit, replace item 4.

Step 4. Observe I/O CHANNEL and status grid, channel 16.  
 a) If CHAN PRI is lit, replace item 5.  
 b) If CHAN PRI is not lit, do step 5.

"g" refers to chassis containing indicated channel.

- Step 5. Observe I/O CHANNEL and status grid, channel 17.
- If none of the indicators are lit, replace item 6.
  - If both CHAN PRI and OD MON are lit, replace gJ29C.
  - If only CHAN PRI is lit, replace item 7.
- Step 6. Observe I/O CHANNEL and status grid, channel 0.
- If none of the indicators are lit, do step 7.
  - If both CHAN PRI and OD MON are lit, replace gJ29D.
  - If CHAN PRI, EI MON, and ID ACK are lit, replace 2J22D.
  - If only CHAN PRI and EI MON are lit, replace gJ31D.
  - If only CHAN PRI is lit, replace item 8.
- Step 7. Observe I/O CHANNEL and status grid, channel 1.
- If none of the indicators are lit, do step 8.
  - If CHAN PRI, EI MON, and ID ACK are lit, replace gJ22D.
  - If both CHAN PRI and EI MON are lit, replace item 9.
  - If both CHAN PRI and ID MON are lit, replace item 10.
  - If both CHAN PRI and EF MON are lit, replace gJ16C.
  - If both CHAN PRI and OD MON are lit, replace item 11.
  - If only CHAN PRI is lit, replace item 12.
- Step 8. Observe I/O CHANNEL and status grid, channel 2.
- If none of the indicators are lit, do step 9.
  - If CHAN PRI is lit, replace item 13.
- Step 9. Observe I/O CHANNEL and status grid, channel 3.
- If none of the indicators are lit, do step 10.
  - If CHAN PRI, EI MON, and ID ACK are lit, replace gJ22C.
  - If only CHAN PRI is lit, replace item 14.
- Step 10. Observe I/O CHANNEL and status grid, channel 4.
- If none of the indicators are lit, do step 11.
  - If CHAN PRI, EI MON, EF/OD ACK, and ID ACK are lit, replace gJ22B.
  - If both CHAN PRI and EI MON are lit, replace gJ31B.
  - If both CHAN PRI and EF MON are lit, replace gJ16B.
  - If both CHAN PRI and OD MON are lit, replace gJ29B.
  - If only CHAN PRI is lit, replace item 15.
- Step 11. Observe I/O CHANNEL and status grid, channel 5.
- If none of the indicators are lit, do step 12.
  - If CHAN PRI, EI MON, and ID ACK are lit, replace gJ22B.
  - If both CHAN PRI and EI MON are lit, replace gJ31B.
  - If both CHAN PRI and EF MON are lit, replace gJ16B.
  - If both CHAN PRI and OD MON are lit, replace gJ29B.
  - If only OD MON is lit, replace gJ29B.
  - If only CHAN PRI is lit, replace item 16.
- Step 12. Observe I/O CHANNEL and status grid, channel 6.
- If none of the indicators are lit, do step 13.
  - If CHAN PRI, EI MON, and ID ACK are lit, replace gJ22A.
  - If only CHAN PRI is lit, replace item 17.

"g" refers to chassis containing indicated channel.

- Step 13. Observe I/O CHANNEL and status grid, channel 7.
- If none of the indicators are lit, do step 14.
  - If both CHAN PRI and ID ACK are lit, replace gJ22A.
  - If only CHAN PRI is lit, replace item 18.
- Step 14. Observe I/O CHANNEL and status grid, channel 10.
- If none of the indicators are lit, do step 15.
  - If CHAN PRI, EI MON, and ID ACK are lit, replace gJ22D.
  - If both CHAN PRI and EI MON are lit, replace gJ31D.
  - If both CHAN PRI and EF MON are lit, replace gJ16C.
  - If both CHAN PRI and OD MON are lit, replace gJ29D.
  - If both CHAN PRI and ID MON are lit, replace gJ19D.
  - If only CHAN PRI is lit, replace item 19.
- Step 15. Observe I/O CHANNEL and status grid, channel 11.
- If none of the indicators are lit, do step 16.
  - If both CHAN PRI and EI MON are lit, replace gJ31D.
  - If both CHAN PRI and OD MON are lit, replace gJ29D.
  - If only CHAN PRI is lit, replace item 20.
- Step 16. Observe I/O CHANNEL and status grid, channel 12.
- If none of the indicators are lit, do step 17.
  - If CHAN PRI, EI MON, and ID ACK are lit, replace gJ22C.
  - If only CHAN PRI is lit, replace item 21.
- Step 17. Observe I/O CHANNEL and status grid, channel 14.
- If none of the indicators are lit, do step 18.
  - If CHAN PRI and EI MON are lit, replace gJ31B.
- Step 18. Observe I/O CHANNEL and status grid, channel 15.
- If none of the indicators are lit, do step 19.
  - If CHAN PRI and EI MON are lit, replace gJ31B.
- Step 19. Observe I/O CHANNEL and status grid, channel 16.
- If none of the indicators are lit, do step 20.
  - If CHAN PRI, EI MON and ID ACK are lit, replace gJ23A.
  - If only ID ACK is lit, replace gJ08B.
- Step 20. Press OP STEP MODE and master clear computer.
- Step 21. Press PHASE STEP MODE.
- Step 22. Press PHASE 1.
- Step 23. Repeatedly set RESTART/START STEP to START STEP until TIMING 21 is lit.
- Step 24. Clear PHASE register.
- Step 25. Set PHASE REPEAT up.
- Step 26. Ground test point 2C16 on chassis 7.
- Step 27. Press PHASE 4.

"g" refers to chassis containing indicated channel.

- Step 28. Observe FUNCTION PRIORITY indicators on panel A1.  
 a) If none of the indicators are lit, do step 29.  
 b) If any one indicator is lit, do step 31.
- Step 29. Observe FUNCTION PRIORITY indicators on panel A8.  
 a) If none of the indicators are lit, replace item 22.  
 b) If any one indicator is lit, do step 30.
- Step 30. Find FUNCTION PRIORITY indicator that is lit in the following list, and replace items as directed.

<u>INDICATOR</u>		<u>REPLACE ITEM</u>
EI	ODD	23
EI	EVEN	24
EF	ODD	25
EF	EVEN	26
OD	ODD	27
OD	EVEN	28
ID	ODD	29
ID	EVEN	30

- Step 31. Find FUNCTION PRIORITY indicator that is lit in the following list, and replace item as directed.

<u>INDICATOR</u>		<u>REPLACE ITEM</u>
EI	ODD	31
EI	EVEN	32
EF	ODD	33
EF	EVEN	34
OD	ODD	35
OD	EVEN	36
ID	ODD	37
ID	EVEN	38

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1	9-51	20G05				Replace 7J09D
	9-51	0XG04				7J14E
2	9-62	02M31				Replace gJ21C
	9-62	22M31				gJ26C
	9-38	1XM31				gJ16D
	9-62	0XM31				gJ19D
	9-61	2XM31				gJ29D
	9-62	3XM31				gJ31D
3	9-63	0XM22				Replace gJ19B
	9-38	12M22				gJ21B
	9-63	2XM22				gJ29B

"g" refers to chassis containing failing channel.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
	9-63	2XM22				Replace gJ26B gJ31B
	9-63	3XM22				
4	9-38	1XM32				Replace gJ16B gJ21B gJ26B gJ29B
	9-63	02M32				
	9-63	22M32				
	9-63	2XM32				
5	9-38	12M23				Replace gJ21A gJ26A gJ19B gJ29B gJ31B
	9-64	22M23				
	9-64	0XM23				
	9-64	2XM23				
	9-64	3XM23				
6	9-53	01N41				Replace 7J02G gJ31C gJ30D gJ31D gJ36D gJ12F 7J18C 7J16F
	9-56	73N41				
	9-61	3XM30				
	9-62	3XM31				
	9-38	7XM31				
	9-56	93N41				
	9-49	11E00				
	9-49	12E00				
7	9-38	12M33				Replace gJ21A gJ26A gJ16B gJ19B gJ29B gJ31B
	9-64	22M33				
	9-38	1XM33				
	9-64	0XM33				
	9-64	2XM33				
	9-64	3XM33				
8	9-61	3XM00				Replace gJ31D gJ19D gJ21D gJ26D gJ29D
	9-61	0XM00				
	9-61	35R00				
	9-61	22M00				
	9-61	2XM00				
9	9-61	3XM10				Replace gJ31D gJ31C gJ16D
	9-56	71N42				
10	9-56	41N42				Replace gJ19C gJ19D
	9-62	0XM11				
11	9-56	61N42				Replace gJ29C gJ29D
	9-62	2XM10				
12	9-38	1XM10				Replace gJ16D gJ19D gJ21D gJ26D gJ29D gJ31D
	9-61	0XM10				
	9-61	02M10				
	9-61	22M10				
	9-61	2XM10				
	9-61	3XM10				

"g" refers to chassis containing failing channel.



<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
13	9-38	1XM01				Replace gJ16D gJ29D
	9-62	2XM01				
14	9-62	02M11				Replace gJ21C gJ26C gJ16D gJ19D gJ31D gJ29D
	9-62	22M11				
	9-38	1XM11				
	9-62	0XM11				
	9-62	3XM11				
	9-62	2XM11				
15	9-38	12M02				Replace gJ21B gJ26B gJ29B gJ31B
	9-63	22M02				
	9-63	2XM02				
	9-63	3XM02				
16	9-38	1XM12				Replace gJ16B gJ19B gJ21B gJ26B gJ29B gJ31B
	9-64	0XM12				
	9-38	12M12				
	9-63	22M12				
	9-63	2XM12				
	9-63	3XM12				
17	9-64	02M03				Replace gJ21A gJ26A gJ19B gJ29B
	9-64	22M03				
	9-64	0XM03				
	9-64	2XM03				
18	9-38	12M13				Replace gJ21A gJ26A gJ19B gJ29B gJ31B
	9-64	22M13				
	9-64	0XM13				
	9-64	2XM13				
	9-64	3XM13				
19	9-61	0XM00				Replace gJ19D gJ21D gJ26D gJ29D gJ31D
	9-61	35R20				
	9-61	22M21				
	9-62	2XM20				
	9-61	3XM20				
20	9-38	1XM30				Replace gJ16D gJ19D gJ21D gJ26D gJ29D gJ31D
	9-61	0XM30				
	9-61	02M30				
	9-61	22M30				
	9-61	2XM30				
	9-61	3XM00				
21	9-38	12M21				Replace gJ21C gJ26C gJ19D gJ29D gJ31D
	9-62	22M21				
	9-62	0XM01				
	9-62	2XM01				
	9-62	3XM01				

"g" refers to chassis containing failing channel.

TABLE A (CONT)

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
22	9-145	79I03				Replace 6J33C
	9-106	20B08				8J10D
	9-52	4XG09				7J17B
	9-50	07G10				7J16E
	9-50	06G10				7J15E
	9-28	0XG71				3J11D
23	9-66	16M37				Replace gJ10B
	9-66	0XV37				gJ09B
24	9-66	16M27				Replace gJ10B
	9-66	0XV27				gJ09B
25	9-66	16M35				Replace gJ12A
	9-66	0XV35				gJ08B
26	9-66	16M25				Replace gJ12A
	9-66	0XV25				gJ08B
27	9-66	16M36				Replace gJ11B
	9-66	0XV36				gJ09B
28	9-66	16M26				Replace gJ11B
	9-66	0XV26				gJ09B
29	9-66	16M34				Replace gJ12B
	9-66	0XV34				gJ08B
30	9-66	16M24				Replace gJ12B
	9-66	0XV24				gJ08B
31	9-66	16M17				Replace gJ10B
	9-66	0XV17				gJ09B
32	9-66	16M07				Replace gJ10B
	9-66	0XV07				gJ09B
33	9-66	16M15				Replace gJ12A
	9-66	0XV15				gJ08B
34	9-66	16M05				Replace gJ12A
	9-66	0XV05				gJ08B
35	9-66	16M16				Replace gJ11B
	9-66	0XV16				gJ09B
36	9-66	16M06				Replace gJ11B
	9-66	0XV06				gJ09B
37	9-66	16M14				Replace gJ12B
	9-66	0XV14				gJ08B
38	9-66	16M04				Replace gJ12B
	9-66	0XV04				gJ08B

"g" refers to chassis containing failing channel

Step 1. Find value of P register under P column in the following pages. (Note that P is arranged in ascending numeric order.)

Step 2. Find values of A<sub>U</sub>, A<sub>L</sub>, and C registers on the following pages, then do one of the following:

- a) Replace card(s) in CARD LOC column corresponding to values in P, A<sub>U</sub>, A<sub>L</sub>, and C registers, or
- b) Follow the instructions that correspond to values in P, A<sub>U</sub>, A<sub>L</sub>, and C registers.

P	A <sub>U</sub>	A <sub>L</sub>	EVEN LOW	C REGISTERS			CARD LOC
				ODD LOW	EVEN HIGH	ODD HIGH	
000000	000000	000000	000000				3J02C
000000	000000	XXXXXX	000000				4J18D
000000	002711	000000	000000				4J21G
000021	000000	000000	000000				4J15B
000022	000000	003000	000000				8J07G
000026	000000	222114	000000				3J05F
000401	000000	340777	000000				4J05E
000504	000000	503000	000000				4J15B 8J33A 8J35A 8J18C
000504	000000	677777	000000				4J08B
000505	000000	503000	000000				8J33A 8J16E
000521	000000	000503	000000				4J26A 8J23A 8J33A 8J35A 8J18C
000521	000000	503000	000000				8J29A 8J33A
000521	000000	XXXXXX	000000				8J33A
000522	000000	000503	000000				4J25A 8J31B 8J32B 8J07C 8J32C 8J14E

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>EVEN LOW</u>	<u>C REGISTERS</u>			<u>CARD LOC</u>
				<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
000530	000000	XXXXXXX	XXXXXXX				8J18B
000710	000000	000000	000000				4J06A
001200	000000	000000	000000				4J06F
001212	000000	001237	000000				4J05F
001215	000000	004000	000000				4J21G
001224	005000	777777	000000				7J10A
001226	005000	777777	000000				7J12B
001227	005000	777777	000000				7J11B
001237	000000	XXXXXXX	000000				4J34B
001247	000000	XXXXXXX	000000				4J05F
001355	424242	424242	000000				4J32B
002433	000000	070007	000000				3J17B
002433	200000	070007	000000				4J08E
002433	707070	070007	000000				8J13D
002433	777777	070007	000000				4J30A 4J31A 7J23F 7J19G 7J22G
003321	000000	777777	000000				3J07A
004215	000006	XXXXXXX	000000				3J19E
004215	777777	000000	000000				3J20C
004367	000000	004766	000000				3J18B
004404	XXXXXXX	XXXXXXX	000706				3J17D
004424	353535	707070	000000				4J18B
005220	000000	005030	000001				4J06G
006055	000000	000010	000000				3J17C
006234	000007	000000	000000				3J08A

"g" refers to chassis containing failing channel.

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>EVEN LOW</u>	<u>C REGISTERS</u>			<u>CARD LOC</u>
				<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
006267	000000	000000	000000				7J33B 7J30C
006302	000007	000000	000000				3J30E 8J35A 8J10B
006303	000007	000000	000000				3J07E 3J28F 8J10C 8J10F 8J10D
006323	000007	000000	000000				8J35A
006324	000007	000000	000000				7J15E 8J35A 8J10E
006371	000000	547233	000000				8J10D
006372	000007	547233	000000				7J17C
006373	000000	547233	000000				4J19E
006373	000007	547233	000000				gJ33C 3J08E 8J10B 8J10D
006447	000100	455447	000000				3J07G
006447	004416	050047	000000				3J23C
006760	000007	547235	000000				7J14E
006761	000007	547235	000000				gJ13B 7J16C
007776	000000	371273	000000				4J06G
007776	000000	377777	000000				3J18C
007776	000000	XXXXXX	000000				3J09D 7J33C
007776	000000	XXXXXX	000000				3J17A 3J25D 7J20A

"g" refers to chassis containing failing channel.

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>EVEN LOW</u>	<u>C REGISTERS</u>			<u>CARD LOC</u>
				<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
							7J21A 7J32A 7J21B 7J26D
010000	377774	777777	000000				8J07E
010047	000000	400000	016445				7J33C
010047	000000	XXXXXX	XXXXXX				7J30B
010063	000000	XXXXXX	XXXXXX				7J30B
012365	353535	000000	000000				4J18E
013055	000000	000000	016445				gJ31C gJ31D gJ35D
013062	000000	000000	016445				gJ35B gJ31C
013063	000000	000000	016445				gJ14B gJ31B
013325	020000	557751	016445				gJ31C
015406	016603	015405	000000				3J27F
015406	016603	015405	016447				3J19E
015407	016603	015406	000000				3J28F
015577	016603	015405	000000				3J28F
017472	003777	777777	016445				3J07D
047775	707070	040304	000000				6J24E
047775	707070	342374	000000				6J37E
177777	000000	070007	000000				8J06B
177777	000100	310456	000000				3J14B

"g" refers to chassis containing jumpered channels.

Step 1. Find value of P register under P column on the following pages. (Note that P is arranged in ascending numeric order.)

Step 2. Find values of A<sub>U</sub>, A<sub>L</sub>, and C registers on the following pages. Then do one of the following:

- a) Replace card(s) in CARD LOC column corresponding to values in P, A<sub>U</sub>, A<sub>L</sub>, and C registers, or
- b) Follow the instructions that correspond to values in P, A<sub>U</sub>, A<sub>L</sub>, and C registers.

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>EVEN LOW</u>	<u>C REGISTERS</u>			<u>CARD LOC</u>
				<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
000000	000000	000000	000000				gJ08B gJ09B gJ10B gJ12B
000000	000000	000000	000001				gJ08B gJ11B
000500	000000	000000	000000				4J25A 4J04C 4J04D
000501	000000	000000	000000				3J14A 3J30B 3J31F
000504	000000	777777	000000				3J30B
000512	000000	000503	000000				7J09D
000512	000000	503000	000000				3J28B 7J16F 8J18C
000517	000000	503000	000000				3J14A
000520	000000	000000	000000				3J25E 3J35E 7J20A
000520	000000	503000	000000				3J32E 3J07G
000522	000000	000503	000000				3J26F
000705	000000	000000	000000				8J18C
000706	000035	777777	000000				4J26A

"g" refers to chassis containing the lower jumpered channels.

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>EVEN LOW</u>	<u>C REGISTERS</u>			<u>CARD LOC</u>
				<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
000707	000000	000000	000000				3J30D
001001	000000	000000	000000				4J23D
001010	000000	000000	000000				gJ20B
001241	000000	000000	000000				3J29G
001714	000000	000000	000000				3J35E 7J23B 7J05C 7J22C
001746	000000	000000	000000				3J15G
002441	200000	000000	000000				3J29G
002526	200000	400000	000000				7J21E 7J16G
003001	000000	000534	000000				3J27F
003051	777777	777777	000000				3J25A
003124	353535	000000	000000				3J30C
003124	353535	342375	000000				3J28D 3J27F 3J28G
003124	353535	424242	000000				3J28D
003124	504401	342375	000000				3J27G
003264	000000	000000	000000				3J30B
003264	752616	527366	000000				3J26F
004777	000000	564054	000000				4J34D
005511	000000	100000	000000				7J30C
006303	000007	000000	000000				gJ24E
006360	000007	547233	000000				gJ24B
006361	000007	547263	000000				7J17E
006371	000000	547233	000000				8J10C

"g" refers to chassis containing channel under test.



<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>EVEN LOW</u>	<u>C REGISTERS</u>			<u>CARD LOC</u>
				<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
006371	000007	547233	000000				3J28D 8J10C 8J05G gJ22A gJ16B gJ21B gJ28B gJ14C
006373	000000	000503	000000				gJ22E
006373	000007	547233	000000	Do test 3.4.4.1			
006373	000007	547235	000000				7J15B
006555	000007	777777	000000				3J10C 3J13F
006745	000007	547231	000000				3J11B
006747	000007	547231	000000				7J14F
006760	000007	547235	000000	Do test 3.4.4.2			
006760	777777	547235	016445				7J02A
006761	000000	754723	500000				7J27G
006761	000007	547235	000000	Do test 3.4.4.3			
006761	000075	472350	000000				7J19G
010332	777700	502706	000000				gJ13A gJ04B gJ05B gJ18A gJ30G gJ32G 7J22A 7J02C
010332	777700	502707	000000	Do test 3.4.4.4			
010332	777700	502716	000000				7J23A 7J02C gJ13A gJ18A gJ23C gJ30G gJ32G

"g" refers to chassis containing channel under test.

3.4.4  
(Cont)

3.4.4  
(Cont)

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>EVEN LOW</u>	<u>C REGISTERS</u>			<u>CARD LOC</u>
				<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
010332	777700	502717	000000				gJ30G gJ32G
011221	777700	502007	000000				gJ03B
011221	777700	502015	000000				gJ03B
011236	400000	016446	000000				gJ30G
011266	400000	016446	000000	Do test 3.4.4.5			
011351	000016	400000	777777				gJ04B gJ05B gJ06B gJ12D gJ01E gJ30G gJ31G gJ32G
011504	400000	016446	000000	Do test 3.4.4.6			
011570	400000	406445	000674				7J20E
011720	000000	502606	777777				gJ17A gJ16F
011720	000000	502607	307600				gJ17A gJ17A
011720	000000	502607	607712				gJ09B
011720	000000	502616	000674				gJ17A gJ09B
011721	000000	502606	777777				gJ02A gJ09B
011721	000000	502607	000674				gJ14C
011721	000000	502607	307712				gJ02A gJ09B
011721	000000	502607	607712				gJ09B
011721	000000	502616	000674				gJ09B
011756	000000	000000	507747				gJ08B
011756	000000	000000	607707				gJ08B gJ08B

"g" refers to chassis containing channel under test.

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>EVEN LOW</u>	<u>C REGISTERS</u>			<u>CARD LOC</u>
				<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
011756	000000	000000	607712				gJ08B
011757	000000	000000	507747				gJ08B
011757	000000	000000	607712				gJ08B
012536	000000	557730	010043				3J23A 3J26G 7J03A
012540	000000	557730	010043				3J30B
012660	000000	000000	016445				gJ07B
012766	000000	000000	016445				gJ07B
013055	000000	000000	016445				gJ14B
013776	000000	557756	016445				gJ08B gJ19D
015575	012005	000017	000000				3J27F
016366	000000	503000	000000				7J28E 7J29E
016366	505640	503000	016445				7J28B 7J28E 7J29E 7J28F
017061	547773	017061	016445				7J27E 7J29E 7J28F
017170	505643	074307	016445				7J15E
017171	505643	002347	016445				7J13B 7J26B 7J29D 7J29F 7J30F 7J25G
017171	505643	030347	016445				7J02E
017171	505661	002143	016445				7J23E
017171	505662	002143	016445				3J26G 7J23E

"g" refers to chassis containing channel under test.

<u>P</u>	<u>A<sub>U</sub></u>	<u>A<sub>L</sub></u>	<u>EVEN LOW</u>	<u>C REGISTERS</u>			<u>CARD LOC</u>
				<u>ODD LOW</u>	<u>EVEN HIGH</u>	<u>ODD HIGH</u>	
017174	505640	000253	016445				3J26A
017470	000000	000000	000000				gJ32C gJ34C gJ34D
017471	505662	002143	016445				7J28D
017472	000000	000000	000000				gJ32C
017540	000000	000000	000000				7J31B 7J34D
060001	000000	000000	000000				8J16E

"g" refers to chassis containing channel under test.

3.4.4.1

HALT, P = 006373

3.4.4.1

A program control halt with P = 006373, A<sub>U</sub> = 000007, and A<sub>L</sub> = 547233 indicates that a malfunction has caused a program jump into the loader routine.

- Step 1. Observe upper input channel ID ACT indicator in CHANNEL and status grid.
- If cleared, do step 2.
  - If lit, replace \*J18E  
\*J19E  
\*J21E.
- Step 2. Press OP STEP MODE and master clear computer.
- Step 3. Scope item 1.
- Step 4. Set FUNCTION CODE to 50:23.
- Step 5. Set DISC ADV P up.
- Step 6. Scope test point 1D20 on chassis 3. Test level is H.
- If H, do step 7.
  - If not H, replace 3J20C(16F23, 9-45).
- Step 7. Master clear computer.
- Step 8. Press PHASE STEP MODE.

\*Chassis containing upper odd jumpered channel

- Step 9. Press PHASE 4.
- Step 10. Press TIMING 41, 42, 43, and 44.
- Step 11. Repeatedly set RESTART/START STEP to START STEP until TIMING 13 is lit.
- Step 12. Press SEQ DES INT.
- Step 13. Scope test point 2D14 on chassis 7. Test level is H.
  - a) If H, do step 14.
  - b) If not H, replace 7J19B(00N41, 9-53).
- Step 14. Press OP STEP MODE and master clear computer.
- Step 15. Ground test points 1F15 and 1G15 on chassis 7.
- Step 16. Scope test point 1A17 on chassis 7. Test level is L.
  - a) If L, do step 17.
  - b) If not L, replace 7J13B(11G10, 9-50).
- Step 17. Remove grounds on test points 1F15 and 1G15 on chassis 7.
- Step 18. Ground test point 1B13 on chassis \*.
- Step 19. Scope test point 1B15 on chassis \*. Test level is L.
  - a) If H, replace \*J24G(6gZ08, 9-75).
  - b) If L, do step 20.
- Step 20. Remove ground on test point 1B13 on chassis \*.
- Step 21. Ground test point 2F6 on chassis \*.
- Step 22. Scope test point 1D14 on chassis \*. Test level is L.
  - a) If H, replace \*J12B(16Mg4, 9-66).
  - b) If L, do step 23.
- Step 23. Remove ground on test point 2F6 on chassis \*.
- Step 24. Ground test point 2E11 on chassis \*.
- Step 25. Scope test point 1E15 on chassis \*. Test level is L.
  - a) If H, replace \*J11B(16Mg6, 9-66).
  - b) If L, do step 26.
- Step 26. Remove ground on test point 2E11 on chassis \*.
- Step 27. Ground test point 2B12 on chassis 7.
- Step 28. Scope test point 1F9 on chassis \*. Test level is H.
  - a) If L, replace \*J29C(6gN42, 9-56).
  - b) If H, do step 29.

\*Chassis containing upper odd jumpered channel.

- Step 29. Press PHASE STEP MODE.
- Step 30. Press I/O TRANSLATOR CHANNEL bit 0.
- Step 31. Remove ground on test point 2B12 on chassis 7.
- Step 32. Ground test point 1C17 on chassis 7.
- Step 33. Scope test point 1E16 on chassis 7. Test level is L.
  - a) If H, replace 7J15B(02G00, 9-50).
  - b) If L, do step 34.
- Step 34. Remove ground on test point 1C17 on chassis 7.
- Step 35. Ground test point 2C11 on chassis 7.
- Step 36. Clear PHASE register, then press PHASE 2.
- Step 37. Scope test point 2D10 on chassis 7. Test level is H.
  - a) If L, replace 7J26B(1XG28, 9-34).
  - b) If H, do step 38.
- Step 38. Press OP STEP MODE and master clear computer.
- Step 39. Remove ground on test point 2C11 on chassis 7.
- Step 40. Ground test point 2F1 on chassis \*\*.
- Step 41. Scope test point 1D16 on chassis \*\*. Test level is L.
  - a) If H, replace \*\*J11B(16Rg6, 9-66).
  - b) If L, do step 42.
- Step 42. Remove ground on test point 2F1 on chassis \*\*.
- Step 43. Ground test point 2B13 on chassis \*\*.
- Step 44. Scope test point 1D20 on chassis \*\*. Test level is L.
  - a) If H, replace \*\*J13B(91Rg0, 9-60).
  - b) If L, do step 45.
- Step 45. Remove ground on test point 2B13 on chassis \*\*, then ground test point 2G10 on chassis \*\*.
- Step 46. Press I/O TRANSLATOR CHANNEL bits 1 and 2.
- Step 47. Scope test point 1D20 on chassis \*\*. Test level is L.
  - a) If H, replace \*\*J13B(91Rg0, 9-60).
  - b) If L, replace 6J40B(51T23, 9-142)  
6J19D(50T45, 9-147)  
6J36D(81R10, 83R10, 9-151)  
6J40D(50T67, 52T67, 9-147).

\*Chassis containing upper odd jumpered channel  
\*\*Chassis containing upper even jumpered channel

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>P</u>	<u>TL</u>	<u>REMARKS</u>
1	9-50	21G10	7	1F16	H	If L replace 7J16B If H scope Item 2
2	9-56	7gN41	*	1G11	H	If L replace *J31C If H do step 4

3.4.4.2

HALT, P = 006760

3.4.4.2

A program halt with P = 006760, A<sub>U</sub> = 000007, and A<sub>L</sub> = 547235 indicates that a malfunction has caused a program jump into the loader routine.

- Step 1. Observe upper input jumpered channel indicators.  
a) If only ID ACK and EF/OD ACK are lit, do step 2.  
b) If only ID ACK, EF/OD ACK, and EI MON are lit, do step 7.  
c) If any other condition, replace 7J02B  
\*\*J06A.
- Step 2. Press OP STEP MODE and master clear computer.
- Step 3. Press PHASE STEP MODE.
- Step 4. Scope item 1.
- Step 5. Ground test point 2D16 on chassis 3 and test point 1D5 on chassis 7.
- Step 6. Scope item 3.
- Step 7. Press OP STEP MODE and master clear computer.
- Step 8. Ground test point 2D16 on chassis 7.
- Step 9. Scope test point 2F15 on chassis 7. Test level is L.  
a) If H, replace 7J23E(00N65, 9-49).  
b) If L, do step 10.
- Step 10. Remove ground on test point 2D16 on chassis 7.
- Step 11. Press SEQ DES INT.
- Step 12. Ground test point 1F8 on chassis 3.
- Step 13. Scope test point 2F30 on chassis 3. Test level is L.  
a) If H, replace 3J26E(02G21, 9-15).  
b) If L, do step 14.

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\*Chassis containing upper odd jumpered channel  
\*\*Chassis containing upper even jumpered channel

3.4.4.2  
(Cont)

3.4.4.2  
(Cont)

- Step 14. Remove ground on test point 1F8 on chassis 3.
- Step 15. Set Z<sub>1</sub> register to 540000.
- Step 16. Ground test point 1G4 on chassis 8.
- Step 17. Scope test point 1G14 on chassis 8. Test level is L.  
a) If H, replace 8J04G(16F50, 9-40).  
b) If L, replace 3J10C(0XG70, 9-28)  
\*J22C(80Mg1, 9-65)  
\*\*J27D(80Mg2, 80Mg3, 9-65).

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1	9-62	3XRg1	*	1E24	H	If L replace *J30D If H scope item 2
2	9-59	31Gg0	**	2C14	H	If L replace **J27D If H do step 5
3	9-22	36N12	7	1C5	L	If H replace 7J02B If L scope item 4
4	9-22	79N12	7	1D4	L	If H replace 7J03B If L scope item 5
5	9-55	25G18	7	2G5	H	If L replace 7J26G If H replace 6J19C *J22C

3.4.4.3

HALT, P = 006761

3.4.4.3

A program control halt with P = 006761, A<sub>U</sub> = 000007, and A<sub>L</sub> = 547235 indicates that a malfunction has caused a program jump into the loader routine.

- Step 1. Observe upper input jumpered channel.  
a) If only CHAN PRI, EI MON, EF/OD ACK, and ID ACK are lit, do step 2.  
b) If only CHAN PRI, EF/OD ACK, and ID ACK are lit, replace 7J14E  
\*J09B  
\*J10B.  
c) If only EI MON, EF/OD ACK, and ID ACK are lit, do step 21.  
d) If only EF/OD ACK and ID ACK are lit, do step 29.  
e) If only EF/OD ACK lit, replace 3J27A  
3J15C.
- Step 2. Press OP STEP MODE and master clear computer.
- Step 3. Scope item 1.

\*Chassis containing upper odd jumpered channel  
\*\*Chassis containing upper even jumpered channel



- Step 4. Press PHASE STEP MODE.
- Step 5. Press TIMING 31 and 34.
- Step 6. Ground test point 1F14 on chassis 3.
- Step 7. Scope item 7.
- Step 8. Press OP STEP MODE.
- Step 9. Remove ground on test point 1F14 on chassis 3, then ground test point 2D16 on chassis 3.
- Step 10. Observe CHAN PRI for ODD upper channels.
  - a) If lit on channels 11 or 13, replace \*J08A.
  - b) If lit on channels 15 or 17, replace \*J06A.
  - c) If none are lit, do step 11.
- Step 11. Ground test point 1G19 on chassis \*, then momentarily ground test point 2E12 on chassis \*. (Same chassis as test point 1G19.)
- Step 12. Observe CHAN PRI for CHAN 17.
  - a) If lit, do step 13.
  - b) If not lit, replace \*J06A.
- Step 13. Remove ground on test point 2E12 on chassis \*, then momentarily ground test point 2E9 on chassis \*.
- Step 14. Observe CHAN PRI for CHAN 15.
  - a) If lit, do step 15.
  - b) If not lit, replace \*J06A.
- Step 15. Remove ground on test point 2E9 on chassis \*, then ground test point 2E3 on chassis \*.
- Step 16. Observe CHAN PRI for CHAN 11.
  - a) If lit, do step 17.
  - b) If not lit, replace \*J06A.
- Step 17. Remove ground on test point 2E3 on chassis \*, then momentarily ground test point 2E6 on chassis \*.
- Step 18. Observe CHAN PRI for CHAN 13.
  - a) If lit, do step 19.
  - b) If not lit, replace \*J06A.
- Step 19. Observe EI for upper input jumpered channel.
  - a) If not lit, do step 20.
  - b) If lit, replace 3J11B  
3J28C  
3J26G  
\*J31C.

\*Chassis containing upper odd jumpered channel

- Step 20. Scope test point 1E16 on chassis \*. Test level is L.
  - a) If H, replace \*J10B(16Mg7, 9-66).
  - b) If L, replace \*J09B(0XVg7, 9-66).
- Step 21. Press OP STEP MODE and master clear computer.
- Step 22. Scope test point 1B24 on chassis 3. Test level is H.
  - a) If L, replace 3J18E(21F36, 9-46).
  - b) If H, do step 23.
- Step 23. Press PHASE STEP MODE.
- Step 24. Clear PHASE register, then press PHASE 1.
- Step 25. Set PHASE REPEAT up.
- Step 26. Press TIMING 31 and 34.
- Step 27. Set RESTART/START STEP to START STEP.
- Step 28. Scope item 10.
- Step 29. Press OP STEP MODE and master clear computer.
- Step 30. Scope item 14.
- Step 31. Press PHASE STEP MODE.
- Step 32. Press TIMING 13.
- Step 33. Press SEQ DES I/OII.
- Step 34. Scope item 21.
- Step 35. Press OP STEP MODE and master clear computer.
- Step 36. Press I/O TRANSLATOR FUNCTION bit 0.
- Step 37. Scope test point 2G27 on chassis 7. Test level is L.
  - a) If H, replace 7J15E(20G07, 9-51).
  - b) If L, do step 38.
- Step 38. Ground test point 1D5 on chassis 7.
- Step 39. Press I/O TRANSLATOR CHANNEL bits 0 and 1.
- Step 40. Scope item 24.
- Step 41. Remove ground on test point 1D5 on chassis 7.

\*Chassis containing upper odd jumpered channel

- Step 42. Press OP STEP MODE and master clear computer.
- Step 43. Ground test point 2D16 on chassis 3.
- Step 44. Observe S<sub>1</sub> register bits 4 and 5.
  - a) If neither is lit, do step 45.
  - b) If bit 4 is lit, replace 7J11F.
  - c) If bit 5 is lit, replace 7J12F.
- Step 45. Remove ground on test point 2D16 on chassis 3, then momentarily ground test point 1A5 on chassis 7.
- Step 46. Press PHASE STEP MODE.
- Step 47. Press TIMING 13.
- Step 48. Press SEQ DES I/OI.
- Step 49. Scope test point 1G23 on chassis 7. Test level is L.
  - a) If H, do step 50.
  - b) If L, do step 52.
- Step 50. Exchange 7J03G with 7J22B.
- Step 51. Refer to paragraph 2.2 and attempt to load the program.
  - a) If same error condition occurs, replace 7J03F.
  - b) If error condition is different from initial load failure, replace 7J22B.
- Step 52. Ground test point 2G27 on chassis \*.
- Step 53. Scope test point 2B6 on chassis \*. Test level is L.
  - a) If H, replace \*J24D(35Yg1, 9-62).
  - b) If L, do step 54.
- Step 54. Remove ground on test point 2G27 on chassis \*, then ground test point 2C11 on chassis 3.
- Step 55. Press TIMING 34.
- Step 56. Press SEQ DES I.
- Step 57. Press FIL.
- Step 58. Set PHASE REPEAT up.
- Step 59. Ground test point 1D8 on chassis 3.
- Step 60. Press PHASE 4.
- Step 61. Ground test point 1E25 on chassis 3.
- Step 62. Scope item 26.

\*Chassis containing upper odd jumpered channel

- Step 63. Remove ground on test points 1E25 and 1D8 on chassis 3.
- Step 64. Set PHASE REPEAT down.
- Step 65. Press OP STEP MODE and master clear computer.
- Step 66. Ground test point 2E7 on chassis \*.
- Step 67. Scope test point 2D26 on chassis \*. Test level is L.  
a) If H, replace \*J14B(63Lg0, 9-70).  
b) If L, do step 68.
- Step 68. Remove ground from test point 2E7 on chassis \*, then ground test point 2D16 on chassis 3.
- Step 69. Scope test point 1F6 on chassis 7. Test level is L.  
a) If H, replace 7J02G(35N12, 9-22).  
b) If L, replace 6J27E(74I11, 75I11, 76I11, 77I11, 30Z11, 9-171)  
\*J05A(10Vg0, 9-65)  
\*J31D(3XMg1, 9-62).

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1	9-28	03G70	3	2B10	H	If L replace 3J13F If H scope item 2
2	9-46	21F34	3	1C24	H	If L replace 3J18E If H scope item 3
3	9-65	80Mg2	*	1F1	H	If L replace *J34A If H scope item 4
4	9-65	80Mg3	*	1G1	H	If L replace *J34A If H scope item 5
5	9-65	80Mg0	*	1D1	H	If L replace *J32A If H scope item 6
6	9-65	80Mg1	*	1E1	H	If L replace *J32A If H do step 4
7	9-49	00N64	7	2C16	H	If L scope item 8 If H scope item 9
8	9-41	92F10	3	1A13	L	If H replace 3J23A If L replace 7J22D
9	9-58	9gN63	*	1F18	H	If L replace *J17A If H do step 8

\*Chassis containing upper odd jumpered channel.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP.</u>	<u>TL</u>	<u>REMARKS</u>
10	9-49	00N63	7	2D16	H	If L replace 7J22D If H scope item 11
11	9-58	8gN64	*	1E21	L	If H replace *J16F If L scope item 12
12	9-58	9gN63	*	1F18	T	If not T scope item 13 If T replace *J26C *J31D
13	9-58	8gN63	*	1F17	L	If H replace *J16F If L replace *J17A
14	9-50	02G00	7	1E16	L	If H replace 7J15B If L scope item 15
15	9-50	20G11	7	1E17	L	If H replace 7J15B If L scope item 16
16	9-58	3gG71	*	1E18	L	If H scope item 17 If L scope item 28
17	9-28	0XG71	3	2C11	L	If H replace 3J11D If L replace *J29E
18	9-51	20G07	7	2G27	H	If L replace 7J15E If H scope item 19
19	9-62	35Y31	*	2B6	H	If L replace *J24D If H scope item 20
20	9-53	01N42	7	2B12	H	If L replace 7J03G If H do step 31
21	9-53	00N42	7	2C14	H	If L replace 7J19G If H scope item 22
22	9-53	01N42	7	2B12	L	If H replace 7J03G If L scope item 23
23	9-51	7gN42	*	1F11	L	If H replace *J31C If L do step 35
24	9-55	25G16	7	2C6	L	If H replace 7J27G If L scope item 25
25	9-55	25G17	7	2E6	L	If H replace 7J27G If L do step 41

\*Chassis containing upper odd jumpered channel

3.4.4.3  
(Cont)

3.4.4.3  
(Cont)

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
26	9-28	0XG71	3	2C11	H	If not H scope item 27 If H do step 63
27	9-46	21F32	3	1E24	L	If H replace 3J23G If L replace 3J11D
28	9-50	09G10	7	1C17	L	If H replace 7J16B If L scope item 18

3.4.4.4

HALT, P = 010332

3.4.4.4

A program control halt with P = 010332, A<sub>U</sub> = 777700, and A<sub>L</sub> = 502707 indicates that a malfunction has caused an interruption of Main Timing in the I/O test.

Step 1. Press OP STEP MODE and master clear computer.

Step 2. Scope item 1.

Step 3. Press PHASE STEP MODE.

Step 4. Press TIMING 41.

Step 5. Press K register bit 0.

Step 6. Scope item 6.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1	9-69	5XLg1	*	2B28	L	If H replace *J04B If L scope item 3
2	9-69	59Lg2	*	1E13	H	If L replace *J31G If H scope item 4
3	9-69	5XLg2	*	2B29	L	If H replace *J05B If L scope item 5
4	9-69	59Lg3	*	2F33	H	If L replace *J32G If H scope item 6
5	9-69	5XLg3	*	2G11	L	If H replace *J30G If L do step 3
6	9-69	52Lg0	*	2B30	L	If H replace *J13A If L scope item 8

\*Chassis containing lower jumpered channel

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
7	9-30	02K03	7	1A1	L	If H replace 7J28B If L scope item 9
8	9-30	11G57	7	1B2	H	If L replace 7J22A If H scope item 10
9	9-30	14G57	7	1C1	L	If H replace 7J02C If L replace *J13A replace *J18A replace *J03B

3.4.4.5

HALT, P = 011266

3.4.4.5

A program control halt with P = 011266, A<sub>U</sub> = 400000, and A<sub>L</sub> = 016446 indicates that a malfunction has caused an interruption of main timing in the I/O test.

Step 1. Observe C<sub>E</sub> register upper.

- a) If C<sub>E</sub> equals 000000, replace \*\*\*J23C.
- b) If C<sub>E</sub> equals 000445, replace \*\*\*J02D  
\*\*\*J01E  
\*\*\*J30G.
- c) If C<sub>E</sub> equals 000446, do step 2.

Step 2. Observe C<sub>O</sub> register lower.

- a) If C<sub>O</sub> equals 000445, replace \*J04B  
\*J05B  
\*J23C.
- b) If C<sub>O</sub> equals 000446, do step 3.

Step 3. Press OP STEP MODE and master clear computer.

Step 4. Press PHASE STEP MODE.

Step 5. Press TIMING 33.

Step 6. Scope test point 2D27 on chassis \*\*. Test level is L.

- a) If H, replace \*\*J02D(8gT33, 9-6).
- b) If L, replace \*\*J05B(5XLg2, 9-69)  
\*\*J01E(8gC02, 9-6)  
\*\*J30G(5XLg3, 6XLg3, 9-69, 9-10).

---

\*Chassis containing lower odd jumpered channel  
\*\*Chassis containing lower even jumpered channel  
\*\*\*Chassis containing upper even jumpered channel

A program control halt with P = 011504, A<sub>U</sub> = 400000, and A<sub>L</sub> = 016446 indicates that a malfunction has caused an interruption of Main Timing in the I/O test.

- Step 1. Observe C<sub>O</sub> register for lower channel.  
 a) If C<sub>O</sub> is cleared, replace \*J01C.  
 b) If C<sub>O</sub> equals XXX445, do step 2.  
 c) If C<sub>O</sub> equals XXX446, do step 15.
- Step 2. Press OP STEP MODE and master clear computer.
- Step 3. Scope item 1.
- Step 4. Press PHASE STEP MODE.
- Step 5. Press TIMING 41, 42, 43 and 44.
- Step 6. Scope test point 2B27 on chassis \*. Test level is L.  
 a) If L, do step 7.  
 b) If not L, replace \*J16F(8gT41, 9-69).
- Step 7. Clear PHASE register, then press PHASE 2 and 4.
- Step 8. Ground test point 2B28 on chassis \*.
- Step 9. Set RESTART/START STEP to START STEP six times.
- Step 10. Clear PHASE register.
- Step 11. Set PHASE REPEAT up.
- Step 12. Press PHASE 4.
- Step 13. Press TIMING 41.
- Step 14. Scope item 3.
- Step 15. Observe C<sub>E</sub> register for upper channel.  
 a) If C<sub>E</sub> is cleared, replace \*\*\*\*J01C.  
 b) If C<sub>E</sub> equals XXX445, do step 16.  
 c) If C<sub>E</sub> equals XXX446, replace \*\*\*J30E.
- Step 16. Press OP STEP MODE and master clear computer.
- Step 17. Scope item 9.
- Step 18. Press PHASE STEP MODE.
- Step 19. Press TIMING 41, 42, 43, and 44.

---

\*Chassis containing lower odd jumpered channel  
 \*\*Chassis containing lower even jumpered channel  
 \*\*\*Chassis containing upper odd jumpered channel  
 \*\*\*\*Chassis containing upper even jumpered channel



- Step 20. Scope test point 2B27 on chassis \*\*\*\*. The test level is L.  
 a) If L, do step 21.  
 b) If not L, replace \*\*\*\*J16F (8gT41, 9-69).
- Step 21. Clear PHASE register, then press PHASE 2 and 4.
- Step 22. Ground test point 2B28 on chassis \*\*\*\*.
- Step 23. Set RESTART/START STEP to START STEP six times.
- Step 24. Clear PHASE register, then press PHASE 4.
- Step 25. Press TIMING 41, then scope item 11.

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1	9-6	8gC01	*	1G32	T	If not T replace *J01E If T scope item 2
2	9-69	52Lg1	*	2C28	L	If H replace *J06B If L do step 4
3	9-69	59Lg2	*	1E13	L	If H replace *J31G If L scope item 4
4	9-69	5XLg2	*	2B29	H	If L replace *J05B If H scope item 5
5	9-69	59Lg3	*	2F33	L	If H replace *J32G If L scope item 6
6	9-69	5XLg3	*	2G11	H	If L replace *J30G If H scope item 7
7	9-69	53Lg0	*	2C29	L	If H replace *J30E If L scope item 8
8	9-69	5XLg0	*	2D29	L	If H replace *J03B If L replace *J04B *J30G *J30E
9	9-6	8gC01	****	1G32	T	If not T replace ****J01E If T scope item 10
10	9-69	52Lg1	****	2C28	L	If H replace ****J06B If L do step 18

\*Chassis containing lower odd jumpered channel

\*\*Chassis containing lower even jumpered channel

\*\*\*Chassis containing upper odd jumpered channel

\*\*\*\*Chassis containing upper even jumpered channel

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
11	9-69	59Lg2	****	1E13	L	If H replace ****J31G If L scope item 12
12	9-69	5XLg2	****	2B29	H	If L replace ****J05B If H scope item 13
13	9-69	59Lg3	****	2F33	L	If H replace ****J32G If L scope item 14
14	9-69	5XLg3	****	2G11	H	If L replace ****J30G If H scope item 15
15	9-69	53Lg0	****	2C29	L	If H replace ****J30E If L scope item 16
16	9-69	5XLg0	****	2D29	L	If H replace ****J03B If L replace ****J04B ****J30G ****J30E

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\*Chassis containing lower odd jumpered channel  
 \*\*Chassis containing lower even jumpered channel  
 \*\*\*Chassis containing upper odd jumpered channel  
 \*\*\*\*Chassis containing upper even jumpered channel



The following paragraphs describe procedures to be used to isolate malfunctions detected in the Program Skip/Stop and DISC ADV P circuitry. These tests are referenced from paragraph 2.2, Operating Procedures.

## 3.5.1

## SKIP/STOP ERROR ISOLATION

3.5.1

The following procedures are used to isolate malfunctions detected in the Program Skip/Stop circuitry. These tests are referenced from paragraph 2.2, Operating Procedures.

## 3.5.1.1

## P ≠ 001151 OR STOP NOT LIT

3.5.1.1

Observe P register. Find value of P in the following list and do as directed.

<u>P</u>	<u>DO THE FOLLOWING</u>
001110	Step 1
001112	Replace item 1
001120	Replace 7J33C
001121	Replace 7J32B
001125	Replace 7J32C
001126	Replace 7J31A
001150	Step 2
001151	Step 3

Step 1. Observe STOP indicator that is lit. Find indicator in the following list and replace card as directed.

<u>STOP INDICATORS</u>	<u>REPLACE</u>
0	7J31A
1	7J32B
2	7J31B
3	7J32C
4	7J31C

Step 2. Observe A<sub>L</sub> register. Find value of A<sub>L</sub> in the following list and replace items as directed.

<u>A<sub>L</sub></u>	<u>REPLACE ITEM</u>
000001	2
000002	3
000004	4
000010	5
000020	6

3.5.1.1  
(Cont)

3.5.1.1  
(Cont)

Step 3. Observe STOP indicator that is not lit. Find indicator in the following list and replace items as directed.

<u>STOP INDICATORS</u>	<u>REPLACE ITEM</u>
0	7
1	8
2	9
3	10
4	11

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 7J31B 7J31C
2						Replace 7J33B 7J33C and/or SELECT SKIP SWITCH 0
3						Replace 7J30B 7J33C and/or SELECT SKIP SWITCH 1
4						Replace 7J30B 7J33C and/or SELECT SKIP SWITCH 2
5						Replace 7J30B 7J33C and/or SELECT SKIP SWITCH 3
6						Replace 7J29C 7J33C and/or SELECT SKIP SWITCH 4
7						Replace 7J29C 7J31A 7J32D and/or SELECT STOP SWITCH 0
8						Replace 7J29C 7J32B 7J32D and/or SELECT STOP SWITCH 1

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
9						Replace 7J29B 7J31B 7J34D and/or SELECT STOP SWITCH 2
10						Replace 7J29B 7J32C 7J34D and/or SELECT STOP SWITCH 3
11						Replace 7J29B 7J31C 7J33D and/or SELECT STOP SWITCH 4

3.5.1.2

P ≠ 001200 OR NO STOP 5

3.5.1.2

Step 1. Observe SEQ DES WAIT.

- a) If lit, do step 3.
- b) If not lit, do step 2.

Step 2. Observe STOP indicators. Find STOP indicator that is lit in the following list, and replace items as directed.

<u>STOP INDICATORS</u>	<u>REPLACE ITEM</u>
0	1
1	2
2	3
3	4
4	5

Step 3. Press OP STEP MODE and master clear computer.

Step 4. Set P to 001155.

Step 5. Press RUN MODE.

Step 6. Set RESTART/START STEP to START STEP.

Step 7. Observe  $A_L$  register. Find value of  $A_L$  in the following list and replace items as directed.

<u><math>A_L</math></u>	<u>REPLACE ITEM</u>
000001	6
000002	7
000004	8
000010	9
000020	10

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 7J27A 7J29C 7J31A and/or SELECT SWITCH 0
2						Replace 7J26A 7J29C 7J32B and/or SELECT SWITCH 1
3						Replace 7J26A 7J29B 7J31B and/or SELECT SWITCH 2
4						Replace 7J30A 7J29B 7J32C and/or SELECT SWITCH 3
5						Replace 7J30A 7J29B 7J31C and/or SELECT SWITCH 4
6						Replace 7J29A 7J33B 7J33C and/or SELECT SKIP SWITCH 0

3.5.1.2  
(Cont)

3.5.1.2  
(Cont)

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
7						Replace 7J29A 7J30B 7J33C and/or SELECT SKIP SWITCH 1
8						Replace 7J28A 7J30B 7J33C and/or SELECT SKIP SWITCH 2
9						Replace 7J28A 7J30B 7J33C and/or SELECT SKIP SWITCH 3
10						Replace 7J27A 7J29C 7J33C

3.5.1.3

STOP ERRONEOUSLY LIT

3.5.1.3

Observe STOP indicators. Find STOP indicator that is lit in the following list and replace card as directed.

<u>STOP INDICATORS</u>	<u>REPLACE</u>
0	7J31A
1	7J32B
2	7J31B
3	7J32C
4	7J31C

3.5.2

PROGRAM FAULT AND DISC ADV P ERROR ISOLATION

3.5.2

The following procedures are used to isolate malfunctions detected in the Program Fault and DISC ADV P circuitry. These tests are referenced from paragraph 2.2, Operating Procedures.

3.5.2.1

P ≠ 001001 OR FAULT OR RUN NOT LIT

3.5.2.1

Observe error indications.

- If P = 000777 and STOP 5 is lit, replace item 1.
- If all indicators are correct but FAULT light is not lit, replace item 2.



3.5.2.1  
(Cont)

3.5.2.1  
(Cont)

<u>ITEM</u>	<u>FIG.</u>	<u>TERM</u>	<u>C</u>	<u>TP</u>	<u>TL</u>	<u>REMARKS</u>
1						Replace 7J26F 7J28D 3J18B 3J17A 3J22B
2						Replace 8J05D 8J04C

3.5.2.2

PROGRAM FAULT LIT

3.5.2.2

Replace 8J05D  
8J04C  
7J26F  
7J28D

3.5.2.3

P ≠ 001001 OR RUN NOT LIT

3.5.2.3

Replace 7J20G and DISC ADV P switch.