TECHNICAL MANUAL

OPERATION AND PROGRAM MANUAL

FOR
GENERAL ELECTRIC TEST SYSTEMS
(GETS)-1000
NSN 4935-01-101-5514

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IMPROVED HAWK AIR DEFENSE GUIDED MISSILE SYSTEM

DEPARTMENT OF THE ARMY **9 FEBRUARY 1981**

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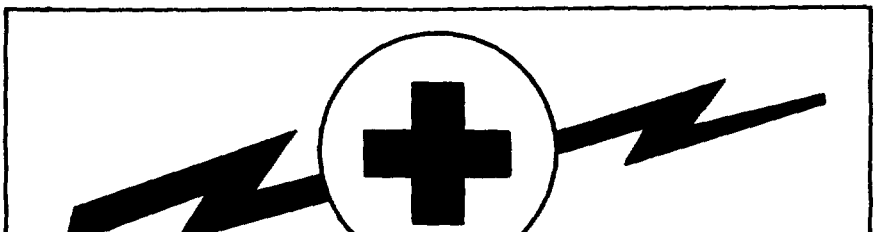
GENERAL ELECTRIC
TEST SYSTEMS
(GETS-1000)

OPERATION AND PROGRAM MANUAL
FOR
U. S. ARMY IMPROVED HAWK MISSILE SYSTEM
PCB/MODULE SCREENING PROGRAM

GENERAL ELECTRIC COMPANY
DAAH01-79-C-1612
HUNTSVILLE OPERATIONS
OF THE SPACE DIVISION
HUNTSVILLE, ALABAMA 35805

WARNING

WARNING



HIGH VOLTAGE

is used in the operation of this equipment

DEATH ON CONTACT

may result if personnel fail to observe safety precautions

Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid. When the technician is aided by operators, he must warn them about dangerous areas.

Whenever possible, the power supply to the equipment must be shut off before beginning work on the equipment Take particular care to ground every capacitor likely to hold a dangerous potential. When working inside the equipment, after the power has been turned off, always ground every part before touching it.

Be careful not to contact high-voltage connections or 115-volt ac input connections when installing or operating this equipment.

Whenever the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body.

Equipment should not be operated during electrical storms.

WARNING: DO NOT BE MISLED BY THE TERM "LOW VOLTAGE". POTENTIALS AS LOW AS 50 VOLTS MAY CAUSE DEATH UNDER ADVERSE CONDITIONS.

For Artificial Respiration, refer to FM 21-11.

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INTRODUCTION

SCOPE

This manual provides a physical and functional description, operating instructions, and operator level maintenance instructions for the computer controlled I-HAWK automatic test system called GETS-1000 (General Electric Test Systems 1000). The GETS-1000 system functions to automatically test 72 of the I-HAWK weapon system printed circuit boards (PCB's).

MANUAL ORGANIZATION AND CONTENT

Section 1, of the manual, provides a physical and functional description of the GETS-1000 system equipment. The overall system, as well as each major system component, is briefly described. All operator controls are illustrated and their function briefly explained. A brief description of the GETS-1000 system software is summarized in Section 1.

Section 2 includes the GETS-1000 system operating procedures which consist of the following: System Power-Up, System Shutdown, System Self Test and PCB/Module Test.

Section 3 includes maintenance procedures authorized at the operator level.

Appendix A to this manual provides a list of abbreviations and acronyms that appear in the manual text. Appendix B provides an alphanumeric list of equipment reference designators for the GETS-1000 system. Appendix C includes a list of the I-HAWK PCB/Modules by identity number and identifies the corresponding test program flexible disk number, English Language Test Design (ELTD) document, and the test Interface Adapter Board (IAB) involved in each PCB/Module test.

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to Commander, U. S. Army Missile Command, ATTN: DRSMI-NPM, Redstone Arsenal, Alabama 35898.

MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS

(EIR'S) EIR's can and must be submitted by anyone who is aware of an unsatisfactory condition with the equipment design or use. It is not necessary to show a new design or list a better way to perform a procedure, just simply tell why the design is unfavorable or why a procedure is difficult. EIR's will be prepared using SF 368, Maintenance Request. Instructions for preparing EIR's are provided in TM 38-750, The Army Maintenance Management System (TAMMS). EIR's should be mailed directly to Commander, U. S. Army Missile Command, ATTN: DRSMI-NEM, Redstone Arsenal, Alabama 35898. A reply will be mailed directly to you.

SECTION 1

GETS-1000 SYSTEM DESCRIPTION

1.1 GENERAL

The GETS-1000 (General Electric Test Systems-1000) (Figure 1-1) is an integrated system of modular equipment mounted in three upright electrical cabinets, designated Unit 1, Unit 2, and Unit 3. The system was designed to individually test 72 I-HAWK system printed circuit board (PCB) modules. The GETS-1000 system has the capability of automatically determining the operational status (GO/NO-GO) of each PCB/Module and displaying test results for the test system operator. A cathode ray tube (CRT) is used for displaying PCB/Module test results, and for displaying operator instructions. Except when called upon (via CRT instructional message) to make some adjustment to a PCB/Module component (capacitor, potentiometer or inductor), no operator intervention is called for while a PCB/Module is under test. The operator may be called upon to make specific test equipment control adjustments before a PCB/Module test commences; however, any such action will be as directed by commands displayed on the CRT.

1.2 GETS-1000 SYSTEM FUNCTIONAL DESCRIPTION

In addition to three electrical cabinets (Units 1, 2, and 3), the test system includes 70 PCB/Module interface adapter boards (IAB's), 72 test program flexible disks, one self test flexible disk, and one system self test adapter board. One RF probe, coaxial cables and test leads are used to interface selected PCB/Modules directly with the test system rather than through an IAB.

The rack-mounted GETS-1000 equipment can be divided into the following six groups:

- Input/Output
- Control
- Stimuli Generating
- Measurement
- Switching
- System Power

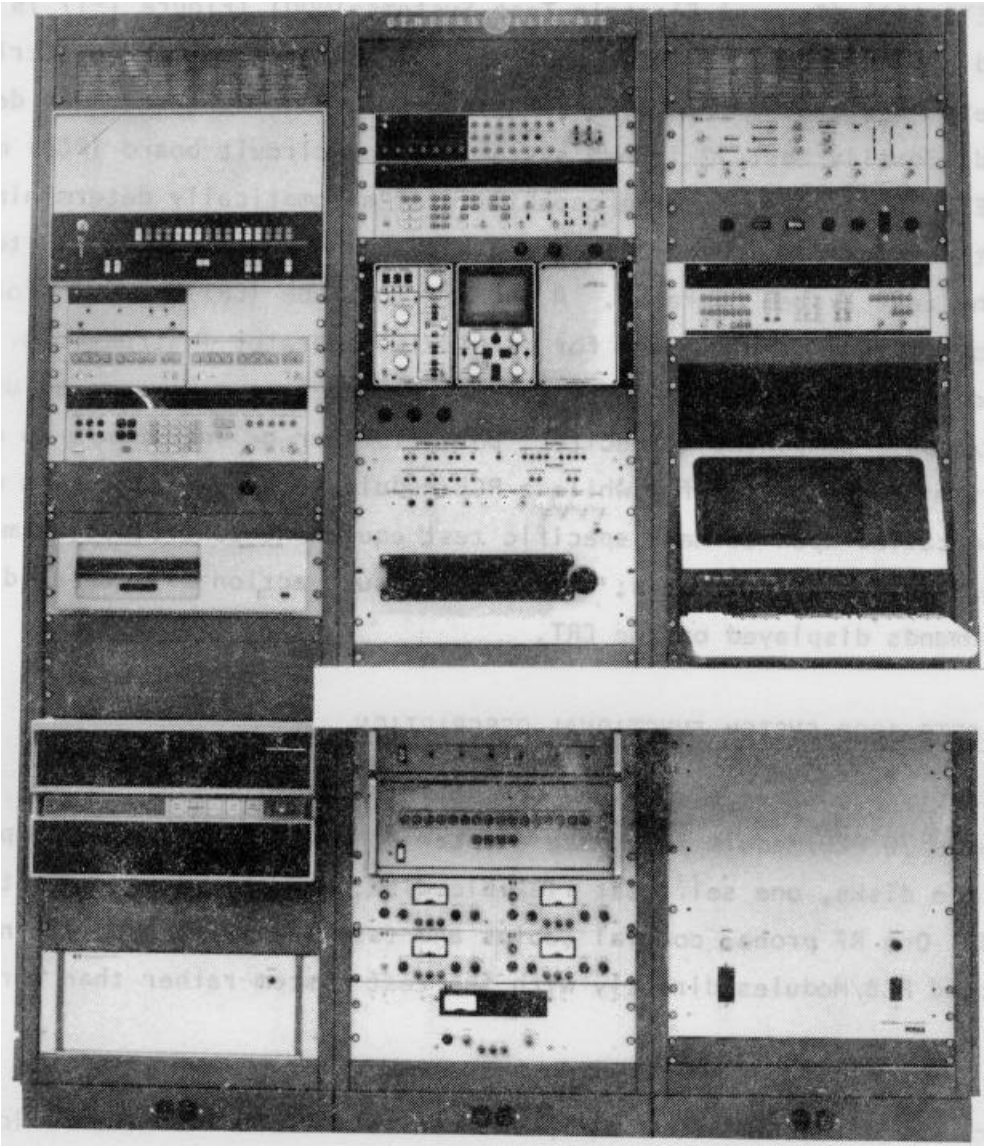


Figure 1-1. General Electric Test Systems-1000 (GETS-1000)

Specific equipment contained in each of the six groups is shown in a simplified system block diagram, Figure 1-2. During the automatic test operation, all stimuli generator, measurement and switching equipment is remotely controlled by the Computer (1A2) central processing unit (CPU) in the control group. Test operator interaction with the GETS-1000 system equipment is limited to the following:

- System Self Test Procedure

  The test operator is guided through the GETS-1000 self test by CRT messages which provide test related information and test operator commands. The operator responds to message commands either by entering a response via the I/O Terminal (3A6) keyboard, or by manipulating some instrument control.

- PCB/Module Test Preparation Procedure

  The test operator must select the proper flexible disk (a separate disk is provided for each of the 72 PCB/Modules) that corresponds to the PCB/Module he wishes to test. A list of the PCB/Module identity numbers and the corresponding test disk identity numbers is provided in Section 2 of this manual.

- PCB/Module Test Procedure

  Once the test operator has identified the PCB/Module to be tested and has installed the flexible disk with an identity number corresponding with the PCB/Module identity number, testing is controlled by the Computer (1A2) CPU. The test operator is guided through the GETS-1000 self test by CRT messages which provide test related information and test operator commands. The operator must respond to message commands either by entering a response via the I/O Terminal (3A6) keyboard or by performing external operations such as connecting the IAB to the Programmable Switch (2A7), connecting a PCB/Module to an IAB and disconnecting these components upon completion of the test. The operator may also be called upon to adjust components on the few lAB's or PCB/ Modules so equipped. Although operator action will be as directed by CRT commands, additional information regarding adjustment of these components is included in Section 2 of this manual.

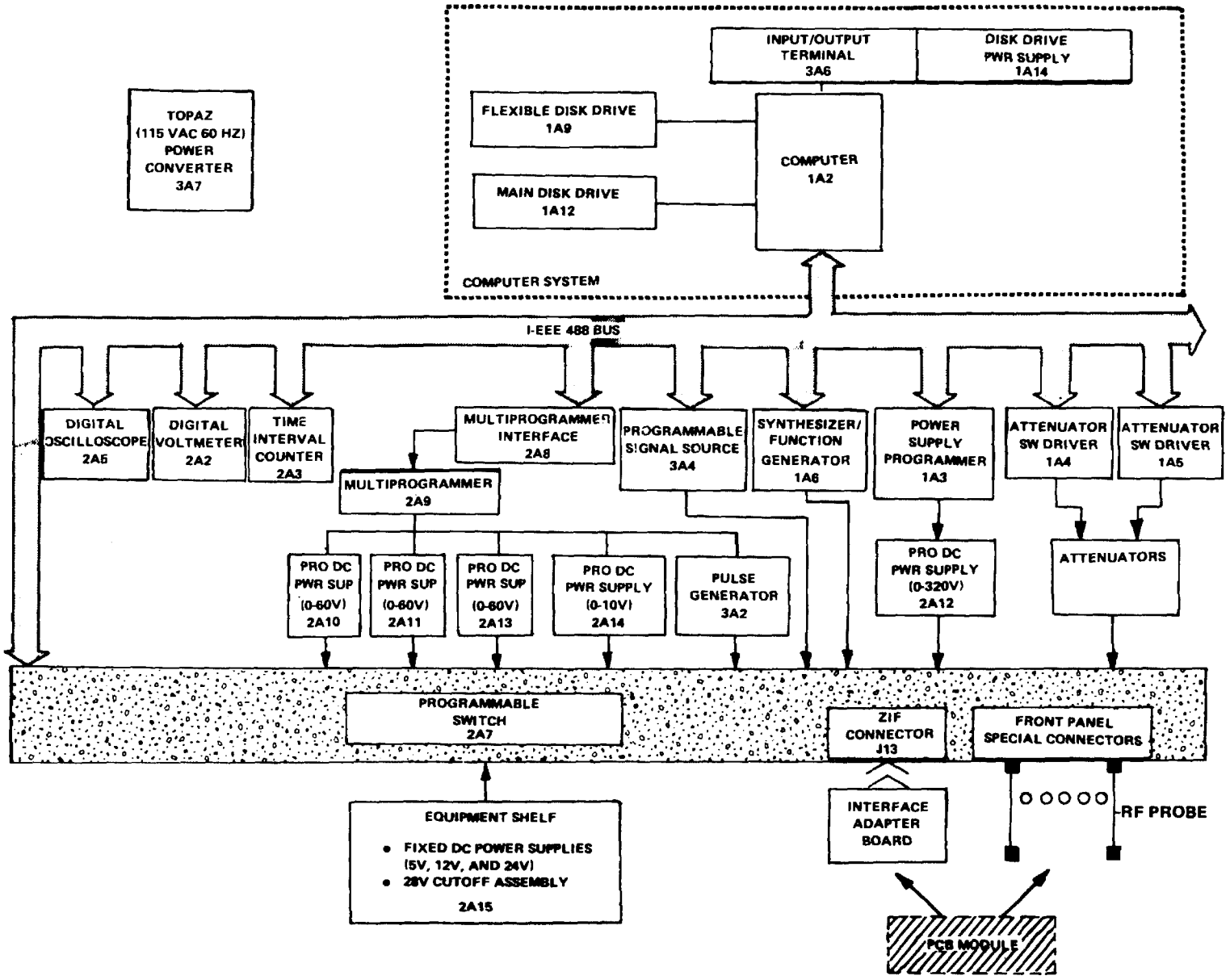


Figure 1-2. GETS-1000 System Block Diagram

- System Shutdown

  Test operator follows the shutdown procedure contained in Section 2 of this manual to remove power from the GETS-1000 system.

The specific interaction of the operator with the controls, indicators, and connectors is explained in Section 2.2, GETS-1000 System Power-Up Procedure; Section 2.3, GETS-1000 Shutdown Procedure; and Section 2.5.5, PCB/Module Test Procedures.

1.3 GETS-1000 SYSTEM PHYSICAL DESCRIPTION

GETS-1000 hardware (Figure 1-3) consists of three electrical equipment cabinets which are bolted together to form a single cabinet system. The system has a height of 77.12 inches, a width of 63.2 inches, a racking width per bay of 19 inches, and a weight of 1828 pounds. Other peripheral equipment includes: 70 test interface adapter boards (IAB's); one RF probe; test cables; 72 test program flexible disks; a self test flexible disk; and a self test adapter board. The three electrical cabinets are. designated Unit 1, Unit 2, and Unit 3. Table 1-1 identifies electrical cabinet equipment by unit number and provides such additional information as the assigned reference designator, manufacturer's part/model number, and the functional group to which each equipment belongs.

Paragraphs 1.3.1 through 1.3.4 describe the electrical cabinets and each item of major test system equipment. Panel controls, indicators, and connectors are also described and their general significance to the operator is explained. The operator must manually operate or observe a number of controls and indicators. In a few instances, cables must be connected to connectors. Those controls, which are under computer program control, are so designated.

1.3.1 ELECTRICAL CABINET SYSTEM

The cabinet system (Figure 1-4) includes three steel cabinets 68-3/8 inches high, 21-1/16 inches wide, and 30-3/4 inches deep which are bolted together to form one assembly. Each cabinet opening will accommodate equipment panels with a maximum width of 19 inches. Each cabinet rear door is equipped with three hinge assemblies and a door latch. A cabinet ventilating fan and air filter is installed near the bottom of each door. A 15 by 17-inch air filter

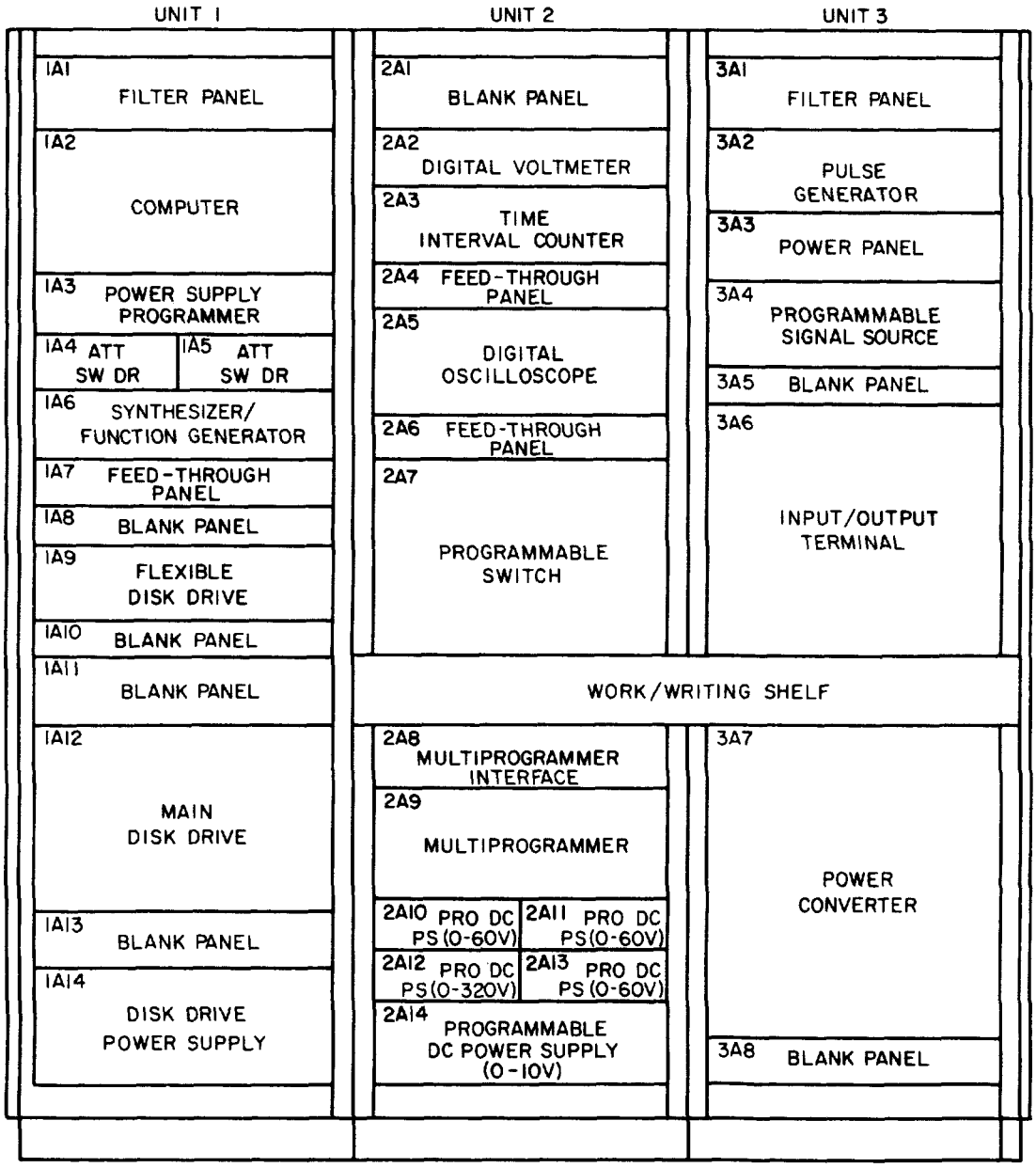


Figure 1-3. GETS-1000 Equipment Location in Units 1, 2, and 3

Table 1-1. GETS-1000 Equipment List

UNIT	EQUIPMENT DESCRIPTION	REF DES	MANUFACTURER PART/MODEL NO.	GROUP
1	Computer	1A2	HP2113B	Control
	Power Supply Programmer	1A3	HP59501A	Control
	Attenuator/Switch Driver	1A4	HP11713A	Switching
	Attenuator/Switch Driver	1A5	HP11713A	Switching
	Synthesizer/Function Gen	1A6	HP3325A	Stimuli
	Flexible Disk Drive	1A9	HP9885M	I/O
	Main Disk Drive	1A12	HP79OOA	Control
	Disk Drive Power Supply	1A14	HP13215A	Power
	*Attenuator	1A15	HP8494G	Switching
	*Attenuator	1A16	HP8494G	Switching
	*Attenuator	1A17	HP8496G	Switching
	*Attenuator	1A18	HP8496G	Switching
	*Thermostat	1A19	BUD TS-15	Measure
2	Digital Voltmeter	2A2	HP3455A	Measure
	Time Interval Counter	2A3	HP5370A	Measure
	Digital Oscilloscope	2A5	Nicolet 2090-3A	Measure
	Programmable Switch	2A7	GE 47E255678G2	Switching
	Multiprogrammer Inter-face	2A8	HP59500A	Control
	Multiprogrammer	2A9	HP6940B	Control
	Programmable DC Power Supply (O-60V)	2A10	HP6294A	Stimuli
	Programmable DC Power Supply (O-60V)	2All	HP6294A	Stimuli
	Programmable DC Power Supply 0-320V)	2A12	HP6209B	Stimuli
	Programmable DC Power Supply (O-60V)	2A13	HP6294A	Stimuli
	Programmable DC Power Supply (O-10V)	2A14	HP6113A	Stimuli
	**Equipment Shelf	2A15	GE 47D255686G1	Power
	**Bus Bar	2A16	GE 47D255671	Power
3	Pulse Generator	3A2	HP8015A	Stimuli
	Power Panel	3A3	GE 47D255695G1	Power
	Programmable Signal Source	3A4	HP8165A	Stimuli
	Input/Output Terminal Display-Terminal keyboard	3A6	HP2645A	I/O
	Power Converter	3A7	Topaz 1647	Power
	Transformer (Step Down)	3A9	Signal 1600-0F	Power
	Terminal Board Assembly	3A10	GE 47C255867G1	Power

* Mounted inside Unit 1 cabinet beneath Computer 1A2

** Mounted inside Unit 2 cabinet above Digital Voltmeter 2A2

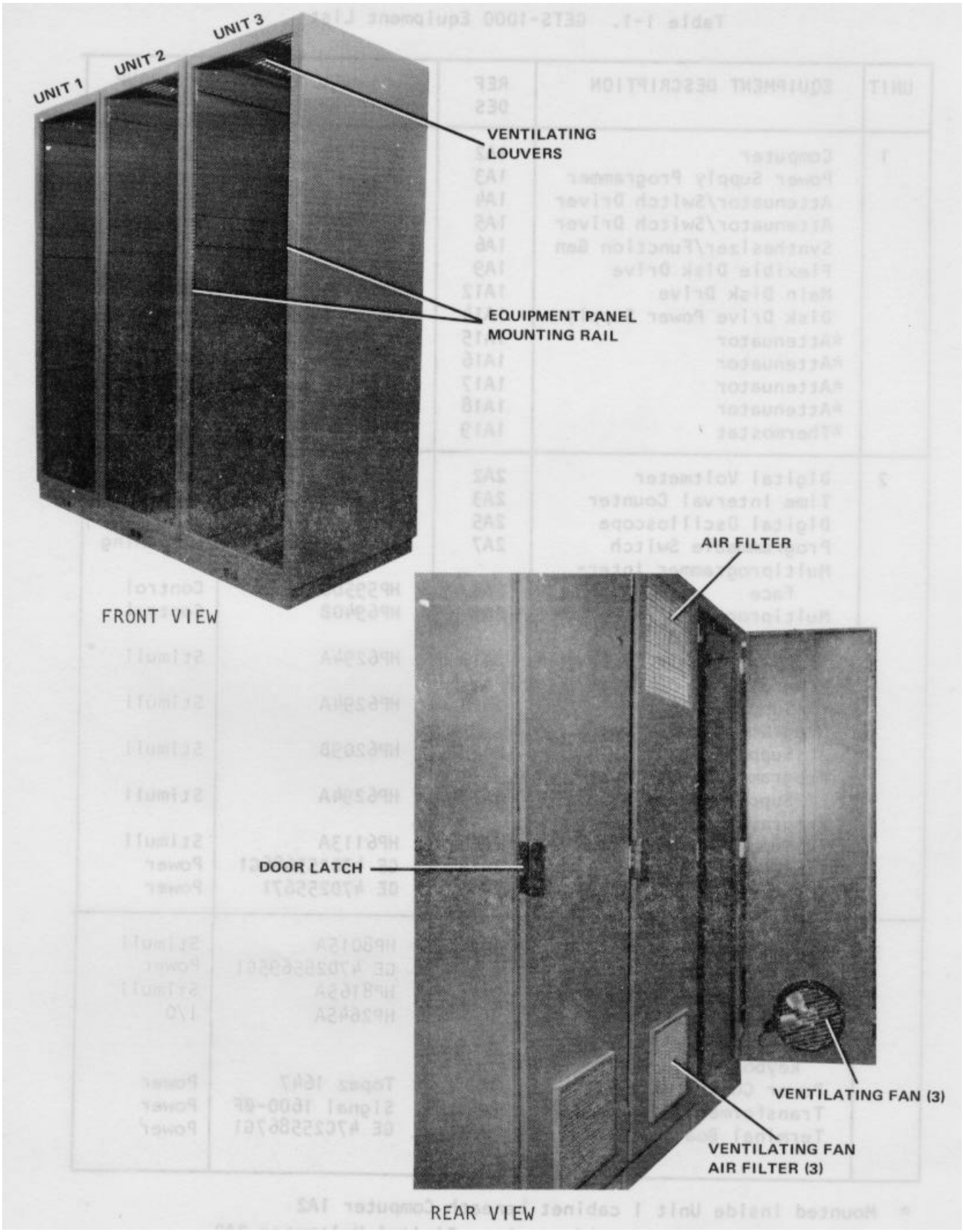


Figure 1-4. GETS-1000 Electrical Cabinet System

is installed at the top of the center cabinet door (Unit 2), and a 5 by 19-inch filter is fitted at the top of the outboard cabinets (see Figure 1-1).

1.3.2 UNIT 1 EQUIPMENT

Unit 1 equipment and equipment controls and indicators are described in Paragraphs 1.3.2.1 through 1.3.2.8.

1.3.2.1 Computer 1A2 (HP2113B) (Figure 1-5)

The Computer 1A2 (HP2113E) (Figure 1-5) is an intermediate performance machine which utilizes 128K bytes of main memory for the I-HAWK ATE application. Other significant features are:

- 128 instructions
- 14 1/O channel capacity
- 2.28 million byte/second direct memory transfer rate
- Self test for CPU and memory (utilized during GETS-1000 self test)
- RTE-IV Operating System

The Computer (1A2) executes all of the programs necessary to test the PCB/ Modules. The program for a single PCB/Module is initially read into the Computer (1A2) main memory from a flexible disk. The Computer (1A2) then transmits the commands to the stimuli generator(s) and Programmable Switch (2A7) which cause the proper stimuli to be applied to the correct connector pins of the PCB/Module under test. Next, additional commands are transmitted which cause a signal to be applied to a selected instrument which performs the measurement. The Computer (1A2) then receives the measurement and determines if the measurement is within the allowable limits.

If the measurement is acceptable, the Computer (1A2) continues with the next step in the test procedure. If it is unacceptable, a final message is displayed to the operator on the CRT display.

During system operation, all of the switches shown in Figure 1-5 are locked out to the operator. A few of the indicators and the power panel key are of significance during the power up procedure. This is explained in Section 2.2.

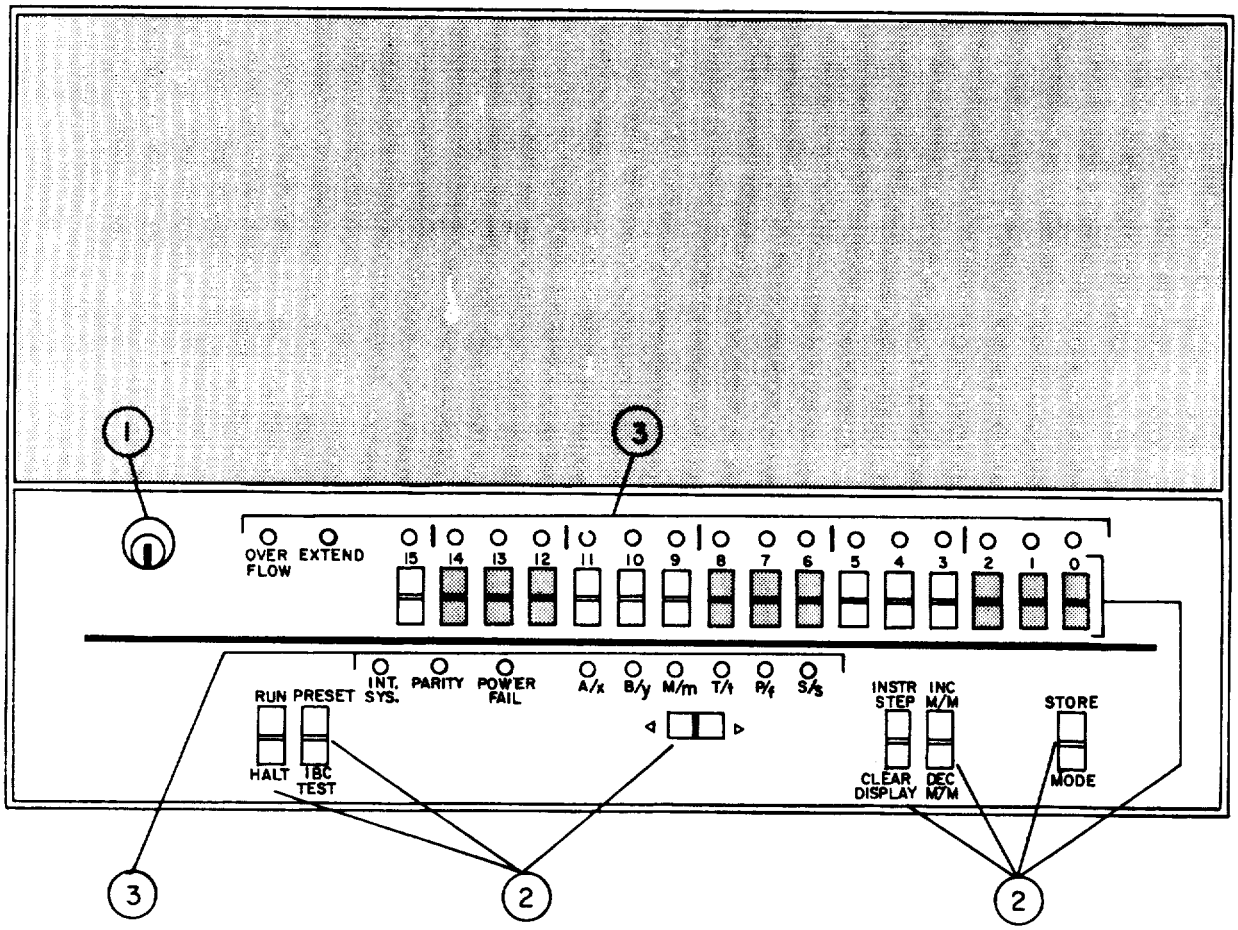


Figure 1-5. Computer 1A2 (HP2113B) Controls, Indicators or Connectors

Table 1-2. Computer Functions 1A2 (HP2113B) Controls, Indicators or Connectors (Figure 1-5)

Key	Control, Indicators or Connector	Function
1	LOCK (Manual action)	Secures the operator panel when access to the POWER OFF/ON and LOCK/OPERATE switches is not desired.
2	MAINTENANCE PANEL SWITCHES (Programmed control)	All switches locked out during operation.
3	MAINTENANCE PANEL INDICATORS (Manual action)	Certain indications are of significance during system power up (Section 2.2)

1.3.2.2 Power Supply Programmer 1A3 (HP59501A) (Figure 1-6)

The Power Supply Programmer 1A3 (HP59501A) (Figure 1-6) controls the volt ie of the GETS-1000 Programmable DC Power Supply (0-320V) 2A12 (HP6209B).

The Power Supply Programmer (1A3) is a digital-to-analog (D/A) converter that provides an output voltage in response to digital data received on the IEEE-488 bus. Two programmable output ranges (1V and 1OV) are available. In addition, a switch on the rear panel allows selecting either a unipolar or bipolar output mode. The unipolar mode used in the GETS-1000 application provides a 0 to .999V or a 0 to 9.99V output range. The Power Supply Programmer (1A3) output can be used as a programming voltage for controlling a wide range of dc voltages and currents from HP power supplies. Isolators within the Power Supply Programmer (1A3) protect other instrumentation on the IEEE-488 bus from damage that could be caused by power supply outputs. Also, an internal circuit ensures that the output is held near zero until programmed data is received.

This instrument is controlled by the Computer (1A2). The operator does not adjust any of the controls.

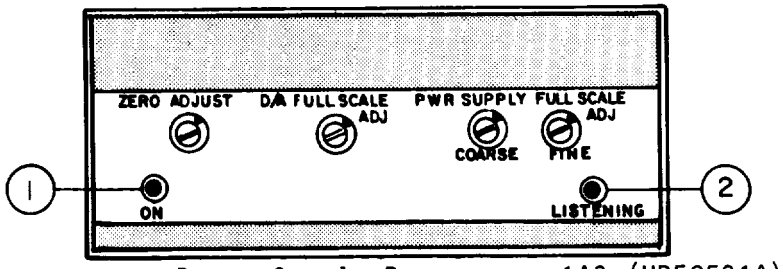


Figure 1-6. Power Supply Programmer 1A3 (HP59501A) Controls, Indicators or Connectors

Table 1-3. Power Supply Programmer Functions 1A3 (HP59501A) Controls, Indicators or Connectors (Figure 1-6)

Key	Control, Indicators or Connector	Function
1	POWER ON (ON) INDICATOR (Viewing not required)	Lights when the 59501A's internal supply voltages are present when the line cord is plugged-in.
2	LISTENING INDICATOR (Programmed indicator)	When lighted, it indicates that the 59501A is enabled to process data words received on the IEEE-488 bus. When it is not lighted, it indicates that the 59501A is inhibited from processing data words.

1.3.2.3 Attenuator/Switch Driver 1A4, 1A5 (HP11713A) (Figure 1-7)

The Attenuator/Switch Driver 1A4, 1A5 (HP11713A) (Figure 1-7) provides for the control of two programmable step attenuators and two coaxial switches. Commands are received from the Computer (1A2) which activate up to eight solid state switches.

Four of the switch outputs are applied to a four section attenuator (1A15, 1A16) and four are applied to a second attenuator (1A17, 1A18). The Attenuator/ Switch Driver (1A4, 1A5) also provides for the control of two coaxial switches when the appropriate command is received from the Computer (1A2). The coaxial switches are contained within the Programmable Switch (2A7).

This instrument is computer controlled. The operator only depresses the power switch if required during the power-up procedure.

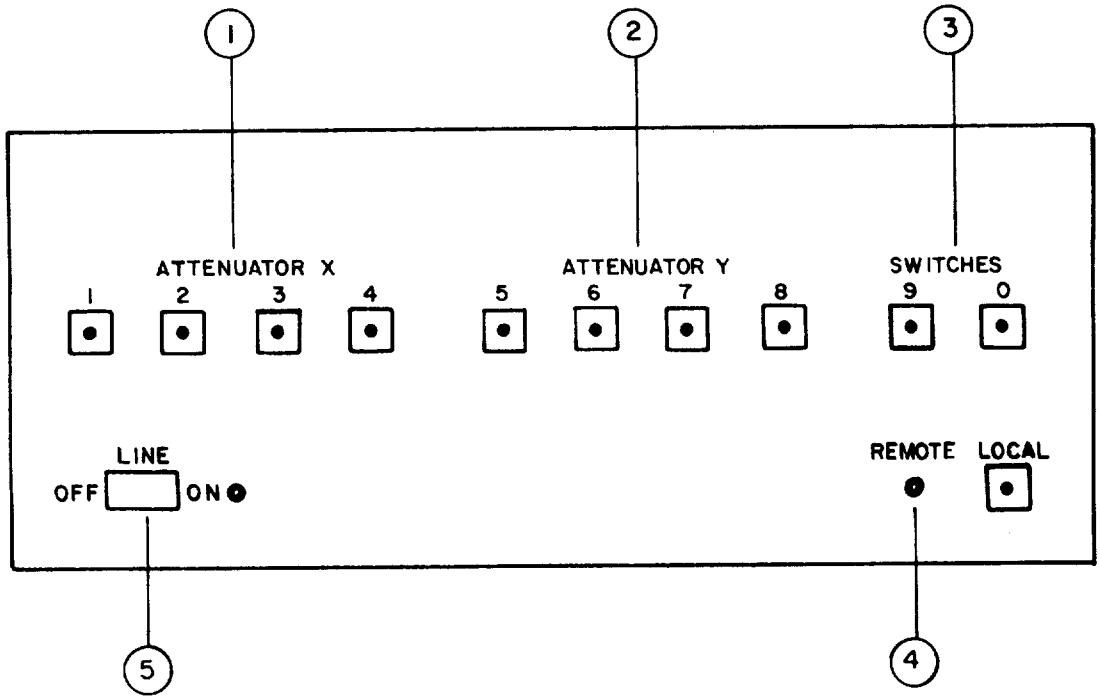


Figure 1-7. Attenuator/Switch Driver 1A4, 1A5 (HP11713A) Controls, Indicators or Connectors

Table 1-4. Attenuator/Switch Driver Functions 1A4, 1A5 (HP11713A)
Controls, Indicators or Connectors (Figure 1-7)

Key	Control, Indicators or Connector	Function
1	ATTENUATOR X (Programmed indicator)	In the local mode, pushbutton switches 1, 2, 3, and 4 activate solid state switches to change the attenuation setting of an attenuator connected to the ATTEN X connector on the rear panel.
2	ATTENUATOR Y (Programmed indicator)	In the local mode, pushbutton switches 5, 6, 7, and 8 activate solid state switches to change the attenuation setting of an attenuator connected to the ATTEN Y connector on the real panel.
3	SWITCHES (Programmed indicator)	In the local mode, pushbutton switches 9 and O change the position of a coaxial switch connected to rear panel banana jacks.
4	REMOTE	LED when on indicates the instrument (Programmed indication) is under remote control.
5	LINE OFF/ON (Manual activity)	Controls primary power.

1.3.2.4 Synthesizer/Function Generator 1A6 (HP3325A) (Figure 1-8)

The Synthesizer/Function Generator 1A6 (HP3325A) (Figure 1-8) is a programmable high performance synthesizer with 11-digit resolution, a function generator with precision waveforms, and a wideband sweeper. Frequency ranges are:

Sine:	17Hz to 20.999999999 MHz
Square:	1uHz to 10.999999999 MHz
Triangle/Ramps:	1uHz to 10.999999999 KHz

In the GETS-1000 system, the Synthesizer/Function Generator (1A6) is remotely controlled by the Computer (1A2) system CPU. The GETS-1000 test operator will not use any of the generator panel controls, except to depress the power switch if the generator display does not light up when system power is turned on. Synthesizer/Function Generator (1A6) controls are illustrated in Figure 1-8 and described in Table 1-5. The Synthesizer/Function Generator (1A6) is one of eight system components in the stimuli generating group.

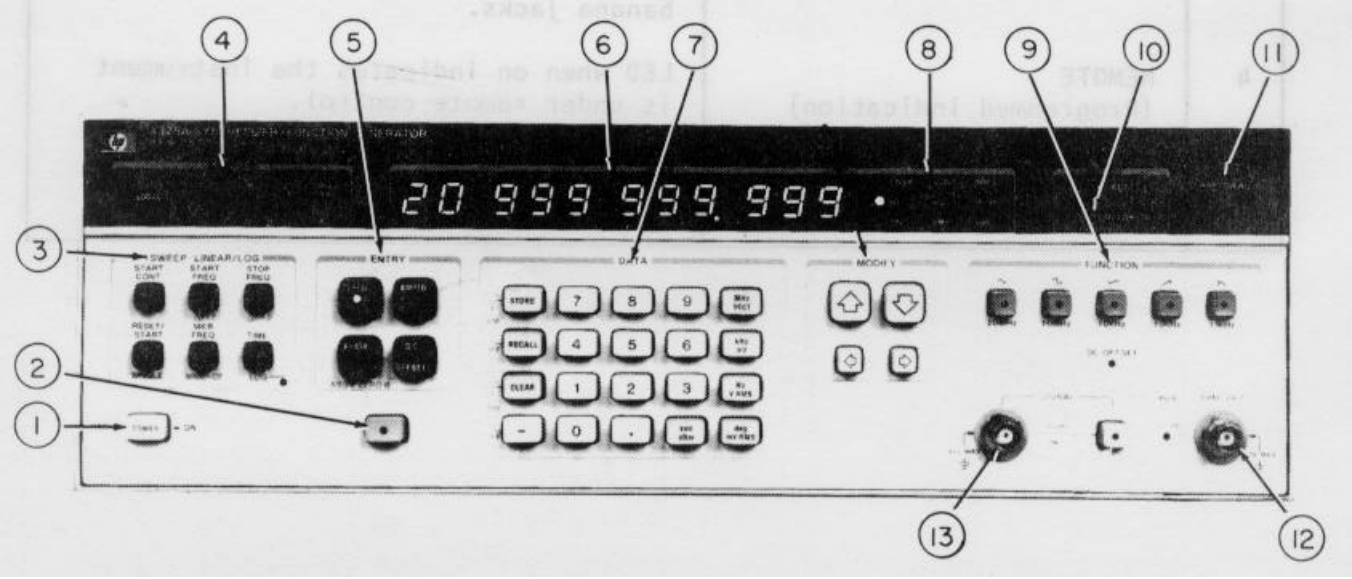


Figure 1-8. Synthesizer/Function Generator 1A6 (HP3325A) Controls, Indicators or Connectors

Table 1-5. Synthesizer/Function Generator Functions 1A6 (HP3325A) Controls, Indicators or Connectors (Figure 1-8)

Key	Control, Indicators or Connector	Function
1	POWER ON KEY (Manual activity)	Applies power to the instrument.

Table 1-5. Synthesizer/Function Generator Functions 1A6 (HP3325A)
Controls, Indicators or Connectors (Figure 1-8) (Continued)

Key	Control, Indicators or Connector	Function
2	BLUE PREFIX KEY (Programmed control and indicator)	This key must be pressed to select any of the key functions labeled in blue.
3	SWEEP KEY GROUP (Programmed control)	These are entry prefix keys for the sweep parameters, plus the sweep start keys. When preceded by the blue prefix key, the sweep parameter keys control sweep modification functions and linear/ log selection.
4	STATUS ANNUNCIATOR GROUP (Programmed indicator)	These annunciators indicate the HP3325A status: Remote; Addressed to Talk; Addressed to Listen; Request Service (SRQ).
5	ENTRY GROUP (Programmed control)	Prefix keys for programming signal parameters.
6	ALPHANUMERIC DISPLAY (Viewing not required)	Displays the value of the parameter selected, error codes, failure modes, amplitude and phase modulation state during PCB/Module tests.
7	DATA GROUP (Programmed control)	This group includes the numeric data keys, the data value suffix keys, the Store and Recall command keys, and the entry Clear key. When preceded by the blue prefix key, the keys in the left column control the modulation functions.
8	UNITS ANNUNCIATORS (Viewing not required)	Display the units of volume represented by the numeric display during PCB/ Module tests.
9	FUNCTION GROUP (Programmed control)	These keys select the output signal function or dc only.
10	MODULATION ANNUNCIATOR (Viewing not required)	Modulation annunciator is on if either AM or Phase modulation is programmed.
11	AMPTD CAL KEY (Programmed control)	Automatically calibrates the amplitude and offset of the output signal. When preceded by the blue prefix key, initiates a self test operation.

Table 1-5. Synthesizer/Function Generator Functions 1A6 (HP3325A) Controls, Indicators or Connectors (Figure 1-8) (Continued)

Key	Control, Indicators or Connector	Function
12	SYNC OUT (Connector)	A square wave sync signal is available at a rear panel connector. This signal is always in sync with the output signal crossover point. (Zero volts or dc offset voltage.)
13	SIGNAL OUTPUT (Connector)	Both standard and high voltage inputs are available at this connector.

1.3.2.5 Feed-Through Panel 1A7 (GE 47D255852G1) (Figure 1-9)

The Feed-Through Panel 1A7 (GE 47D255852G1) (Figure 1-9) is a blank panel, drilled and fitted with a grommet which permits a coaxial cable to be routed to the front panel connectors of selected instruments.

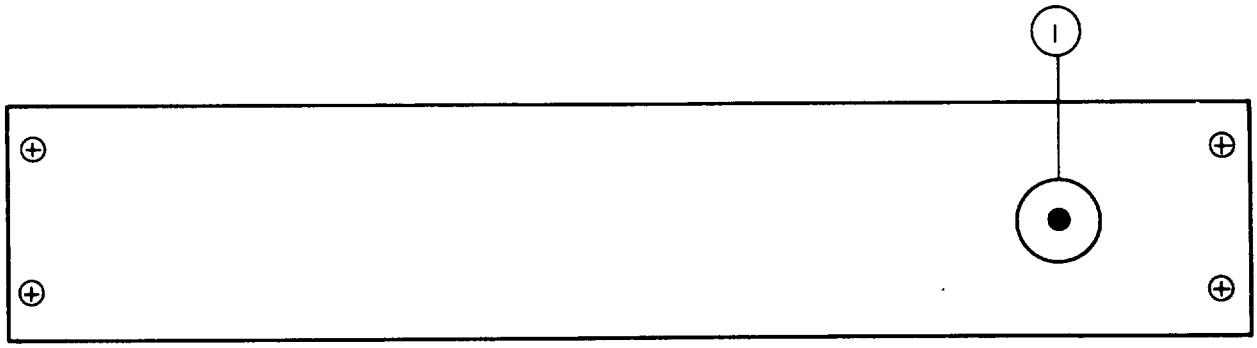


Figure 1-9. Feed-Through Panel 1A7 (GE 47D255852G1) Controls, Indicators or Connectors

Table 1-6. Feed-Through Panel 1A7 (GE 47D255852G1) Controls, Indicators or Connectors (Figure 1-9)

Key	Control, Indicators or Connector	Function
1	FEED-THROUGH PORT	Provides front access for cabling.

1.3.2.6 Flexible Disk Drive 1A9 (HP9885M) (Figure 1-10)

The Flexible Disk Drive 1A9 (HP9885) (Figure 1-10) provides for storage of the I-HAWK PCB/Module test programs. The total storage available is 514,560 bytes. This storage is organized into 67 tracks per disk, 30 sectors per track and 250 bytes per sector.

Instructions for proper handling, storage, and installation of the disk is provided in paragraph 2.5.2.

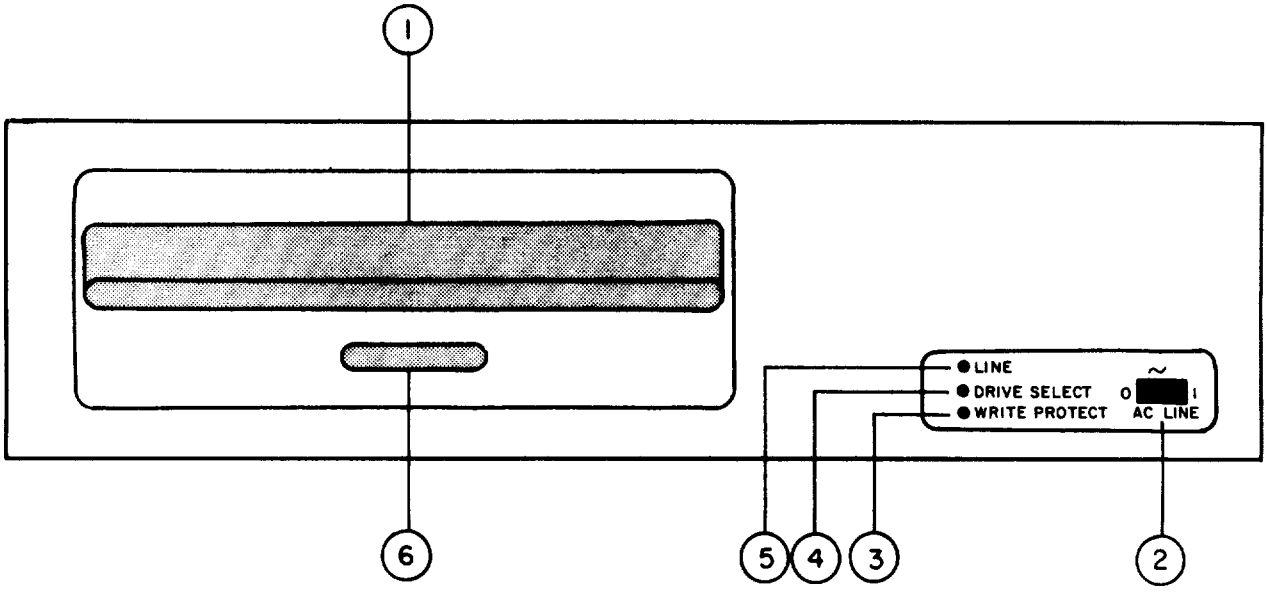


Figure 1-10. Flexible Disk Drive 1A9 (HP9885M) Controls, Indicators or Connectors

Table 1-7. Flexible Disk Drive 1A9 (HP9885M) Controls, Indicators or Connectors (Figure 1-10)

Key	Control, Indicators or Connector	Function
1	LATCH PLATE (Manual activity)	The Latch Plate locks the flexible disk into place after it has been inserted into the Flexible Disk Drive.
2	AC LINE SWITCH (Manual activity)	Applies power to the device. AC Line Switch should always be in the "ON" (number 1) position.

Table 1-7. Flexible Disk Drive lA9 (HP9885M) Controls, Indicators or Connectors (Figure 1-10) (Continued)

Key	Control, Indicators or Connector	Function
3	WRITE PROTECT INDICATOR LAMP (RED) (Viewing not required)	This is a safety feature which will lock out the drive from writing on to the flexible disk when the WRITE TAB is missing from the flexible disk. The Write Protect Indicator Lamp will illuminate RED when this condition exists.
		NOTE **The flexible disk should be checked to assure that the WRITE TAB is in the correct position before insertion into the Flexible Disk Drive. (See Para. 2.5.2)**
4	DRIVE SELECT INDICATOR LAMP (AMBER) (Viewing not required)	The amber Drive Select Indicator Lamp will illuminate when the computer has accessed the flexible disk.
5	LINE INDICATOR LAMP (GREEN) (Manual activity)	The green Line Indicator Lamp will illuminate when power is applied to the device.
6	LATCH PLATE RELEASE (Manual activity)	The Latch Plate Release is depressed to open the latch plate for insertion of the flexible disk. It is also depressed, to extract the flexible disk upon completion of test. (When the Latch Plate Release is depressed, at the completion of the test, the latch plate will open, and the flexible disk will be partially ejected from the Flexible Disk Drive for easy removal.)

1.3.2.7 Main Disk Drive 1A12 (HP7900A) (Figure 1-11)

The Main Disk Drive 1A12 (HP790OA) (Figure 1-11) provides for a total of 4,915,200 bytes of storage. The data transfer rate to main memory is 312K bytes/second. This storage is contained on two disks. One disk is fixed and cannot be removed from the chassis. The other disk is a removable cartridge which is used primarily during program development and field maintenance activities. The complete software system which includes the operating system, device subroutines, self test, and procedure files resides on the fixed disk.

The operator manually interacts with the Main Disk Drive (1A12) during the power-up procedure (Section 2-2).

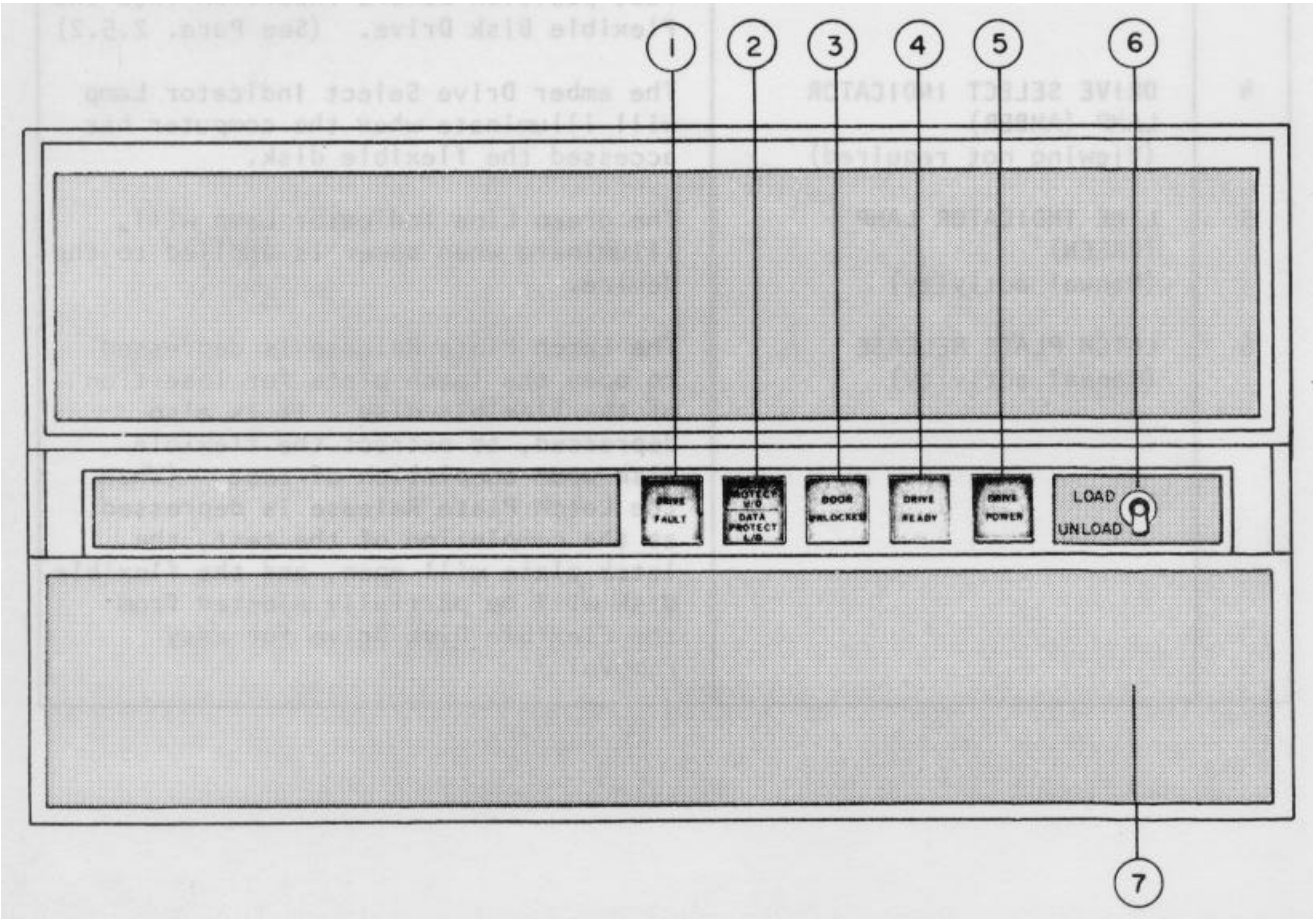


Figure 1-11. Main Disk Drive 1A12 (HP7900A) Controls, Indicators or Connectors

Table 1-8. Main Disk Drive 1A12 (HP79OOA) Controls, Indicators or Connectors (Figure 1-11)

Key	Control, Indicators or Connector	Function
1	DRIVE FAULT INDICATOR LAMP (Manual activity)	Lights whenever an illegal memory operation is attempted, a malfunction in the read/write hardware circuitry occurs, or if a seek operation is not completed in 850 milliseconds.
2	DATA PROTECT L/D INDICATOR LAMP (Manual activity)	Lights whenever the L/D PROTECT switch is in the "ON" position. When lit, the lower fixed disk is protected against any write operations.
	DATA PROTECT U/D INDICATOR LAMP (Manual activity)	Lights whenever the U/D PROTECT switch is in the ON position. When lit, the upper removable disk is protected against any write operations.
3	DOOR UNLOCKED INDICATOR LAMP (Manual activity)	Lights whenever the LOAD/UNLOAD switch is set to UNLOAD and the drive spindle is stopped.
4	DRIVE READY INDICATOR LAMP (Manual activity)	Lights when the disk drive motor has reached 2400 r/min, the air filtration system has been purged of unclean air, and the heads are in a loaded position over cylinder zero. Stays lit during legal memory operations.
5	DRIVE POWER INDICATOR LAMP (Manual activity)	Lights when the disk power supply has been interconnected to the disk drive and the disk power supply POWER switch is set to "ON."
6	LOAD/UNLOAD SWITCH (Manual activity)	Turns disk drive spindle motor on and off (On in the LOAD position and Off in the UNLOAD position). When set to LOAD (ON) the front panel interlocks are energized, preventing entry to the removable disk cartridge. In the UNLOAD (OFF) position, the spindle motor is stopped and the front panel can be opened to load or change a disk cartridge.
7	Air Filtration Screen	Coarse filtration screen for the disk drive.

1.3.2.8 Disk Drive Power Supply 1A14 (HP13215A) (Figure 1-12)

The Disk Drive Power Supply 1A14 (HP13215A) (Figure 1-12) provides the required operating voltages for the system main Disk Drive (1A12). This main Disk Drive (1A12) requires a variety of very stable voltages in order to perform reliably and maintain precise rotation speed.

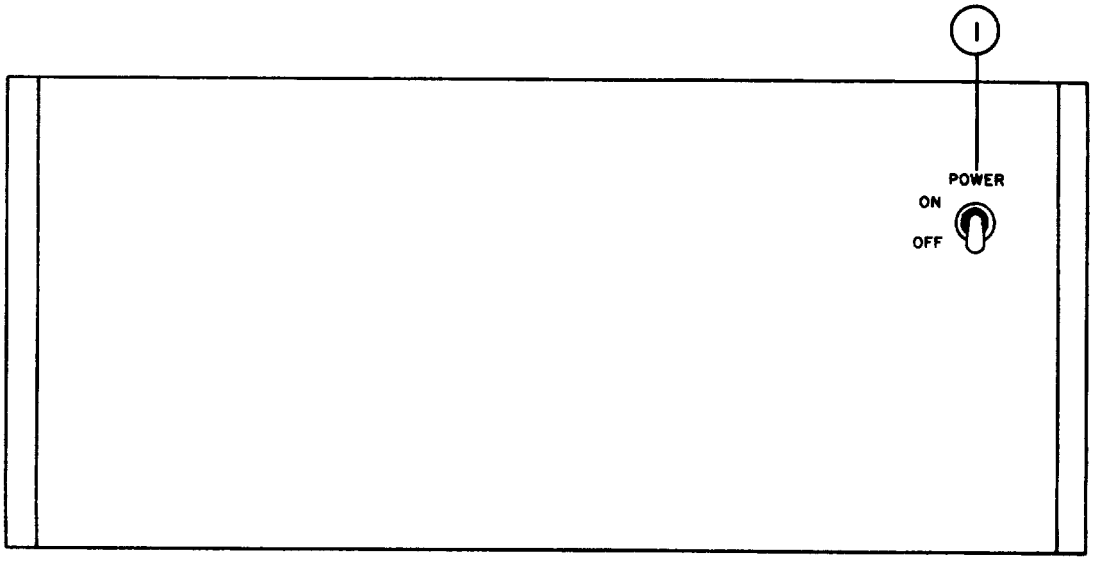


Figure 1-12. Disk Drive Power Supply 1A14 (HP13215A) Controls, Indicators or Connectors

Table 1-9. Disk Drive Power Supply 1A14 (HP13215A) Controls, Indicators or Connectors (Figure 1-12)

Key	Control, Indicators or Connector	Function
1	POWER ON/OFF SWITCH	Activates Disk Drive Power Supply which applies power to the Disk Drive 1A12 (HP7900A).

1.3.3 UNIT 2 EQUIPMENT

Unit 2 equipment controls and indicators are described in Paragraphs 1.3.3.1 through 1.3.3.11.

1.3.3.1 Digital Voltmeter 2A2 (HP3455A) (Figure 1-13)

The Digital Voltmeter 2A2 (HP3455A) (Figure 1-13) measures DC voltages from 1 microvolt to 1000 volts in five ranges extending from .1 volt full scale to 1000 volts full scale. Measurement results are presented in 5.5 digits during normal operation or 6.5 digits when the Digital Voltmeter (2A2) is set to the high resolution mode. All ranges except the 1000 volt range have 50 percent overrange capability and are overload protected from input voltages up to i 1000 volts.

The Digital Voltmeter (2A2) measures resistance from 1 milliohm to 15 megohms in six ranges extending from .1 kilohms full scale to 10,000 kilohms full scale. Measurement results are presented in 5.5 digits during normal operation or in 6.5 digits when set to the high resolution mode.

The Digital Voltmeter (2A2) measures true RMS AC voltages from 10 microvolts to 1000 volts in four ranges extending from 1 volt to 1000 volts range. Readings are displayed in 5.5 digits. All ranges have 50 percent overrange capability and are protected from input voltages up to 1000 volts RMS. The frequency response is from 30Hz to 1MHz.

The Digital Voltmeter (2A2) has both an internal self test and auto calibration capability.

The operator depresses the power switch during the system power-up procedure. The display must be viewed by the operator during selected PCB/Module tests as described in Section 2.5.5.

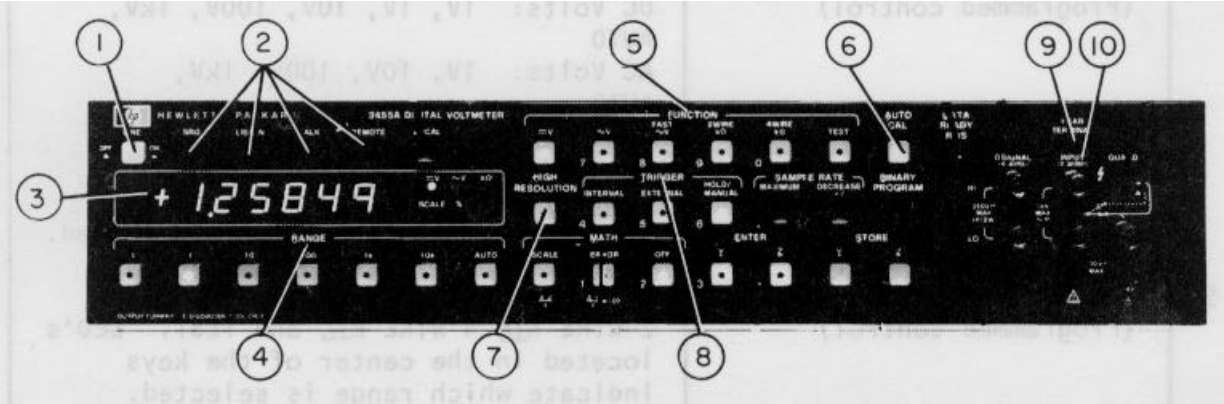


Figure 1-13. Digital Voltmeter 2A2 (HP3455A) Controls, Indicators or Connectors

Table 1-10. Digital Voltmeter 2A2 (HP3455A) Controls, Indicators or Connectors (Figure 1-13)

Key	Control, Indicators or Connector	Function
1	LINE OFF/ON SWITCH (Manual activity)	Push on/push off.
2	STATUS INDICATORS (Programmed control)	
	SRQ	Indicates that the 3455A "requires service" from the computer.
	LISTEN	Lights when the 3455A is addressed to receive data from the computer.
	TALK	Lights when the 3455A is addressed to transmit to the computer.
	REMOTE	Lights when the 3455A is under computer control.
3	DISPLAY (Viewing required for selected PCB/Module)	Indicates polarity and amplitude of the measurement. Measurement results are presented in either 5.5 digits or 6.5 digits depending upon whether the HIGH RESOLUTION feature is off or on. An LED in the upper left corner of the display indicates sample rate of the 3455A. Five LED's, located to the right of the display, indicate whether the display is presenting DC Voltage, AC Voltage, Ohms or Scale.
4	RANGE SELECTION KEYS (Programmed control)	Permit selection of ranges as follows: DC Volts: 1V, IV, 10V, 100V, 1kV, AUTO AC Volts: 1V, 10V, 1OOV, 1kV, AUTO Ohms: 1K, 1K, 10K, 100K, 1,000K, 10,000K, AUTO LED's located in the center of the keys indicate which range is selected.
5	FUNCTION SELECTION KEYS (Programmed control)	DC Volts, AC Volts, FAST AC Volts, 2 WIRE KΩ, 4 WIRE KΩ, and TEST. LED's located in the center of the keys indicate which range is selected.

Table 1-10. Digital Voltmeter 2A2 (HP3455A) Controls, Indicators or Connectors (Figure 1-13) (Continued)

Key	Control, Indicators or Connector	Function
6	AUTO CAL SWITCH (Programmed control)	Allows the Auto-Cal feature to be turned on or off. LED in center of Key indicates Auto-Cal on.
7	HIGH RESOLUTION SWITCH (Programmed control)	Switches display from 5.5 digit presentation to 6.5 digit presentation. An LED located in the center of the key indicates High Resolution on when lit.
8	TRIGGER SELECTION KEYS (Programmed control)	Permits selection of INTERNAL, EXTERNAL, or HOLD/MANUAL trigger. Each key has an LED which lights to indicate the trigger source selected.
9	REAR TERMINAL INDICATOR (Viewing not required)	Indicates when the rear input terminals have been selected.
10	INPUT TERMINALS	The two wire input terminals on the rear of the instrument are used. These terminals are not used by the test operator.

1.3.3.2 Time Interval Counter 2A3 (HP5370A) (Figure 1-14)

The Time Interval Counter 2A3 (HP5370A) (Figure 1-14) performs measurements of time interval, frequency and period. Measurement ranges are as follows:

Frequency	-	.1Hz to 100MHz
Period	-	10 nanosec to 10 seconds
Time Interval	-	10 nanosec to 10 seconds

For time intervals, both one source and two source measurements can be made. The trigger level can be displayed and adjusted for both the start and stop

The Time Interval Counter (2A3) can be armed either internally or externally. Also, the counter has a statistics capability. The standard deviation, mean, maximum or minimum values of a selected sample size can be computed and displayed.

The Time Interval Counter (2A3) is primarily computer controlled. The operator only depresses the STBY/ON Switch (if required) during power up operations. Four switches must be set to the proper positions, as described in Section 2.2, prior to using the counter for PCB/Module testing.

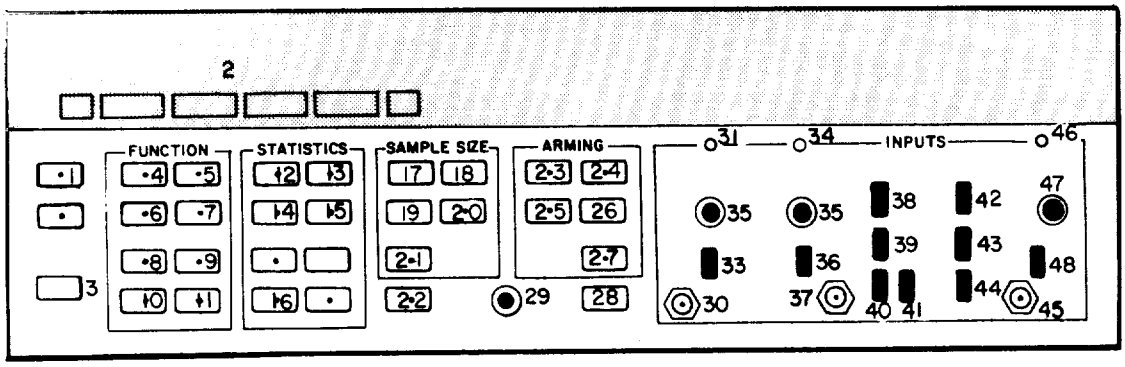


Figure 1-14. Time Interval Counter 2A3 (HP5370A) Controls, Indicators or Connectors

Table 1-11. Time Interval Counter 2A3 (HP5370A) Controls, Indicators, or Connectors (Figure 1-14)

Key	Control, Indicators or Connector	Function
1	LOCAL REMOTE (Programmed indicator and control)	Places counter in computer controlled mode.
2	FRONT PANEL DISPLAY (Viewing not required)	Displays counter status, results of time interval measurements, and error conditions.
3	LINE STBY/ON (Manual activity)	Supplies power to entire machine in the ON position.
4	TI (Programmed control)	Time interval function measures time differences from START channel to STOP channel.
5	TRIG LVL (Programmed control)	Measures the voltage of the trigger levels of the START and STOP input channels and simultaneously displays them continuously.
6	FREQ (Programmed control)	Measures frequency of the STOP channel signal. START channel is ignored.
7	PERIOD (Programmed control) is ignored.	Measures a period average of STOP channel input events. START channel
8	1 PERIOD (Programmed Control)	Measures one period of the input signal of the STOP channel and displays it as either frequency or period depending on the chosen function. 1 PERIOD is disabled when machine is in Time Interval function.
9	0.01 s (Programmed control)	Gate time of 0.01 second is enabled.
10	0.1 s (Programmed control)	Gate time of 0.1 second is enabled.
11	1 s (Programmed control)	Gate time of 1 second is enabled.

Table 1-11. Time Interval Counter 2A3 (HP5370A) Controls, Indicators or Connectors (Figure 1-14) (Continued)

Key	Control, Indicators or Connector	Function
12	MEAN (Programmed control)	Causes counter to measure and display the mean estimate which is the sample average from N time interval measurements minus a constant REFERENCE value.
13	STD DEV (Programmed control)	Displays the standard deviation estimate for the selected sample size.
14	MIN (Programmed control)	Displays the minimum time interval within the sample.
15	MAX (Programmed control)	Displays the maximum time interval within the sample size.
16	DSP EVTS (Programmed control)	Displays the number of events input to the STOP channel which were held off during the sample measurement window. If hold off signal is not present, displays the number of samples that have occurred per display cycle.
17	1 (Programmed control)	Instrument makes 1 measurement and displays result.
18	100 (Programmed control)	Instrument makes one hundred measurements and displays result.
19	1K (Programmed control)	Instrument makes one thousand measurements and displays result.
20	10K (Programmed control)	Instrument makes ten thousand measurements and displays result.
21	100K (Programmed control)	Instrument makes one hundred thousand measurements, and displays result.
22	MAN RATE (Programmed control)	Initiates a new sample for measurement when DISPLAY RATE control is in HOLD position. Old measurement value remains on display until replaced by new value. Also see DISPLAY RATE 32.
23	+TI ONLY (Programmed control)	In the +TI ONLY mode, all STOP channel events are ignored until the arrival of the START event. The counter is armed internally.

Table 1-11. Time Interval Counter 2A3 (HP5370A) Controls, Indicators or Connectors (Figure 1-14) (Continued)

Key	Control, Indicators or Connector	Function
24	±TI (Programmed control)	In the ±TI mode, START event occurring before STOP event will automatically be assigned as a positive time interval and vice versa as a negative time interval. First incoming signal (either START or STOP) arms the counters.
25	EXT HOLD OFF (Programmed control)	Used in conjunction with EXT ARM mode switch; it enables the external hold off signal to inhibit STOP channel input signal.
26	PERIOD COMPLMNT (Programmed control)	When the PERIOD COMPLMNT switch is activated repeatedly, the measurement will switch from +TI to -TI or vice versa in a toggle fashion. Period Complement is operational only in the ±TI mode. Once a mode is selected, the ±TI range holds and the reading will not flicker between the two results. The switch has no effect when the instrument is externally armed, or when the TI is less than 10 nanoseconds.
27	EXT ARM (Programmed control)	In ± TI mode, the START and STOP channels are simultaneously armed after the arrival of the EXT input signal. As soon as the channels are armed, the time interval defined by the first event occurring in each channel is measured, regardless of the order of arrival. In + TI only mode, the START channel is armed after the arrival of the EXT input. Time Interval is defined by the first event in the Start channel and the first event in the Stop channel arriving after the first event in the Start channel.
28	MAN INPUT (Programmed control)	EXT INPUT signals for external arm and/or external holdoff functions can be generated manually through the MAN INPUT switch.

Table 1-11. Time Interval Counter 2A3 (HP5370A) Controls, Indicators or Connectors (Figure 1-14) (Continued)

Key	Control, Indicators or Connector	Function
29	DISPLAY RATE (Programmed control)	Determines time between sample measurements. Rotating this control more counterclockwise will add more time between measurements which in turn, displays previous measurements longer and gives a more stable display.
30	CONNECTOR	Input BNC connector for the EXT HOLD-OFF and/or EXT ARM signals with an input load impedance of 1 megohm.
31	EXT (Viewing not required)	LED indicator which when blinking, indicates that the external signal is triggering.
32	LEVEL (Viewing not required)	Trigger level control for the external input signal.
33	1 SE 2 (Programmed control)	This switch setting determines which slope of the external input signal will be used as the triggering slope.
34, 46	TRIGGERING (Viewing not required)	LED indicators which when blinking, indicate that the START and/or STOP channel is triggering machine.
35, 47	TRIGGER LEVEL (Programmed control)	LEVEL controls used in conjunction with attenuator switches 42, 46 to select voltage at which triggering occurs.
36, 48	SLOPE SELECT (Programmed control)	This switch setting determines which slope of the START and STOP channel input signals will be used as the triggering slope.
37, 45	CONNECTORS	Input BNC connectors for the START and STOP channel signal inputs.
38, 42	IMPEDANCE SELECT (Manual activity)	Input impedance switches used to select an input impedance of 50 ohms or 1 megohm shunted by less than 30 pF.
39, 43	ATTENUATION SELECT (Manual activity)	Selects attenuation for input signal. Used in conjunction with LEVEL control to set trigger point. Input level is not affected in ÷ 1 position. Input signal amplitude is reduced by a factor of 10 in ÷ 10 position.

Table 1-11. Time Interval Counter 2A3 (HP5370A) Controls, Indicators or Connectors (Figure 1-14) (Continued)

Key	Control, Indicators or Connector	Function
40, 44	COUPLING SELECT (Manual activity)	Coupling switches used to select direct Key or capacitor coupling for input signal.
41	INPUT AMPLIFIER CONTROL SWITCH (Manual activity)	a. START COM - Operationally connects START and STOP channels in parallel. Used for single source time interval measurement. STOP channel jack is not active. START and STOP input impedance switches must be set to same position. b. SEP - Allows independent operation of START and STOP channels.

1.3.3.3 Feed-Through Panel 2A4 (GE 47D255839G1) (Figure 1-15)

The Feed-Through Panel 2A4 (GE 47D255839G1) (Figure 1-15) is a blank panel, drilled and fitted with grommets which permit coaxial cables to be routed to the front panel connectors of selected instruments.

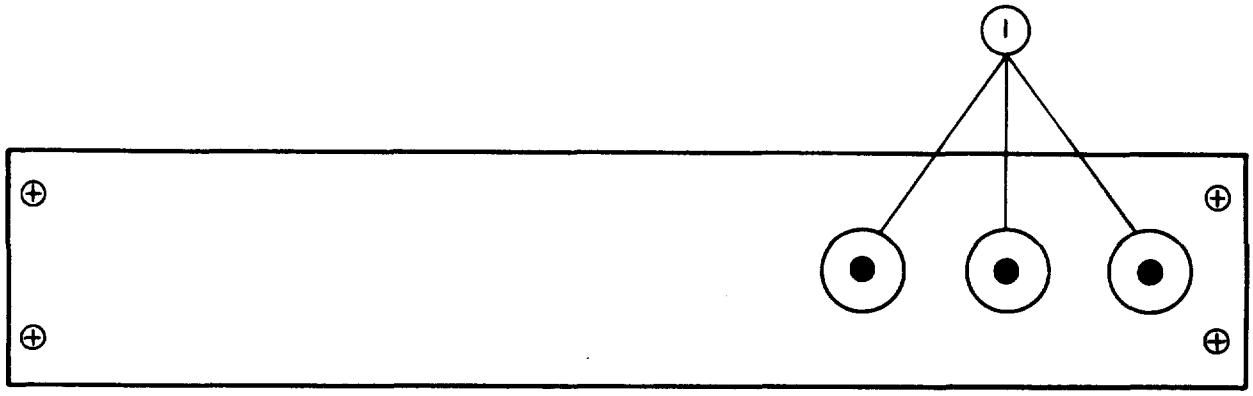


Figure 1-15. Feed-Through Panel 2A4 (GE 47D255839G1) Controls, Indicators or Connectors

Table 1-12. Feed-Through Panel 2A4 (GE 47D255839G1) Controls, Indicators or Connectors (Figure 1-15)

Key	Control, Indicators or Connector	Function
1	FEED-THROUGH PORT	Provides front access for cabling.

1.3.3.4 Digital Oscilloscope 2A5 (Nicolet 2090-3A) (Figure 1-16)

The Digital Oscilloscope 2A5 (Nicolet 2090-3A) (Figure 1-16) accepts external measurements, converts the measurements to eight-bit digital format and stores the measurements in main memory which has 4096 storage locations. The maximum measurement rate is 50 nanosec per point. The waveform(s) can be viewed by manipulating the appropriate oscilloscope controls. The Digital Oscilloscope (2A5) main memory contents can be transferred to the Computer (1A2) to provide automated waveform analysis. This is the preferable mode of operation for those PCB/Module waveforms which must be analyzed for distortion since it minimizes operator interaction. A few waveforms for which automated analysis is not practical will require observation by the operator to determine go/no-go status. The specific instruction for use of the Digital Oscilloscope (2A5) will be included in the instructions provided for the test of each PCB/Module.

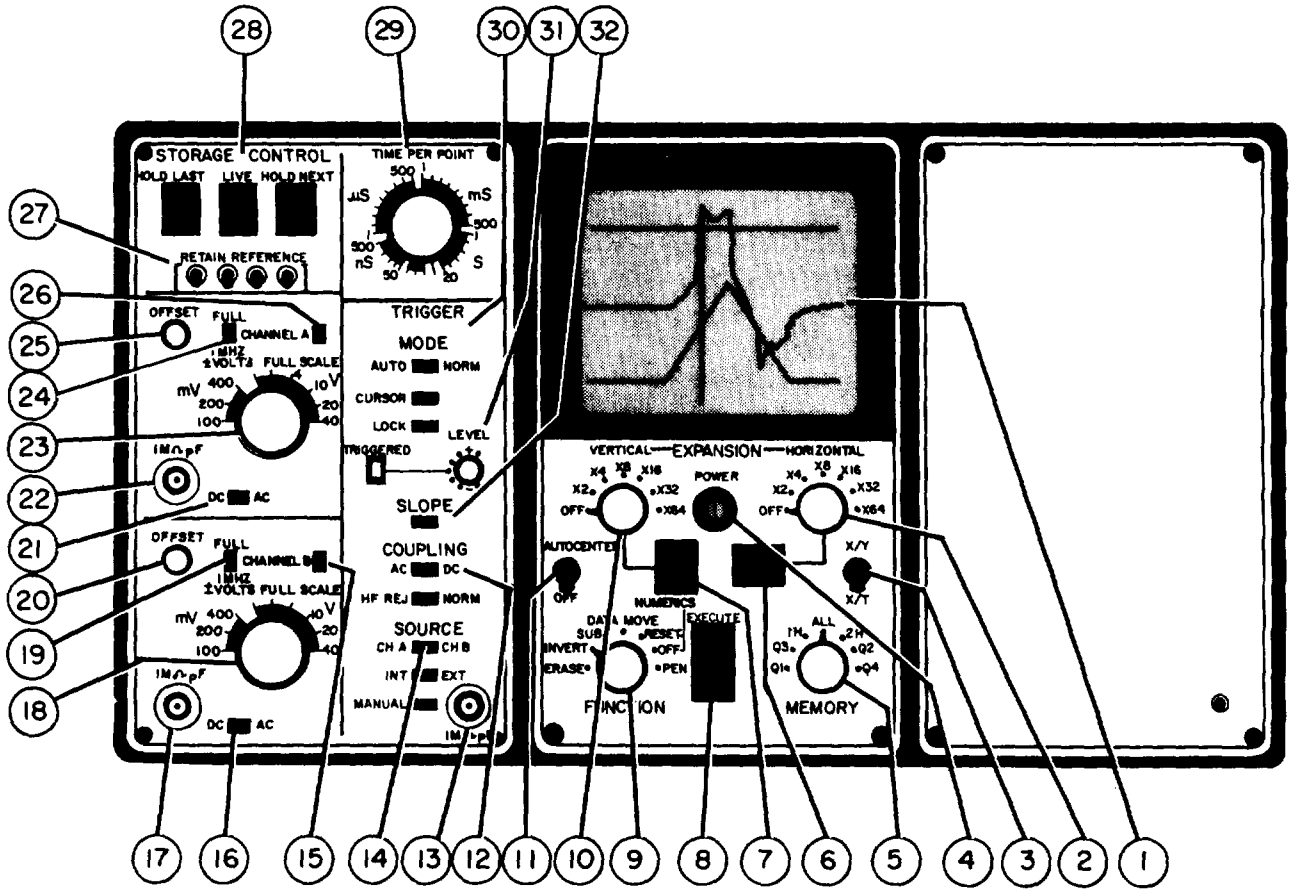


Figure 1-16. Digital Oscilloscope 2A5 (Nicolet 2090-3A) Controls, Indicators or Connectors

Table 1-13. Digital Oscilloscope 2A5 (Nicolet 2090-3A)
Controls, Indicators or Connectors (Figure 1-16)

Key	or Connector Control, Indicators	Function
1	CATHODE RAY TUBE (CRT) DISPLAY (Viewing required for selected PCB/Modules)	Waveforms are displayed on the Cathode Ray Tube display.
2	HORIZONTAL EXPANSION (Manual Activity)	The HORIZONTAL EXPANSION switch allows the operator to select a scale multiplier factor from 1 to 64.
3	XY/XT SELECTOR SWITCH (Manual Activity)	The switch should be in the X/T position. This will permit the normal display of a waveform amplitude as a function of time.
4	POWER ON INDICATOR	Indicates power has been applied to the instrument.
5	MEMORY SELECTOR SWITCH (Manual Activity)	
	ALL	The waveform is placed in the entire 4096 word memory.
	IH	The waveform is placed in the first half of memory (2048 words).
	2H	The waveform is placed in second half of memory.
	Q1, Q2, Q, Q4	The waveform is placed in the selected quarter (1024 words) of memory.
6	PADDLE SWITCH (Manual Activity)	The PADDLE switch, located below the HORIZONTAL EXPANSION switch is used to move the vertical marker line left or right.
7	PADDLE SWITCH (Manual Activity)	The PADDLE switch, located below the VERTICAL EXPANSION switch, is used to move the horizontal marker line up or down.
8	EXECUTE CONTROL (Manual Activity)	All functions are executed by pressing the Execute Control Button.

Table 1-13. Digital Oscilloscope 2A5 (Nicolet 2090-3A) Controls, Indicators or Connectors (Figure 1-16) (Continued)

Key	Control, Indicators or Connector	Function
9	FUNCTION SWITCH (Manual Activity)	
	ERASE	Waveform in memory is erased.
	INVERT	Waveform in memory is inverted.
	SUBTRACT	The corresponding points of two waveforms in memory are subtracted from each other.
	DATA MOVE	The waveform is vertically repositioned so that the point intersected by the vertical marker line appears at the same level as the horizontal marker line.
	RESET NUMERICS	The normal origin of t_o = trigger time and V_o= zero volts is changed to the present position of the cursor line intersection.
	NUMERICS OFF	Numerics will not be displayed.
	PEN	Permits use of pen recorder drive signals.
10	VERTICAL EXPANSION SWITCH (Manual Activity)	The VERTICAL EXPANSION switch allows the operator to select a scale multiplier from 1 to 64.
11	AUTOCENTER SWITCH	When the AUTOCENTER switch is in the ON position, the horizontal marker line will be positioned so that it is at the same level as that of the data point intersected by the vertical marker line.
12	COUPLING (Manual Activity)	Selects either AC or DC coupling for triggering.
13	CONNECTOR	Input for external trigger.

Table 1-13. Digital Oscilloscope 2A5 (Nicolet 2090-3A) Controls, Indicators or Connectors (Figure 1-16) (Continued)

Key	Control, Indicators or Connector	Function
14	SOURCE	
	CH A/CH B (Manual Activity)	Selects either Channel A or Channel B for trigger source.
	INT/EXT (Manual Activity)	Selects internal or external source for triggering.
	MANUAL (Manual Activity)	Depressing this button manually triggers the oscilloscope.
15	CHANNEL B (Manual Activity)	Turns on Channel B.
16	AC/DC SWITCH (Manual Activity)	DC position displays signal with reference to ground. AC position filters out any constant level of DC voltage.
17	CONNECTOR	Channel B input.
18	± VOLTS FULL SCALE (Manual Activity)	Selects the full scale voltage for the Cathode Ray Tube (CRT).
19	FULL/I MHz SWITCH (Manual Activity)	Controls bandwidth of the amplifier. When the switch is in the FULL (up) position, it allows full 20 MHz operation. In the 1 MHz (down) position, it filters out signals above 1 MHz.
20	OFFSET CONTROL (Manual Activity)	Normally used to set the trace to OV with the input disconnected.
21	AC/DC SWITCH (Manual Activity)	DC position displays signal with reference to ground. AC position filters out any constant level of DC voltage.
22	CONNECTOR	Channel A input.
23	± VOLTS FULL SCALE (Manual Activity)	Selects the full scale voltage for the Cathode Ray Tube (CRT).
24	FULL/1 MHz SWITCH (Manual Activity)	Controls bandwidth of the amplifier. When the switch is in the FULL (up) position, it allows full 20 MHz operation. In the 1 MHz (down) position, it filters out signals above 1 MHz.

Table 1-13. Digital Oscilloscope 2A5 (Nicolet 2090-3A) Controls, Indicators or Connectors (Figure 1-16) (Continued)

Key	Control, Indicators or Connector	Function
25	OFFSET CONTROL (Manual Activity)	Normally used to set the trace to OV with the input disconnected.
26	CHANNEL A (Manual Activity)	Turns on Channel A.
27	RETAIN REFERENCE SWITCHES (Manual Activity)	Prevents new signal information from being entered into the memory. A switch is provided for each quarter of memory.
28	STORAGE CONTROL LIVE (Programmed Control)	Allows oscilloscope to respond to the input signal and trigger.
	HOLD NEXT (Programmed Control)	Allows only one sweep after button is depressed.
	HOLD LAST (Programmed Control)	Prevents any further triggering and retains last sweep prior to depressing switch.
29	TIME PER POINT CONTROL (Manual Activity)	The TIME PER POINT CONTROL is used to select the sweep speed. The sweep speed is variable from 50S/Point to 20S/Point.
30	TRIGGER MODE NORMAL (Manual Activity)	Triggering is produced by the entered signal.
	AUTO (Manual Activity)	A sweep will be triggered automatically if no entered sweep is received 29 mseconds after the proceeding sweep has ended.
	CURSOR (Manual Activity)	A sweep will be triggered at the posi- of the vertical cursor line.
	LOCK (Manual Activity)	After the cursor trigger position has been selected, it may be locked at that position so the vertical marker line can be moved to another location to get numerical readings.
31	LEVEL CONTROL (Manual Activity)	The LEVEL CONTROL is used for setting the trigger level.
32	SLOPE SWITCH (Manual Activity)	The SLOPE SWITCH selects the positive or the negative level for triggering.

1.3.3.5 Feed-Through Panel 2A6 (GE 47D255657G1) (Figure 1-17)

The Feed-Through Panel 2A6 (GE 47D255657G1) (Figure 1-17) is a blank panel, drilled and fitted with grommets, which permits coaxial cables to be routed to the front panel connectors of selected instruments.

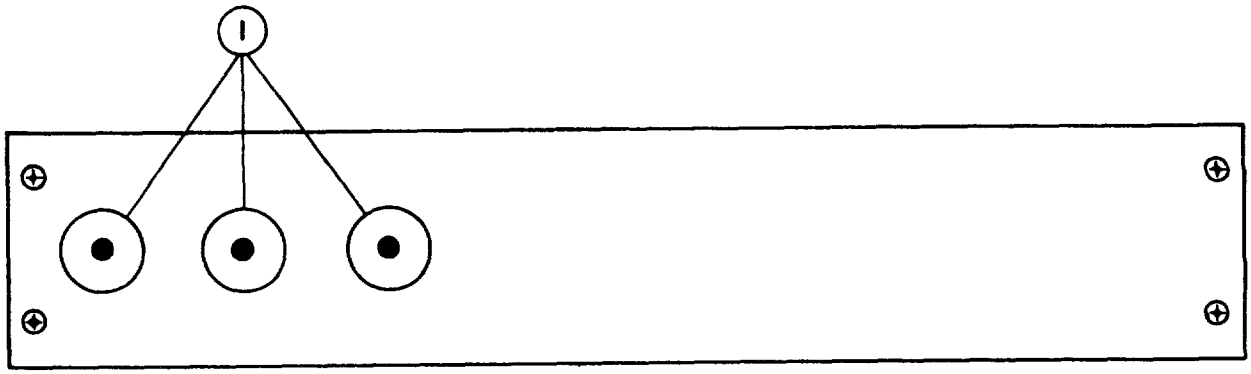


Figure 1-17. Feed-Through Panel 2A6 (GE 47D255657G1) Controls, Indicators or Connectors

Table 1-14. Feed-Through Panel 2A6 (GE 47D255657G1) Controls, Indicators or Connectors (Figure 1-17)

Key	Control, Indicators or Connector	Function
1	FEED-THROUGH PORT	Provides front access for cabling.

1.3.3.6 Programmable Switch 2A7 (GE 47E255678G2) (Figure 1-18)

The Programmable Switch 2A7 (GE 47E255678G2) (Figure 1-18) interfaces the GETS-1000 instruments with the PCB/Module under test via an interface adapter. The Programmable Switch 2A7, under test program control, sequentially connects stimulus signals to the PCB/Module and connects measurement points to measuring instruments.

The Programmable Switch (2A7) contains 80 stimulus routing relays, 100 test point relays and five coaxial relays for routing signals with frequencies above 1 MHz. The Programmable Switch (2A7) also provides the capability to apply 24 discrete outputs to the PCB/Module under test. Two additional components contained in the switch are a square wave source and a RF amplifier.

An RF probe is located external to the switch and is used for testing selected PCB/Modules. The RF probe is connected by the operator to the RF probe input jack located on the front panel of the switch. This connection is made only as required for PCB/Module testing.

The Programmable Switch (2A7) contains a 160-pin, Zero Insertion Force (ZIF) connector into which the interface adapter board is inserted prior to testing.

A fixture is also provided as part of the Programmable Switch (2A7) for guiding and supporting the lAB.

The Programmable Switch (2A7) is controlled by a microprocessor and provides an interface with the IEEE-488 bus. The microprocessor performs testing and fault isolation to the board level.

The operator interaction with the Programmable Switch (2A7) involves (1) insertion of the Interface Adapter Board and (2) connection of cables or RF probe from the front panel to selected PCB/Modules.

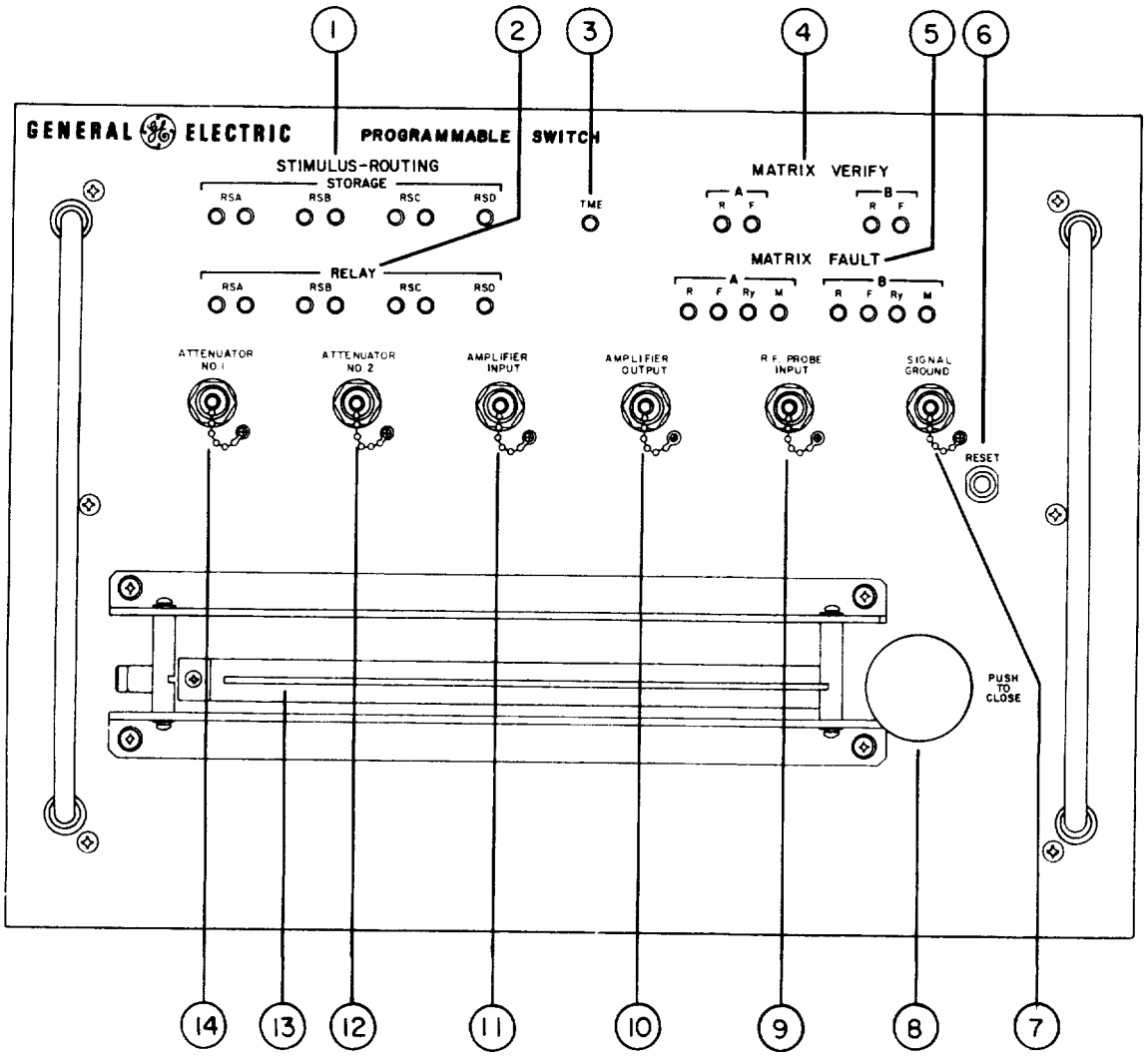


Figure 1-18. Programmable Switch 2A7 (GE 47E255678G2) Controls, Indicators or Connectors

Table 1-15. Programmable Switch 2A7 (GE 47E255676G2) Controls, Indicators or Connectors (Figure 1-18)

Key	Control, Indicators or Connector	Function
1	STATUS LIGHTS: SR STORAGE VERIFY (Viewing not required)	Verifies stimuli routing relay address stored.
2	STATUS LIGHTS: SR RELAY VERIFY (Viewing not required)	Verifies stimuli routing relay has operated.
3	STATUS LIGHT: TEST MEASURE ERROR (Viewing not required)	Illuminates when address or relay errors occur.

Table 1-15. Programmable Switch 2A7 (GE 47E255676G2) Controls, Indicators or Connectors (Figure 1-18) (Continued)

Key	Control, Indicators or Connector	Function
4	STATUS LIGHTS: MATRIX A and B VERIFY (Viewing not required)	Verifies test point relay address stored.
5	STATUS LIGHTS: MATRIX A and B FAULT (Viewing not required)	Indicates errors in test point address or test point relay when errors occur.
6	RESET SWITCH	Initializes the Programmable Switch which provides manual system reset.
7	CONNECTOR (Manual Activity)	Provides a front panel ground.
8	ZIF ACTIVATOR KNOB (Manual Activity)	Mechanically closes ZIF connector and signals the Computer (1A2) that the ZIF is closed.
9	CONNECTOR (Manual Activity)	Provides connection for the RF probe.
10	CONNECTOR (Manual Activity)	Provides a signal output from the RF amplifier.
11	CONNECTOR (Manual Activity)	Provides an input to the RF amplifier of the Programmable Switch.
12	CONNECTOR (Manual Activity)	Provides a bi-directional access to Attenuator Number 2.
13	ZIF CONNECTOR (V13) (Manual Activity)	Connector for the Interface Adapter Boards (lABs)
14	CONNECTOR (Manual Activity)	Provides a bi-directional access to Attenuator Number 1.

1.3.3.7 Multiprogrammer Interface 2A8 (HP59500A) (Figure 1-19)

The Multiprogrammer Interface 2A8 (HP59500A) (Figure 1-19) buffers and transmits data and control signals between the IEEE-488 bus and the Multiprogrammer 2A9. It converts the serial ASCII alphanumerics of the IEEE-488 bus to the 16-bit parallel format required by the Multiprogrammer (2A9). The Multiprogrammer Interface (2A8) also adapts the 3-wire handshake process used on the IEEE-488 bus to the 2-wire methods employed by the Multiprogrammer 2A9.

The operator depresses the power on switch if required during system power-up procedure.

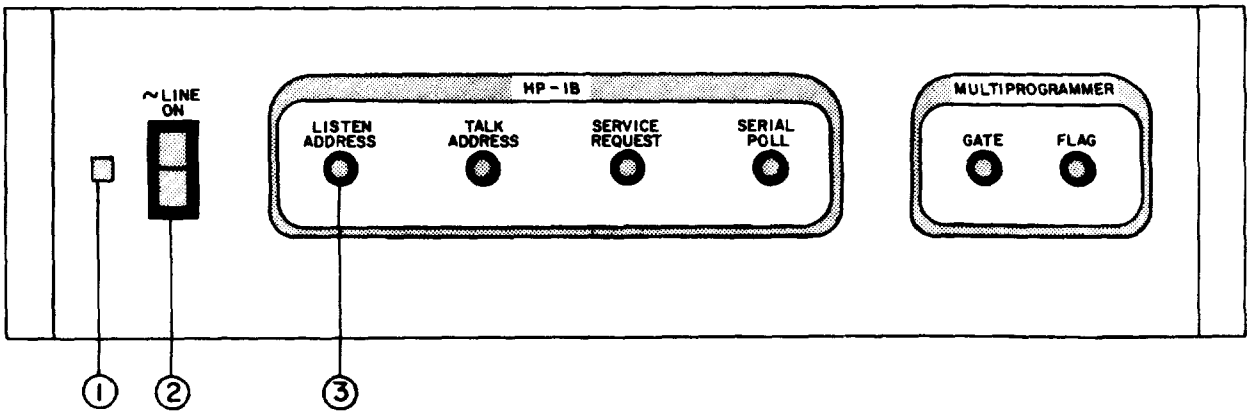


Figure 1-19. Multiprogrammer Interface 2A8 (HP59500A) Controls, Indicators or Connectors

Table 1-16. Multiprogrammer Interface 2A8 (HP59500A) Controls, Indicators or Connectors (Figure 1-19)

Key	Control, Indicators or Connector	Function
1	LINE POWER INDICATOR LAMP (Manual activity)	Lamp illuminates when power is applied to instrument.
2	LINE POWER "ON"/"OFF" SWITCH (Manual activity)	Applies power to instrument (Power supplied is 115VAC/6OHz).
3	LISTEN ADDRESS (IEEE-488) (Programmed indicator,	Lights when multiprogrammer is addressed to listen. viewing not required)

1.3.3.8 Multiprogrammer 2A9 (HP6940B) (Figure 1-20)

The Multiprogrammer 2A9 (HP6940B) (Figure 1-20) provides programmable control for three Power Supplies 0-60V (2A10, 2A11), and 2A13), one Power Supply 0-10V (2A14), and the Pulse Generator (3A2). Control and data words are received from the Multiprogrammer Interface (2A8).

The data word is stored and subsequently latched in an output card which provides the programming signals for the instruments identified above.

One programmable resistance card controls each of the power supplies. Two discrete output cards and three D/A converter cards provide the control for the Pulse Generator (3A2).

The operator depresses the ~ LINE ON switch if required during the system powerup procedure.

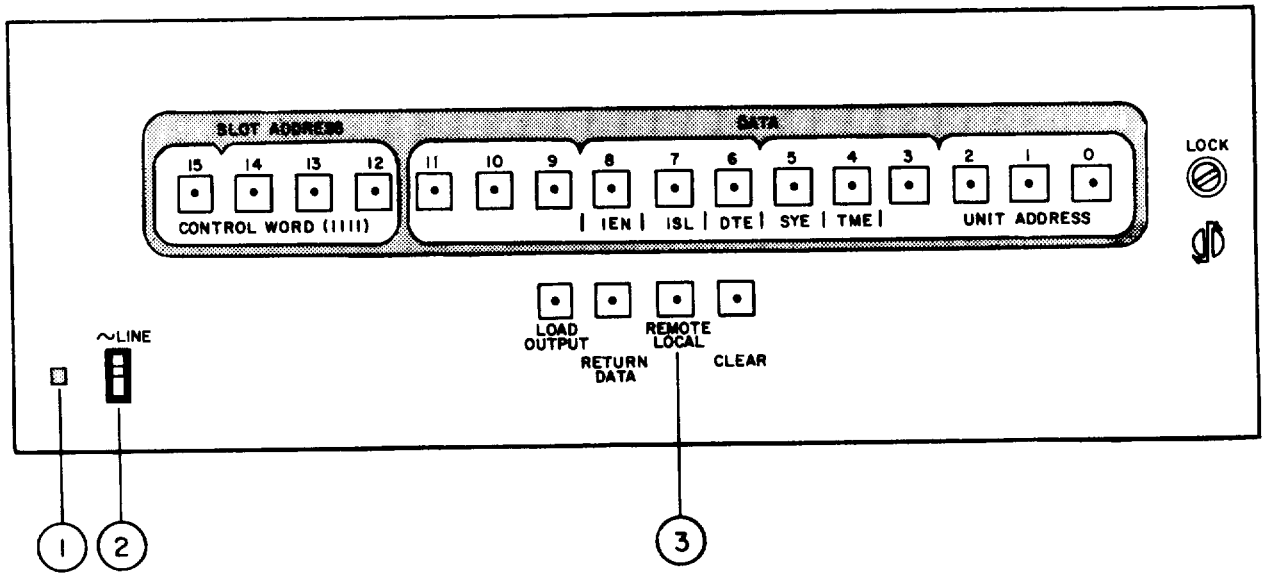


Figure 1-20. Multiprogrammer 2A9 (HP6940B) Controls, Indicators or Connectors

Table 1-17. Multiprogrammer 2A9 (HP694OB) Controls, Indicators or Connectors (Figure 1-20)

Key	Control, Indicators or Connector	Function
1	LINE/ON SWITCH INDICATOR LAMP (Manual activity)	Line/On Switch Indicator Lamp illuminates when the LINE/ON switch is in the ON position.
2	LINE/ON SWITCH (Manual activity)	LINE/ON Switch is in the ON position during remote programming.
3	REMOTE/LOCAL PUSHBUTTON (Manual activity)	In the REMOTE position, the computer has access to the unit. In the LOCAL position, the computer is bypassed through the Bus interface. NOTE The REMOTE/LOCAL pushbutton must be in the REMOTE position in order for the GETS-1000 system to operate.

1.3.3.9 Programmable DC Power Supply (0-60V) 2A10, 2All, and 2A13 (HP6294A) (Figure 1-21)

The Programmable DC Power Supply (0-60V) 2A10, 2A11, and 2A13 (HP6294A) (Figure 1-21) is a remotely programmed power supply which provides an output voltage of O-60VDC at 1 amp. Overload protection provides a current limit for direct shorts. The supply can be operated at either a + or - polarity. Polarity control is provided by programmable switches contained within the Programmable Switch (2A7). Remote programming is controlled by the Computer (1A2) and the Multiprogrammer (2A9) which contains a programmable resistance output card. This card applies the programmed voltage to the Programmable DC Power Supply 0-60V (2A10, 2A11, and 2A13).

The operator must verify during power on operations that the power switch and current control knob are in the correct position.

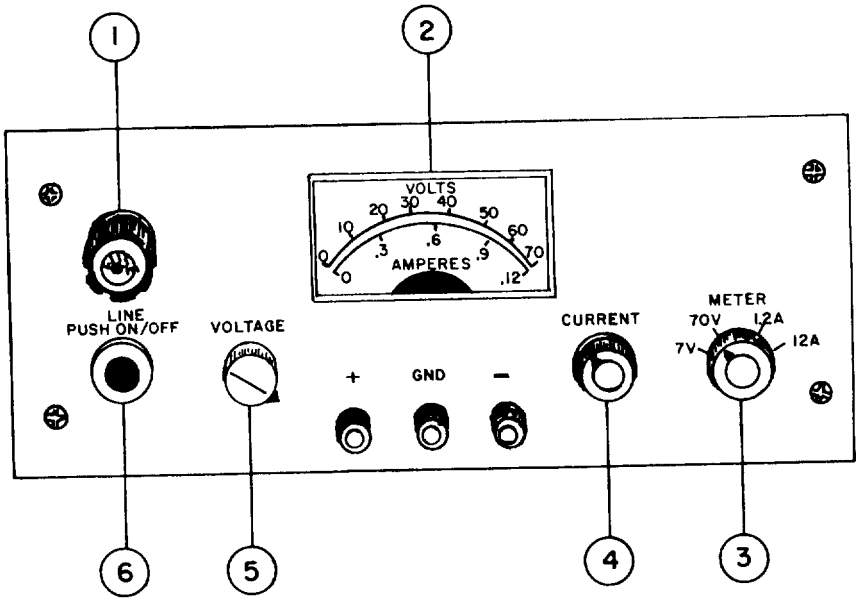


Figure 1-21. Programmable DC Power Supply (0-60V) 2A10, 2A11, and 2A13 (HP6294A) Controls, Indicators or Connectors

Table 1-18. Programmable DC Power Supply (0-60V) 2A10, 2A11, and 2A13 (HP6294A) Controls, Indicators or Connectors (Figure 1-21)

Key	Control, Indicators or Connector	Function
1	LINE FUSE (Manual activity)	Over-current protector.
2	VOLTS/AMPERES METER (Viewing not required)	Indicates voltage or current output.
3	METER FUNCTION SELECT CONTROL (Manual activity)	Selects either 70V/7V on voltage scale or 1.2A/0.12A on ampere scale.
4	CURRENT (Manual activity)	Adjusts course/fine current for manual operation only.
5	VOLTAGE (Programmable control)	Adjusts course/fine voltage level.
6	LINE/ON POWER SWITCH (Manual activity)	Applies power to instrument. Switch shows white center in ON position.

1.3.3.10 Programmable DC Power Supply (0-320V) 2A12 (HP6209B) (Figure 1-22)

The Programmable DC Power Supply (0-320V) 2A12 (HP6209B) (Figure 1-22) is a remotely programmed power supply which provides an output voltage of 0-320VDC at 0.1 amp. Input voltage is 115V/230V at a frequency of 48 to 63Hz. Overload protection provides a current limit for direct shorts. The Programmable DC Power Supply (2A12) can be operated at either a + or a - polarity. Polarity control is provided by programmable switches contained within the Programmable Switch (2A7). Remote programming is controlled by the Computer (1A2) and the Power Supply Programmer (1A3).

The operator must verify during the system power-up procedure that the power switch and current control knob are in the correct position.

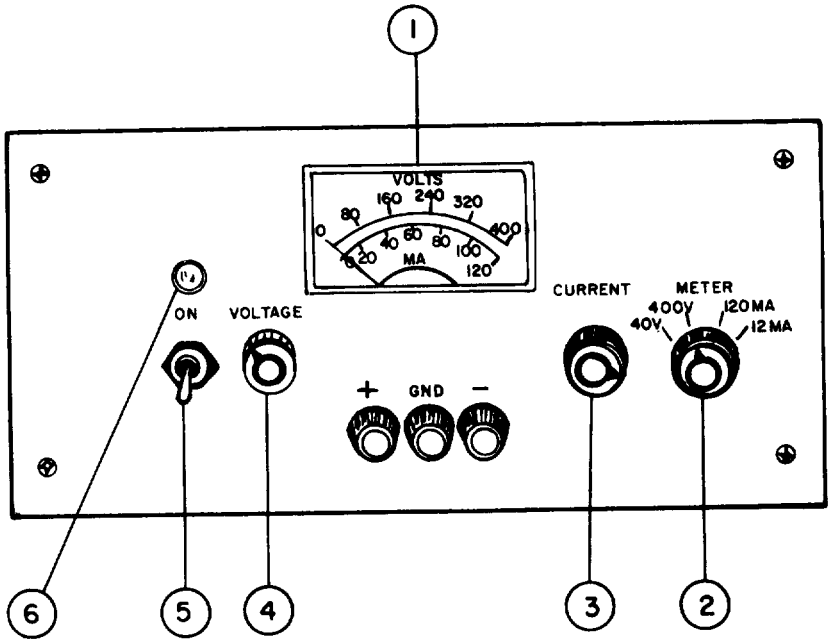


Figure 1-22. Programmable DC Power Supply (0-320V) 2A12 (HP6209B) Controls, Indicators or Connectors

Table 1-19. Programmable DC Power Supply (0-320V) 2A12 (HP6209B) Controls, Indicators or Connectors (Figure 1-22)

Key	Control, Indicators or Connector	Function
1	VOLTS/MILLIAMPERE METER (Viewing not required)	Indicates voltage or current output.
2	METER FUNCTION SELECT CONTROL (Manual activity)	Selects either 400V/40V on voltage scale or 120ma/12ma on milliampere scale
3	CURRENT (Manual activity)	Adjusts course/fine current for manual operation only.
4	VOLTAGE (Programmed control)	Adjusts course/fine voltage level.
5	LINE/ON POWER SWITCH (Manual activity)	Applies power to instrument.
6	LINE POWER INDICATOR LAMP (Manual activity)	Lamp illuminates when power is applied to instrument.

1.3.3.11 Programmable DC Power Supply (0-10V) 2A14 (HP6113A) (Figure 1-23)

The Programmable DC Power Supply (0-10V) 2A14 (HP6113A) (Figure 1-23) is a remotely programmed power supply which provides an output voltage of from 0-I0VDC at 2 amps. Overload protection provides a current limit for direct shorts. The Programmable DC Power Supply (2A14) can be operated at either a + or - polarity. Polarity control is provided by programmable switches contained within the Programmable Switch (2A7). Remote programming is controlled by the Computer (1A2) and the Multiprogrammer (2A9) which contains a programmable resistance output card. This card applies the programmed voltage to the Programmable DC Power Supply (0-10V) 2A14.

The operator must verify, during the power-up procedure, that the power switch and current control knob are in the correct position (Section 2.2).

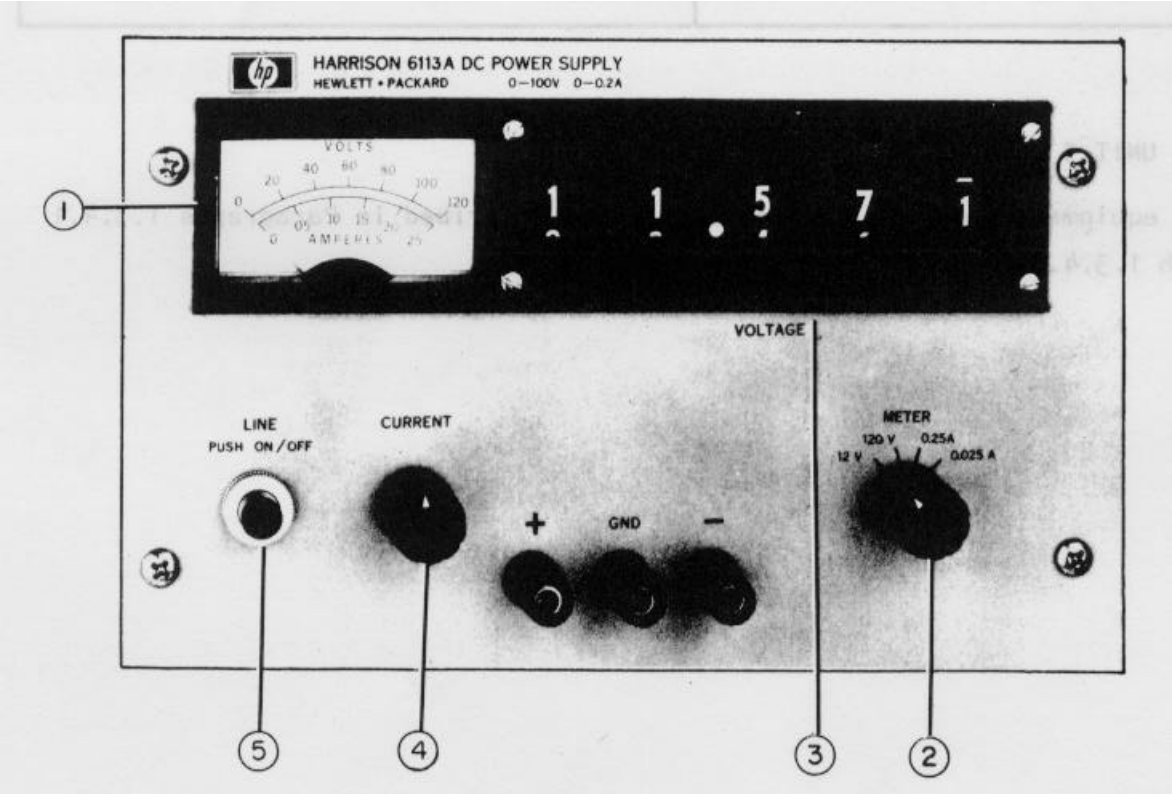


Figure 1-23. Programmable DC Power Supply (0-10V) 2A14 (HP6113A) Controls, Indicators or Connectors

Table 1-20. Programmable DC Power Supply (0-10V) 2A14 (HP6113A) Controls, Indicators or Connectors (Figure 1-23)

Key	Control, Indicators or Connector	Function
1	VOLTS/AMPERES METER (Viewing not required)	Indicates voltage or current output.
2	METER FUNCTION SELECT CONTROL (Manual activity)	Selects either 120V/12V on voltage scale or 0.25A/O.025A on ampere scale.
3	VOLTAGE (Programmed control)	Manual voltage adjustment.
4	CURRENT (Programmed control)	Manual current adjustment.
5	LINE/PUSH "ON"/"OFF" SWITCH (Manual activity)	Applies power to instrument.

1.3.4 UNIT 3 EQUIPMENT

Unit 3 equipment controls and indicators are described in Paragraphs 1.3.4.1 through 1.3.4.5.

1.3.4.1 Pulse Generator (HP8015A) (Figure 1-24)

The 500MHZ Pulse Generator 3A2 (HP8015A) (Figure 1-24) features dual outputs (A and B), each capable of delivering pulses up to 16V in amplitude (or a combined total of 30V when A and B outputs are connected in parallel). Pulse repetition rate, pulse width, and rise and fall times of variable pulse wave shapes are adjustable. The Pulse Generator (3A2) controls are illustrated in Figure 1-24 and described in Table 1-21.

The Pulse Generator (3A2) is remotely controlled by the Computer (1A2) CPU. Except for verifying the proper position of panel controls as part of the test system power-up procedure (Paragraph 2.2), the test operator will not manipulate Pulse Generator (3A2) controls unless directed to do so by a CRT display message as part of the preparation for a PCB/Module test.

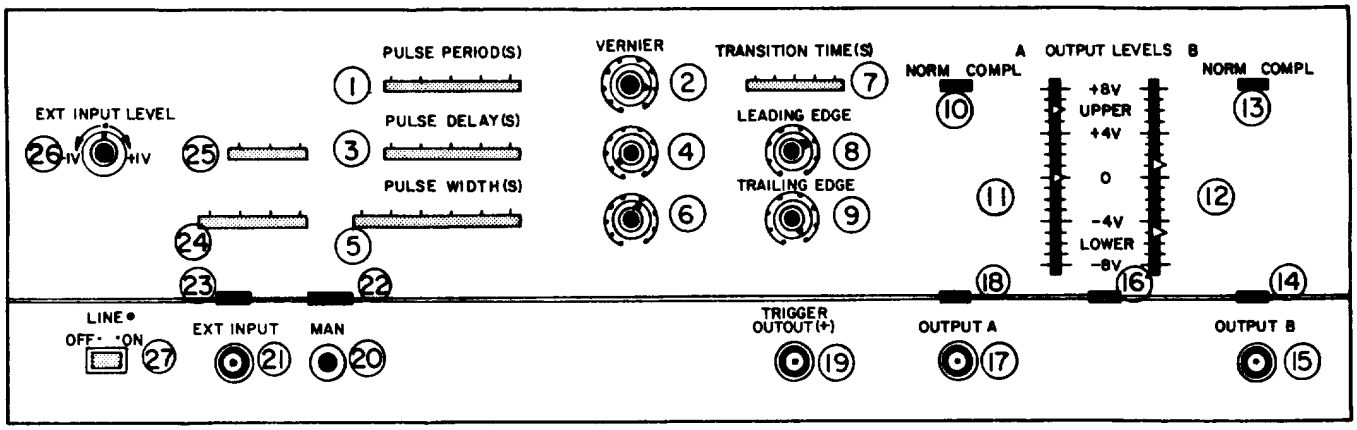


Figure 1-24. Pulse Generator 3A2 (HP8015A) Controls, Indicators or Connectors

Table 1-21. Pulse Generator 3A2 (HP8015A) Controls, Indicators or Connectors (Figure 1-24)

Key	Control, Indicators or Connector	Function
1	PULSE PERIOD SWITCH (Programmed control)	For selecting the range of pulse rate in the NORM, GATE, and BURST mode.
2	PULSE PERIOD VERNIER (Programmed control)	For continuous adjustment of the repetition rate between the limits of the range selected. In the EXT WIDTH mode the rate controls define the frequency of the trigger output pulses only.

Table 1-21. Pulse Generator 3A2 (HP8015A) Controls, Indicators or Connectors (Figure 1-24) (Continued)

Key	Control, Indicators or Connector	Function
3	PULSE DELAY SWITCH (Programmed Control)	Selects the range of pulse delay with respect to trigger output in NORM, GATE and EXT TRIG modes. Selects the range of delay of second pulse with respect to first in DOUBLE PULSE. Selects the range of delay of output B with respect to output A in the B DEL mode.
4	PULSE DELAY VERNIER (Programmed Control)	For continuous adjustment of pulse delay between the limits of the range selected.
5	PULSE WIDTH SWITCH (Programmed Control)	For selecting the range of pulse width and square wave in the NORM, GATE, EXT TRIG and BURST modes.
6	PULSE WIDTH VERNIER (Programmed Control)	For continuous adjustment of pulse width between the limits of the range selected.
7	TRANSITION TIME SWITCH (Programmed Control)	For selecting the range of leading and trailing edge transition times.
8 9	LEADING EDGE and TRAILING EDGE VERNIERS (Programmed Control)	For continuous adjustment of transition times between the limits of the range selected.
10	NORM-COMP SWITCH (Manual Activity)	For selecting normal pulses (leading edge is positive transition) or their complement (leading edge is negative transition) from output A.
11	OUTPUT LEVELS - A (Programmed Control)	Two sliders for setting output pulse levels. Scaling depends on output configuration (A+B/A Sep B and internal and external impedances).
12	OUTPUT LEVELS - B (Programmed Control	Same as A above.
13	NORM-COMP SWITCH (Manual Activity)	Same as 10.

Table 1-21. Pulse Generator 3A2 (HP8015A) Controls, Indicators or Connectors (Figure 1-24) (Continued)

Key	Control, Indicators or Connector	Function
14	Zs -50Ω/1KΩ Switch (Manual Activity)	For selecting source impedance of output B (affects scaling of OUTPUT LEVEL-B sliders).
15	OUTPUT B (Connector)	BNC connector.
16	A + B/A Sep B SWITCH (Manual Activity)	For selecting separate or combined outputs. When outputs combined (A+B) use output A only.
17	OUTPUT A (Connector)	BNC connector.
18	Zs - 50Ω/1KΩ (Manual Activity)	Switch For selecting source impedance of output A (affects scaling of OUTPUT LEVEL-A sliders).
19	TRIGGER OUTPUT (+) (Connector)	BNC connector. Positive trigger pulses present in all modes.
20	MAN PUSHBUTTON (Manual Activity)	For generating external trigger signals when in the GATE, EXT TRIG and EXT WIDTH modes. Effective only when NEG-POS-MAN switch 22 is in the MAN position.
21	EXT INPUT CONNECTOR (Connector)	DC coupled input to which external triggering/gating signals are applied. Input impedance either 50Ω or 500Ω with corresponding maximum input levels of ± 7V or ± 25V, respectively.
22	NEG-POS-MAN SWITCH (Manual Activity)	For selecting the polarity/slope and/or source of external trigger signals. In the POS (slope/polarity) and NEG (slope/polarity) positions, signals are applied to EXT INPUT connector 21.
23	Z_{IN} 50Ω/500Ω Switch (Manual Activity)	Selects input impedance of EXT INPUT.
24	NORM, GATE, EXT,TRIG and EXT WIDTH SWITCH (Manual Activity)	For selecting mode of operation of 8015A.

Table 1-21. Pulse Generator 3A2 (HP8015A) Controls, Indicators or Connectors (Figure 1-24) (Continued)

Key	Control, Indicators or Connector	Function
25	NORM, DOUBLE PULSE, B DEL SWITCH (Manual Activity)	In DOUBLE PULSE 8015A delivers two pulses/trigger output - one in phase with the trigger and one delayed by delay control. In B DEL, the pulse defined by channel A output controls occurs immediately after the trigger output while the pulse defined by channel B output controls occurs after delay controls.
26	EXT INPUT LEVEL CONTROL (Manual Activity)	Defines the threshold level of the external input over a range of +1V to -1V (Z_{IN} - 50Ω) or +10V to -I0V (Z_{IN} - 500Ω).
27	LINE ON-OFF (Manual Activity)	Press-for-on-press-for-off switch.

1.3.4.2 Power Panel 3A3 (GE 47D255695G1) (Figure 1-25)

The Power Panel 3A3 (GE 47D255695G1) (Figure 1-25) contains a circuit breaker which switches 115V, 60 cycle power from the output of the TOPAZ Power Converter (3A7) to the instruments contained within Units 1, 2, and 3. The Power Panel (3A3) contains an over temperature indicator which lights if the system temperature in Unit 1 exceeds 40°C (104°F).

The operator controls the circuit breaker switch as described in Sections 2.2 and 2.3.

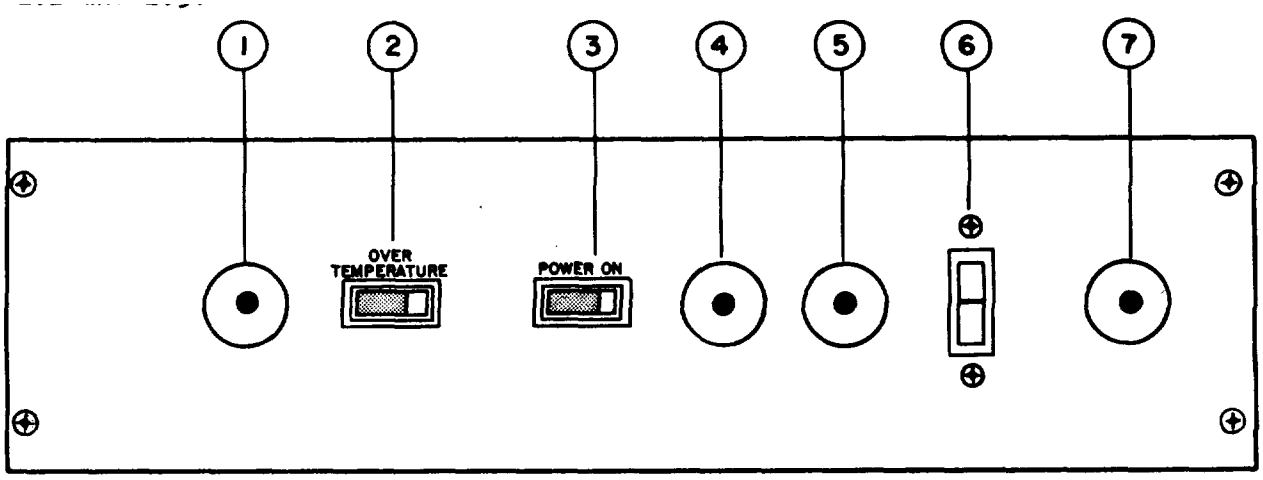


Figure 1-25. Power Panel 3A3 (GE 47D255695G1) Controls, Indicators or Connectors

Table 1-22. Power Panel 3A3 (GE 47D255695G1) Controls, Indicators or Connectors (Figure 1-25)

Key	Control, Indicators or Connector	Function
1	FEED THROUGH PORT	Provides front access for cabling.
2	OVER TEMPERATURE LAMP (Manual activity)	Indicates system over temperature when lit.
3	POWER ON LAMP (Manual activity)	Indicates system is applied to Units 1, 2, and 3.
4	FEED-THROUGH PORT	Provides front access for cabling.
5	FEED-THROUGH PORT	Provides front access for cabling.
6	POWER ON/OFF CIRCUIT BREAKER (Manual activity)	Provides system power to Units 1, 2, 3.
7	FEED-THROUGH PORT	Provides front access for cabling.

1.3.4.3 Programmable Signal Source 3A4 (HP8165A) (Figure 1-26)

The Programmable Signal Source 3A4 (HP8165A) (Figure 1-26) generates sinewaves, triangle waves, ramp waves, square waves and pulses over a frequency range of 1 MHz to 50 MHz. In the GETS-1000 system, this signal source is remotely controlled by the Computer (1A2) CPU during PCB/Module automatic test operations; therefore, the test operator will not be called upon to operate any of the Programmable Signal Source (3A4) controls--except to verify that the LINE ON/ OFF switch is depressed and the green line indicator is lighted whenever power is applied to the GETS-1000 system.

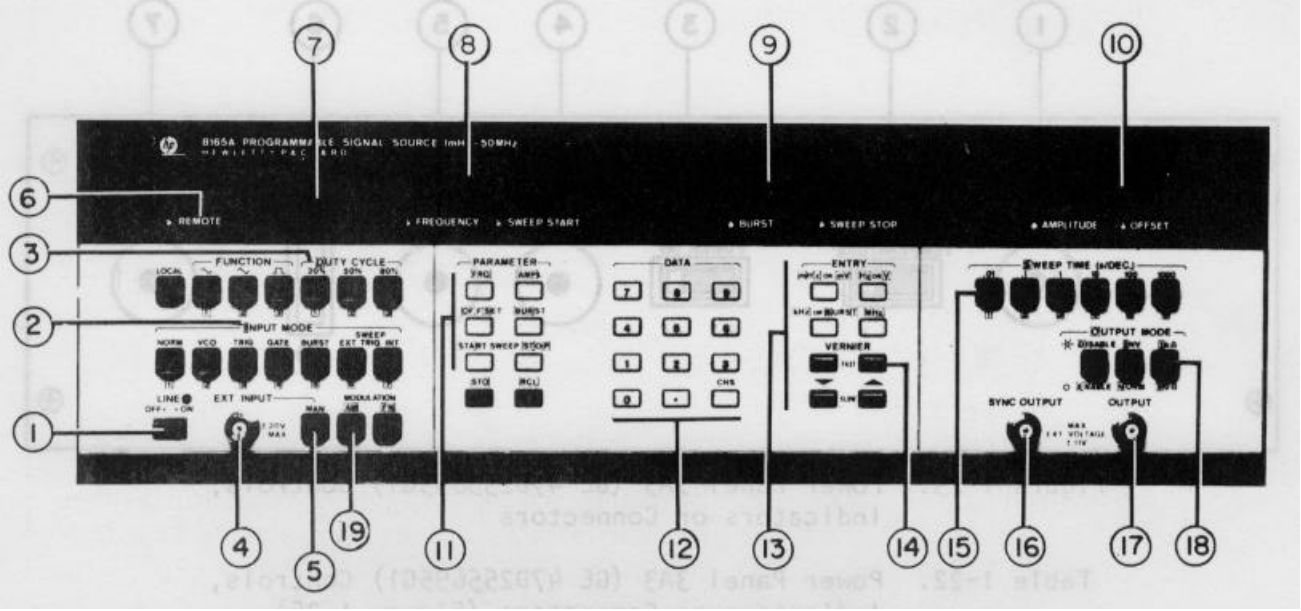


Figure 1-26. Programmable Signal Source 3A4 (HP8165A) Controls, Indicators or Connectors

Table 1-23. Programmable Signal Source 3A4 (HP8165A) Controls, Indicators or Connectors (Figure 1-26)

Key	Control, Indicators or Connector	Function
1	LINE ON/OFF (Manual activity)	Primary AC power switch and indicator.
2	INPUT MODE (Programmed control)	Pushbutton selectors for NORM (continuous), external TRIGger, GATE and triggered BURST modes. Built-in indicator lights when mode selected.
3	FUNCTION and DUTY CYCLE (Programmed control)	Two sets of pushbuttons select output waveform: sine, triangle, square, ramp 20%/80%, pulse 20%/80%.

Table 1-23. Programmable Signal Source 3A4 (HP8165A) Controls, Indicators or Connectors (Figure 1-26) (Continued)

Key	Control, Indicators or Connector	Function
4	EXT INPUT (Connector)	Connector for external signal in VCO, TRIG, GATE, BURST and (option 002 only) SWEEP EXT TRIG modes.
5	MAN (Programmed Control)	Manual trigger for TRIG and BURST modes.
6	REMOTE (Viewing not required)	REMOTE indicator lights when computer system assumes control.
7	ERROR LAMP (Viewing not required)	Indicates operator or program error.
8	4-DIGIT DISPLAY (Viewing not required)	4-digit display for frequency and sweep start. Lamps indicate magnitude and parameter.
9	4-DIGIT DISPLAY (Viewing not required)	4-digit display for burst length and sweep stop.
10	4-DIGIT DISPLAY (Viewing not required)	4-digit display for amplitude and offset voltages.
11 12 13	PARAMETER DATA ENTRY KEYS (Programmed Controls)	PARAMETER, DATA, ENTRY keys for 3-step operation: select parameter, select data, enter magnitude.
14	VERNIER KEYS (Programmed Control)	Allow output frequency, amplitude and offset to be varied after selecting parameter.
15	SWEEP TIME (Programmed Control)	Pushbutton selectors for sweep time Built-in indicators light for selected range.
16	SYNC OUTPUT (Connector)	BNC connector providing SYNC OUTPUT signal.
17	OUTPUT (Connector)	BNC connector providing signal output.
18	OUTPUT MODE (Manual Activity)	Pushbuttons enable/disable output,, selects normal or inverted output, 1 kΩ or 50 Ω source impedance. Built-in indicators light for selected status.
19	MODULATION AM (Programmed Control)	Selects amplitude modulation.

1.3.4.4 Input/Output (1/0) Terminal 3A6 (HP2645A) (Figure 1-27)

The I/O Terminal 3A6 (HP2645A) (Figure 1-27) includes a detachable keyboard and a terminal display assembly using a cathode ray tube (CRT) for displaying Computer (1A2) output and operator input messages. The I/O Terminal (3A6) provides the means for the test operator to receive messages from the Computer (1A2) (via the display assembly), and to communicate with the Computer (1A2) (via the keyboard).

The I/O Terminal (3A6) keyboard controls are described in Paragraph 1.3.4.4.1; the terminal display is described in Paragraph 1.3.4.4.2.

1.3.4.4.1 Terminal Keyboard The detachable terminal keyboard (Figure 1-27) includes the following seven groups of controls:

- Character Set Group
- Numeric Group
- Display Group
- Edit Group
- Device Control and Special Function Group
- Terminal Control Group
- Communications Group

1.3.4.4.1.1 Character Set Group. The character set group (see Figure 1-27) consists of a key set nearly identical to a standard typewriter keyboard. Keys, in this group, are used for entering data (alphabetic letters, punctuation marks, numerals, and some special characters) into the terminal. Although the key set contains both lower-case and upper-case letters, only the upper-case set will be used by the test operator. The lower-case alphabet set will be locked out by a CAPS LOCK key located in the Terminal Control Group section. The CAPS LOCK key has the same effect as pressing the SHIFT key except that the SHIFT key must still be pressed in order to enter the top character on a dual character key; for example, an = sign on the =,- key. The operator will be called upon to enter a limited amount of information into the computer through the terminal keyboard. Such information will include the clock time and date at power-up; an operator log-on code, some in-process test codes; and test frequencies for certain of the PCB/Modules under test. The information is entered as it would be On a standard typewriter. The cursor, which is a blinking dash (-) line that appears on the display, tells the operator where the next character, or space, will occur. The cursor also serves as a pointer. If an error is made in data entered, the BACKSPACE key is pressed until the cursor is positioned under the character that is to be corrected. Once the correction is made, the space bar (below the character set) is pressed until the cursor is correctly positioned to continue entering data.

The RETURN key function is similar to that of a standard typewriter; that is, it returns the cursor to the lefthand margin. The RETURN key may also be used by the operator during GETS-1000 self test and PCB/Module testing to advance the test program following some operator entry on the I/O Terminal (3A6) keyboard. The ECS, TAB, and CNTL keys have special functions and must not be used by the operator.

1.3.4.4.1.2 Numeric Group. The numeric group (see Figure 1-27) consists of a standard adding machine keyboard. These keys have the same function as the numerical keys on the typewriter key set. The operator could use either method of entering numerical data; however, this group is most useful to persons needing to enter great amounts of numerical data into the I/O Terminal (3A6) and who are accustomed to operating an adding machine.

1.3.4.4.1.3 Display Group. The display group keys are not for test operator use. Manipulation of these keys by the operator can cause the CRT memory contents to be altered or destroyed. The display group (see Figure 1-27) includes a key set for controlling the position of data displayed on the CRT and movement of the display cursor. The SET TAB and CLEAR TAB keys have the same function as on a typewriter. The four keys with an arrow on them are used for moving the cursor in the direction indicated by the arrow. The operator does not need these keys to position the cursor; the BACKSPACE and space bar keys on the character set keyboard are sufficient for this purpose. The ROLL UP, ROLL DOWN, CLEAR DSPLY, NEXT PAGE, AND PREV PAGE are used by maintenance/programmer personnel to display and control the I/O Terminal (3A6) memory contents. These keys are not for operator use.

1.3.4.4.1.4 Edit Group. The edit group keys are not for test operator use. Manipulation of these keys, by the operator, can cause the CRT memory contents to be altered or destroyed. The edit group (see Figure 1-27) includes four keys that may be used by maintenance/programmer personnel to delete or add characters or lines of displayed data. These keys should not be used by the operator.

1.3.4.4.1.5 Device Control and Special Functions Group (see Figure 1-27). The device control and special function group includes eight special function keys (f1 through f8), a READ and a RECORD key and a green and a gold device control key. In this group of keys, only the special function keys (f2, f4, f5, f6, and f8) are used by the test operator. Manipulation of other keys in this group can cause the system to malfunction.

1.3.4.4.1.6 Terminal Control Group. In the terminal control group (see Figure 1-27), only the REMOTE, CAPS LOCK, and RESET TERMINAL keys are of concern to the test operator. When in the "down" position, the REMOTE key places the terminal in communication with the Computer (1A2). The REMOTE key should always be in the down position. The CAPS LOCK key should be in the "down" position also. This key locks the typewriter alphabetic key set (but not the dual character keys) in the upper-case position. The RESET TERMINAL key can be pressed by the operator if the terminal does not respond (or echo) when an entry is made. The RESET TERMINAL key should be pressed only once within one-half second.

1.3.4.4.1.7 Communications Group. Controls in this group (see Figure 1-27) are protected by a plastic cover. These controls are set when the I/O Terminal (3A6) is installed in the GETS-1000 system and are not used by the test operator.

1.3.4.4.2 Terminal Display Assembly (see Figure 1-27) The display CRT is used to display operator information instruction messages from the system Computer (1A2), to display results of GETS-1000 system and equipment self tests, and to display test results of I-HAWK system PCB/ Module testing. The CRT has a display capacity of 24 lines of 80 characters per line, or a total of 1920 characters. All operator instructions as well as system self test and PCB/Module test results are displayed on this assembly.

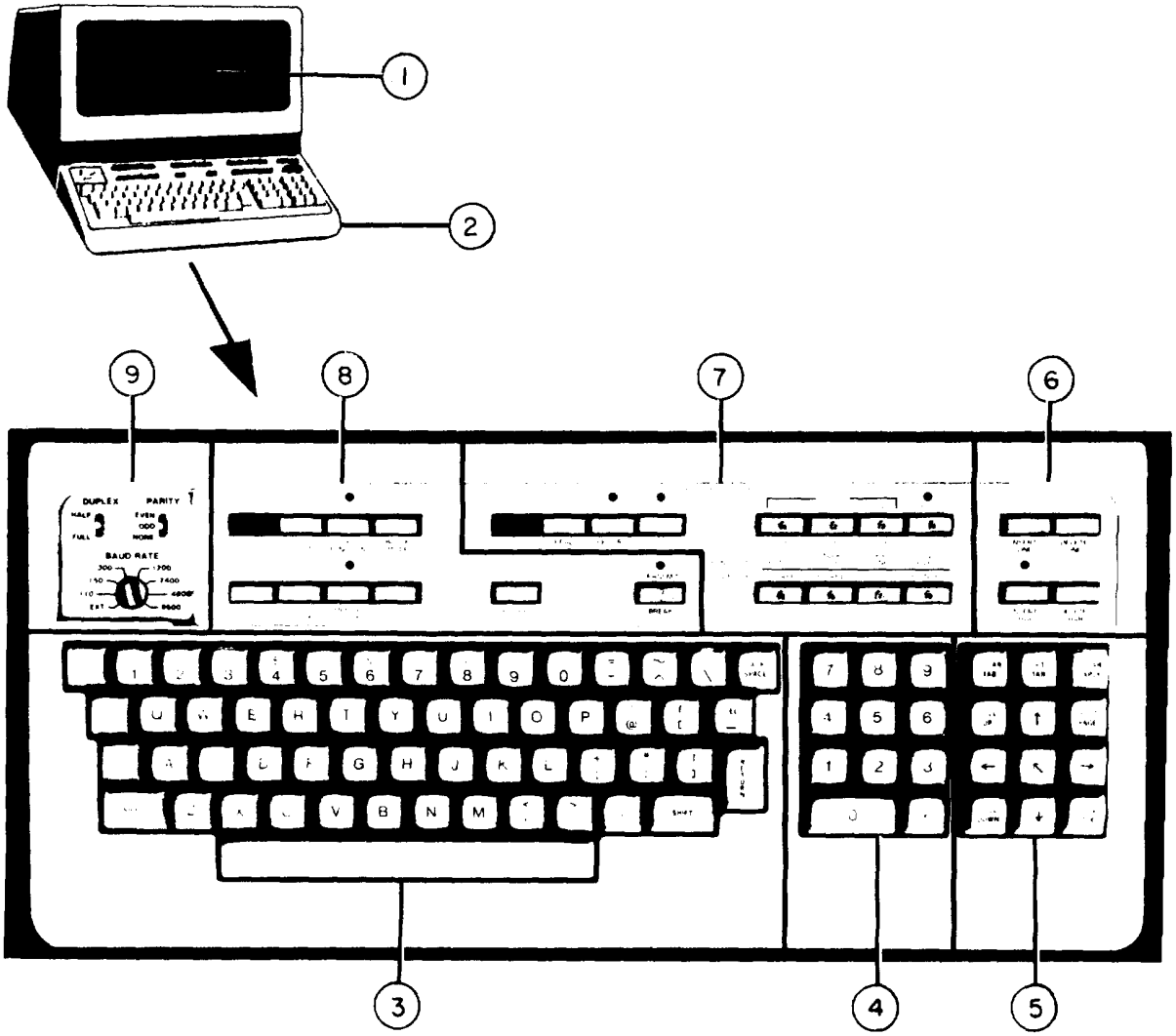


Figure 1-27. Input/Output Terminal 3A6 (HP2645A) Controls, Indicators or Connectors

Table 1-24. Input/Output Terminal 3A6 (HP2645A) Controls, Indicators or Connectors (Figure 1-27)

Key	Control, Indicators or Connector	Function
1	TERMINAL DISPLAY (Viewing required)	The Cathode Ray Tube (CRT) is used in the TERMINAL DISPLAY for displaying computer output messages and operator input messages.
2	TERMINAL KEYBOARD (Manual Activity)	The detachable TERMINAL KEYBOARD includes the following seven groups of controls: (1) Character Set Group, (2) Numeric Group, (3) Display Group, (4) Edit Group, (5) Device Control and Special Function Group, (6) Terminal Control Group, and (7) Communications Group.

Table 1-24. Input/Output Terminal 3A6 (HP2645A) Controls, Indicators or Connectors (Figure 1-27) (Continued)

Key	Control, Indicators or Connector	Function
3	CHARACTER SET GROUP (Manual Activity)	The CHARACTER SET GROUP consists of a key set nearly identical to a standard typewriter keyboard. Keys, in this group, are used for entering data (alphabetic letters, punctuation marks, numerals and some special characters) into the terminal.
4	NUMERIC GROUP (Manual Activity)	The NUMERIC GROUP consists of a standard adding machine keyboard. These keys have the same function as the numerical keys on the typewriter key set. This group is used when entering great amounts of numerical data into the terminal.
5	DI)SPLAY GROUP (Viewing not required)	The DISPLAY GROUP keys ARE NOT FOR TEST OPERATOR USE.
6	EDIT GROUP (Viewing not required)	The EDIT GROUP keys ARE NOT FOR TEST OPERATOR USE.
7	DEVICE CONTROL AND SPECIAL FUNCTIONS GROUP (Manual Activity)	The DEVICE CONTROL AND SPECIAL FUNCTIONS GROUP includes eight special function keys (fl through f8) a READ and RECORD key and a green and gold device control key. Only the special function keys (f2, f4, f5, f6 and f8) are used by the test operator.
8	TERMIINAL CONTROL GROUP (Manual Activity)	In the TERMINAL CONTROL GROUP only the REMOTE, CAPS LOCK and RESET TERMINAL keys are of concern to the test operator.
9	COMMUNCATIONS GROUP (Viewing not required)	Controls in the COMMUNICATIONS GROUP are protected by a plastic cover and are not used by the test operator.

1.3.4.5. Power Converter 3A7 (T3AZ 1647) (Figure 1-28)
The Power Converter 3A7 (TOPAZ 1647) (Figure 1-28) provides 5 KVA of power at a voltage of 115V ± 5% and frequency of 60 Hz ± 5% to the GETS-1000 instruments. The Power Converter (3A7) will operate on input power which has a voltage range of 105 VAC to 125 VAC and a frequency range of 40 Hz at 400 Hz. The unit provides 5 KVA at an efficiency of 70%.

The Power Converter (3A7) is not controlled by the Computer (1A2) and must be manually operated according to the instructions in the power-up (Section 2.2) and shut down (Section 2.3) procedures.

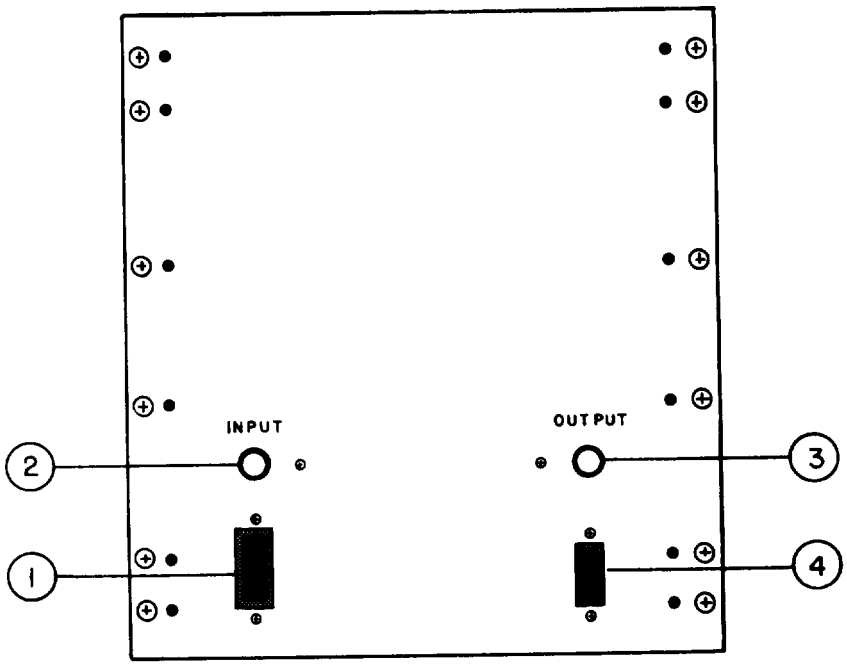


Figure 1-28. Power Converter 3A7 (TOPAZ 1647) Controls, Indicators or Connectors

Table 1-25. Power Converter 3A7 (TOPAZ 1647) Controls, Indicators or Connectors (Figure 1-28)

Key	Control, Indicators or Connector	Function
1	INPUT POWER BREAKER SWITCH (Manual activity)	Applies facility power to Power Converter. (Required facility power is 115 VAC/40-400 Hz.)
2	INPUT POWER INDICATOR LAMP (Manual activity)	Indicator lamp illuminates when the Input Power Breaker Switch is in the ON position.

Table 1-25. Power Converter 3A7 (TOPAZ 1547) Controls, Indicators or Connectors (Figure 1-28) (Continued)

Key	Control, Indicators or Connector	Function
3	OUTPUT POWER INDICATOR LAMP (Manual activity)	Indicator lamp illuminates when Output Power Breaker Switch is in the ON position.
4	OUTPUT ON/OFF POWER BREAKER SWITCH	Provides output power to the Power Panel (3A3). (Manual activity)

1.4 TEST SET SOFTWARE

GETS-1000 software includes the system software, self test programs, and PCB/Module Test Programs.

- System Software

  The system software is comprised of the following:
  - P RTE-IVA operating system (Ref. 2001) modified with Rev. 1940 Multi-Terminal Interface Software (MTIS).
  - HP Real-Time BASIC interpreter.
  - HP Basic Device Subroutine Table Generator.
  - HP Fortran IV Compiler.
  - HP Interactive Text Editor.
  - HP File Manager "Procedure" Files to Guide System Operation.
  - System "Self-Test" Programs.
  - Standard "Survey Test" Program Library for use in PCB/Module testing.
  - I-EEE 488 Bus "Device Subroutine" Library. This library is comprised of those subroutines which control those instruments shown in Figure 1-2 connected to the I-EEE 488 bus.

- Test Equipment Self Test Programs

These programs provide self test capability for the equipment listed in Figure 1-2.

- PCB/Module Test Programs

These programs reside on flexible test program disks. A flexible disk is provided for each of the 72 PCB/Modules. Once a flexible disk is installed in the Flexible Disk Drive (1A9), the test program

is under the Computer (1A2) operating system control. The test program causes the Computer (1A2) operating system to route specified stimuli to the PCB/Module under test. The PCB/Module responds to the stimuli and if the response is within tolerance, testing will continue. If PCB/Module response is not within tolerance, the test program will cause a fail message to be displayed on the I/O Terminal (3A6) display. Operator interaction with PCB/ Module testing is limited to:

1. Selecting the test program flexible disk that corresponds with the PCB/Module to be tested and installing the disk in the Flexible Disk Drive (1A9).

2. Selecting the test 1AB (or test cable) that corresponds with the PCB/Module to be tested.

3. Connecting the PCB/Module to the IAB (or the cable connector to the PCB/Module).

4. Installing the lAB/Module in the Programmable Switch (2A7) ZIF connector (or the test cable to the cable connector).

5. Responding to the display messages that occur in the course of the automatic test. Messages to the operator include a fail message if the GETS-1000 test equipment fails the survey self test, or if the PCB/Module under test fails any portion of the overall test; an operator command, if the operator must manually adjust a GETS-1000 instrument control or PCB/ Module active component; and instructions for disconnecting the items connected in Steps 1 through 4 above.

SECTION 2

GETS-1000 SYSTEM OPERATION

2.1 GENERAL

This section provides a test system power-up procedure, system self test procedure, test procedures for the 72 PCB/Modules, and a system shutdown procedure. The GETS-1000 system includes three equipment consoles, designated Unit 1, Unit 2, and Unit 3 (see Figure 2-1). Each of these three units, as well as each panel contained in these units, has been assigned a reference designator as an aid to identifying a particular assembly or component within the total test system. The first panel in Unit 1 becomes 1A1; the second panel becomes 1A2, etc. These designators appear on the panel faces along with the equipment name, manufacturer's name, and model number. As an aid to the test system operator in quickly locating equipment panels referenced in the procedures, procedural steps identify the equipment designator as well as the equipment name, manufacturer, and model number.

2.2 GETS-1000 SYSTEM POWER-UP PROCEDURE

The system power-up procedure (Table 2-1) includes the setting of switches and controls required to place the test system on line, and verification of the status of switches, controls, and indicators which should remain in the operating mode when the test system power is switched off. Because the position of switches and controls could be changed during a maintenance procedure, or mistakenly changed by the operator, verification of switch and control positions makes up a major part of the power-up procedure. By comparison, the test system shutdown procedure is very short since only the disconnection of electrical power to the test system is required.

The power-up procedure (Table 2-1) includes five columns. The first column identifies the procedural step number; the second column identifies the system unit, and, as applicable, the panel reference designator, equipment name, manufacturer, and equipment model number. Column three states the action to be taken, and column four describes the results that should be achieved. Column five identifies the corrective action to be taken by the operator if the proper result is not achieved.

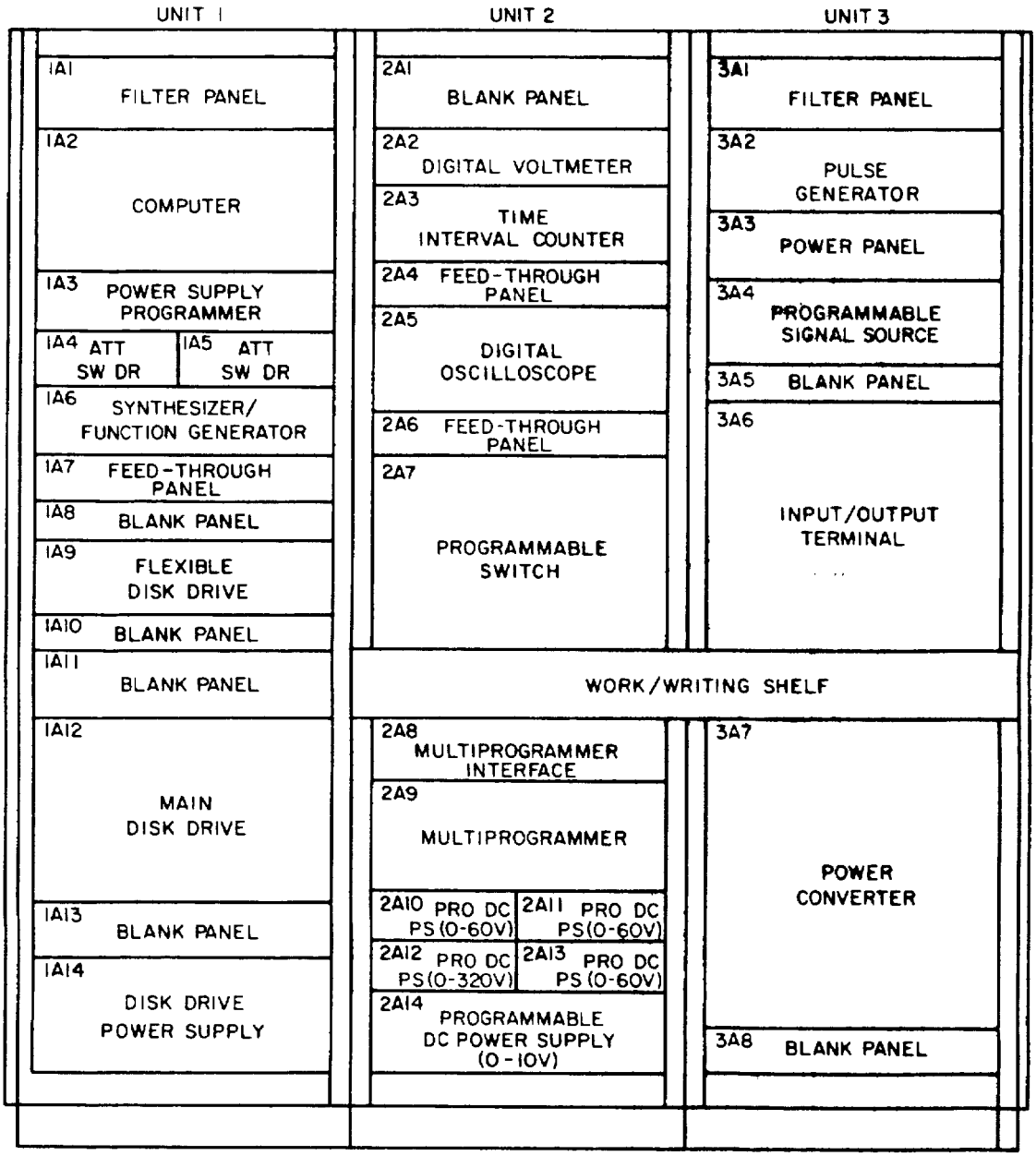


Figure 2-1. GETS-1000 System Equipment Designators

Figure 2-2 is located at the end of the power-up procedure and is provided as an aid to the operator in familiarizing himself with the location of the various GETS-1000 equipment panels and controls identified in the system power-up and system shutdown procedures. The numerals on Figure 2-2 point out the equipment referred to in the corresponding procedural steps. The uncircled numerals relate to the power-up procedure; circled numbers relate to the shutdown procedure.

Table 2-1. GETS-1000 System Power-Up Procedures

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
1 (NOTE)	Units 1, 2, and 3	Set room temperature not greater than 85°F and not greater than 50% humidity. **CAUTION** **To help insure the operational readiness of the GETS-1000 system, keep the system facility clean and airborne dust or other contaminants at the lowest possible level. Keep rear cabinet doors closed.** **NOTE** **If room (facility) temperature or humidity exceeds the levels noted above, the GETS-1000 system may not operate satisfactorily. Bring facility temperature and humidity to acceptable**	Room temperature not greater than 85°F and not greater than 50% humidity.	If room temperature or humidity is not within acceptable limits, bring the room temperature and humidity to acceptable levels and allow equipment temperature to stabilize for 10 minutes before continuing with the power-up procedure.

NOTE: Step numbers are keyed to uncircled numbers on Figure 2-2.

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
1 Units	1, 2 and 3	**NOTE levels and allow equipment tempera- ture to stabilize before continuing with the power-up procedure.**		

NOTE

The GETS-1000 system requires approximately 1 hour warmup time after initial power-up. This time is required for the various instruments and equipment to stabilize. The system should remain on-line if testing is planned within a 12-hour time period

CAUTION

Verify that Unit 3 Power Panel (3A3) power switch is in the OFF position before beginning the power-up procedure. Damage to test system equipment could occur if some equipment controls are improperly positioned when power is initially applied to the system.

NOTE

Check for installation of flexible disk.

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
2	Unit 3 Power Panel 3A3 (GE 47D255695G1)	Verify that Power Panel (3A3) power switch is in the OFF position.		
3	Unit 3 Power Con- verter 3A7	1. Set INPUT power switch to the up position. not light.	Yellow INPUT indicator lighted.	Notify support maintenance if INPUT indicator does
	(Topaz 1647)	2. Verify that OUTPUT power switch is in the up position. **NOTE** **Normally the OUTPUT power switch will remain in the up position and the INPUT power switch will be used to connect and dis-connect power to the the GETS-1000 system.**	Green OUTPUT indicator lighted.	If OUTPUT indicator does not light, verify that INPUT power switch is in the up position. If the fault persists, notify support maintenance.
4	Unit 1 Flexible Disk Drive 1A9 (HP9885M)	Set 0/1 AC line switch to 1. **NOTE** **The 0/1 AC line switch should remain in the 1 position when system is shut down.**	Line switch is set to 1.	

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
5	Unit 1 Disk Drive Power Supply 1A14 (HP13215A)	Verify that POWER ON/OFF switch is set to ON. **NOTE** **The Disk Drive Power Supply (1A14) POWER ON/ OFF switch should remain ON when system is shut down.**	Power ON/OFF switch set to ON.	
6	Unit 1 Main Disk Drive 1A12 (HP7900A)	Set LOAD/UNLOAD toggle switch to the LOAD position.		
7	Unit 2 Programmable DC Power Supplies 2A10O, 2All and 2A13 (HP629L4A)	1. Verify that METER selector, on all three power supplies, is in the 70V position. **CAUTION** **The METER selectors should remain in the 70V position when system is shut down. The Power Supply meters could be damaged if the METER selector is not in the 70V posi- tion when system power is applied.**	Meter selector switches in the 70V position.	

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
7	Unit 2 Programmable DC Power Supplies 2A10O, 2A11 and 2A13 (HP6294A) (Continued)	2. Verify that LINE pushbutton switch is on (shows white center). Press pushbutton switch if center of button is black. **NOTE** Power supply LINE pushbutton switches should remain on when GETS-1000 system is shut down.	LINE button shows white center.	
8	Unit 2 Programmable DC Power Supply 2A12 HP6209B)	1. Verify that METER selector is in the 400V position. **CAUTION** **The power supply meter could be damaged if the METER selector is not in the 400V position when system power is applied.** 2. Verify that panel toggle switch is set to ON.	METER selector in the 400V position. Toggle switch ON.	

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
8	Unit 2 Programmable DC Power Supply 2A12 (HP6209B) (Continued)	**NOTE** **METER selector should remain at the 400V position, and the toggle switch in the ON position when system is shut down.**		
9	Unit 2 Programmable DC Power Supply 2A14 (HP6113A)	1. Verify that METER selector is in the 12V position. **CAUTION** **The power supply meter could be damaged if the METER selector is not in the 12V position when GETS-1000 system power is applied.**	METER selector in the 12V position.	
		2. Verify that LINE push-button switch is on (shows white center). Press pushbutton switch if center of pushbutton is black.	LINE pushbutton shows white center.	

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
9	Unit 2 Programmable DC Power Supply 2AI4 (HP6113A) (Continued)	**NOTE** The METER selector should remain in the 12V position and the LINE pushbutton switch should remain on when GETS-1000 system is shut down.		
10	Unit 3 Input/Output (I/O) Terminal 3A6 (HP2645)	Verify that REMOTE and CAPS LOCK keys on 1/0 Terminal (3A6) are in the down position **NOTE** **The REMOTE and CAPS LOCK keys should remain in the down position when GETS-1000 system is shut down.**		
11	Unit 3 Power Panel 3A3 (GE 47D255695G 1)	**Apply power to the computer system, instruments and power supplies by setting Power Panel (3A3) power switch to the ON position**. **CAUTION** **If OVER TEMPERATURE indicator is lighted, verify that all three cabinet**	Power Panel switch ON; yellow POWER ON indicator lighted.	If POWER ON indicator does not light, verify that step 3 was performed. If fault persists, notify support maintenance.

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
11	Unit 3 Power Panel 3A3 (GE 47D255695G1) (Continued)	ventilating fans are running. If OVER TEMPERATURE indicator is still lighted, set Power Panel (3A3) switch to OFF. Then open Unit 1 rear cabinet door and check setting of fan system thermostat located at top (1A2 level) of cabinet. Theremostat should be set at 100°F. If thermostat is set below 100°F, reset to proper setting then repeat step 11. If OVER TEMPERATURE indicator still lights, allow system to cool down (lower facility temperature) before proceeding with power-up procedure.		

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
11	Unit 3 Power Panel 3A3 (GE 47D255695G1) (Continued)	**NOTE** **Once the power switch on Power Panel (3A3) has been set to ON, several indicators on the test system panels will either light momentarily and then stay out; flash for a few seconds and then go out, or remain lighted. Note that the I/O Terminal (3A6) CRT displays TERMINAL READY a few seconds after power is switched on. If the system power-up was normal; that is, no malfunctions occurred during power-up and all equipment controls were properly positioned before power was applied, the conditions identified in steps 12 through 25 should exist after approximately 1 minute.**		

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
12	Unit 1 Computer 1A2 (HP2113E)	Verify that the following indicators light and remain lighted within minute after system power is applied (Step 11): • RUN/HALT • INTERRUPT • S/S		1. If computer indicators 15, 14, 9 and 6 are lighted, verify that the HP7900A Disk Drive (1A12) green DRIVE POWER indicator and WHITE DRIVE READY are lighted. If not lighted, set power switch on Power Panel (3A3) to OFF and then repeat steps 5 and 6. Then power-up system and recheck computer indicators after 1 minute. Notify support maintenance if fault persists. 2. If no indicators on the computer light, use key to open computer panel and check position of computer POWER switch. POWER switch should be set to the right. If indicators still do not light after setting POWER switch to the right, notify support maintenance.

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
12	Unit 1 Computer 1A2 (HP2113E) (Continued)			3. If the following computer panel indicators are lighted, • OVERFLOW • POWER FAIL • T/t use key to open computer panel and check position of LOCK/OPERATE switch. If the LOCK/OPERATE switch is in the OPERATE position, set it to the LOCK position. Switch system power OFF momentarily then recheck computer indicators after 1 minute. If the computer RUN/HALT, INTERRUPT and S/s indicators still do not light, notify support maintenance.
13	Unit 3 Input/Output (I/O) Terminal 3A6 (HP2645)	1. Verify that transmit indicator is lighted. 2. Verify that remote and CAPS/LOCK switches are in the down position.		Notify support maintenance if TRANSMIT indicator does not light.

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
14	Unit 1 Main Disk Drive 1A12 (HP7900A)	1. Green DRIVE POWER indicator lighted. 2 White DRIVE READY indicator lighted (this indicator lights approximately 30 seconds after system power is applied). 3. PROTECT U.D. and PROTECT L.D. indicator not lighted.		Notify support maintenance if green DRIVE POWER indicator did not light. Notify support maintenance if white DRIVE READY indicator did not light within 1 minute after system power is applied. Notify support maintenance if PROTECT U.D. or PROTECT L.D. indicator is lighted.
15	Unit 1 Flexible Disk Drive 1A9 (HP9885M)	Green LINE indicator lighted.		Notify support maintenance If green LINE indicator did not light.
16	Unit 3 Pulse Generator 3A2 (HP8015A) switch.	1. Verify that LINE indicator is lighted. If not lit, press LINE OFF/ON pushbutton 2. Verify that NORM/DOUBLE PULSE PULSE/B DEL switch is in NORM position.	White LINE indicator lighted.	Notify support maintenance if LINE indicator did not light.

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
16	Unit 3 Pulse Generator 3A2 ((HP8015A) (Continued)	3. Verify that NORM/GATE EXT TRIG/EXT WIDTH is in NORM position. 4. Verify that Zin 50Ω/ 500Ω switch is in the 500Ωposition. 5. Verify that NEG/POS/MAN switch is in the POS position. 6. Verify that RATE (Hz) PULSE PERIOD (S) REM/20n/lμ/.1m/10m/1 switch is in the REM position. 7. Verify that PULSE DELAY (S REM/20n/lμ/.1m 10m/1switch is in the REM position. 8. Verify the PULSE WIDTH (S) REM/SQ/10n/1μ/.1m 10m/1 switch is in the REM position. 9. Verify that TRANSITION TIME (S) REM/6n/.5Ω/ 50μ/5m/0.5 switch is in the REM position.		

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
16	Unit 3 Pulse Generator 3A2 (HP8015A)) (Continued)	10. Verify that NORM/COMPL switch in both OUTPUT A and B are in the NORM position. 11. Verify that Zs 50Ω/1kΩ switch in both OUTPUT Aand B are in the 50Ω position. 12. Verify that A+B/A Sep B switch is in the A Sep B position. **NOTE** **All switches should remain in the positions set in steps 1 through 12 above when the system is shut down. All functions of the Pulse Generator are under program control when panel switches are set as indicated in steps 1 through 12 above.**		

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
16	Unit 3 Pulse Generator 3A2 (HP8015A) (Continued)	**NOTE** **If the operator is required to manipulate any of the Pulse Generator (3A2) controls during PCB/ Module testing, he will be so directed by a CRT message.**		
17	Unit 3 Programmable Signal Source 3A4 **(HP8165A)**	Verify that LINE indicator is lighted. If not lit, press LINE OFF/ON push-button switch. **NOTE** **The LINE OFF/ON switch should remain ON when the GETS-1000 system is shut down.**	Green LINE indicator lighted. **NOTE** **All indicators may flash when power is first applied.**	Notify support maintenance if LINE indicator did not light.
18	Unit 2 Digital Voltmeter 2A2 (HP3455A)	Verify that display is lighted. If not, press LINE OFF/ON pushbutton switch.	Display lighted; some indicators lighted. **NOTE** **All indicators may flash when power is first applied.**	Notify support maintenance if display did not light after pressing LINE OFF/ON pushbutton.,

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
18	Unit 2 Digital Voltmeter 2A2 (HP3455A) (Continued)	NOTE The LINE OFF/ON switch should remain ON when the GETS-1000 system is shut down.		
19	Unit 2 Time Interval Counter 2A3 (HP5370A)	1. Verify that display is lighted. If not, press LINE STBY/ON pushbutton switch.	Display lighted; some indicators lighted. **NOTE** **All indicators may flash when power is first applied.**	Notify support maintenance if display did not light after pressing LINE STBY/ON pushbutton.
		2. Set two 50Ω/1MΩ switches on INPUTS panel to 1MΩ.	Two 50Ω/1MΩ switches in the 1MΩ position.	
		3. Set two ÷/1/÷10 witches on INPUTS panel to ÷10. **NOTE** **Switches identified in 1, 2, and 3 above should remain in the position indicated when the test system is shut down.**	Two ÷1/÷10 switches In the ÷10 position.	

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
20	Unit 2 Digital Oscilloscope 2A5 (Nicolet 2090-3A)	1. Verify that red POWER indicator switch is lighted. If not, press POWER switch. 2. Verify that MEMORY switch is in the ALL position.	Red POWER indicator lighted.	Notify support maintenance if POWER indicator did not light.
21	Unit 20 Multi- programmer Interface 2A8 (HP59500A))	Verify that ~LINE/ON indicator is lighted. If not, press ~LINE/ON switch. **NOTE** **~LINE/ON switch should remain on when test system is shut down.**	Amber ~LINE/ON indicator lighted. not light.	Notify support maintenance If ~LINE/ON indicator did
22	Unit 2 Multi- programmer 2A9 (HP6940B))	Verify that ~LINE/ON indicator is lighted. If not, press ~LINE/ON switch. **NOTE** **The ~LINE/ON switch should be left on when the GETS-1000 system is shut down.**	Amber ~LINE/ON indicator lighted.	Notify support maintenance if ~LINE/ON indicator did not light.

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
23	Unit 1 Power Supply Programmer 1A3 (HP59501A)	Verify that green ON indicator is lighted. **NOTE** **Indicator should be lighted whenever system power is applied through Power Panel 3A3.**	Green ON indicator lighted.	Notify support maintenance if green ON indicator is not lighted.
24	Unit 1 Attenuator/ Switch Driver CD 1A4 and 1A5 (HP11713A)	On both units, verify that LINE OFF/ON switch is in the ON position (green indicator lighted).	Green ON indicator lighted.	Notify support maintenance if green ON indicator did not light.
25	Unit 1 Synthesizer/ Function Generator 1A6 (HP3325A)	1. Verify that display is lighted. If display is not lighted, press POWER pushbutton. **NOTE** **POWER pushbutton should remain on depressed) when the test system is shut down.**	Notify support maintenance if display did not illuminate.	

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
25	Unit 1 Synthesizer/ Function Generator 1A6 (HP3325A) (Continued)	2. Verify that red indicator in SIGNAL switch is not lighted. If red indicator is lit, depress switch and verify that indicator goes out. **CAUTION** **Unless called for by a PCB/Module test procedure, the SIGNAL switch indicator should not be M lighted. Operation with the indicator lighted could damage the equipment.**		If red SIGNAL indicator cannot be extinguished, notify support maintenance.
26	Unit 3 I/O Terminal 3A6 (HP2645A)	1. The following SYSTEM BOOT UP message is displayed on I/O terminal. Follow message instructions. ----------**SYSTEM BOOT UP**---------- **WAIT 2 MINUTES FOR THE DISK PACKS TO WARM UP** **CAUTION** **Do not handle self test flexible disk unless you are completely familiar with the disk handling and storage instructions contained in section II of the operator's manual .** **WHILE WAITING, INSERT THE "SELF TEST" FLEXIBLE DISK INTO THE 1A9 FLEXIBLE DISK DRIVE(BR9885)** **SECURE THE LATCH** **WHEN READY PRESS THE "GO" KEY (f5) TO PROCEED.**	Operator installs self-test flexible disk in Flexible Disk Drive (1A9), then presses GO key (f5).	If a TERMINAL READY message is displayed rather than the SYSTEM BOOT UP message, repeat step 11 then interrupt power momentarily at computer panel. To interrupt power, use key to open Computer Panel (1A2) door and switch POWER switch OFF momentarily. If SYSTEM BOOT UP message still does not appear, notify support maintenance.

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
26	Unit 3 I/O Terminal 3A6 (HP2645A) (Continued)	2. The following messages will appear sequentially, with the previous messages rolling up on the screen to make room for succeeding messages. The operator must enter a response, via the keyboard, when prompted by a display command and then press RETURN key. If an error is made in the entry string, use the BACKSPACE key to return cursor to the space where the entry error was made, then re-enter response before pressing RETURN.		**CAUTION** **Do not press function keys (f1 through f8) more than once in rapid succession. If keys are pressed repeatedly, program execution becomes unpredictable and the system may lock up.**

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
26	Unit 3 I/0 Terminal 3A6 (HP2645A)	SET TIME BY ENTERING DATE AS MO/DA/YR# --/--/-- AND ENTERING TIME AS HR:MM --:-- SYSTEM DATE AND TIME ARE --- -- --- ---- . . . . . BEGIN INITIALIZATION . . . . INITIALIZATION COMPLETE . . . PLEASE LOG ON: LOG ON T=01 --- -- --- ---- --:-- :-- 3. The operator "logs on" by entering the word "Test" when prompted by the message PLEASE LOG ON. Then press RETURN to get the following message:	Date, for example 06/10/80, entered and RETURN key pressed Time, for example 09:15, entered and RETURN key pressed. System displays date and time; for example: TUE 10 JU 1980 08:15:00 Operator enters log-on code word "Test". Operator presses GO key (f5) begin self test.	If entry error is made, press BACKSPACE key until cursor is under space where first entry error was made. Then re-enter response.

Table 2-1. GETS-1000 System Power-Up Procedures (Continued)

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
27	Units 1, 2, and 3 Cabinet Ventilating Blowers	Verify that all three cabinet ventilating blowers are operating.		Notify support maintenance if all blowers are not operating.

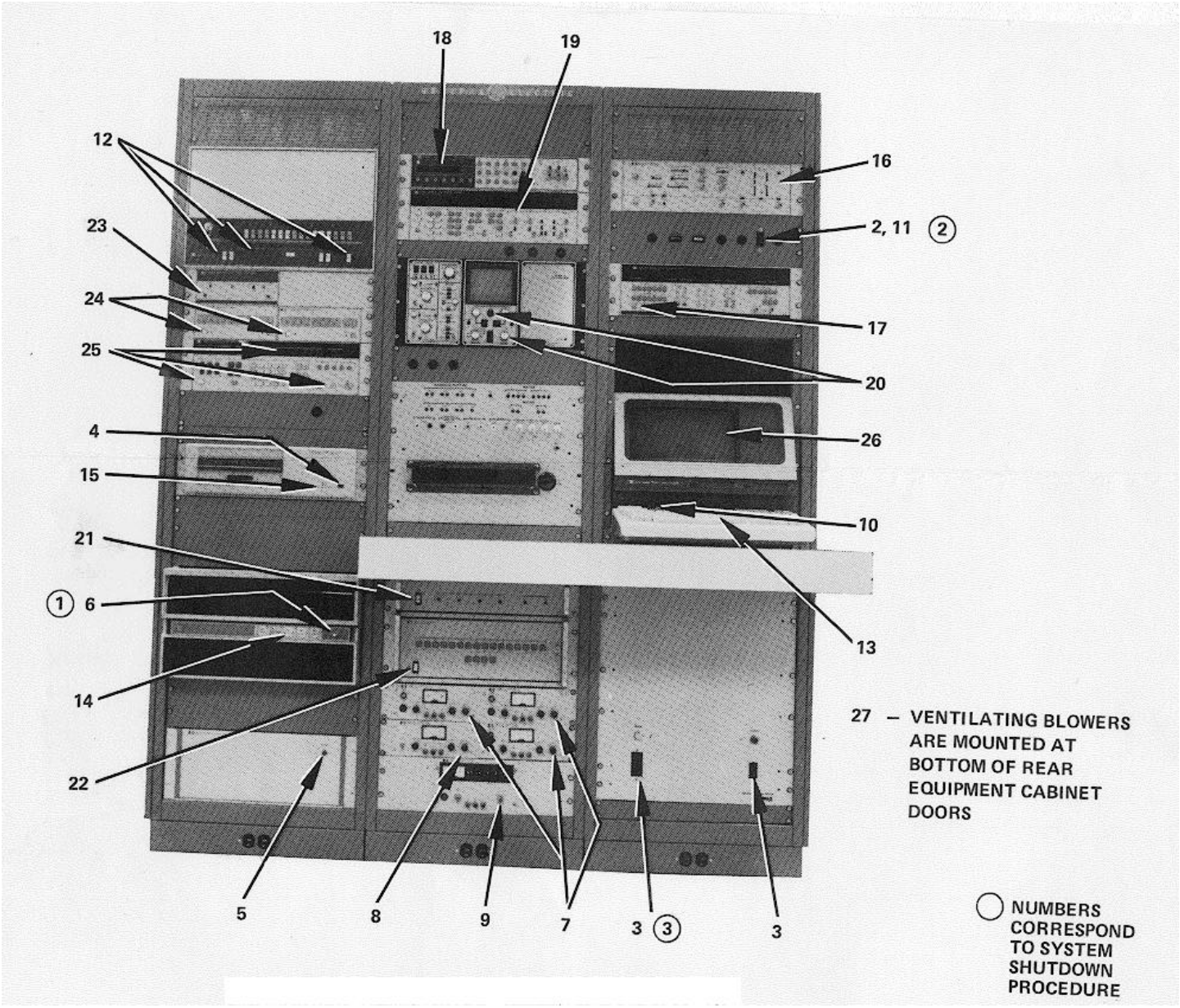


Figure 2-2. GETS-1000 Equipment Controls

2.3 GETS-1000 SYSTEM SHUTDOWN PROCEDURE

The system shut down procedure is given in Table 2-2, which is presented in the same format as Table 2-1, GETS-1000 Power-Up Procedure. As shown in Table 2-2, only two power supply switches need to be deenergized to shut down the system.

2.4 GETS-1000 SYSTEM SELF TEST

The GETS-1000 system self test procedure is utilized by both the test operator and support maintenance personnel. The test operator may initiate the system self test after he has powered up the system to verify that all system equipment will respond properly when PCB/Module testing commences. Maintenance personnel will use the system self test procedure when performing system diagnostic troubleshooting, and post repair checkout.

2.4.1 SCOPE OF GETS-1000 SELF-TEST

The GETS-1000 test system must be functionally capable of supplying, within tolerance, specified test stimuli to each of the PCB/Modules and measuring PCB/ Module response to the test stimuli in order to establish the functional status of PCB/Modules. The objective of the GETS-1000 self test is that of determining if the system is functionally ready to test the PCB/Modules.

The GETS-1000 system self test is segmented into the following three parts:

1. Computer System Self Test

    - Memory Test
    - Instrument Bus Test
    - Disk Media Test

2. Instrumentation Self Test

    - Digital Voltmeter 2A2 (HP3455A)
    - Time Interval Counter 2A3 (HP5370A)
    - Digital Oscilloscope 2A5 (Nicolet 2090-3A)
    - Synthesizer/Function Generator 1A6 (HP3325A)
    - Programmable Signal Source 3A4 (HP8165A)

Table 2-2. GETS-1000 System Shutdown Procedure

STEP	UNIT/ COMPONENT	ACTION	RESULT/VERIFICATION	REMARKS/CORRECTIVE ACTION
(1) **(NOTE)**	Unit 1 Main Disk Drive 1A12 (HP7900A)	Set LOAD/UNLOAD toggle switch to the UNLOAD position. **CAUTION** **If system power is disconnected before Disk Drive LOAD/ UNLOAD switch is switched to UNLOAD, the disk drive head may not retract, which could cause the head to touch the disk surface thus resulting in a "crash"that could render the GETS-1000 system inoperable.**	Disk drive toggle switch in the UNLOAD position.	
(2)	Unit 3 Power Panel 3A3 (GE47D255695G1)	Set power switch to OFF.	Yellow POWER ON indicator goes out.	
(3)	Unit 3 Power Converter 3A7 (Topaz 1647)	Set INPUT power switch to the down position.		

NOTE: Step numbers are keyed to circled numbers on Figure 2-2

3. Total System Self Test

- Programmable Switch Test 2A7 (GE 47E255678G2)
- System Verification Test (system signals are routed through .Programmable Switch (2A7).

Test operator interaction with the GETS-1000 system during a normal self test procedure is limited to the following:

- Installing the self test flexible disk.
- Making notes of any GETS-1000 equipment that failed the self test.
- Installing the self test adapter board when directed to do so by a display message.
- Pressing the GO key (I/O Terminal (3A6) function key f5) at conclusion of each of the three self test segments (after having. noted any equipment failures).
- Pressing the ABORT key (I/O Terminal (3A6) function key f8) when so directed by a display command, or whenever the abort option is offered on the display and the operator desires to discontinue (or restart) the self test.

Three categories of GETS-1000 system error messages (either operator or machine induced) could be displayed on the I/O Terminal (3A6) CRT when the operator conducts the GETS-1000 self test: (1) Computer (1A2) operating system software error messages, (2) instrumentation system software error messages, and (3) 1/O Terminal (3A6) software error messages. Recovery from system problems represented by these error messages is frequently possible but requires operator interaction beyond that required during a normal self test procedure. The three categories of software system errors, together with possible recovery techniques, are discussed separately in Paragraph 2.6. The test operator should become familiar with the error message types and the recovery techniques before attempting to operate the GETS-1000 system.

2.4.2 SELF TEST PROCEDURE

The GETS-1000 system self test procedure can be initiated by the test operator a
in any of the following situations:

- Upon completion of the GETS-1000 system power-up procedure. The system is designed to prevent the test operator from starting a PCB/Module test until the GETS-1000 equipment has been self tested.
- Upon completion of a PCB/Module test procedure. The operator will be presented a "menu" on the I/0 Terminal (3A6) CRT which allows him to select either the system self test or another PCB/Module test.
- Whenever the CRT display message offers the option of continuing or aborting a test. The CRT message directs the operator to press the ABORT key (f8) if he elects to discontinue a test in progress. The test "menu" will then be displayed and the operator can elect to run (or rerun) a PCB/Module test or run the self test.

At the conclusion of the GETS-1000 system power-up procedure, the test operator "logs on" by entering the code word "TEST" on the I/O Terminal (3A6) keyboard. He then presses the RETURN key and the following message is displayed:

- -! GOOD MORNING !- -

This is your GETS-1000 greeting for the I-HAWK crew. If the GETS-1000 has been powered down for more than 20 minutes it is recommended that you wait 1 hour for the equipment to worm up before starting the GETS-1000 SELF TEST.

If power has been off for 20 minutes or less then allow 20 minutes warm up time before starting SELF TEST.

After the system is warmed up press the “GO” key (f5) to proceed. The SYSTEM SELF TEST is coming up.

When the operator presses the GO key (f5) (following system warm-up) as directed by the ! GOOD MORNING ! message, the Computer System Test (the

first segment of the three segment self test) will start. Once the self test is underway, the test system operator is guided through the self test by messages that appear on the I/0 Terminal (3A6) CRT while the test is in progress. At the conclusion of each segment of the three segment self test, the operator will be directed by a display message to press the GO key (f5) to proceed. If the computer system fails self test, a message will appear on the I/0 Terminal (3A6) CRT requesting the operator to notify support maintenance. If one or more of the test instruments fail during the instrumentation self test, a message will appear on the I/0 Terminal (3A6) CRT which identifies the failed component(s). Similarly, following the total system self test, a message on the I/0 Terminal (3A6) CRT will identify any components that failed. The operator must notify support maintenance of any instruments or equipment that failed the self test.

At the conclusion of the self test, the operator will be instructed by a display message to press the GO key (f5), which causes the following test menu message to be displayed:

```
**************************************************************************
  !! GETS -1000 AT YOUR SERVICE !!
**************************************************************************
  TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE)
       1.  PRESS "PCB TEST" KEY (f4)
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  TO RUN GETS1000 SELF TEST
       1.  PRESS "SELF TEST" KEY (f2)
**************************************************************************
```

The above message provides the operator with the option of repeating the self test or performing a PCB/Module test. This same message will appear: (1) at the conclusion of a PCB/Module test; (2) when the operator elects to exercise the test abort option offered by a display message; and (3) when directed by a display message to discontinue the test in progress by pressing the ABORT key (f8).

2.5 PCB/MODULE TESTING

2.5.1 GENERAL

Before starting the first PCB/Module test of the day, the test operator must power up the GETS-1000 system (see Paragraph 2.2) unless the system is already on-line. Then he must perform a system self test (Paragraph 2.4). PCB/Module test programs are contained on flexible disks (a separate disk for each module). Once the test operator installs the test program disk in the Flexible Disk Drive (1A9), the program is automatically loaded onto the computer system main disk and the test is under control of the computer system microprocessor.

In addition to supplying the instruction messages for the test operator to connect the PCB/Module to the GETS-1000 system, and to disconnect the PCB/Module after test, the test program (flexible disk) controls GETS-1000 instruments to create the necessary test stimuli, route the stimuli to the proper locations in the PCB/Module, compare the PCB/Module response to establish acceptable values, then provide a go/no-go decision, with a corresponding CRT message to the test operator.

At the conclusion of the GETS-1000 system self test, the operator will be given the option of repeating the self test or initiating a PCB/Module test.

Before attempting to conduct a PCB/Module test, the test operator should review thoroughly the following paragraphs:

2.5.2 Flexible Disk Handling and Storage

2.5.3 lAB and PCB/Module Handling

2.5.4 1/0 Terminal (3A6) Special Function Keys

2.6 GETS-1000 System Software Error Messages

Test operator instructions that support each of the PCB/Module automatic tests
are included in Paragraph 2.5.5.

PCB/Module Test Programs contain a survey test to determine the readiness of the GETS-1000 system to test only that PCB/Module. The survey test tolerances may be more exacting for a particular instrument than when the same instrument is checked during self test. An instrument may fail the survey test for a PCB/

Module program and still pass the self test. When this situation occurs the PCB/Module in which the failure occurs cannot be run and support maintenance should be notified. This action does not preclude running other PCB/Module programs providing the survey tests for those programs run successfully.

2.5.2 FLEXIBLE DISK HANDLING AND STORAGE

Test programs for the I-HAWK system PCB/Modules are contained on flexible disks. A separate disk is provided for each of the 72 PCB/Modules. A flexible disk is also provided for the GETS-1000 self test program. Flexible disks are easily damaged by physical mishandling and by air contaminants such as dust and smoke. Always observe the following precautions when handling, installing, and storing flexible disks.

CAUTION

Use extreme care not to touch exposed areas of disk (see Figure 2-3) with the fingers.

CAUTION

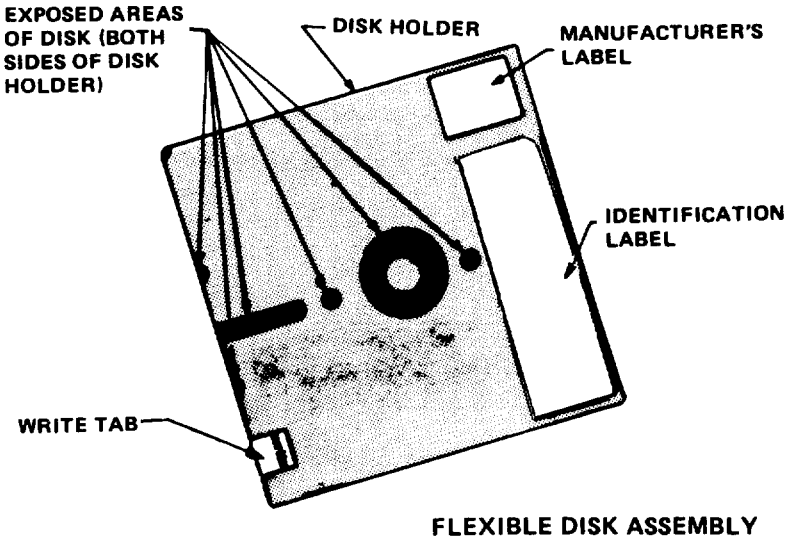
Do not attempt to use a disk if the WRITE tab has been removed (see Figure 2-3).

CAUTION

Do not bend disk while handling, and use care when installing disk in Flexible Disk Drive (1A9). Install disk, label side up.

CAUTION

Return disk to its storage jacket immediately after use to avoid accidental damage to disk surface, or contamination; then return disk to the storage file.



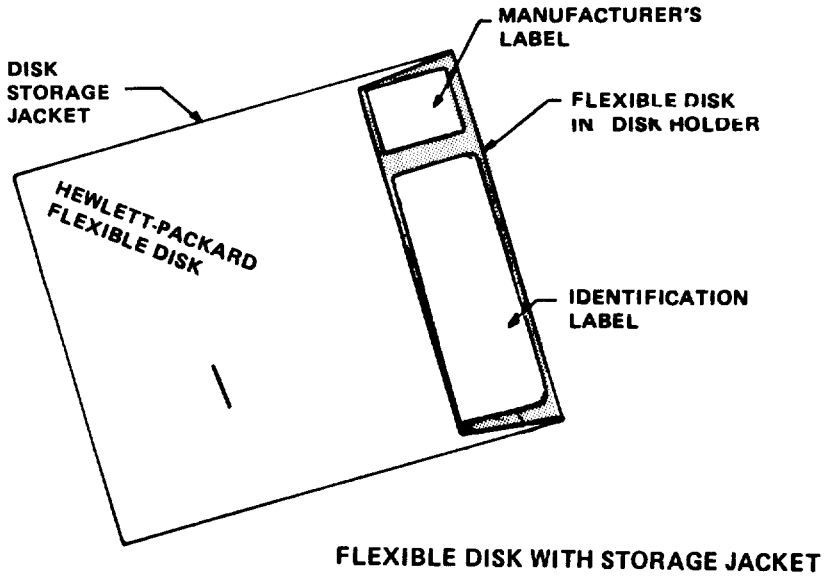


Figure 2-3. Flexible Disk Assembly

CAUTION

Disk storage file should be located in an area with the same environmental conditions (temperature and humidity) as the test equipment.

2..2.1. Flexible Disk Installation

STEP 1. Select proper disk from disk storage file. Select disk number that corresponds to the PCB/Module number you are testing. Refer to Table 2-3 when selecting the flexible disk.

STEP 2. Remove disk assembly from storage jacket (see Figure 2-3).

STEP 3. Depress disk latch door release (see Figure 2-4) on front panel of Flexible Disk Drive (1A9). When release latch is depressed, disk door will open to allow insertion of disk (see Figure 2-5).

CAUTION

Do not bend disk assembly or touch exposed areas of disk.

STEP 4. Grasp disk at the label end (label side up) and carefully insert disk into disk slot (see Figure 2-6). Push disk into slot until it catches (does not move out when hand pressure is released).

STEP 5. Press downward on disk door (see Figure 2-4) until disk door release latch engages.

2.5.2.2 Flexible Disk Removal

STEP 1. Depress disk door release latch (see Figure 2-5) on front panel of Flexible Disk Drive (1A9) to open disk door.

STEP 2. Carefully pull disk assembly out of Flexible Disk Drive (1A9).

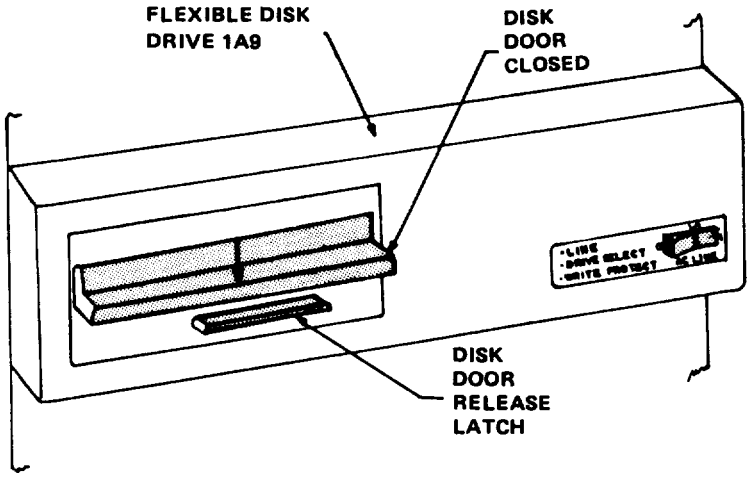


Figure 2-4. Flexible Disk Drive Assembly 1A9 - Disk Door Closed

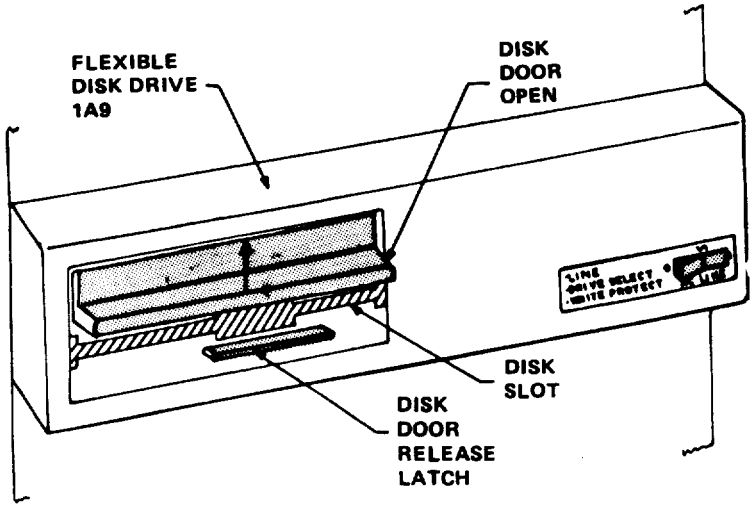


Figure 2-5. Flexible Disk Drive Assembly 1A9 - Disk Door Open

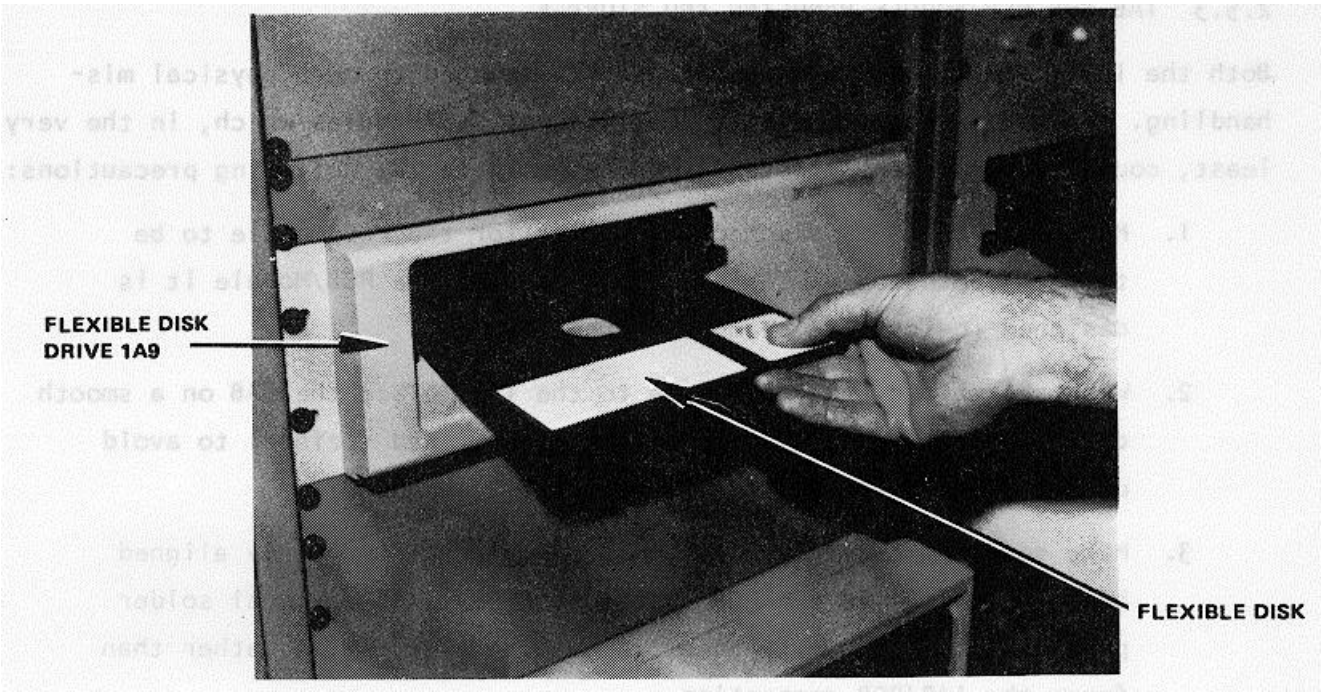


Figure 2-6. Installing Flexible Disk in Flexible Disk Drive

CAUTION
Use extreme care not to touch exposed areas of disk.

STEP 3. Carefully insert disk assembly in storage jacket (see Figure 2-3), then return disk to the storage file.

2.5.3 IAB AND PCB/MODULE HANDLING AND STORAGE

Both the IAB's and the PCB/Modules are easily damaged through physical mishandling. To avoid damaging either the IAB's or PCB/Modules which, in the very least, could result in invalid test results, observe the following precautions:

1. Make sure the IAB selected is correct for the PCB/Module to be tested. Both IAB number and the number of the PCB/Module it is designed to test are stamped on the IAB.
2. When assembling the PCB/Module to the IAB, place the IAB on a smooth clean surface (ideally on a slightly cushioned surface) to avoid damaging the printed circuit protective finish.
3. Make sure the mating connector(s) and pins are properly aligned before pushing IAB and PCB/Module together. If residual solder particles cause interference, remove these particles rather than force the IAB/PCB connection.
4. When connecting (or disconnecting) the IAB/PCB/Modules, use care not to distort (bend or twist) the IAB.
5. To avoid damaging coatings on IAB/PCB/Module, keep hand tools away from the area where IAB/PCB/Module connecting and disconnecting is being accomplished.
6. Be sure lAB identification number faces up (and notch on connector edge is to the left) when inserting IAB/PCB/Module in ZIF (Zero Insertion Force) connector on the GETS-1000 Programmable Switch (2A7).
7. Do not remove IAB/PCB/Module from ZIF connector until directed to do so by an I/0 Terminal (3A6) display message.
8. Return PCB/Module to the protective container it was received in immediately after testing is complete.
9. Return IAB to the storage file immediately after testing is complete.

2.5.4 I/O TERMINAL (3A6) SPECIAL FUNCTION KEYS The I/0 Terminal (3A6) special function keys are used frequently during the PCB/ Module test procedures. Of the eight special function keys provided, four will be used by the test operator. These four key designations and functions are

described in Table 2-3. The test operator should be familiar with the information presented in Table 2-3 before attempting to run a PCB/Module test.

2.5.5 PCB/MODULE TEST PROCEDURES

At the conclusion of the GETS-1000 self test (Paragraph 2.4), the following message will be displayed on the CRT:

```
**************************************************************************
                    !! GETS -1000 AT YOUR SERVICE !!
**************************************************************************
          TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE)
                    1.  PRESS "PCB TEST" KEY (f4)
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
          TO RUN GETS1000 SELF TEST
                    1.  PRESS "SELF TEST" KEY (f2)
**************************************************************************
```

When the operator presses the PCB TEST key (f4), the I/0 Terminal (3A6) display provides instructional messages to the test operator for initiating any one of the PCB/Module tests and for directing any necessary operator interaction during a PCB/Module test. Included in this section is a separate paragraph for each PCB/Module test which supplements the display-directed instructions and summarizes the test operator interaction during test preparation, testing, and after testing.

CAUTION

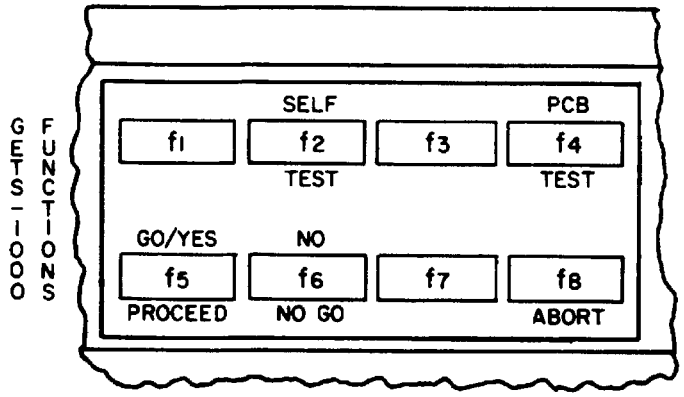
The test operator should remove all jewelry from his hands and wrists before conducting PCB/Module tests. Metal objects placed close to the IAB/PCB/Module assembly during testing could compromise the test results or could possibly damage PCB/Module components.

A list of the PCB/Modules and corresponding disks and lAB's is provided in Appendix C.

Table 2-3. I/0 Terminal 3A6 Special Function Keys

CAUTION

Do not press any keys unless prompted by a display message.



CAUTION

Do not strike keys more than once in rapid succession. If keys are struck repeatedly, program execution becomes unpredictable and the system may lock up.

KEY NO.	KEY DESIGNATION	KEY FUNCTION	REMARKS
1	Not Used		
2	Self Test	Initiates System Self Test	Active only when CRT display indicates that self test may be run.
3	Not Used		
4	PCB Test	Initiates PCB Test.	Active only when CRT display indicates that PCB test may be initiated.
5	GO/YES/PROCEED	Standard "Affirmative" Response	Always active.
6	GO/NO GO	Standard "Negative" Response	Active only while Self Test or PCB test is underway.
7	Not Used		
8	Abort	Standard "Abort" Response	Active when the display message provides the option of aborting a PCB/Module test.

2.5.5.1 10110343 Network, Meter Sensitivity PCB/Module

This paragraph supplements the GETS-1000 I/O Terminal (3A6) display directed instructions for testing the 10110343 Network, Meter Sensitivity PCB/Module. Information in this paragraph includes the identifying numbers for the test program flexible disk and lAB's that are required for initiating the voltage regulator test; notes and cautions associated with test preparation and PCB/Module test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.1.1 Preparation for Testing

General notes and cautions relating to preparation for testing the Network, Meter Sensitivity PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by an I/O Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing or can disrupt the entire GETS-1000 system operation.

CAUTION

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

NOTE

See paragraph 2.5.4 for a description of the eight special function keys on the I/0 Terminal (3A6) keyboard. Some of these keys will be actuated during relay assembly testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in paragraph 2.6.

CAUTION

Do not install flexible disk in Flexible Disk Drive (1A9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the 10110343 Network, Meter Sensitivity PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk Number	IAB Number
10110343	Network, Meter Sensitivity	FD47D255716	ASSY 47D255716G1

2.5.5.1.2 Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the I/O Terminal (3A6) display.

CAUTION

Use extreme care not to damage IAB or the PCB/Module when connecting these two parts.

Step 1: Connect the Network, Meter Sensitivity PCB/Module to IAB as shown in Figure 2-7. Check that the PCB/Module connector pins align with holes in IAB. Bend pins slightly if necessary to ensure proper alignment. Also, check to see that pins are free of solder.

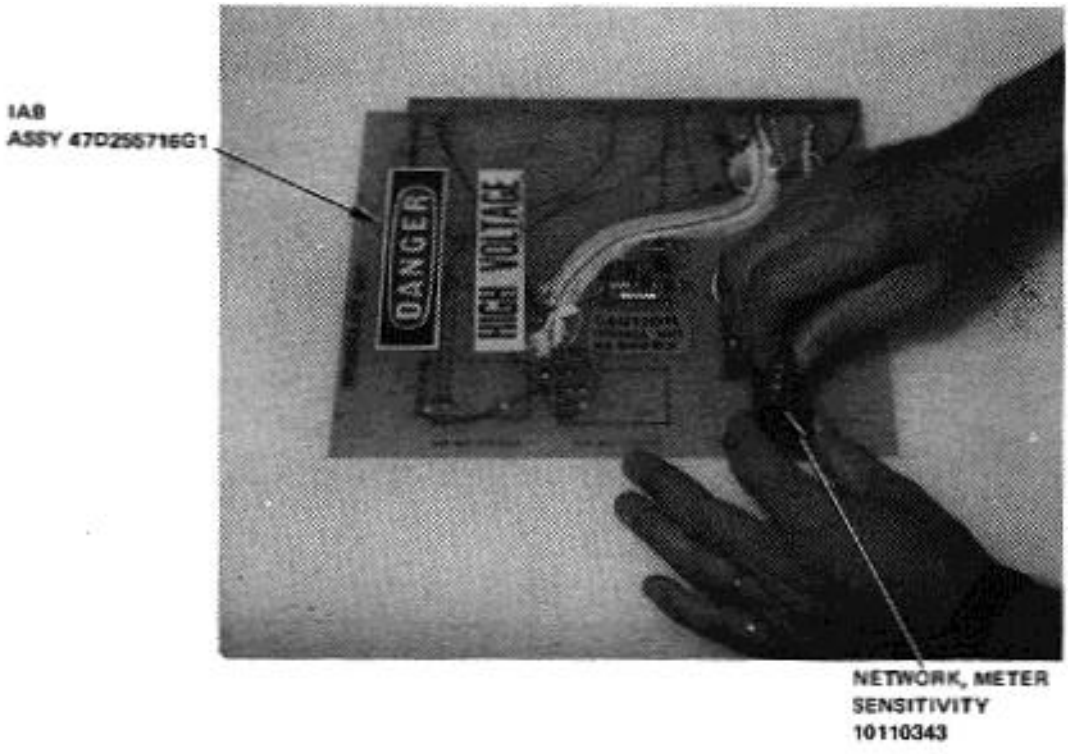


Figure 2-7. Connecting the Network, Meter Sensitivity PCB/Module to the IAB

Step 2: Verify that no IAB is installed in the ZIF connector.

NOTE

The following message will be displayed on the I/O Terminal (3A6) prior to initiating a PCB/Module test.

! ! GETS - 1000 AT YOUR SERVICE ! !
TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE) 1. PRESS "PCB TEST" KEY (f4)
TO RUN GETS- 1000 SELF TEST 1. PRESS "SELF TEST"KEY (f2)

Step 3: Press PCB TEST key (f4) to start PCB/Module test.

NOTE

The following message is displayed when PCB TEST key (f4) is pressed:

- TO TEST PCB MODULE - CAUTION Do not handle test program flexible disks until you are completely familiar with the disk handling instructions contained in section II of the operator's manual. 1. INSERT PROPER FLEXIBLE DISK (FLOPPY) INTO THE 1A9 FLEXIBLE DISC DRIVE (HP9885). SECURE THE LATCH. 2. PRESS "PCB TEST" KEY (f4) TO BEGIN TEST.
-- TO ABORT NOW -- 1. PRESS "ABORT" KEY (f8).

Step 4: Install test program flexible disk FD47D255716 in Flexible Disk Drive (1A9) (see Figure 2-8) as instructed by display message.

CAUTION

Do <u>not</u> install IAB in ZIF connector until directed to do so by a display message.

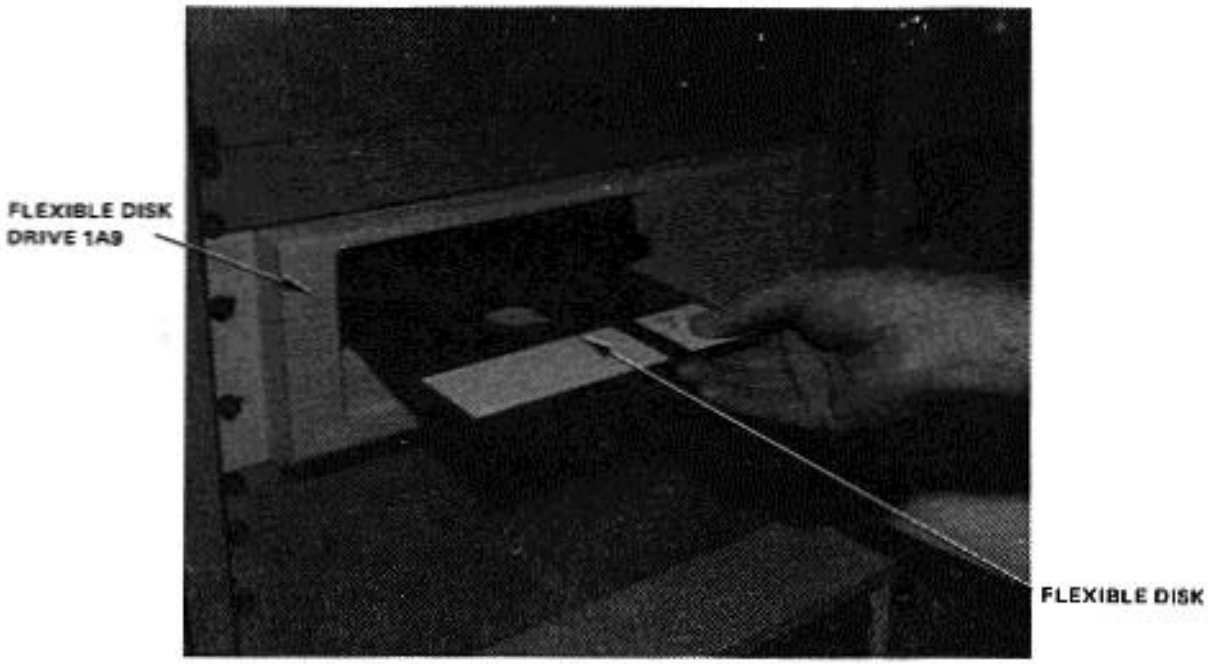


Figure 2-8. Installing Flexible Disk in Flexible Disk Drive (1A9)

Step 5: Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS-1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

Step 6: When directed by a display message, insert the IAB/PCB/Module assembly into the Programmable Switch (2A7) ZIF connector (see Figure 2-9). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

Figure 2-9. Inserting IAB/PCB/Module in ZIF Connector

Step 7: Lock ZIF connector by pushing ZIF locking handle in all of the way.

Step 8: As instructed by the display message, press PROCEED key (f5) to continue.

NOTE

When the PROCEED key (f5) is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:

(1) The operator has installed the wrong IAB, in which case a display message will instruct him to select the correct disk/IAB combination.

(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.

Step 9: When directed by a display message, remove IAB/PCB/Module assembly from Programmable Switch (2A7) by pulling the ZIF connector locking handle all of the way forward and removing the IAB/PCB/Module assembly.

Step 10: When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

CAUTION

Return flexible disk to the storage file so that it will not be accidentally damaged in the work area.

CAUTION

Use extreme care not to damage PCB/Module or IAB while separating the two parts.

Step 11: Disconnect PCB/Module from test IAB.

Step 12: Store IAB.

2.2.5.2 10112008 Oscillator, Audio Frequency (10KC) PCB/Module

This paragraph supplements the GETS-1000 I/0 Terminal (3A6) display directed instructions for testing the 10112008 Oscillator, Audio Frequency (IOKC) PCB/Module. Information in this paragraph includes the identifying numbers for the test program flexible disk and lAB's that are required for initiating the voltage regulator test; notes and cautions associated with test preparation and PCB/Module test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.2.1 Preparation for Testing

General notes and cautions relating to preparation for testing the Oscillator, Audio Frequency (10KC) PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by an I/O Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing or can disrupt the entire GETS-1000 system operation.

CAUTION

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

NOTE

See paragraph 2.5.4 for a description of the eight special function keys on the I/0 Terminal (3A6) keyboard. Some of these keys will be actuated during relay assembly testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in paragraph 2.6.

CAUTION

Do not install flexible disk in Flexible Disk Drive (1A9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the 10112008 Oscillator, Audio Frequency (10KC) PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk Number	IAB Number
10112008	Oscillator, Audio Frequency (10KC)	FD47D255716	ASSY 470255716G1

2.5.5.2.2 Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the I/O Terminal (3A6) display.

CAUTION

Use extreme care not to damage IAB or the PCB/Module when connecting these two parts.

Step 1: Connect Oscillator, Audio Frequency (10KC) PCB/Module to lAB as shown in Figure 2-10. Check that the PCB/Module connector pins align with holes in lAB. Bend pins slightly if necessary to ensure proper alignment.

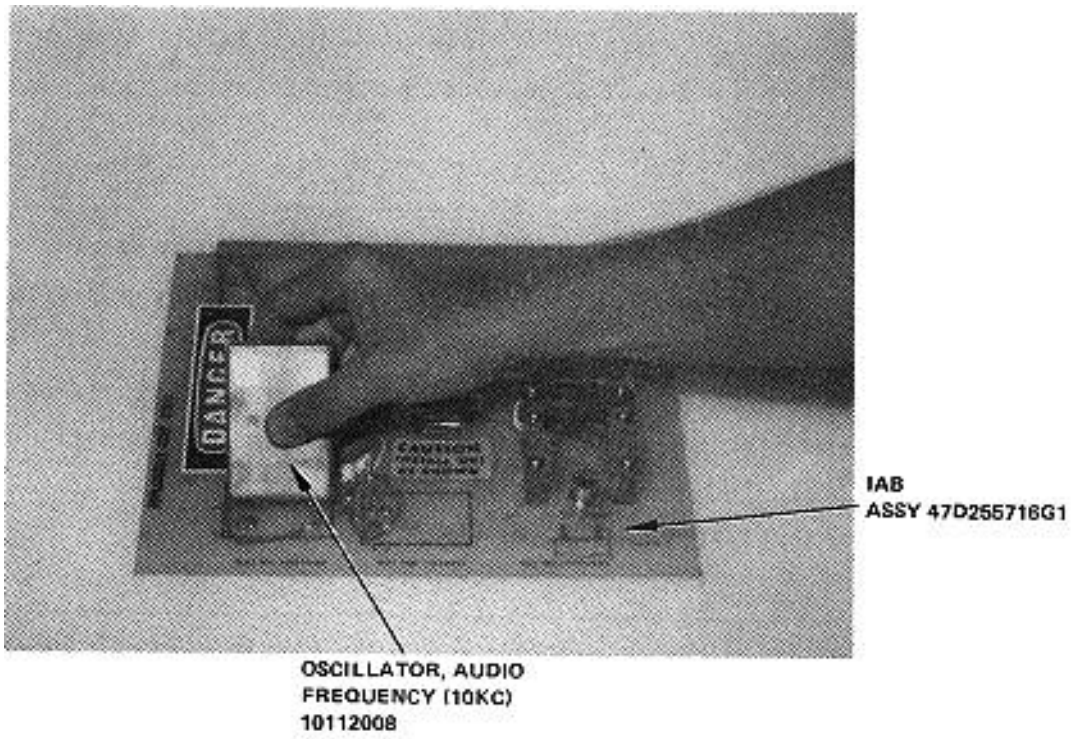


Figure 2-10. Connecting the Oscillator, Audio Frequency (10KC) PCB/Module to the IAB

Step 2: When the PCB/Module has been inserted into the IAB, turn the IAB over and connect one end of the Q-Ball clip to the ground connector of the PCB/Module (J3-1), which extends through the underside of the IAB, as shown in Figure 2-11.

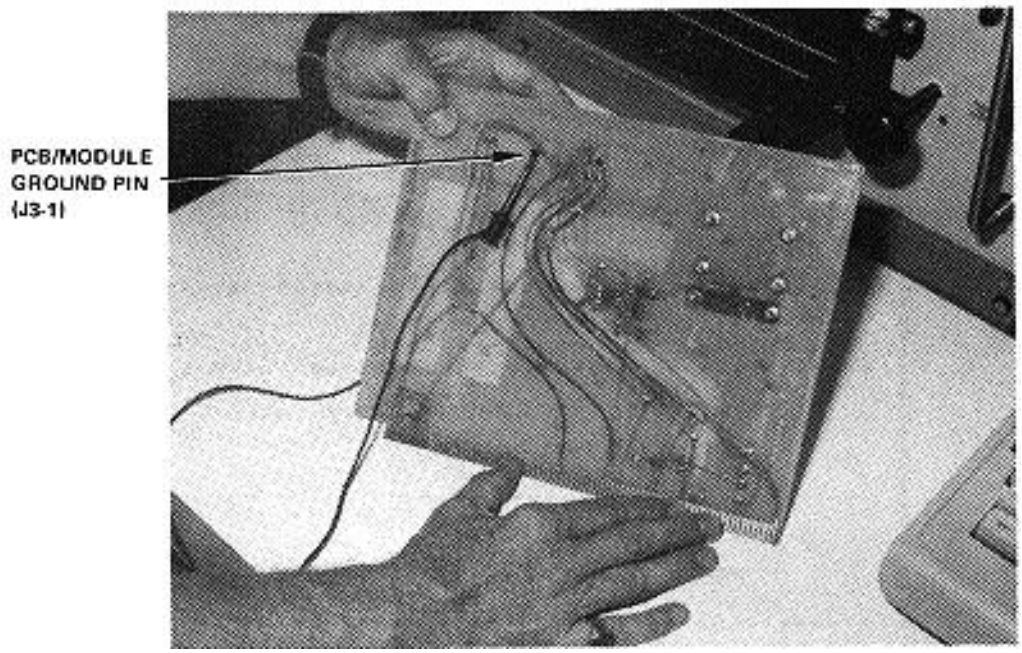


Figure 2-11. Connecting the Q-Ball Clip to the Ground Connector Pin (J3-1) of the PCB/Module

Step 3: Turn IAB right side up and connect the other end of the Q-Ball clip to the ground connector pin (El) of the IAB as shown in Figure 2-12.

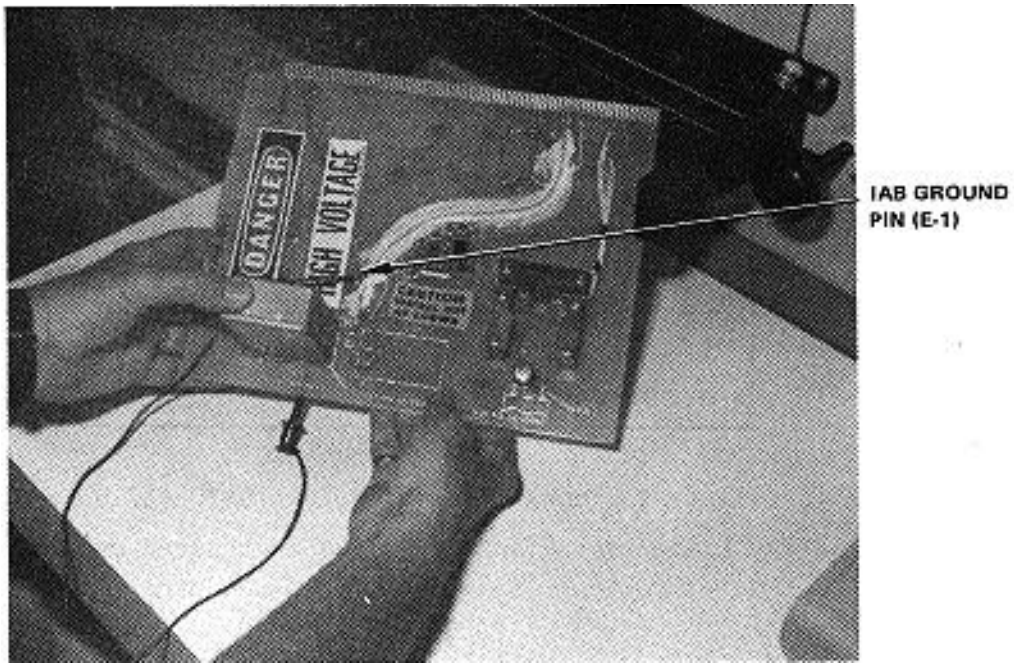


Figure 2-12. Connecting the Q-Ball Clip to the Ground Connector Pin (E1) of the IAB

Step 4: Verify that no IAB is installed in the ZIF connector.

NOTE

The following message will be displayed on the I/O Terminal (3A6) prior to initiating a PCB/Module test.

! ! GETS - 1000 AT YOUR SERVICE ! !
TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE) 1. PRESS "PCB TEST" KEY (f4)
TO RUN GETS- 1000 SELF TEST 1. PRESS "SELF TEST"KEY (f2)

Step 5: Press PCB TEST key (f4) to start PCB/Module test.

NOTE

The following message is displayed when PCB TEST key (f4) is pressed:

- TO TEST PCB MODULE - CAUTION Do not handle test program flexible disks until you are completely familiar with the disk handling instructions contained in section II of the operator's manual. 1. INSERT PROPER FLEXIBLE DISK (FLOPPY) INTO THE 1A9 FLEXIBLE DISC DRIVE (HP9885). SECURE THE LATCH. 2. PRESS "PCB TEST" KEY (f4) TO BEGIN TEST.
-- TO ABORT NOW -- 1. PRESS "ABORT" KEY (f8).

Step 6: Install test program flexible disk FD47D255716 in Flexible Disk Drive (1A9) (see Figure 2-13) as instructed by display message.

CAUTION

Do <u>not</u> install IAB in ZIF connector until directed to do so by a display message.

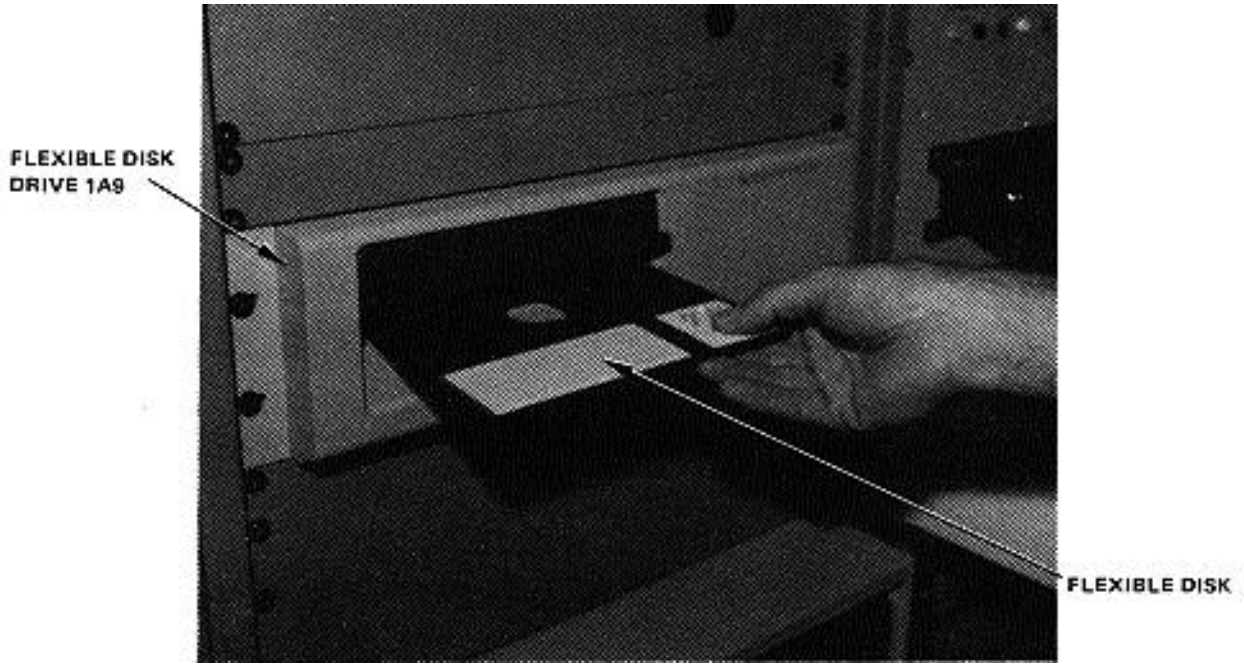


Figure 2-13. Installing Flexible Disk in Flexible Disk Drive (1A9)

Step 7: Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS-1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

Step 8: When directed by a display message, insert the IAB/PCB/Module assembly into the Programmable Switch (2A7) ZIF connector (see Figure 2-14). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

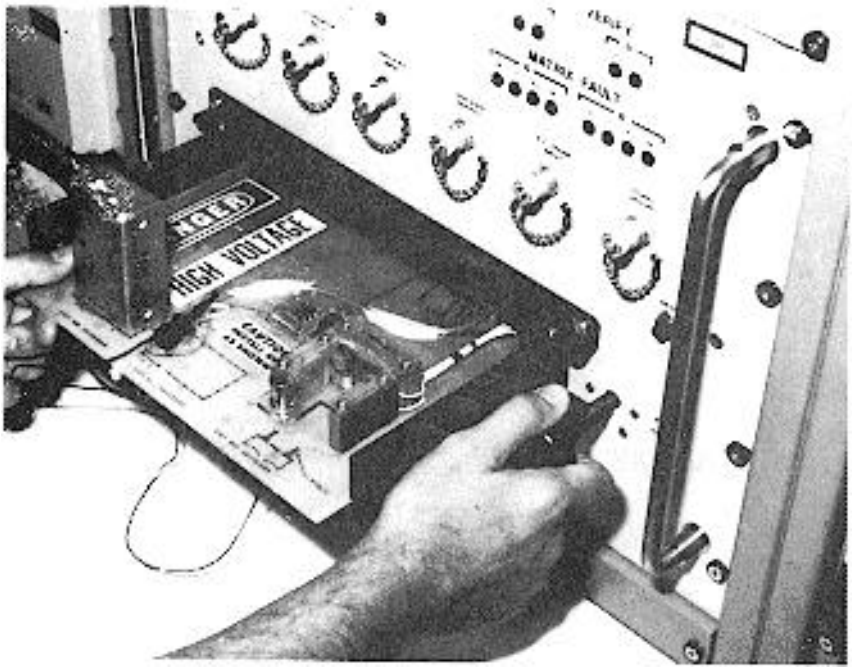


Figure 2-14. Inserting IAB/PCB/ Module in ZIF Connector

Step 9: Lock ZIF connector by pushing ZIF locking handle in all of the way.

Step 10: As instructed by the display message, press PROCEED key (f5) to continue.

NOTE

When the PROCEED key (f5) is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:

(1) The operator has installed the wrong IAB, in which case a display message will instruct him to select the correct disk/IAB combination.
(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.

Step 11 When directed by a display message, remove IAB/PCB/Module assembly from Programmable Switch (2A7) by pulling the ZIF connector locking handle all of the way forward and removing the IAB/PCB/Module assembly.

Step 12 Disconnect the Q-Ball clip from the ground connector pin (J3-1), of the PCB/Module, and the ground connector pin (El) of the IAB at this time.

Step 13 When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

CAUTION

Return flexible disk to the storage file so that it will not be accidentally damaged in the work area.

CAUTION

Use extreme care not to damage PCB/Module or IAB while separating the two parts.

Step 14 Disconnect PCB/Module from test IAB.

Step 15 Store IAB.

2.5.5.3 10112391 Amplifier, Detector PCB/Module

This paragraph supplements the GETS-1000 I/O Terminal (3A6) display directed instructions for testing the 10112391 Amplifier, Detector PCB/Module. Information in this paragraph includes the identifying numbers for the test program flexible disk and IAB's that are required for initiating the voltage regulator test; notes and cautions associated with test preparation and PCB/Module test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.3.1 Preparation for Testing

General notes and cautions relating to preparation for testing the Amplifier, Detector PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by an I/0 Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing or can disrupt the entire GETS-1000 system operation.

CAUTION

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

NOTE

See paragraph 2.5.4 for a description of the eight special function keys on the I/O Terminal (3A6) keyboard. Some of these keys will be actuated during relay assembly testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in paragraph 2.6.

CAUTION

Do not install flexible disk in Flexible Disk Drive (1A9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the 10292709 Amplifier, Detector PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk No.	IAB Number
10112391	Amplifier, Detector	FD47D255716	ASSY 47D255716G1

2.5.5.3.2 Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the I/O Terminal (3A6) display.

CAUTION

Use extreme care not to damage IAB or the PCB/ Module when connecting these two parts.

Step 1: Connect the Amplifier, Detector PCB/Module to IAB as shown in Figure 2-15. Check that the PCB/Module connector pins align with holes in IAB. Bend pins slightly if necessary to ensure proper alignment. Also check to see that pins are free of solder.

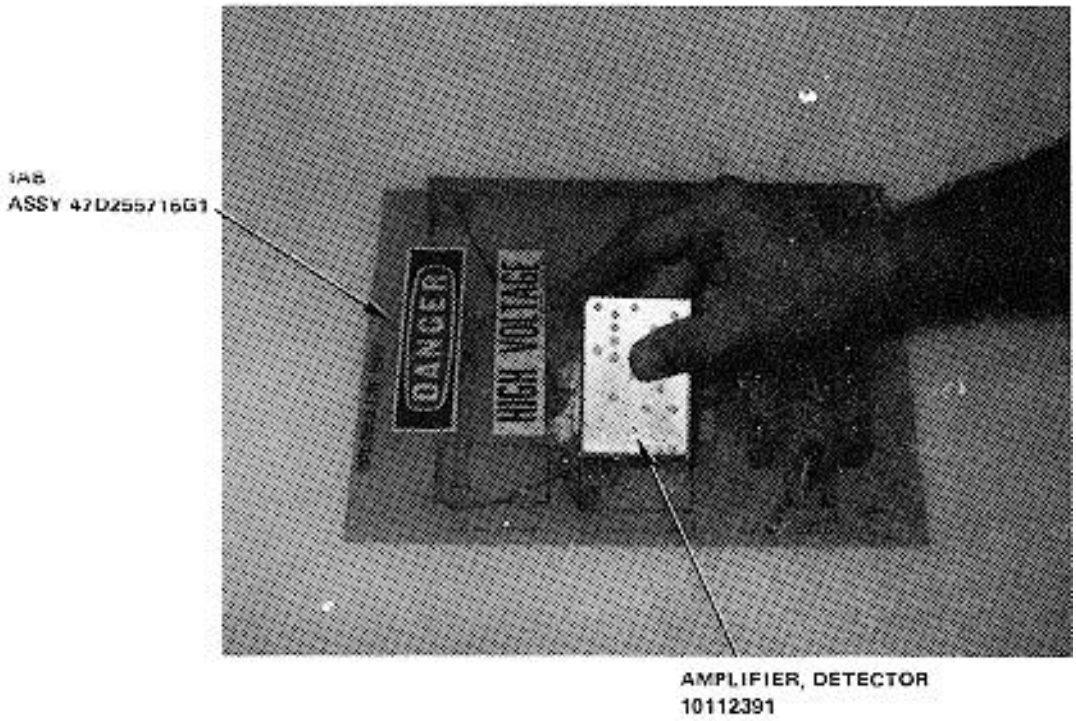


Figure 2-15. Connecting the Amplifier, Detector PCB/Module to the IAB

Step 2: When the PCB/Module has been inserted into the IAB, turn the IAB over and connect one end of the Q-Ball clip to the ground connector (J2-1) of the PCB/Module, which extends through the underside of the IAB, as shown in Figure 2-16.

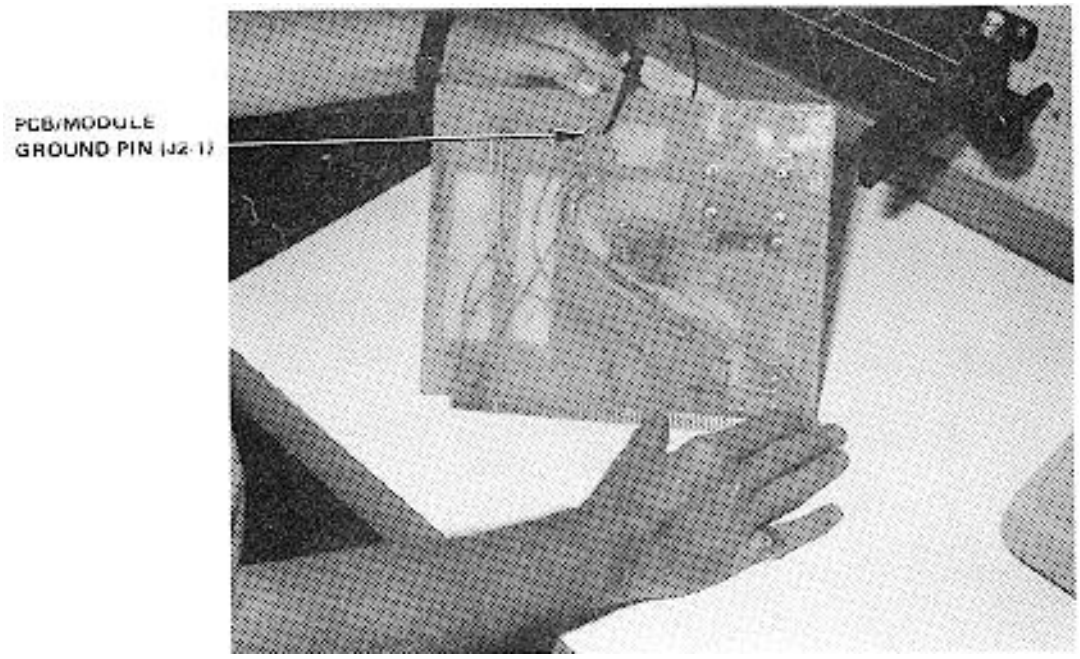


Figure 2-16. Connecting the Q-Ball Clip to the Ground Connector Pin (J2-1) of the PCB/Module

Step 3 Turn IAB right side up and connect the other end of the Q-Ball clip to the ground connector pin of the IAB as shown in Figure 2-17.

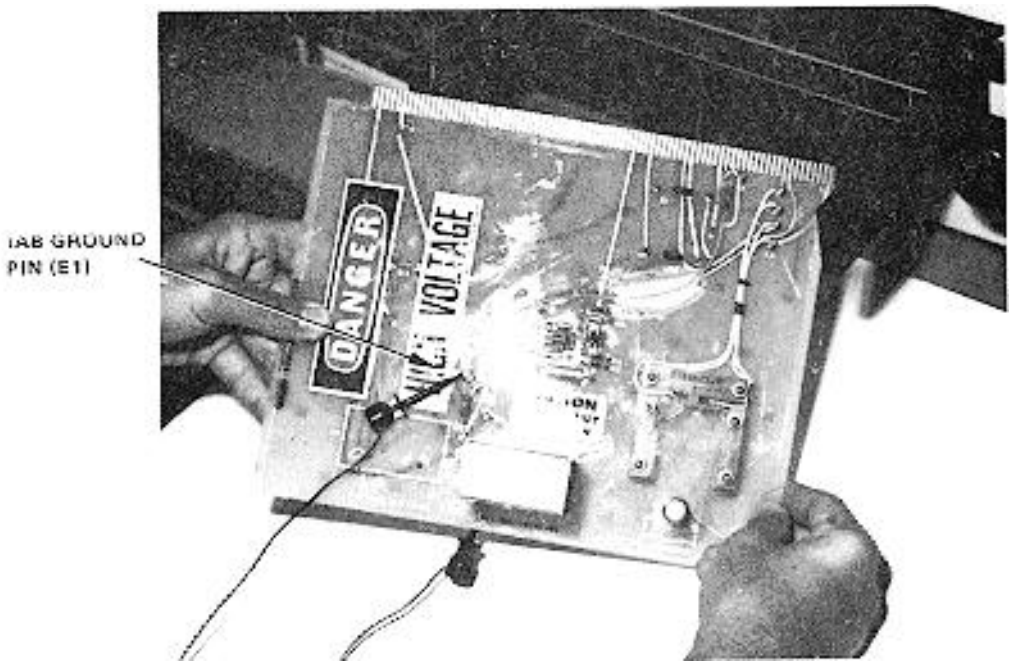


Figure 2-17. Connecting the Q-Ball Clip to the Ground Connector Pin (E1) of the IAB

NOTE

The following message will be displayed on the I/O Terminal (3A6) prior to initiating a PCB/Module test.

! ! GETS - 1000 AT YOUR SERVICE ! !
TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE) 1. PRESS "PCB TEST" KEY (f4)
TO RUN GETS- 1000 SELF TEST 1. PRESS "SELF TEST"KEY (f2)

Step 4 Press PCB TEST key (f4) to start PCB/Module test.

NOTE

The following message is displayed when PCB TEST key (f4) is pressed:

- TO TEST PCB MODULE - CAUTION Do not handle test program flexible disks until you are completely familiar with the disk handling instructions contained in section II of the operator's manual. 1. INSERT PROPER FLEXIBLE DISK (FLOPPY) INTO THE 1A9 FLEXIBLE DISC DRIVE (HP9885). SECURE THE LATCH. 2. PRESS "PCB TEST" KEY (f4) TO BEGIN TEST.
-- TO ABORT NOW -- 1. PRESS "ABORT" KEY (f8).

Step 5 Install test program flexible disk FD47D255716 in Flexible Disk Drive (1A9) (see Figure 2-13) as instructed by display message.

CAUTION

Do <u>not</u> install IAB in ZIF connector until directed to do so by a display message.

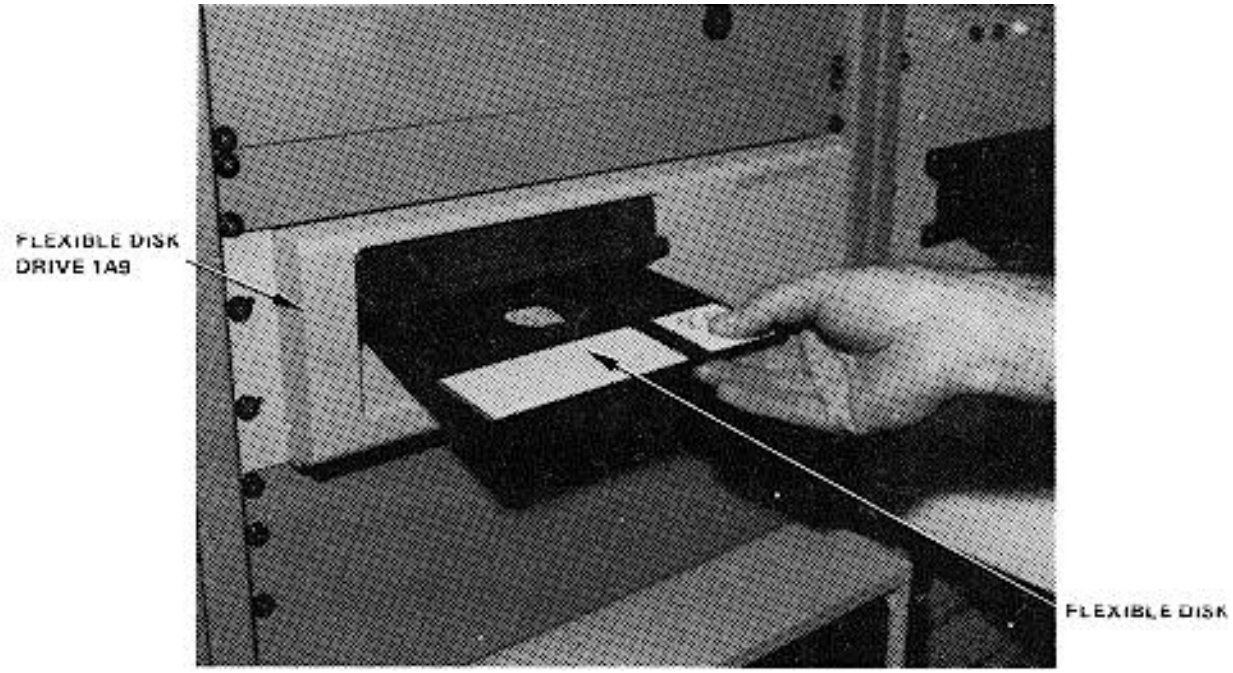


Figure 2-18. Installing Flexible Disk in Flexible Disk Drive (1A9)

Step 6: Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS-1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

Step 7: When directed by a display message, insert IAB/PCB/Module assembly into the Programmable Switch (2A7) ZIF connector (see Figure 2-19). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

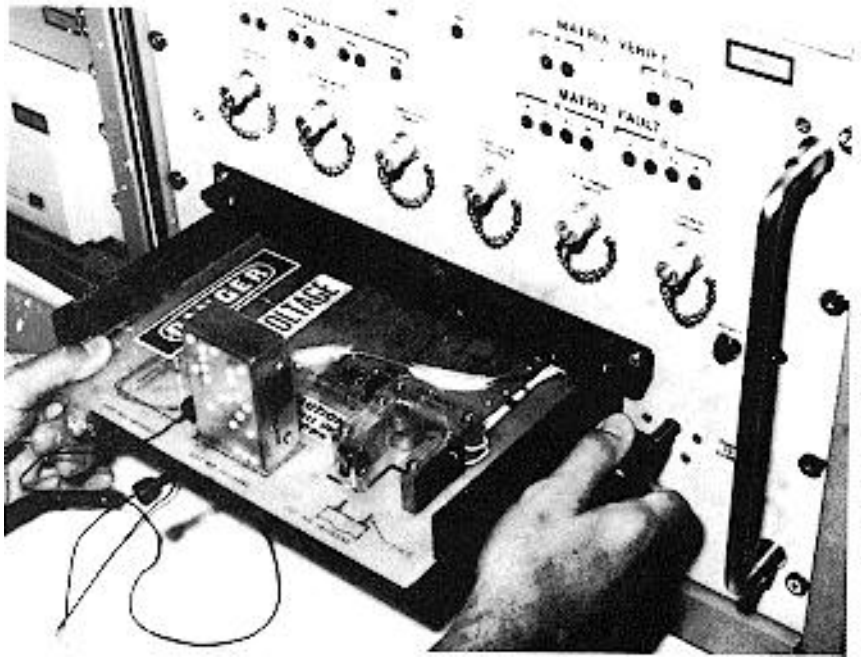


Figure 2-19. Inserting IAB/PCB/Module in ZIF Connector

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

Step 8: Lock ZIF connector by pushing ZIF locking handle in all of the way.

Step 9: As instructed by the display message, press PROCEED key (f5) to continue.

NOTE

When the PROCEED key (f5) is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:

(1) The operator has installed the wrong IAB, in which case a display message will instruct him to select the correct disk/IAB combination.
(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.

Step 10 When directed by a display message, remove IAB/PCB/Module assembly from the Programmable Switch (2A7).

CAUTION

Remove the cable connector from the IAB and Programmable Switch (2A7) panel before removing the IAB/PCB/Module from the ZIF connector.

The IAB/PCB/Module assembly is removed from the Programmable Switch (2A7) by pulling the ZIF connector locking handle all the way forward and removing the IAB/PCB/Module assembly.

Step 11 When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

CAUTION

Return flexible disk to the storage file so that it will not be accidentally damaged in the work area.

CAUTION

Use extreme care not to damage PCB/Module or IAB while separating the two parts.

Step 12: Disconnect PCB/Module from test IAB.

Step 13: Store IAB.

2.5.5.4 10181564 Amplifier, DC Lamp Driver

This paragraph supplements the GETS-1000 I/O Terminal (3A6) display directed instructions for testing the 10181564 Amplifier, DC Lamp Driver PCB/Module. Information in this paragraph includes the identifying numbers for the test program flexible disk and lABs that are required for initiating the voltage regulator test; notes and cautions associated with test preparation and PCB/Module test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.4.1 Preparation for Testing

General notes and cautions relating to preparation for testing the Amplifier, DC Lamp Driver PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by an I/O Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing or can disrupt the entire GETS-1000 system operation.

CAUTION

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

NOTE

See paragraph 2.5.4 for a description of the eight special function keys on the I/O Terminal (3A6) keyboard. Some of these keys will be actuated during relay assembly testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in paragraph 2.6.

CAUTION

Do not install flexible disk in Flexible Disk Drive (1A9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the 10181564 Amplifier, DC Lamp Driver PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk Number	IAB Number
10181564	Amplifier, DC Lamp Driver	FD47D255725	ASSY 47D255725G1

2.5.5.4.1. Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the I/0 Terminal (3A6) display.

CAUTION
Use extreme care not to damage IAB or the PCB/Module when connecting these two parts.

Step 1: Connect the Amplifier, DC Lamp Driver PCB/Module to IAB as shown in Figure 2-20. Check that the PCB/Module connector pins align with holes in IAB. Bend pins slightly, if necessary, to ensure proper alignment.

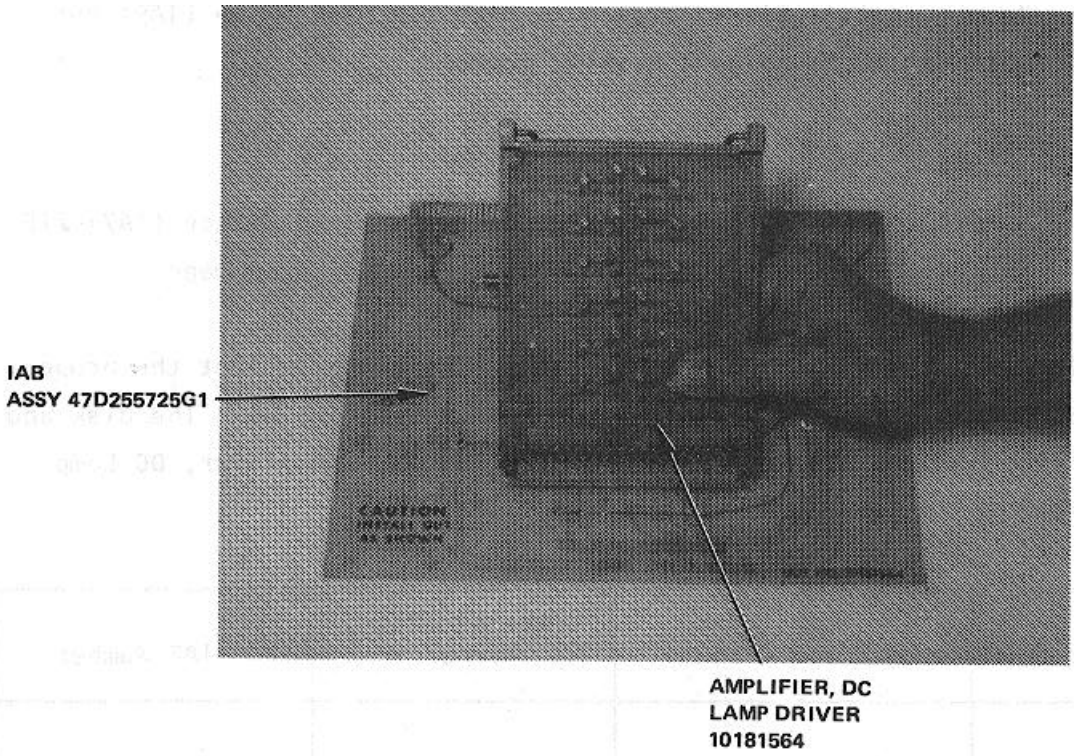


Figure 2-20. Connecting the Amplifier, DC Lamp Driver PCB/Module to the IAB

Step 2: Verify that no IAB is installed in the ZIF connector.

NOTE

The following message will be displayed on the I/0 Terminal (3A6) prior to initiating a PCB/Module test.

```
**********************************************
*                                            *
*          !! GETS-1000 AT YOUR SERVICE !!   *
*                                            *
**********************************************
*                                            *
*    TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE)
*      1. PRESS "PCB TEST" KEY (f4)          *
*                                            *
*--------------------------------------------*
*                                            *
*    TO RUN GETS-1000 SELF TEST              *
*      1. PRESS "SELF TEST" KEY (f2)         *
*                                            *
**********************************************
```

Step 3: Press PCB TEST key (f4) to start PCB/Module test.

NOTE

The following message is displayed when PCB TEST key (f4) is pressed:

```
.              - TO TEST PCB MODULE -

/                    CAUTION
|            Do not handle test program
|            flexible disks unless you are
|            completely familiar with the
|            disk handling instructions
|            contained in section II of the
|            operator's manual.

) 1. INSERT PROPER FLEXIBLE DISK (FLOPPY) INTO
)---THE 1A9 FLEXIBLE DISC DRIVE (HP9885).  SECURE THE LATCH.

) 2. PRESS "PCB TEST" KEY(f4) TO BEGIN TEST.

------------------------------------------------------------

                  - TO ABORT NOW -

) 1. PRESS "ABORT" KEY(f8).
```

Step 4: Install test program flexible disk FD47D255725 in Flexible Disk Drive (1A9) (see Figure 2-21) as instructed by display message.

CAUTION

Do <u>not</u> install IAB in ZIF connector until directed to do so by a display message.

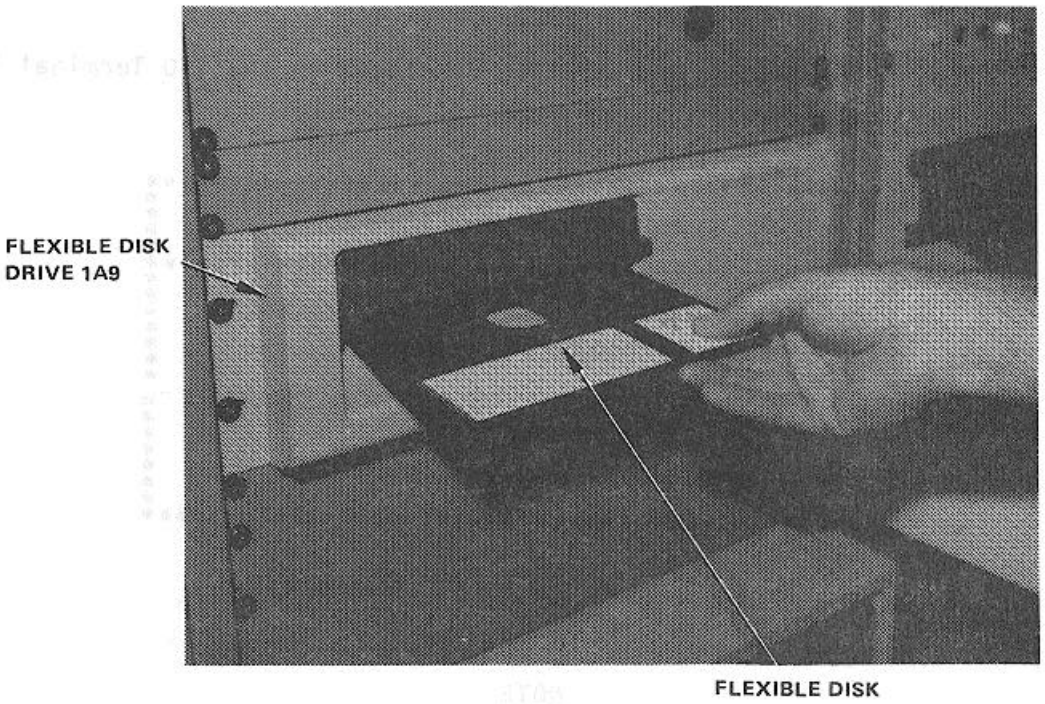


Figure 2-21. Installing Flexible Disk in Flexible Disk Drive (1A9)

Step 5: Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS-1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

Step 6: When directed by a display message, insert the IAB/PCB/Module assembly into the Programmable Switch (2A7) ZIF connector (see Figure 2-22). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

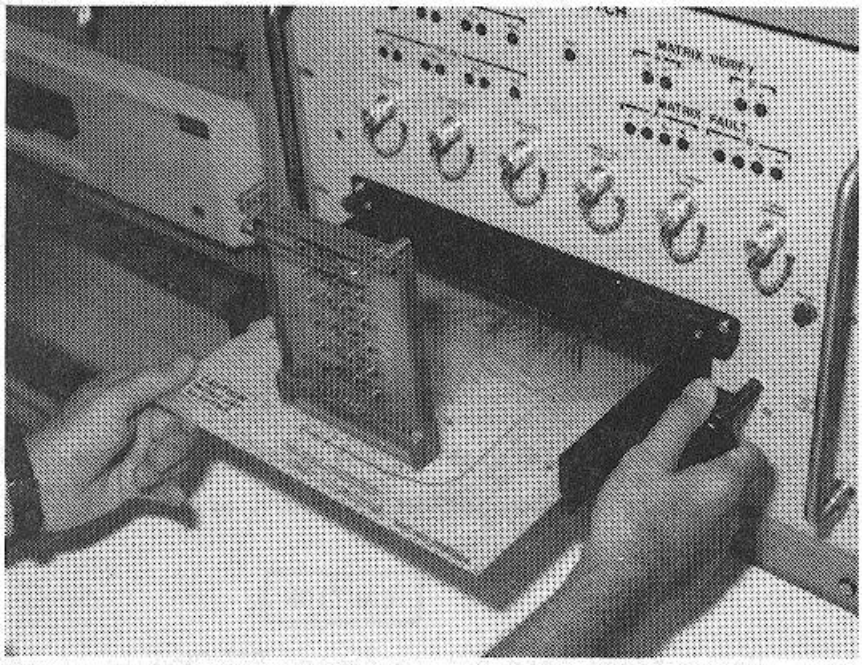


Figure 2-22. Inserting IAB/PCB/Module in ZIF Connector

Step 7: Lock ZIF connector by pushing ZIF locking handle in all of the way.

Step 8: As instructed by the display message, press PROCEED key (f5) to continue.

NOTE

When the PROCEED key (f5) is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:

(1) The operator has installed the wrong IAB, in which case a display message will instruct him to select the correct disk/IAB combination.

(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.

Step 9: When directed by a display message, remove IAB/PCB/Module assembly from Programmable Switch (2A7) by pulling the ZIF connector locking handle all of the way forward and removing the IAB/PCB/Module assembly.

Step 10: When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

CAUTION
Return flexible disk to the storage file so that It will not be accidentally damaged In the work area.

CAUTION
Use extreme care not to damage PCB/Module or IAB while separating the two parts.

Step 11: Disconnect PCB/Module from test IAB.

Step 12: Store IAB.

2.5.5.5. 10182877 Amplifier, Logarithmic PCB/Module

This paragraph supplements the GETS-1000 I/0 Terminal (3A6) display - directed instructions for testing the 10182877 Amplifier, Logarithmic PCB/Module. Information in this paragraph includes the identifying numbers for the test program flexible disk and IAB's that are required for initiating the voltage regulator test; notes and cautions associated with test preparation and PCB/Module test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.5.1. Preparation for Testing

General notes and cautions relating to preparation for testing the Amplifier, Logarithmic PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by an I/O Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing - or can disrupt the entire GETS-1000 system operation.

CAUTION

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

NOTE

See paragraph 2.5.4 for a description of the eight special function keys on the I/0 Terminal (3A6) keyboard. Some of these keys will be actuated during relay assembly testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in paragraph 2.6.

CAUTION

Do not install flexible disk in Flexible Disk Drive (1A9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the 10182877 Amplifier, Logarithmic PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk Number	IAB Number
10182877	Amplifier, Logarithmic	FD47D255708	ASSY 47D255708G1

2.5.5.5.2. Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the I/O Terminal (3A6) display.

CAUTION
Use extreme care not to damage IAB or the PCB/Module when connecting these two parts.

Step 1: Connect the Amplifier, Logarithmic PCB/Module to IAB as shown in Figure 2-23. Check that the PCB/Module connector pins align with holes in IAB. Bend pins slightly if necessary to ensure proper alignment. Also, check to see that pins are free of solder.

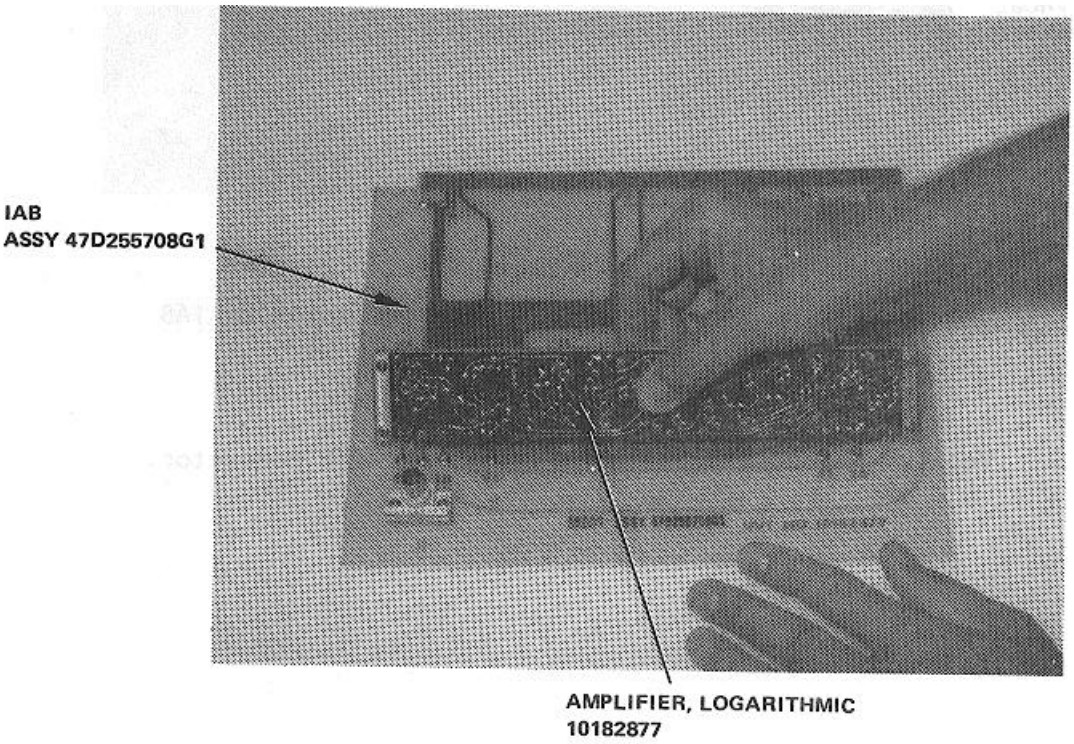


Figure 2-23. Connecting the Amplifier Logarithmic PCB/Module to the IAB

Step 2: Connect the RF probe (handle end) to the connector on the IAB, ASSY 47D255708G1, as shown in Figure 2-24. Connect the other end, of the RF probe, to the RF probe input connector located on the programmable switch (2A7) panel, as shown in Figure 2-24.

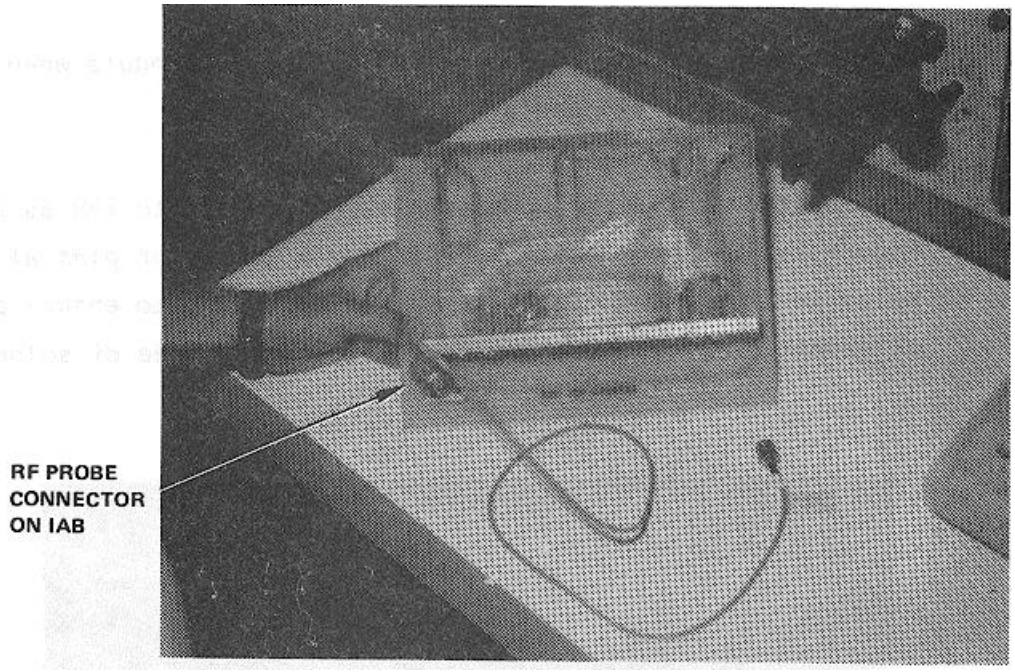


Figure 2-24. Location of RF Probe Connector on IAB

Step 3: Verify that no IAB is installed in the ZIF connector.

NOTE

The following message will be displayed on the I/O Terminal (3A6) prior to initiating a PCB/Module test.

```
!! GETS-1000 AT YOUR SERVICE !!

TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE)
   1. PRESS "PCB TEST" KEY (f4)

TO RUN GETS-1000 SELF TEST
   1. PRESS "SELF TEST" KEY (f2)
```

Step 4: Press PCB TEST key (f4) to start PCB/Module test.

NOTE

The following message is displayed when PCB TEST key (f4) is pressed:

```
          - TO TEST PCB MODULE -

                CAUTION
        Do not handle test program
        flexible disks unless you are
        completely familiar with the
        disk handling instructions
        contained in section II of the
        operator's manual.

> 1. INSERT PROPER FLEXIBLE DISK (FLOPPY) INTO
>    THE 1A9 FLEXIBLE DISC DRIVE (HP9885).  SECURE THE LATCH.

> 2. PRESS "PCB TEST" KEY(f4) TO BEGIN TEST.

-------------------------------------------------------

              - TO ABORT NOW -

> 1. PRESS "ABORT" KEY(f8).
```

Step 5: Install test program flexible disk FD47D255708 in Flexible Disk Drive (IA9) (see Figure 2-25) as instructed by display message.

CAUTION

Do not install IAB in ZIF connector until directed to do so by a display message.

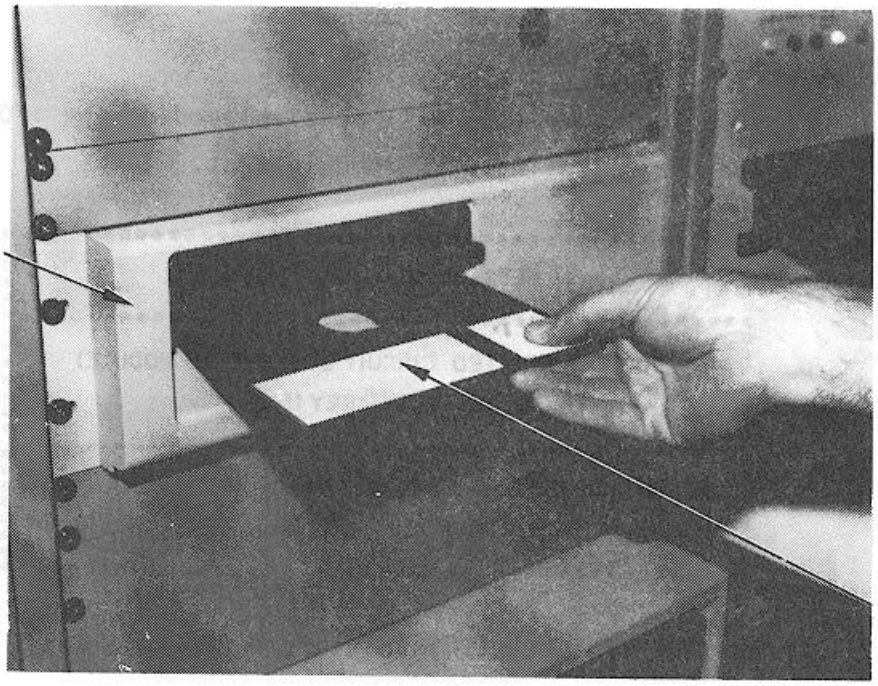


Figure 2-25. Installing Flexible Disk in Flexible Disk Drive (IA9)

Step 6: Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS-1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

Step 7: When directed by a display message, insert the IAB/PCB/Module assembly into the Programmable Switch (2A7) ZIF connector (see Figure 2-26). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

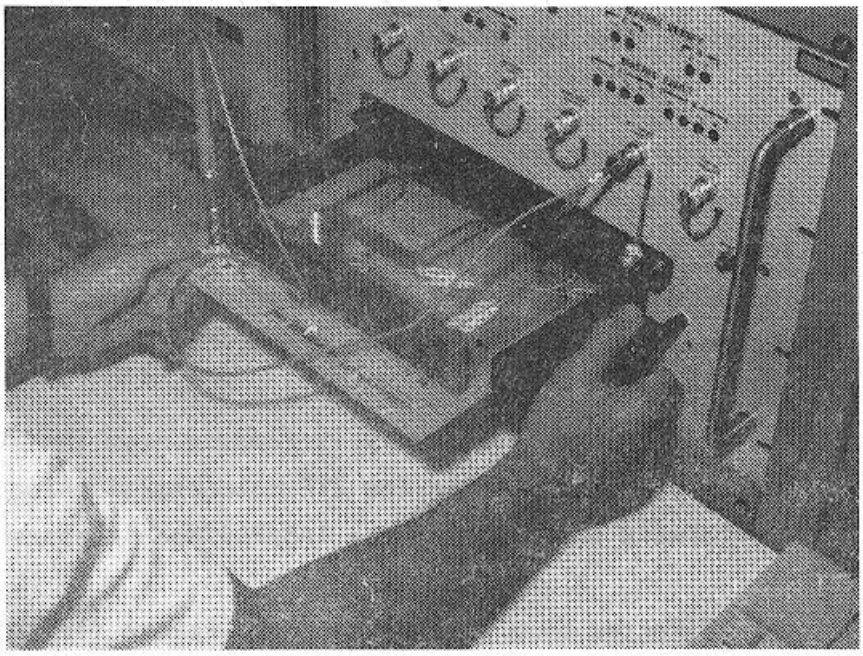


Figure 2-26. Inserting IAB/PCB/Module in ZIF Connector

Step 8: Lock ZIF connector by pushing ZIF locking handle in all of the way.

Step 9: As instructed by the display message, press PROCEED key (f5) to continue.

NOTE

When the PROCEED key (f5) is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:

(1) The operator has installed the wrong IAB, in which case a display 2ssage will instruct him to select the correct disk/IAB combination.

(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.

Step 10: When directed by a display message, remove IAB/PCB/Module assembly from the Programmable Switch (2A7).

CAUTION

Remove the RF probe from the IAB connector and Programmable Switch (2AT) panel RF Probe Input Converter before removing the IAB/PCB/Module from the ZIF connector. When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

The IAB/PCB/Module assembly is removed from the Programmable Switch (2A7) by pulling the ZIF connector locking handle all the way forward and removing the IAB/PCB/Module assembly.

Step 11: When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

CAUTION

Return flexible disk to the storage file so that it will not be accidentally damaged in the work area.

CAUTION

Use extreme care not to damage PCB/Module or IAB while separating the two parts.

Step 12: Disconnect PCB/Module from test IAB.

Step 13: Store IAB.

2.5.5.6. 10182878 Gate Logic (TOJ) (NOR) PCB/Module

This paragraph supplements the GETS-1000 I/O Terminal (3A6) display - directed instructions for testing the 10182878 Gate Logic (TOJ) (NOR). Information in this paragraph includes the identifying numbers for the test program flexible disk and IAB's that are required for initiating the voltage regulator test; notes and cautions associated with test preparation and PCB/Module test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.6.1. Preparation for Testing

General notes and cautions relating to preparation for testing the Gate Logic (TOJ) (NOR) PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by an I/O Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing - or can disrupt the entire GETS-1000 system operation.

CAUTION

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

NOTE

See paragraph 2.5.4 for a description of the eight special function keys on the I/0 Terminal (3A6) keyboard. Some of these keys will be actuated during relay assembly testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in paragraph 2.6.

CAUTION

Do not install flexible disk in Flexible Disk Drive (1A9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the Gate Logic (TOJ) (NOR) PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk Number	IAB Number
Number 10182878	Gate Logic (TOJ) (NOR)	FD47D255702	ASSY 47D255702G1

2.5.5.6.2. Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the I/0 Terminal (3A6) display.

CAUTION
Use extreme care not to damage IAB or the PCB/Module when connecting these two parts.

Step 1: Connect the Gate Logic (TOJ) (NOR) PCB/Module to IAB as shown in Figure 2-27. Check that the PCB/Module connector pins align with holes in IAB. Bend pins slightly, if necessary, to ensure proper alignment. Also, check to see that pins are free of solder.

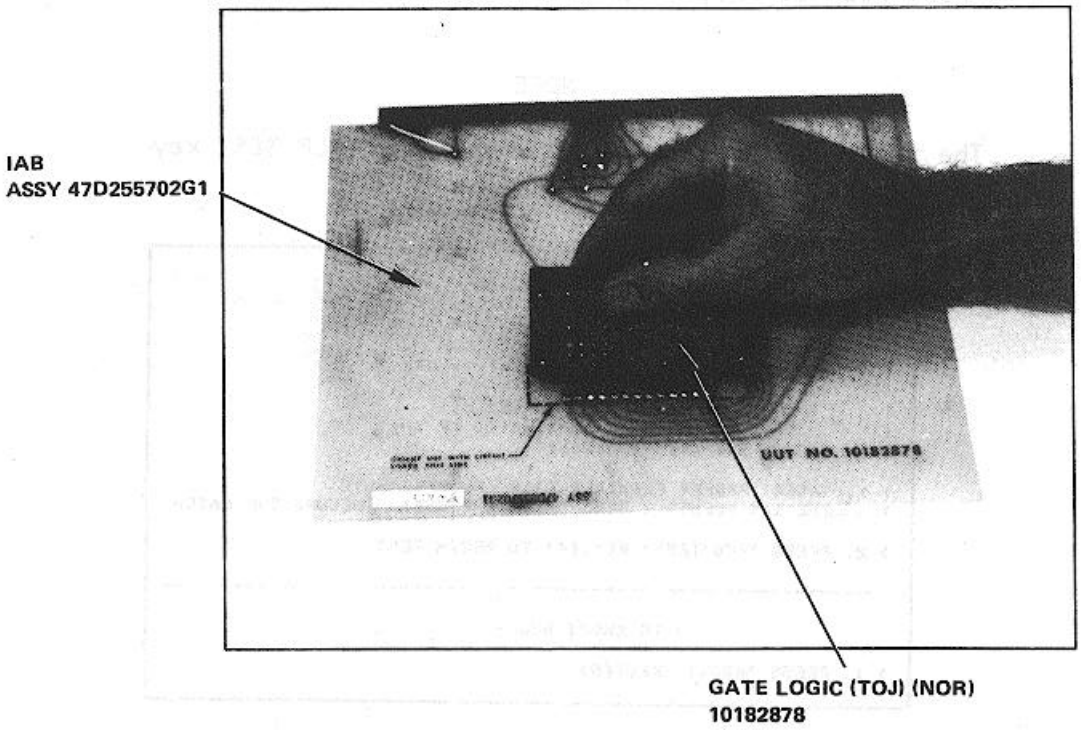


Figure 2-27. Connecting the Gate Logic (TOJ) (NOR) PCB/Module to the IAB

Step 2: Verify that no IAB is installed in the ZIF connector.

NOTE

The following message will be displayed on the I/O Terminal (3A6) prior to initiating a PCB/Module test.

```
!! GETS-1000 AT YOUR SERVICE !!

TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE)
   1. PRESS "PCB TEST" KEY (f4)

TO RUN GETS-1000 SELF TEST
   1. PRESS "SELF TEST" KEY (f2)
```

Step 3: Press PCB TEST key (f4) to start PCB/Module test.

NOTE

The following message is displayed when PCB TEST key (f4) is pressed:

```
.            - TO TEST PCB MODULE -

!                  CAUTION
!          Do not handle test program
!          flexible disks unless you are
!          completely familiar with the
!          disk handling instructions
!          contained in section II of the
!          operator's manual.

) 1. INSERT PROPER FLEXIBLE DISK (FLOPPY) INTO
)---THE 1A9 FLEXIBLE DISC DRIVE (HP9885). SECURE THE LATCH.

) 2. PRESS "PCB TEST" KEY(f4) TO BEGIN TEST.

-------------------------------------------------------

                - TO ABORT NOW -

) 1. PRESS "ABORT" KEY(f8).
```

Step 4: Install test program flexible disk FD47D255702 in Flexible Disk Drive (IA9) (see Figure 2-28) as instructed by display message.

CAUTION

Do not install IAB in ZIF connector until directed to do so by a display message.

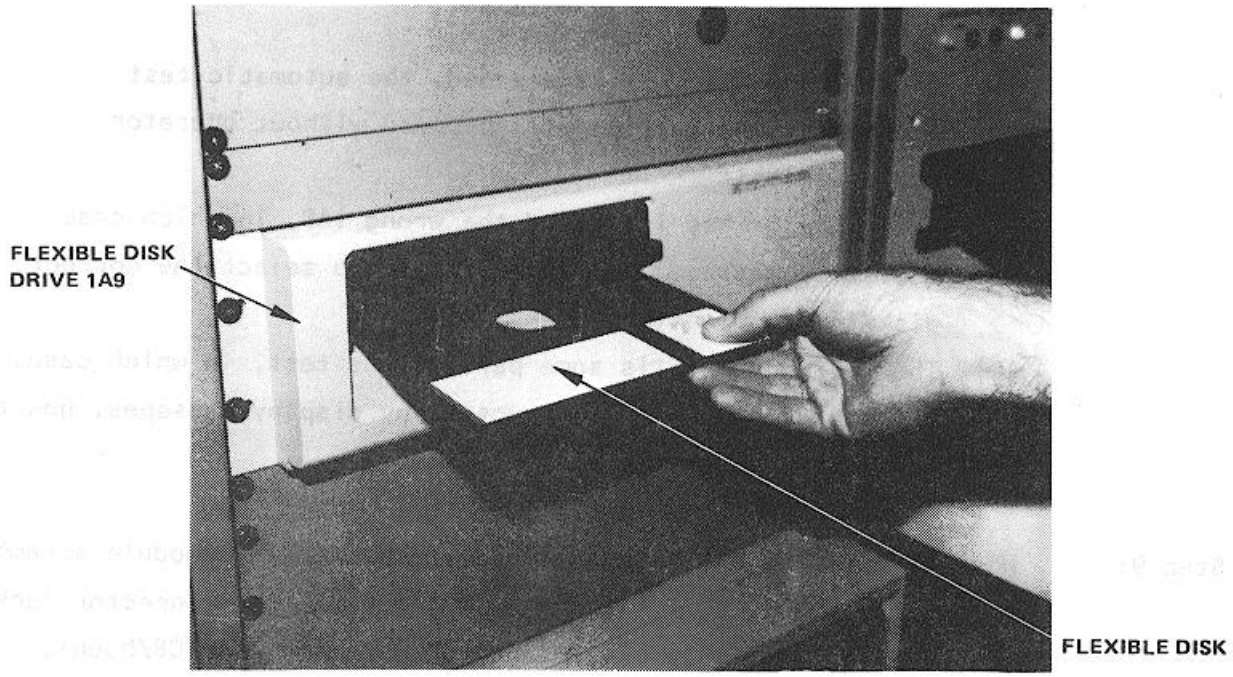


Figure 2-28. Installing Flexible Disk in Flexible Disk Drive (1A9)

Step 5 Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS-1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

Step 6 (2A7) inserting When directed by a display message, insert IAB/PCB/Module assembly into the Programmable Switch ZIF connector (see Figure 2-29). Be sure ZIF locking handle is pulled all of the way forward before IAB/PCB/Module.

NOTE

When the PROCEED key (f5) is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:

(1) The operator has installed the wrong IAB, in which case a display message will instruct him to select the correct disk/IAB combination.

(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.

Step 9: When directed by a display message, remove IAB/PCB/Module assembly from Programmable Switch (2A7) by pulling the ZIF connector locking handle all of the way forward and removing the IAB/PCB/Module assembly.

Step 10: When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

CAUTION

Return flexible disk to the storage file so that it will not be accidentally damaged in the work area.

CAUTION

Use extreme care not to damage PCB/Module or IAB while separating the two parts.

Step 11: Disconnect PCB/Module from test IAB.

Step 12: Store IAB.

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

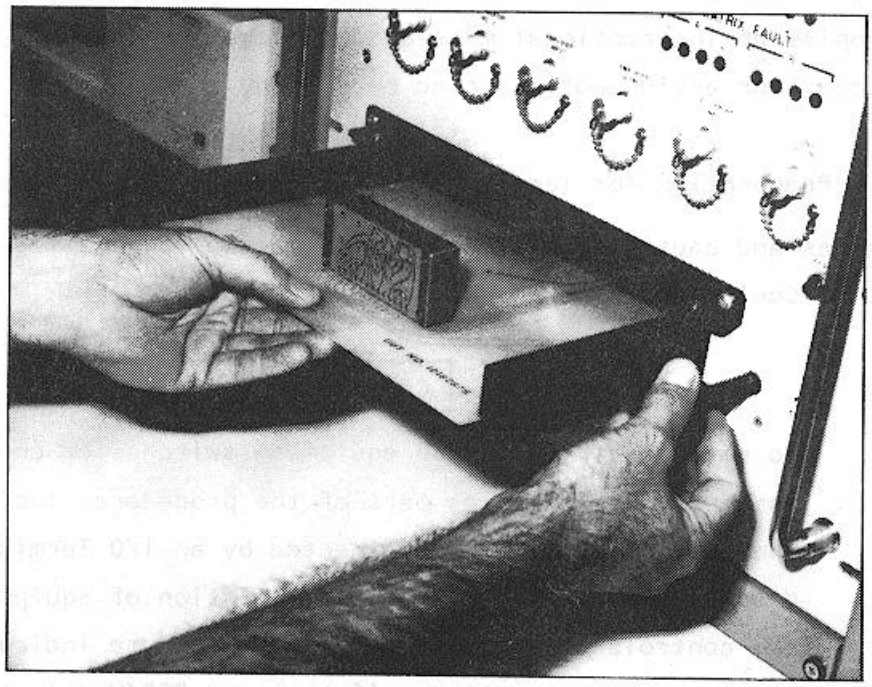


Figure 2-29. Inserting IAB/PCB/Module in ZIF Connector

Step 7: Lock ZIF connector by pushing ZIF locking handle in all of the way.

Step 8: As instructed by the display message, press PROCEED key (f5) to continue.

2.5.5.7. 10182881 Amplifier, Differential Conical Scan PCB/Module

This paragraph supplements the GETS-1000 I/O Terminal (3A6) display - directed instructions for testing the 10182881 Amplifier, Differential Conical Scan PCB/Module. Information in this paragraph includes the identifying numbers for the test program flexible disk and IAB's that are required for initiating the voltage regulator test; notes and cautions associated with test preparation and PCB/Module test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.7.1. Preparation for Testing

General notes and cautions relating to preparation for testing the Amplifier, Differential Conical Scan PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by an I/0 Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing - or can disrupt the entire GETS-1000 system operation.

CAUTION

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

NOTE

See paragraph 2.5.4 for a description of the eight special function keys on the I/O Terminal (3A6) keyboard. Some of these keys will be actuated during relay assembly testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in paragraph 2.6.

CAUTION

Do not install flexible disk in Flexible Disk Drive (IA9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the 10182881 Amplifier, Differential Conical Scan PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk Number	IAB Number
10182881	Amplifier, Differential, Conical Scan	FD47D255739	ASSY 47D255739G1

2.5.5.7.2. Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the 1/O Terminal (3A6) display.

CAUTION
Use extreme care not to damage IAB or the PCB/Module when connecting these two parts.

Step 1: Connect the Amplifier, Differential Conical Scan PCB/Module to IAB as shown in Figure 2-30. Check that the PCB/Module connector pins align with holes in IAB. Bend pins slightly if necessary to ensure proper alignment. Also, check to see that pins are free of solder.

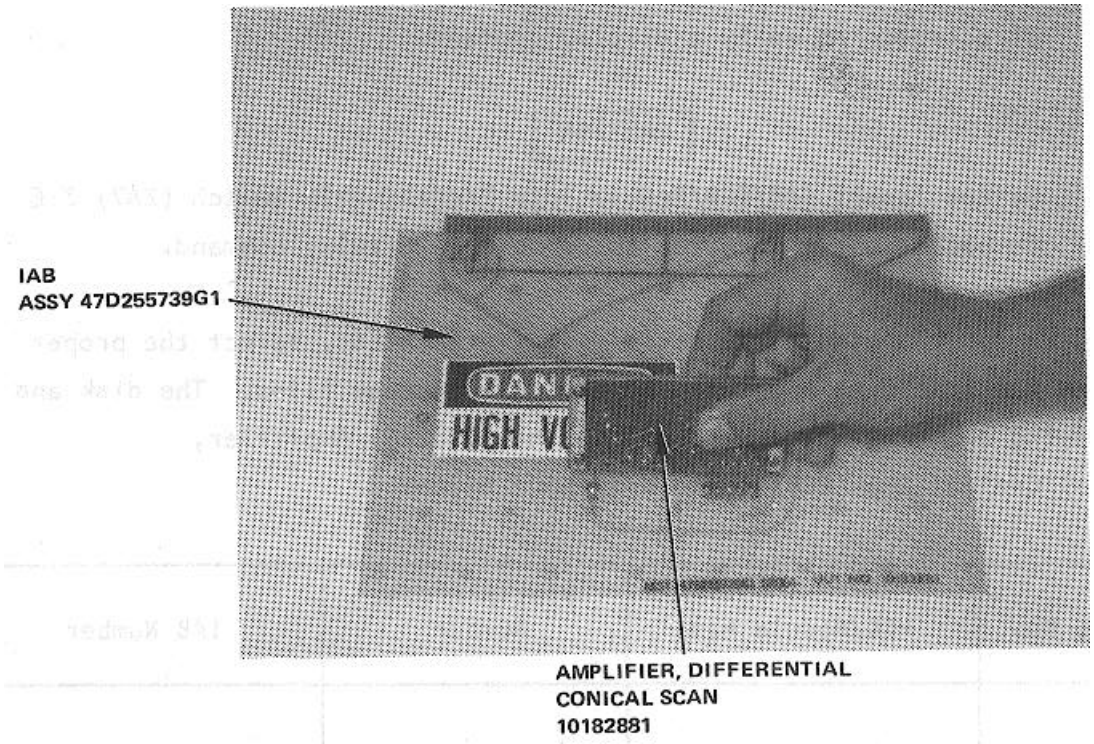


Figure 2-30. Connecting the Amplifier, Differential Conical Scan PCB/Module to the IAB

Step 2: Verify that no IAB is installed in the ZIF connector.

NOTE

The following message will be displayed on the I/O Terminal (3A6) prior to initiating a PCB/Module test.

```
**********************************************
*                                            *
*          !! GETS-1000 AT YOUR SERVICE !!   *
*                                            *
**********************************************
*                                            *
*    TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE)
*       1. PRESS "PCB TEST" KEY (f4)         *
*                                            *
*--------------------------------------------*
*                                            *
*    TO RUN GETS-1000 SELF TEST              *
*       1. PRESS "SELF TEST" KEY (f2)        *
*                                            *
**********************************************
```

Step 3: Press PCB TEST key (f4) to start PCB/Module test.

NOTE

The following message is displayed when PCB TEST key (f4) is pressed:

```
.              - TO TEST PCB MODULE -

!                    CAUTION
!            Do not handle test program
!            flexible disks unless you are
!            completely familiar with the
!            disk handling instructions
!            contained in section II of the
!            operator's manual.

) 1. INSERT PROPER FLEXIBLE DISK (FLOPPY) INTO
)   THE 1A9 FLEXIBLE DISC DRIVE (HP9885).  SECURE THE LATCH.

) 2. PRESS "PCB TEST" KEY(f4) TO BEGIN TEST.

-------------------------------------------------------------

.                - TO ABORT NOW -

) 1. PRESS "ABORT" KEY(f8).
```

Step 4: Install test program flexible disk FD47D255739 in Flexible Disk Drive (1A9) (see Figure 2-31) as instructed by display message.

CAUTION

Do <u>not</u> install IAB in ZIF connector until directed to do so by a display message.

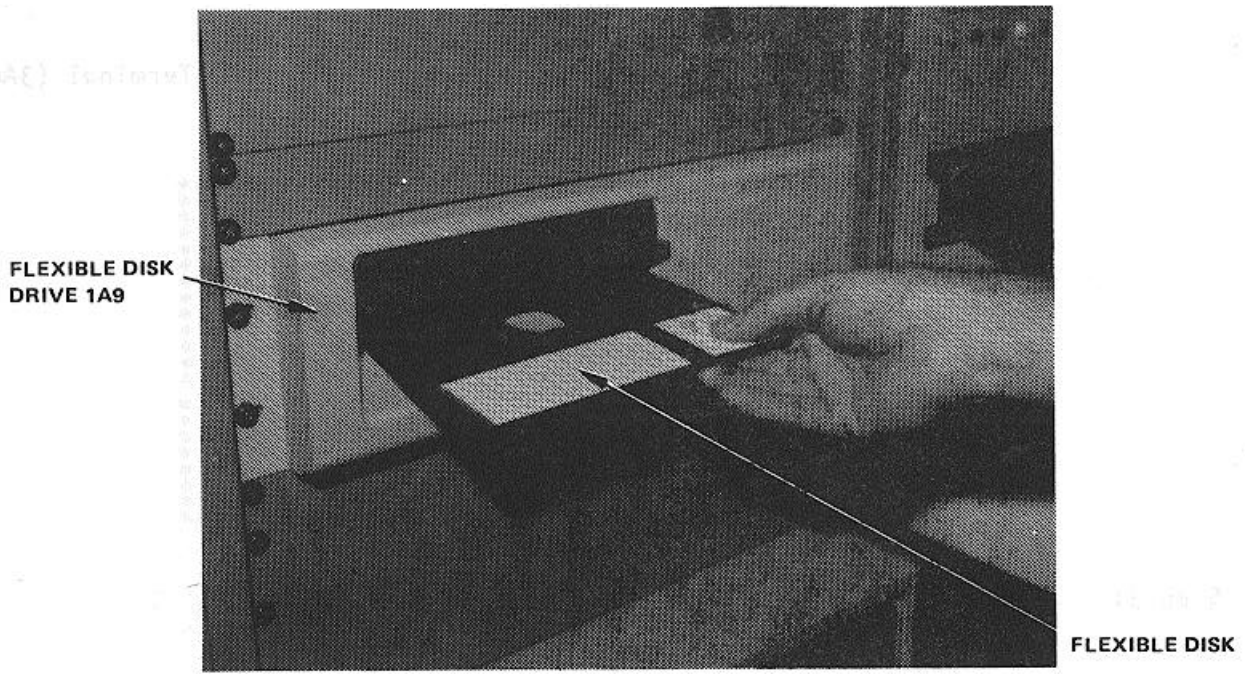


Figure 2-31. Installing Flexible Disk in Flexible Disk Drive (1A9)

Step 5: Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS-1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

Step 6: When directed by a display message, insert the IAB/PCB/Module assembly into the Programmable Switch (2A7) ZIF connector (see Figure 2-32). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

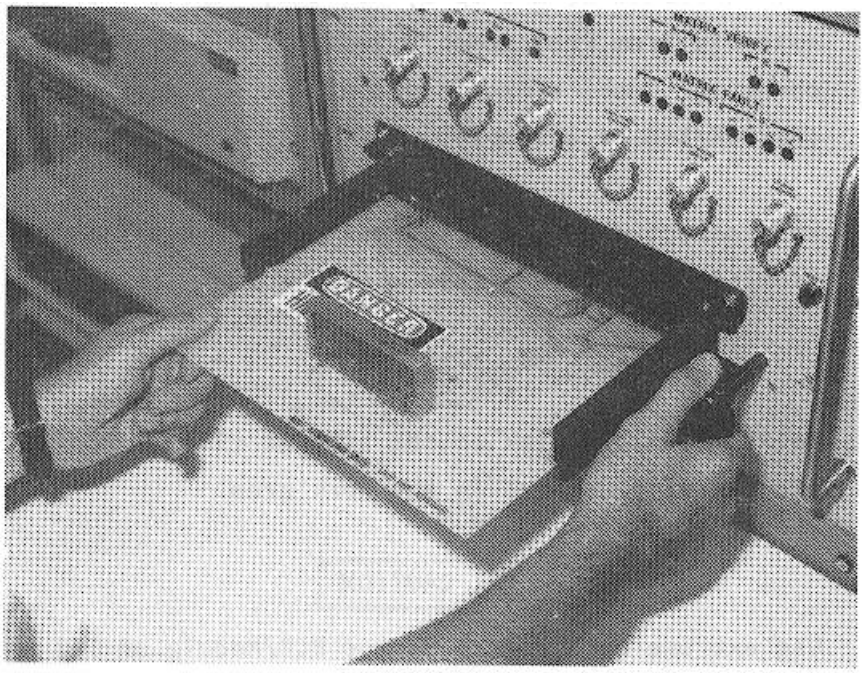


Figure 2-32. Inserting IAB/PCB/Module in ZIF Connector

Step 7: Lock ZIF connector by pushing ZIF locking handle in all of the way.

Step 8: As instructed by the display message, press PROCEED key (f5) to continue.

NOTE

When the PROCEED key (f5) is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:

(1) The operator has installed the wrong IAB, in which case a display message will instruct him to select the correct disk/IAB combination.

(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.

Step 9: When directed by a display message, remove IAB/PCB/Module assembly from Programmable Switch (2A7) by pulling the ZIF connector locking handle all of the way forward and removing the IAB/PCB/Module assembly.

Step 10: When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

CAUTION

Return flexible disk to the storage file so that it will not be accidentally damaged in the work area.

CAUTION

Use extreme care not to damage PCB/Module or IAB while separating the two parts.

Step 11: Disconnect PCB/Module from test IAB.

Step 12: Store IAB.

2.5.5.8 10183153 Amplifier, Null and Range Output PCB/Module

This paragraph supplements the GETS-1000 I/0 Terminal (3A6) display directed instructions for testing the 10183153 Amplifier, Null and Range Output, PCB/Module. Information in this paragraph includes the identifying numbers for the test program flexible disk and lAB's that are required for initiating the voltage regulator test; notes and cautions associated with test preparation and PCB/Module test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.8.1 Preparation for Testing

General notes and cautions relating to preparation for testing the Amplifier, Null and Range Output, PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by an I/0 Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing or can disrupt the entire GETS-1000 system operation.

Caution

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

NOTE

See paragraph 2.5.4 for a description of the eight special function keys on the I/O Terminal (3A6) keyboard. Some of these keys will be actuated during relay assembly testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in paragraph 2.6.

CAUTION

Do not install flexible disk in Flexible Disk Drive (1A9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the 10183153 Amplifier, Null and Range Output PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk No.	IAB Number
10183153	Amplifier, Null and Range Output	FD47D255707	ASSY 47D255707G1

2.5.5.8.2 Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the I/0 Terminal (3A6) display.

CAUTION

Use extreme care not to damage IAB or the PCB/Module when connecting these two parts.

Step 1: Connect the Amplifier, Detector PCB/Module to IAB as shown in Figure 2-33. Check that the PCB/Module connector pins align with holes in IAB. Bend pins slightly, if necessary, to ensure proper alignment. Also check to see that pins are free of solder. Note that the PCB/Module is attached on the underside of the IAB (see Figure 2-34).

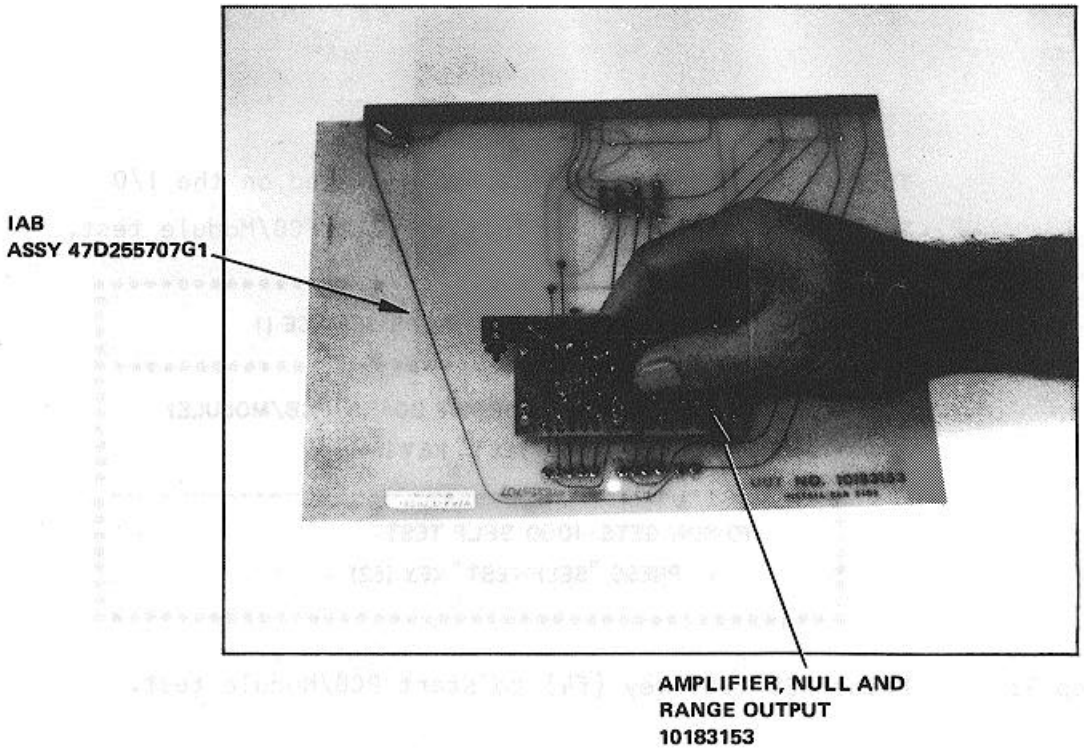


Figure 2-33. Connecting the Amplifier, Null and Range Output PCB/Module to the IAB

Step 2: Verify that no IAB is installed in the ZIF connector.

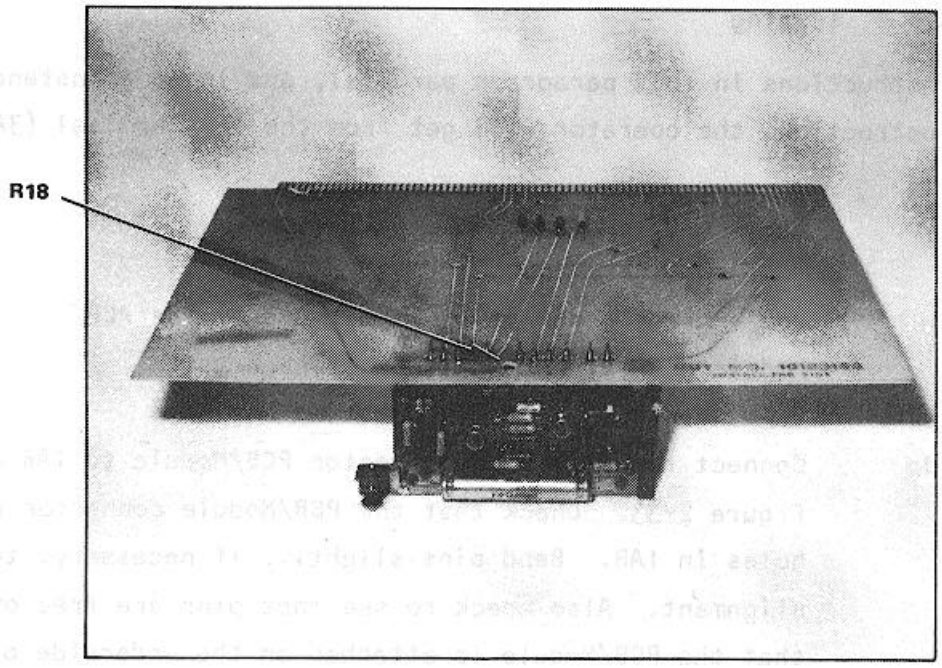


Figure 2-34. Amplifier Null and Range Output Connected to the IAB

NOTE

The following message will be displayed on the I/0 Terminal (3A6) prior to initiating a PCB/Module test.

!! GETS - 1000 AT YOUR SERVICE !!
TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE) **1. PRESS "PCB TEST" KEY (f4)**
TO RUN GETS- 1000 SELF TEST **1. PRESS "SELF TEST" KEY (f2)**

Step 3: Press PCB TEST key (f4) to start PCB/Module test.

NOTE

The following message is displayed when PCB TEST key (f4) is pressed:

TO TEST PCB MODULE

CAUTION

) Do not handle test program flexible disks unless you are completely
) familiar with the disk handling instructions contained in section II of the
) operator's manual.
)
) INSERT PROPER FLEXIBLE DISK (FLOPPY) INTO
) THE IAS FLEXIBLE DISC DRIVE (HP98BS). SECURE THF LATCH.
) 2. PRESS “PCB TEST” KEY(f4) TO BEGIN TEST.

) TO ABORT NOW
) 1. PRESS “ABORT” KEY(f8).

Step 4: Install test program flexible disk FD47D255701 in Flexible Disk Drive (1A9) (see Figure 2-35) as instructed by display message.

CAUTION

Do <u>not</u> install IAB in ZIF connector until directed to do so by a display message.

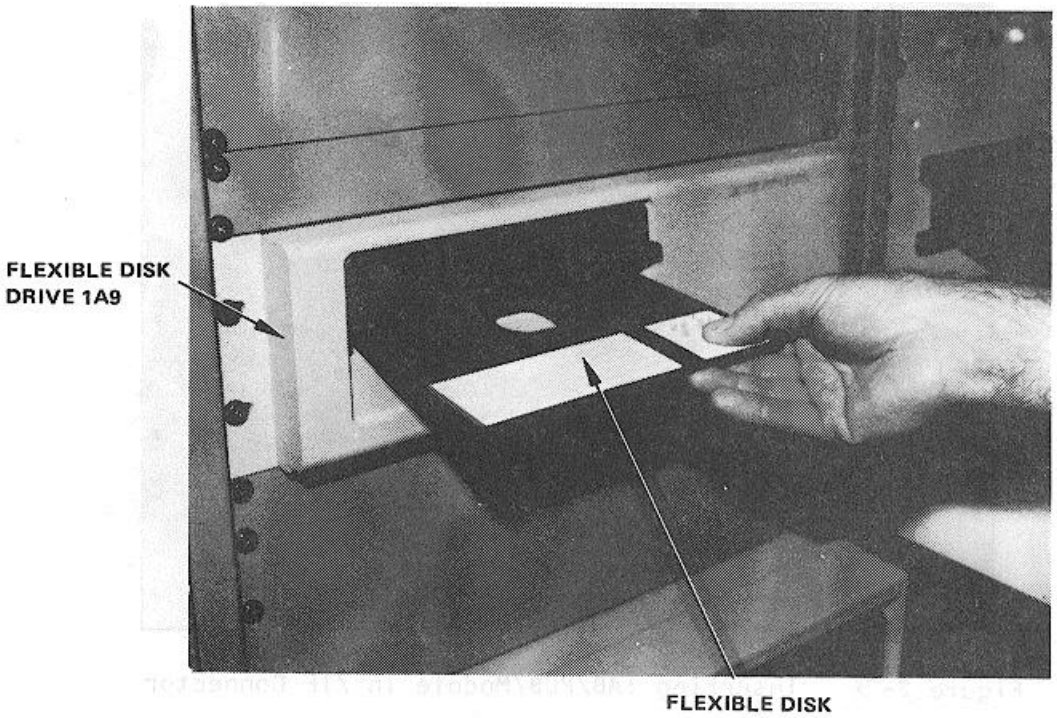


Figure 2-35. Installing Flexible Disk in Flexible Disk Drive (1A9)

Step 5: Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS-1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

Step 6: When directed by a display message, insert IAB/PCB/Module assembly into the Programmable Switch (2A7) ZIF connector (see Figure 2-36). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

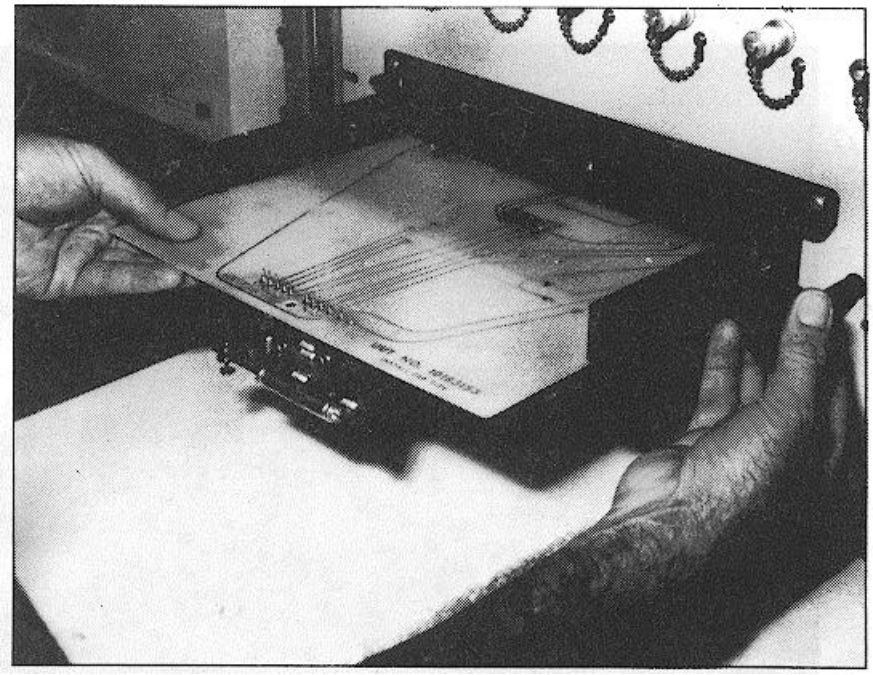


Figure 2-36. Inserting IAB/PCB/Module in ZIF Connector

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

Step 7: Lock ZIF connector by pushing ZIF locking handle in all of the way.

Step 8: As instructed by the display message, press PROCEED key (f5) to continue.

NOTE

When the PROCEED key (f5) is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:

(1) The operator has installed the wrong IAB, in which case a display message will instruct him to select the correct disk/IAB combination.
(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.
(3) Potentiometer R18 on the PCB/Module fails the test, in which case a display message will direct the operator to manually adjust the potentiometer.

Step 9: If directed by a display message to manually adjust potentiometer R18 on the Amp, Null and Range Output PCB/Module, observe the GETS-1000 instrument identified on the display message while making the potentiometer adjustment through the access hole shown in Figure 2-33.

Step 10: When directed by a display message, remove IAB/PCB/Module assembly from the Programmable Switch (2A7) by pulling the ZIF connector

locking handle all of the way forward and removing the IAB/PCB/Module assembly.

Step 11: When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

CAUTION

Return flexible disk to the storage file so that it will not be accidentally damaged in the work area.

CAUTION

Use extreme care not to damage PCB/Module or IAB while separating the two parts.

Step 12: Disconnect PCB/Module from test IAB.

Step 13: Store IAB.

2.5.5.9 10183154 Control, Oscillator Frequency PCB/Module

This paragraph supplements the GETS-1000 I/0 Terminal (3A6) display - directed instructions for testing the 10183154 Control, Oscillator Frequency PCB/Module. Information in this paragraph includes the identifying numbers for the test program flexible disk and lAB's that are required for initiating the voltage regulator test; notes and cautions associated with test preparation and PCB/Module test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.9.1 Preparation for Testing

General notes and cautions relating to preparation for testing the Control, Oscillator Frequency PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by an I/O Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing - or can disrupt the entire GETS-1000 system operation.

CAUTION

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

NOTE

See paragraph 2.5.4 for a description of the eight special function keys on the I/O Terminal (3A6) key-board. Some of these keys will be actuated during relay assembly testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in paragraph 2.6.

CAUTION

Do not install flexible disk in Flexible Disk Drive (IA9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the 10183154 Control, Oscillator Frequency PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk No.	IAB Number
10183154	Control, Oscillator Frequency	FD47D255718	ASSY 47D255718G1

2.5.5.9.2 Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the I/0 Terminal (3A6) display.

CAUTION

Use extreme care not to damage IAB or the PCB/Module when connecting these two parts.

Step 1: Connect the Control, Oscillator Frequency PCB/Module to IAB as shown in Figure 2-37. Note that the PCB/Module is attached on the underside of the IAB (see Figure 2-38). Check that the PCB/Module connector pins align with holes in IAB. Bend pins slightly, if necessary, to ensure proper alignment. Also check to see that pins are free of solder.

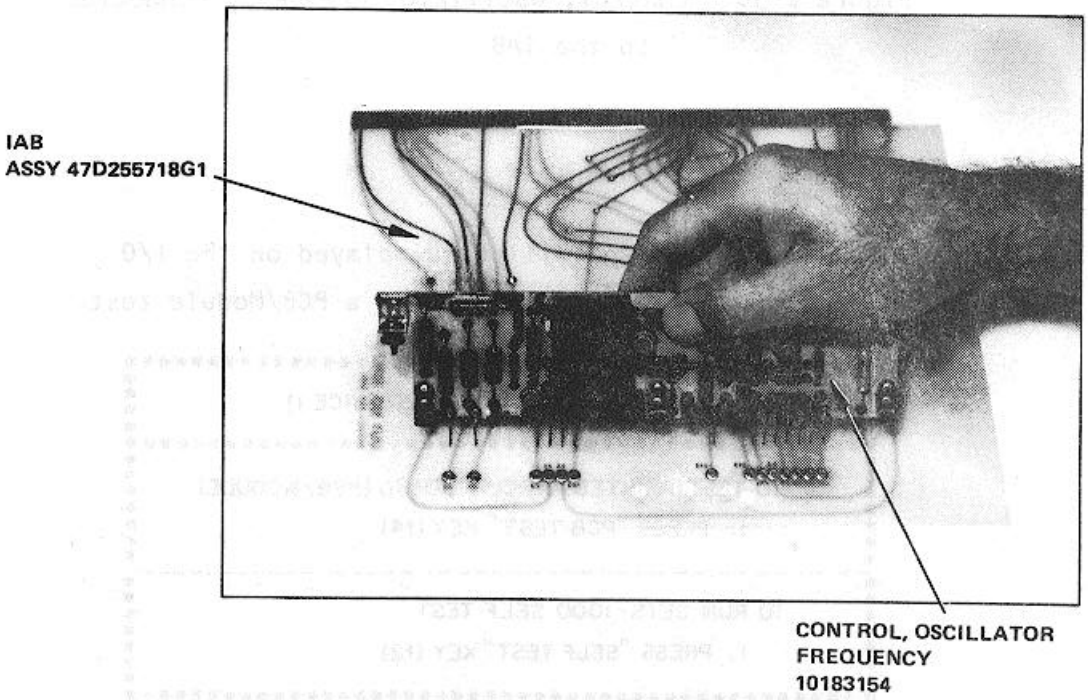


Figure 2-37. Connecting the Control, Oscillator Frequency PCB/Module to the IAB

Step 2: Verify that no IAB is installed in the ZIF connector.

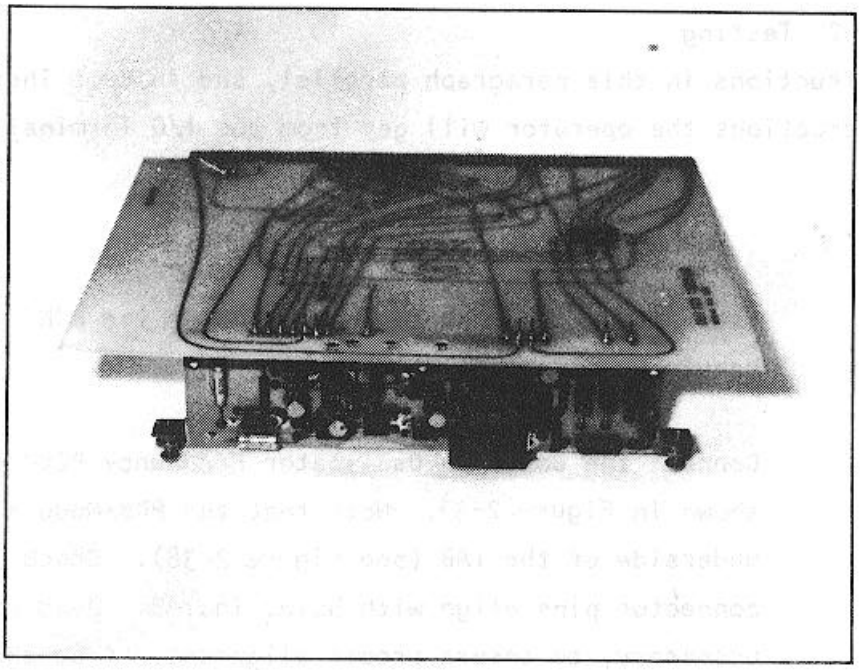


Figure 2-38. Control, Oscillator Frequency Connected to the IAB

NOTE

The following message will be displayed on the I/O Terminal (3A6) prior to initiating a PCB/Module test.

!! GETS - 1000 AT YOUR SERVICE !!
TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE) **1. PRESS "PCB TEST" KEY (f4)**
TO RUN GETS - 1000 SELF TEST **1. PRESS "SELF TEST" KEY (f2)**

Step 3: Press PCB TEST key (f4) to start PCB/Module test.

NOTE

The following message is displayed when PCB TEST key (f4) is pressed:

TO TEST PCB MODULE

CAUTION

) Do not handle test program flexible disks unless you are completely
) familiar with the disk handling instructions contained in section II of the
) operator's manual.
)
) INSERT PROPER FLEXIBLE DISK (FLOPPY) INTO
) THE IA9 FLEXIBLE DISC DRIVE (HP98BS). SECURE THF LATCH.
) 2. PRESS “PCB TEST” KEY(f4) TO BEGIN TEST.

) TO ABORT NOW
) 1. PRESS “ABORT” KEY(f8).

Step 4: Install test program flexible disk FD47D255718 in Flexible Disk Drive (1A9) (see Figure 2-39) as instructed by display message.

CAUTION

Do <u>not</u> install IAB in ZIF connector until directed to do so by a display message.

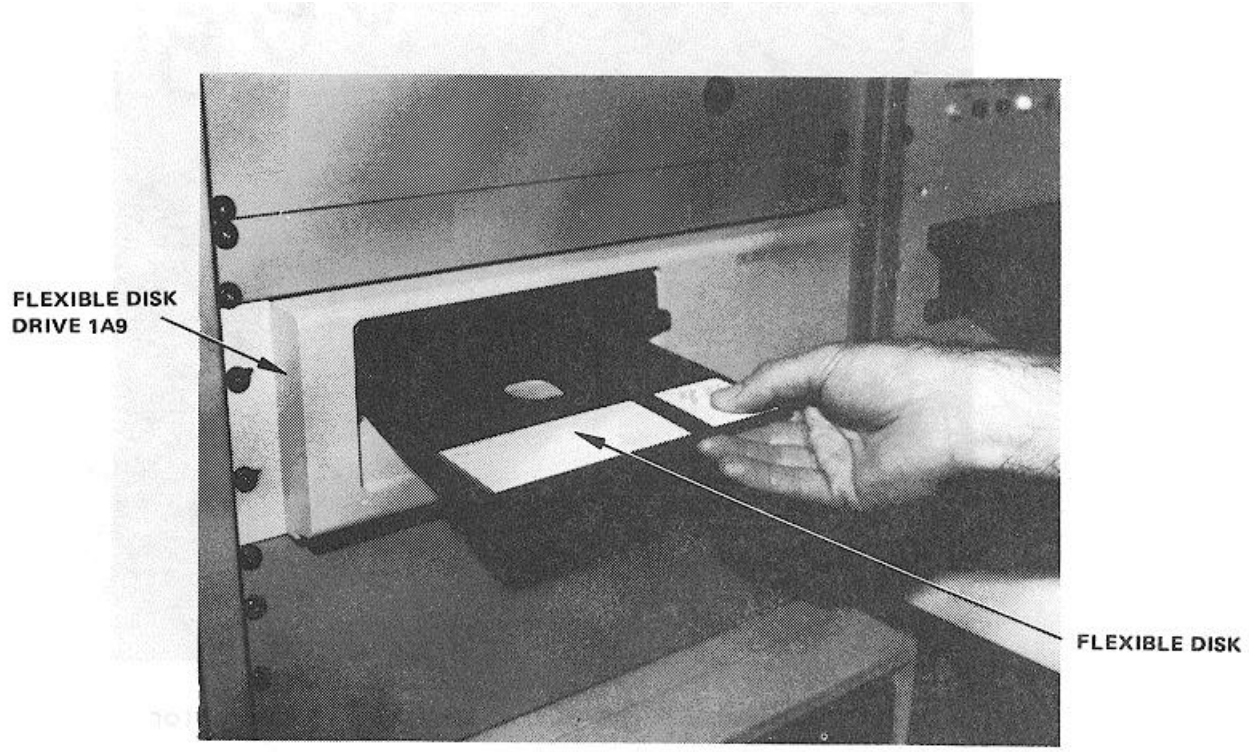


Figure 2-39. Installing Flexible Disk in Flexible Disk Drive (1A9)

Step 5: Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS-1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

Step 6: When directed by a display message, insert IAB/PCB/Module assembly into the Programmable Switch (2A7) ZIF connector (see Figure 2-40). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

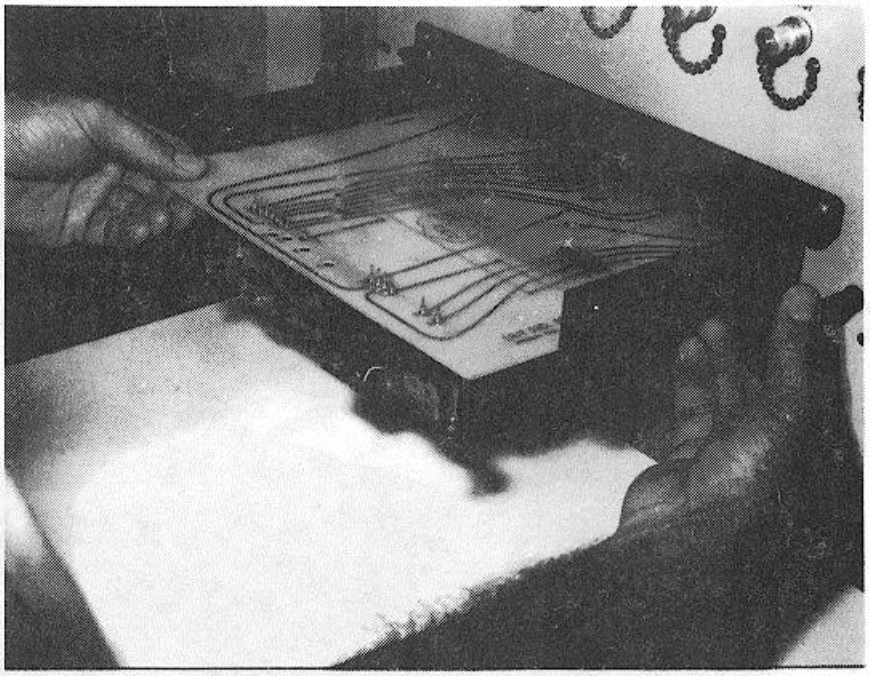


Figure 2-40. Inserting IAB/PCB/Module in ZIF Connector

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

Step 7: Lock ZIF connector by pushing ZIF locking handle in all of the way.

Step 8: As instructed by the display message, press PROCEED key (f5) to continue.

NOTE

When the PROCEED key (f5) Is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:

(1) The operator has installed the wrong IAB, in which case a display message will instruct him to select the correct disk/IAB combination.
(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.
(3) Any one of four potentiometers, on the PCB/Module, fails the test, in which case a display message will direct the operator to manually adjust the potentiometer.

Step 9: If directed by a display message to manually adjust a potentiometer on the Control, Oscillator Frequency PCB/Module, observe the GETS-1000 instrument, identified on the display message, while making the potentiometer adjustment. Refer to Figure 2-41 for location of the four potentiometers.

Figure 2-41. Control, Oscillator Frequency PCB/Module Potentiometer Access Holes

Step 10: When directed by a display message, remove IAB/PCB/Module assembly from Programmable Switch (2A7) by pulling the ZIF connector locking handle all of the way forward and removing the IAB/PCB assembly.

Step 11: When directed by a display message, remove flexible disk from Flexible Disk Drive 1A9.

CAUTION

Return Flexible disk to the storage file so that it will not he accidentally damaged in the work area.

CAUTION

Use extreme care not to damage PCB/Module or IAB while separating the two parts.

Step 12: Disconnect PCB/Module from test IAB.

Step 13: Store lAB.

2.5.5.10 10183604 Detector, Receiver Failure PCB/Module

This paragraph supplements the GETS-1000 I/0 Terminal (3A6) display directed instructions for testing the 10183604 Detector, Receiver Failure PCB/Module. Information in this paragraph includes the identifying numbers for the test program flexible disk and lAB's that are required for initiating the voltage regulator test; notes and cautions associated with test preparation and PCB/Module test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.10.1 Preparation for Testing

General notes and cautions relating to preparation for testing the Detector, Receiver Failure PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by an I/O Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing or can disrupt the entire GETS-1000 system operation.

CAUTION

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

NOTE

See paragraph 2.5.4 for a description of the eight special function keys on the I/O Terminal (3A6) keyboard. Some of these keys will be actuated during relay assembly testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in paragraph 2.6.

CAUTION

Do not install flexible disk in Flexible Disk Drive (IA9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the 10183604 Detector, Receiver Failure PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk Number	IAB Number
10183604	Detector, Receiver Failure	FD47D255703	ASSY 47D255703G1

2.5.5.10.2 Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the I/O Terminal (3A6) display.

CAUTION

Use extreme care not to damage IAB or the PCB/Module when connecting these two parts.

Step 1: Connect the Detector, Receiver Failure PCB/Module to IAB as shown in Figure 2-42. Check that the PCB/Module connector pins align with holes in IAB. Bend pins slightly, if necessary, to ensure proper alignment.

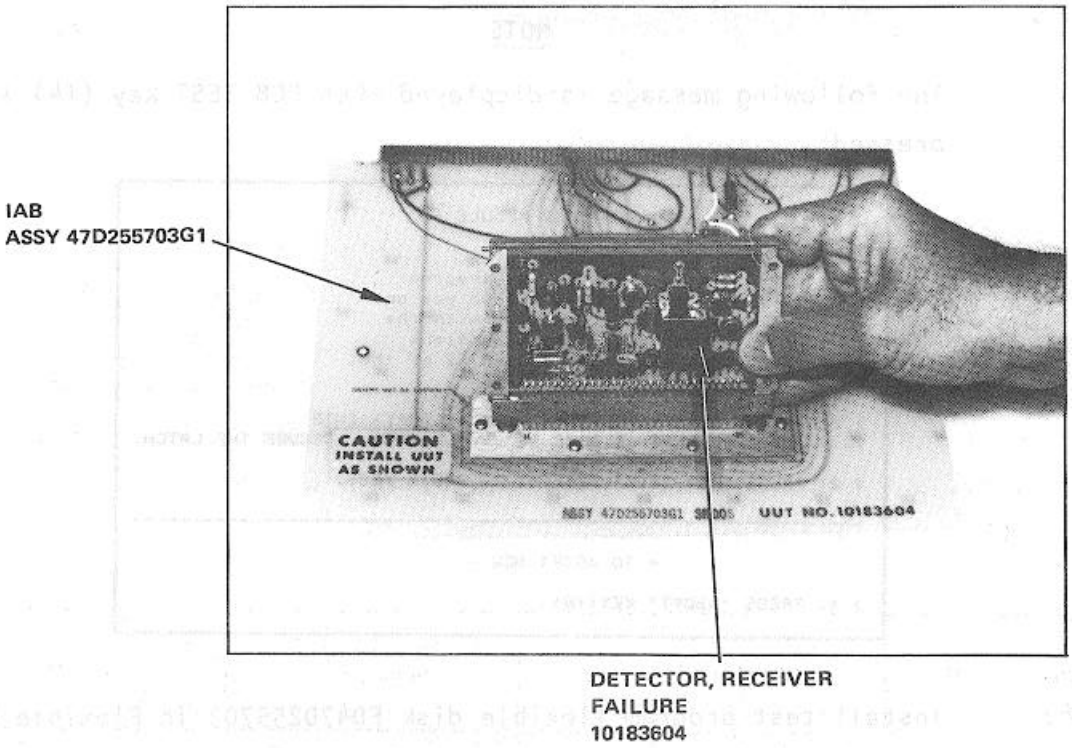


Figure 2-42. Connecting the Detector, Receiver Failure PCB/Module to the IAB

Step 2: Verify that no IAB is installed in the ZIF connector.

NOTE

The following message will be displayed on the I/0 Terminal (3A6) prior to initiating a PCB/Module test.

!! GETS - 1000 AT YOUR SERVICE !!
TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE) **1. PRESS "PCB TEST" KEY (f4)**
TO RUN GETS- 1000 SELF TEST **1. PRESS "SELF TEST" KEY (f2)**

Step 3: Press PCB TEST key (f4) to start PCB/Module test.

NOTE

The following message is displayed when PCB TEST key (f4) is pressed:

TO TEST PCB MODULE

CAUTION

) Do not handle test program flexible disks unless you are completely
) familiar with the disk handling instructions contained in section II of the
) operator's manual.
)
) INSERT PROPER FLEXIBLE DISK (FLOPPY) INTO
) THE IAS FLEXIBLE DISC DRIVE (HP98BS). SECURE THF LATCH.
) 2. PRESS “PCB TEST” KEY(f4) TO BEGIN TEST.

) TO ABORT NOW
) 1. PRESS “ABORT” KEY(f8).

Step 4: Install test program flexible disk FD47D255703 in Flexible Disk Drive (1A9) (see Figure 2-43) as instructed by display message.

CAUTION

Do not install IAB in ZIF connector until directed to do so by a display message.

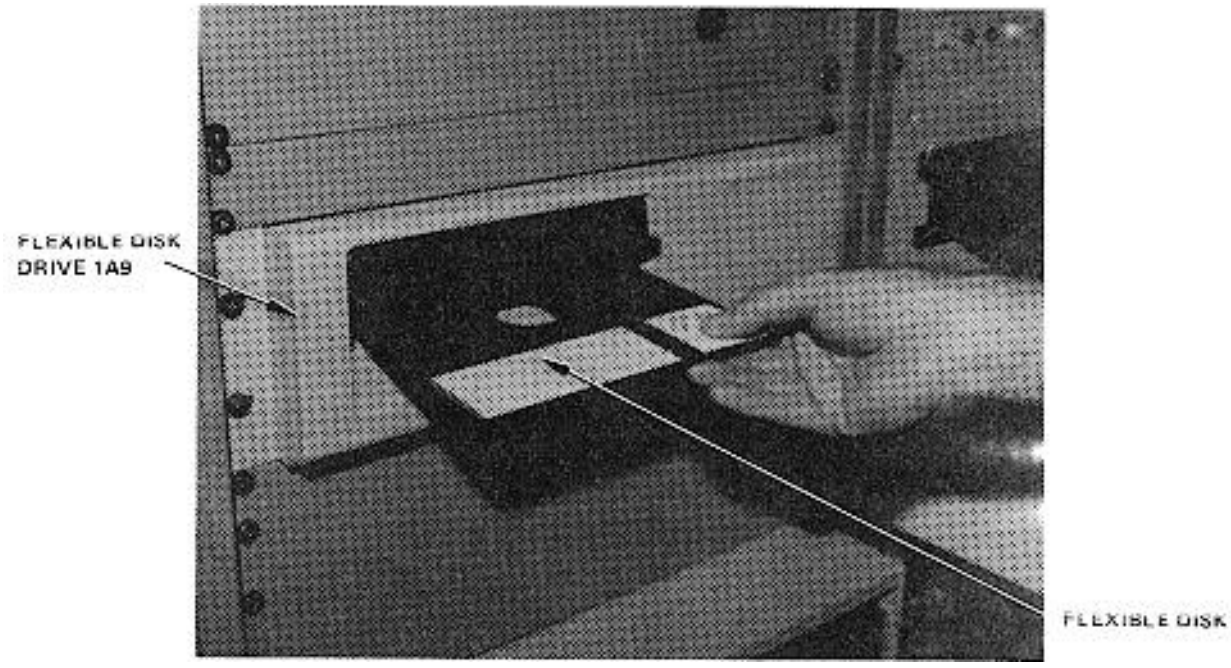


Figure 2-43. Installing Flexible Disk in Flexible Disk Drive (1A9)

Step 5: Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

Step 6: When directed by a display message, insert the IAB/PCB/Module assembly into the Programmable Switch (2A7) ZIF connector (see Figure 2-44). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

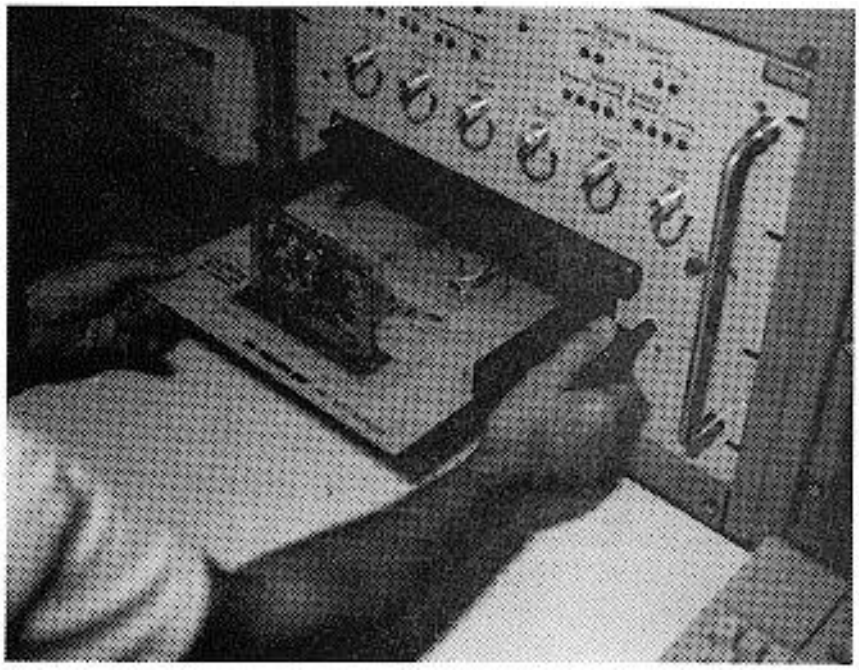


Figure 2-44. Inserting IAB/PCB/Module in ZIF Connector

Step 7: Lock ZIF connector by pushing ZIF locking handle in all of the way.

Step 8: As instructed by the display message, press PROCEED key (f5) to continue.

NOTE

When the PROCEED key (f5) is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:

(1) The operator has installed the wrong IAB, in which case a display message will instruct him to select the correct disk/IAB combination.

(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.

Step 9: When directed by a display message, remove IAB/PCB/Module assembly from Programmable Switch (2A7) by pulling the ZIF connector locking handle all of the way forward and removing the IAB/PCB/Module assembly.

Step 10: When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

CAUTION

Return flexible disk to the storage file so that it will not be accidentally damaged in the work area.

CAUTION

Use extreme care not to damage PCB/Module or IAB while separating the two parts.

Step 11: Disconnect PCB/Module from test IAB.

Step 12: Store IAB.

2.5.5.11 10288745 Amplifier, Audio Frequency PCB/Module

This paragraph supplements the GETS-1000 I/O Terminal (3A6) display directed instructions for testing the 10288745 Amplifier, Audio Frequency PCB/Module. Information in this paragraph includes the identifying numbers for the test program flexible disk and lAB's that are required for initiating the voltage regulator test; notes and cautions associated with test preparation and PCB/Module test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.11.1 Preparation for Testing

General notes and cautions relating to preparation for testing the Amplifier, Audio Frequency PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by an I/O Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing or can disrupt the entire GETS-1000 system operation.

CAUTION

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

NOTE

See paragraph 2.5.4 for a description of the eight special function keys on the I/O Terminal (3A6) keyboard. Some of these keys will be actuated during relay assembly testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in paragraph 2.6.

CAUTION

Do not install flexible disk in Flexible Disk Drive (1A9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the 10288745 Amplifier, Audio Frequency PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk Number	IAB Number
10288745	Amplifier, Audio Frequency	FD470255748	ASSY 470255748G1

2.5.5.11.1 Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the I/O Terminal (3A6) display.

CAUTION

Use extreme care not to damage IAB or the PCB/Module when connecting these two parts.

Step 1: Connect the Amplifier, Audio Frequency PCB/Module to IAB as shown in Figure 2-45. Check that the PCB/Module connector pins align with holes in IAB. Bend pins slightly if necessary to ensure proper alignment.

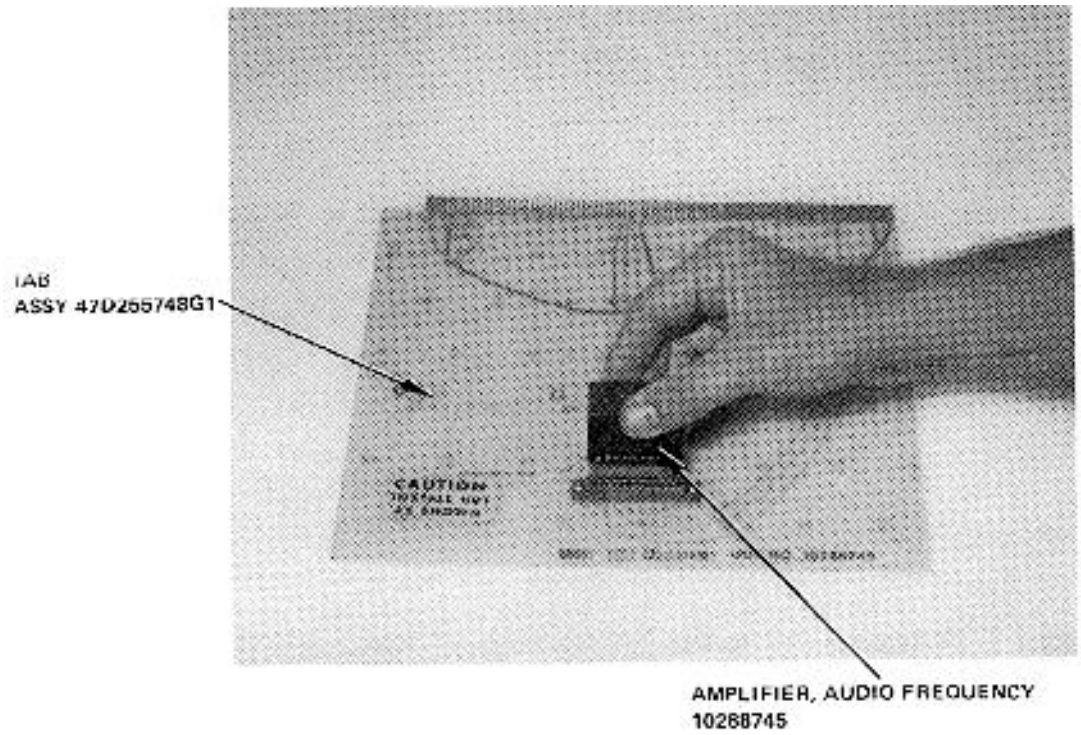


Figure 2-45. Connecting the Amplifier, Audio Frequency PCB/Module to the IAB

Step 2: Verify that no IAB is installed in the ZIF connector.

NOTE

The following message will be displayed on the I/O Terminal (3A6) prior to initiating a PCB/Module test.

!! GETS -1000 AT YOUR SERVICE !!
TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE) 1. PRESS "PCB TEST" KEY (f4)
TO RUN GETS- 1000 SELF TEST 1. PRESS "SELF TEST KEY (f2)

Step 3: Press PCB TEST key (f4) to start PCB/Module test.

NOTE

The following message is displayed when PCB TEST key (f4) is pressed:

- TO TEST PCB MODULE - **CAUTION** **Do not handle test program flexible disks unless you are completely familiar with the disk handling instructions contained in section II of the operator's manual** 1. INSERT PROPER FLEXIBLE DISK (FLOPPY) INTO THE 1A9 FLEXIBLE DISC DRIVE (HP9885). SECURE THE LATCH. 2. PRESS "PCB TEST" KEY TO BEGIN TEST.
- TO ABORT NOW'- 1. PRESS 'ABORT' KEY(f8).

step 4: Install test program flexible disk FD47D255748 in Flexible Disk Drive (lA9) (see Figure 2-46) as instructed by display message.

CAUTION

Do <u>not</u> install IAB in ZIF connector until directed to do so by a display message.

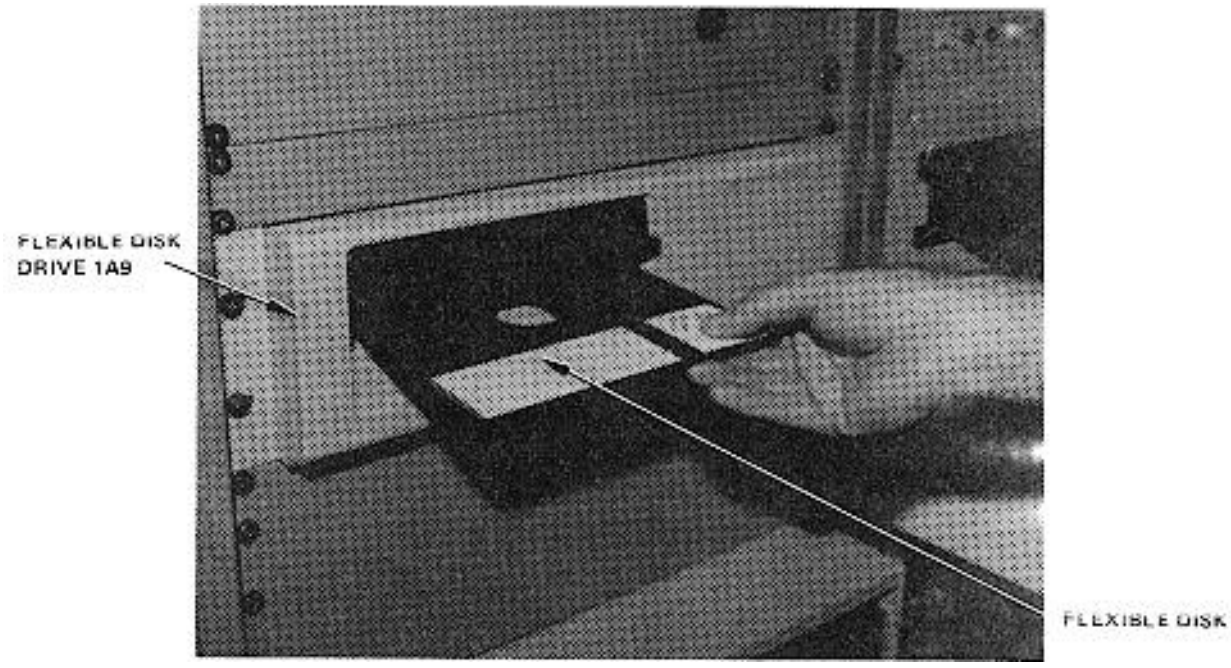


Figure 2-46. Installing Flexible Disk in Flexible Disk Drive (1A9)

Step 5: Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS-1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

Step 6: When directed by a display message, insert the IAB/PCB/Module assembly into the Programmable Switch (2A7) ZIF connector (see Figure 2-47). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

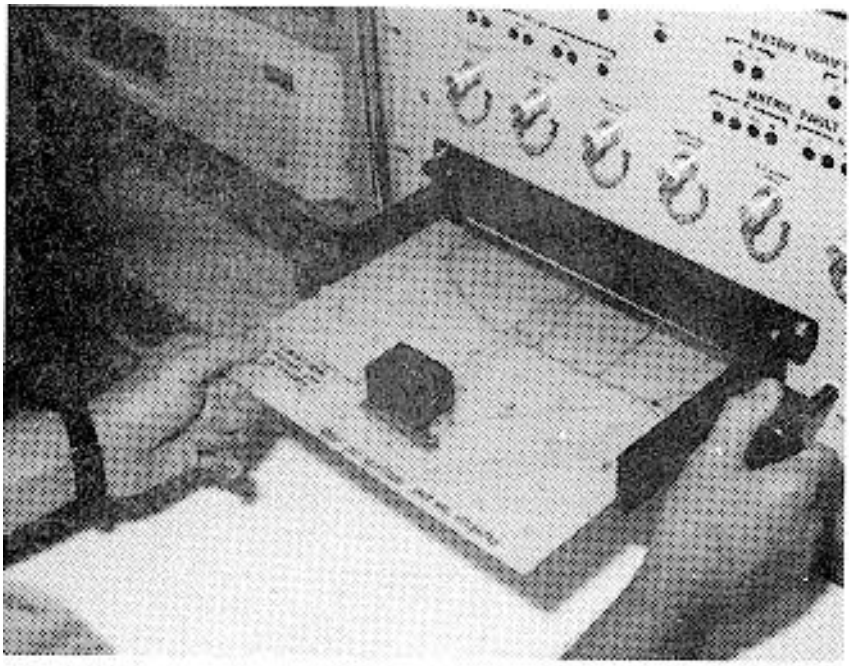


Figure 2-47. Inserting IAB/PCB/Module in ZIF Connector

Step 7: Lock ZIF connector by pushing ZIF locking handle in all of the way.

Step 8: As instructed by the display message, press PROCEED key (f5) to continue.

NOTE

When the PROCEED key (f5) is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:

(1) The operator has installed the wrong IAB, in which case a display message will instruct him to select the correct disk/IAB combination.

(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.

Step 9: When directed by a display message, remove IAB/PCB/Module assembly from Programmable Switch (2A7) by pulling the ZIF connector locking handle all of the way forward and removing the IAB/PCB/Module assembly.

Step 10: When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

CAUTION

Return flexible disk to the storage file so that it will not be accidentally damaged in the work area.

CAUTION

Use extreme care not to damage PCB/Module or IAB while separating the two parts.

Step 11: Disconnect PCB/Module from test IAB.

Step 12: Store IAB.

2.5.5.12 10288847 Power Supply Interconnecting Board PCB/Module

This paragraph supplements the GETS-1000 I/O Terminal (3A6) display directed instructions for testing the 10288847 Power Supply Interconnecting Board PCB/Module. Information in this paragraph includes the identifying numbers for the test program flexible disk and lAB's that are required for initiating the voltage regulator test; notes and cautions associated with test preparation and PCB/Module test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.12.1 Preparation for Testing

General notes and cautions relating to preparation for testing the Power Supply Interconnecting Board PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by a I/O Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing or can disrupt the entire GETS-1000 system operation.

CAUTION

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

NOTE

See paragraph 2.5.4 for a description of the eight special function keys on the I/O Terminal (3A6) keyboard. Some of these keys will be actuated during relay assembly testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in paragraph 2.6.

CAUTION

Do not install flexible disk in Flexible Disk Drive (1A9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the 10288847 Power Supply Interconnecting Board PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk Number	IAB Number
10288847	Power Supply Inter-connecting Board	FD47D255704	ASSY 47D255704G1

2.5.5.12.2 Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the I/O Terminal (3A6) display.

CAUTION

Use extreme care not to damage IAB or the PCB/Module when connecting these two parts.

Step 1: Connect the Power Supply Interconnecting Board PCB/Module to IAB as shown in Figure 2-48. Check that the PCB/Module connector pins align with holes in IAB. Bend pins slightly if necessary to ensure proper alignment.

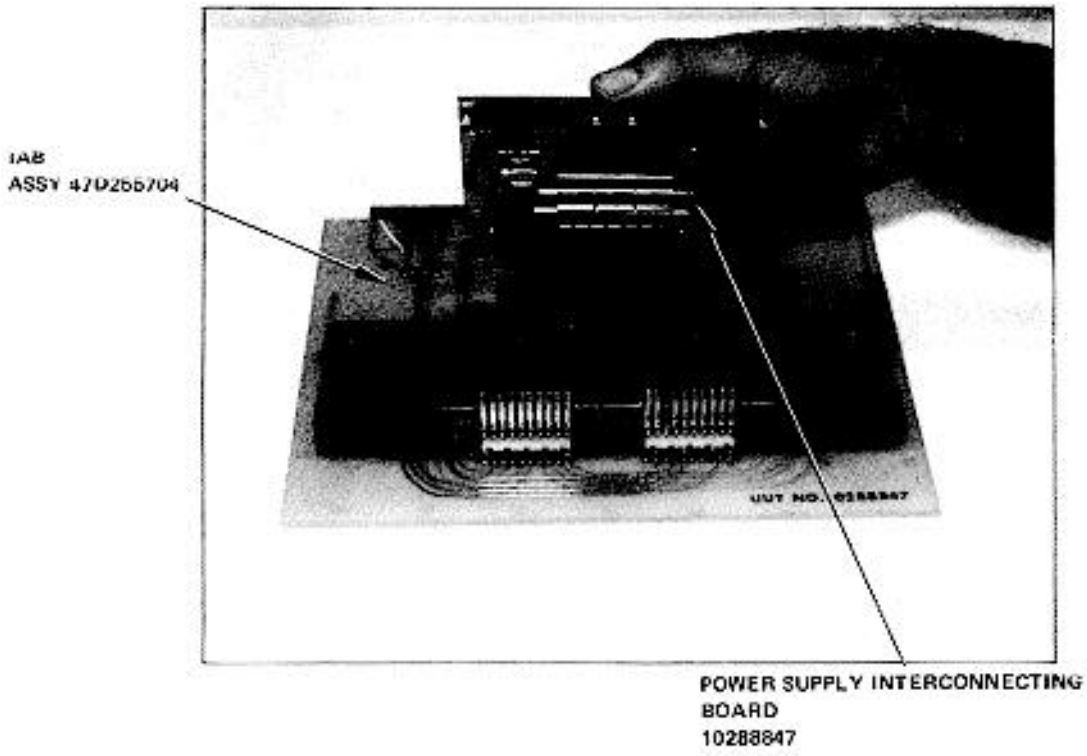


Figure 2-48. Connecting the Power Supply Interconnecting Board PCB/Module to the IAB

Step 2: Verify that no IAB is installed in the ZIF connector.

NOTE

The following message will be displayed on the I/O Terminal (3A6) prior to initiating a PCB/Module test.

!! GETS -1000 AT YOUR SERVICE !!
TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE) 1. PRESS "PCB TEST" KEY (f4)
TO RUN GETS- 1000 SELF TEST 1. PRESS "SELF TEST KEY (f2)

Step 3: Press PCB TEST key (f4) to start PCB/Module test.

NOTE

The following message is displayed when PCB TEST key (f4) is pressed:

- TO TEST PCB MODULE - **CAUTION** **Do not handle test program flexible disks unless you are completely familiar with the disk handling instructions contained in section II of the operator's manual** 1. INSERT PROPER FLEXIBLE DISK (FLOPPY) INTO THE 1A9 FLEXIBLE DISC DRIVE (HP9885). SECURE THE LATCH. 2. PRESS "PCB TEST" KEY TO BEGIN TEST.
- TO ABORT NOW'- 1. PRESS "ABORT" KEY(f8).

Step 4: Install test program flexible disk FD47D255704 in Flexible Disk Drive (1A9) (see Figure 2-49) as instructed by display message.

CAUTION

Do <u>not</u> install lAB in ZIF connector until directed to do so by a display message.

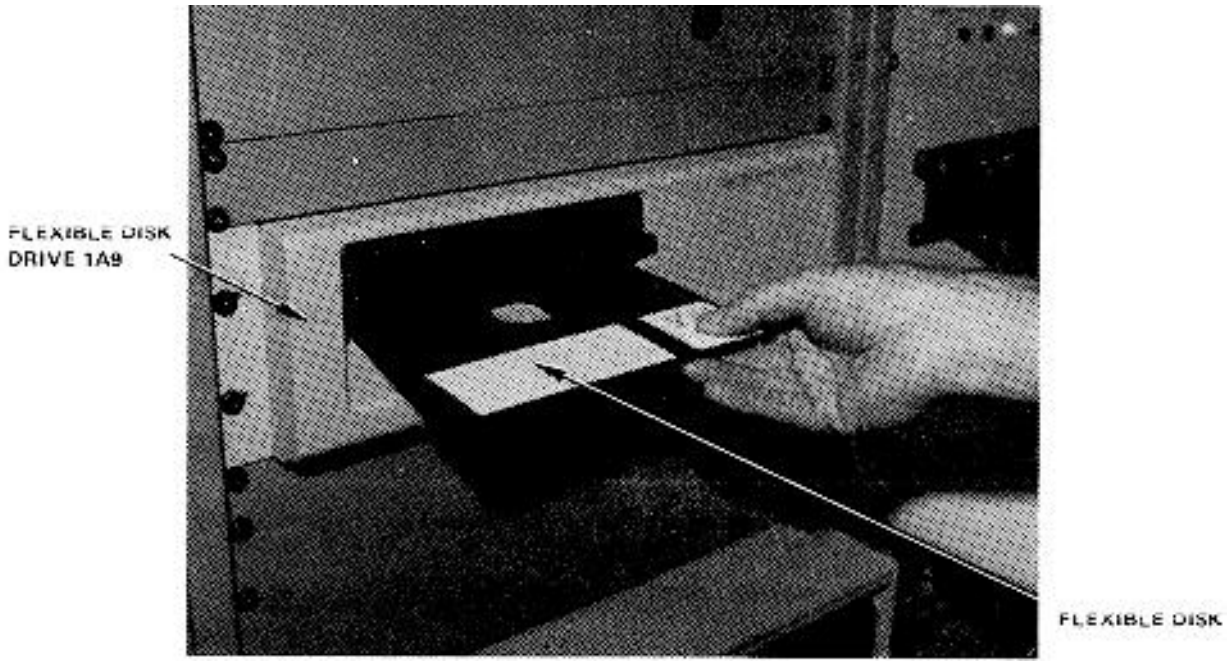


Figure 2-49. Installing Flexible Disk in Flexible Disk Drive (1A9)

Step 5: Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS-1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

Step 6: When directed by a display message, insert the IAB/PCB/Module assembly into the Programmable Switch (2A7) ZIF connector (see Figure 2-50). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

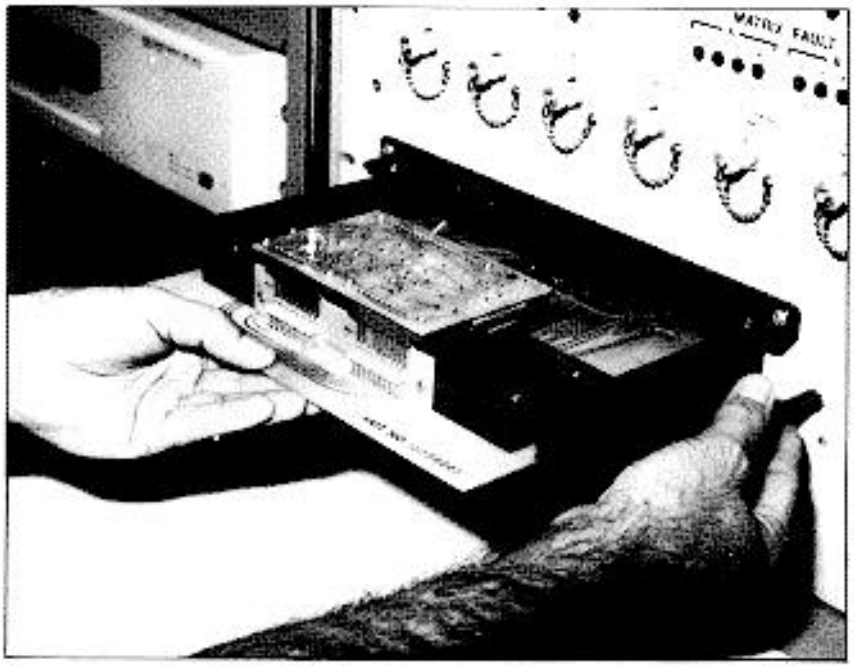


Figure 2-50. Inserting IAB/PCB/Module in ZIF Connector

Step 7: Lock ZIF connector by pushing ZIF locking handle in all of the way.

Step 8: As instructed by the display message, press PROCEED key (f5) to continue.

NOTE

When the PROCEED key (f5) is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:

(1) The operator has installed the wrong IAB, in which case a display message will instruct him to select the correct disk/IAB combination.

(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.

Step 9: When directed by a display message, remove IAB/PCB/Module assembly from Programmable Switch (2A7) by pulling the ZIF connector locking handle all of the way forward and removing the IAB/PCB/Module assembly.

Step 10: When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

CAUTION

Return flexible disk to the storage file so that it will not be accidentally damaged in the work area.

CAUTION

Use extreme care not to damage PCB/Module or IAB while separating the two parts.

Step 11: Disconnect PCB/Module from test IAB.

Step 12: Store IAB.

2.5.5.13 10292709 Amplifier, Detector PCB/Module

This paragraph supplements the GETS-1000 I/O Terminal (3A6) display directed instructions for testing the 10292709 Amplifier, Detector PCB/Module. Information in this paragraph includes the identifying numbers for the test program flexible disk and lAB's that are required for initiating the voltage regulator test; notes and cautions associated with test preparation and PCB/Module test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.13.1 Preparation for Testing

General notes and cautions relating to preparation for testing the Amplifier, Detector PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by an I/O Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing or can disrupt the entire GETS-1000 system operation.

CAUTION

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

NOTE

See paragraph 2.5.4 for a description of the eight special function keys on the I/O Terminal (3A6) keyboard. Some of these keys will be actuated during relay assembly testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in paragraph 2.6.

CAUTION

Do not install flexible disk in Flexible Disk Drive (1A9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the 10292709 Amplifier, Detector PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk No.	IAB Number
10292709	Amplifier, Detector	FD47D255701	ASSY 47D255701G1

2.5.5.13.2 Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the I/O Terminal (3A6) display.

CAUTION

Use extreme care not to damage IAB or the PCB/ Module when connecting these two parts.

Step 1: Connect the Amplifier, Detector PCB/Module to IAB as shown in Figure 2-51. Check that the PCB/Module connector pins align with holes in IAB. Bend pins slightly, if necessary, to ensure proper alignment. Also check to see that pins are free of solder.

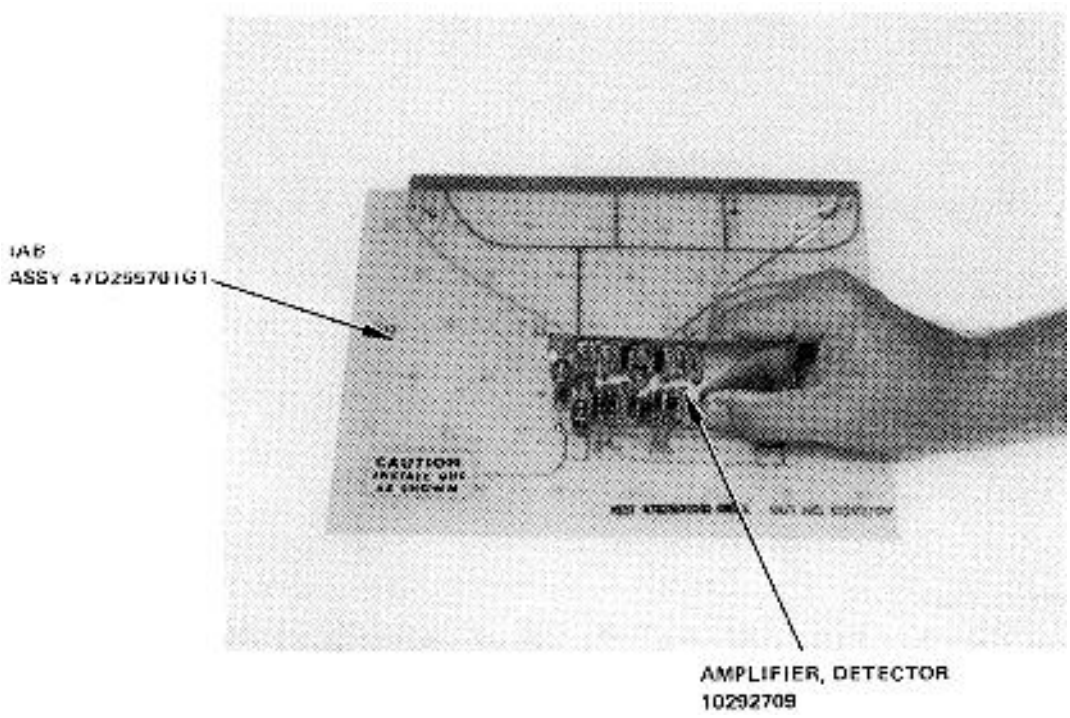


Figure 2-51. Connecting the Amplifier, Detector PCB/Module to the IAB

Step 2: Connect one end of the cable connector to the connector on the IAB, ASSY 47D255701G1, as shown in Figure 2-52. Connect the other end, of the cable connector, to the Attenuator No. 1 connector located on the Programmable Switch (2A7) panel, as shown in Figure 2-54.

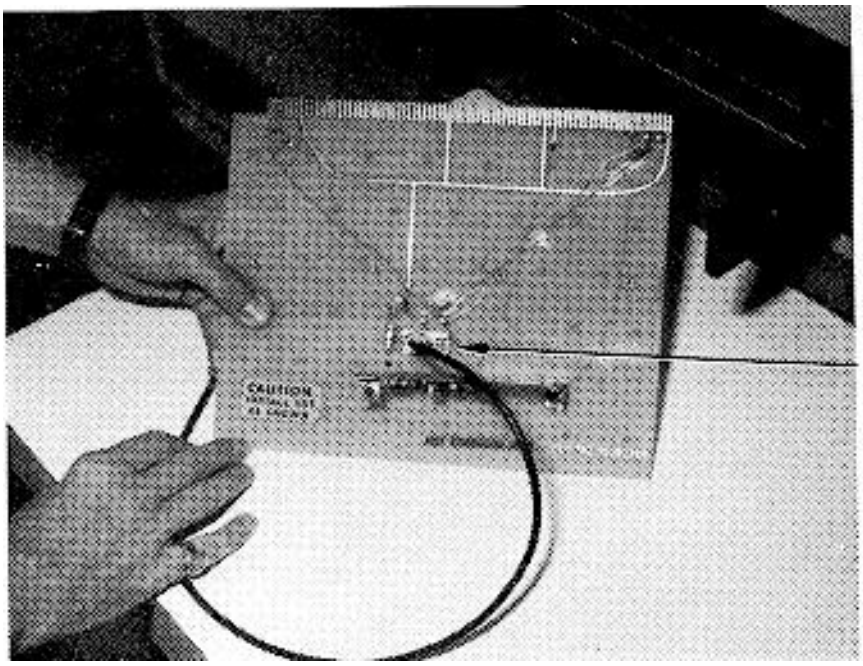


Figure 2-52. Location of Cable Connector on the IAB

Step 3: Verify that no IAB is installed in the ZIF connector.

NOTE

The following message will be displayed on the I/O Terminal (3A6) prior to initiating a PCB/Module test.

!! GETS -1000 AT YOUR SERVICE !!
TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE) 1. PRESS "PCB TEST" KEY (f4)
TO RUN GETS- 1000 SELF TEST 1. PRESS "SELF TEST KEY (f2)

Step 4: Press PCB TEST key (f4) to start PCB/Module test.

NOTE

The following message is displayed when PCB TEST key (f4) is pressed:

- TO TEST PCB MODULE -
CAUTION **Do not handle test program flexible disks unless you are completely familiar with the disk handling instructions contained in section II of the operator's manual**
1. INSERT PROPER FLEXIBLE DISK (FLOPPY) INTO THE 1A9 FLEXIBLE DISC DRIVE (HP9885). SECURE THE LATCH. 2. PRESS "PCB TEST" KEY TO BEGIN TEST.
- TO ABORT NOW'-
1. PRESS 'ABORT' KEY(f8).

Step 5: Install test program flexible disk FD47D255701 in Flexible Disk Drive (1A9) (see Figure 2-53) as instructed by display message.

CAUTION

Do not install IAB in ZIF connector until directed to do so by a display message.

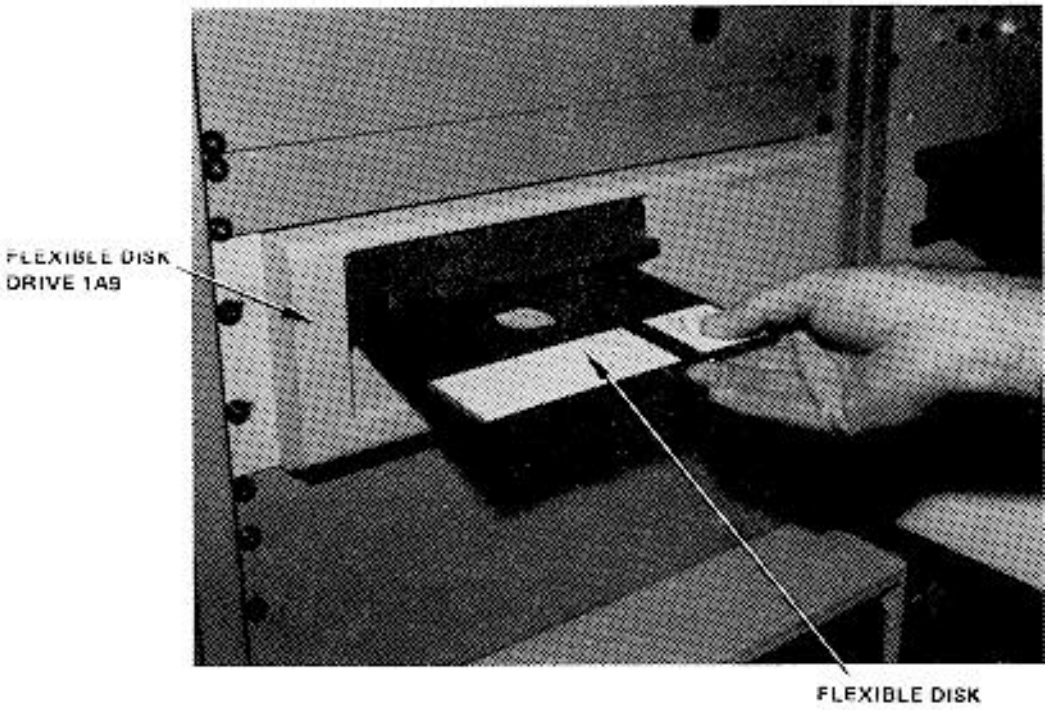


Figure 2-53. Installing Flexible Disk in Flexible Disk Drive (1A9)

Step 6: Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS-1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

Step 7: When directed by a display message, insert IAB/PCB/Module assembly into the Programmable Switch (2A7) ZIF connector (see Figure 2-54). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

Step 8: Lock ZIF connector by pushing ZIF locking handle in all of the way.

Step 9: As instructed by the display message, press PROCEED key (f5) to continue.

NOTE

When the PROCEED key (f5) is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:

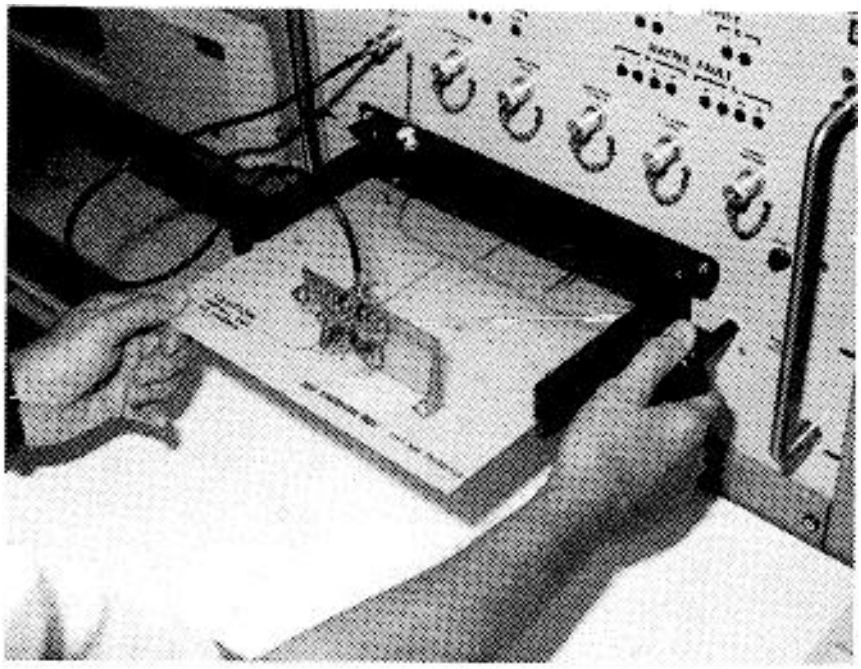


Figure 2-54. Inserting IAB/PCB/Module in ZIF Connector

(1) The operator has installed the wrong IAB, in which case a display message will instruct him to select the correct disk/IAB combination.

(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.

Step 10: When directed by a display message, remove IAB/PCB/Module assembly from the Programmable Switch (2A7).

CAUTION

Remove the cable connector from the IAB and Programmable Switch (2A7) panel before removing the IAB/PCB/Module from the ZIF connector.

The IAB/PCB/Module assembly is removed from the Programmable Switch (2A7) by pulling the ZIF connector locking handle all the way forward and removing the IAB/PCB/Module assembly.

Step 11: When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

CAUTION
Return flexible disk to the storage file so that it will not be accidentally damaged in the work area.

CAUTION
Use extreme care not to damage PCB/Module or IAB while separating the two parts.

Step 12: Disconnect PCB/Module from test IAB.

Step 13: Store IAB.

2.5.5.14 10292715 Voltage Regulator (+3V) PCB/Module

Instructions for testing the 10292715 Voltage Regulator (+3V) PCB/Module. Information in this paragraph includes the identifying numbers for test program flexible disk and lAB's that are required for initiating the voltage regulator test; notes and cautions associated with test preparation and PCB/ Module test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/ Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.14.1 Preparation for Testing

General notes and cautions relating to preparation for testing the Voltage Regulator (+3V) PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by an I/O Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing, or can disrupt the entire GETS-1000 system operation.

CAUTION

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

NOTE

See Paragraph 2.5.4 for a description of the eight special function keys on the I/O Terminal (3A6) keyboard. Some of these keys will be actuated during voltage regulator testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in Paragraph 2.6.

CAUTION

Do not install flexible disk in Flexible Disk Drive (1A9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the 10292715 Voltage Regulator (+3V) PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk Number	IAB Number
10292715	Voltage Regulator (+3V)	FD47D255706	ASSY 47D255706G1

2.5.5.14.2 Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the I/O Terminal (3A6) display.

CAUTION
Use extreme care not to damage IAB or the PCB/ Module when connecting these two parts.

STEP 1: Connect the Voltage Regulator (+3V) PCB/Module to IAB as shown in Figure 2-55. Check that the PCB/Module connector pins align with holes in IAB. Bend pins slightly, if necessary, to ensure proper alignment. Also, check to see that pins are free of solder.

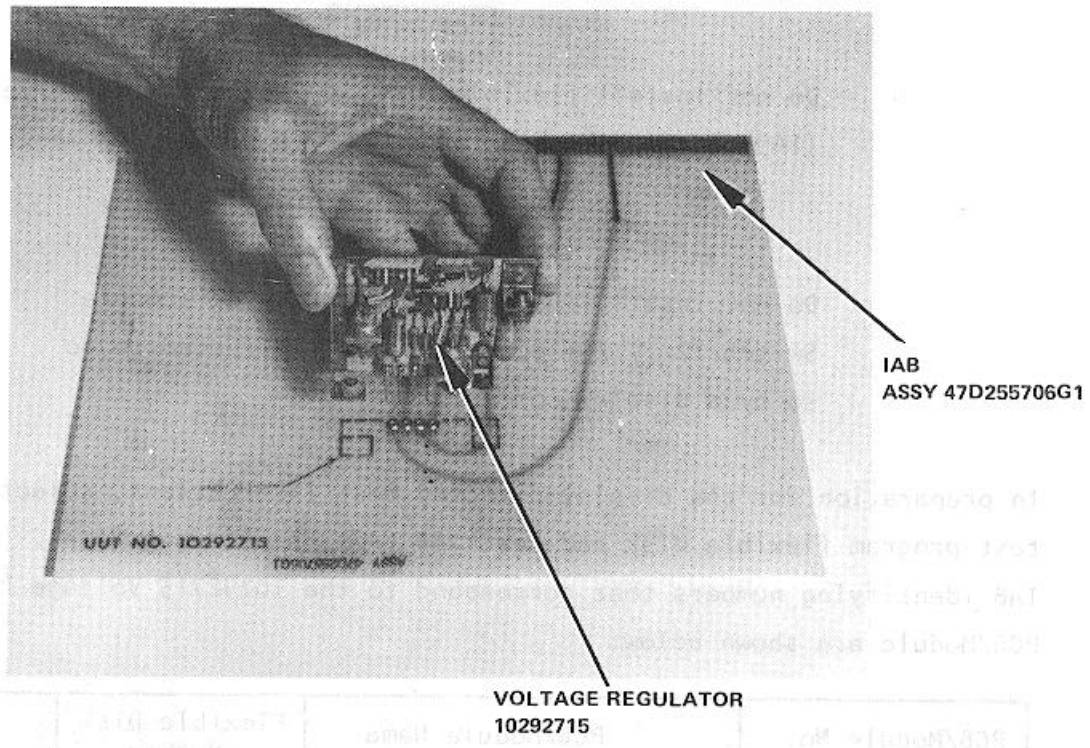


Figure 2-55. Connecting the Voltage Regulator (+3V) PCB/Module to the 1AB

STEP 2: Verify that no IAB is installed in the ZIF connector.

NOTE
The following message will be displayed on the I/O Terminal (3A6) prior to initiating a PCB/Module test.

```
****************************************************************************
              !! GETS - 1000 AT YOUR SERVICE !!
****************************************************************************

   TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE) *
       I.  PRESS "PCB TEST" KEY (f 4)

 ----------------------------------------------------------------------------
   TO RUN GETS- 1000 SELF TEST
       I.  PRESS "SELF TEST" KEY (f 2)

****************************************************************************
```

STEP 3: Press PCB TEST key (f4) to start PCB/Module test.

NOTE
The following message is displayed when PCB TEST key (f 4) is pressed:

```
                     - TO TEST PCB MODULE -

                            CAUTION
         Do not handle test program flexible disks unless you are completely
         familiar with the disk handling instructions contained in section II of the
         operator's manual.

> 1.     INSERT PROPER FLEXIBLE DISK (FLOPPY) INTO
         THE 1A9 FLEXIBLE DISC DRIVE (HP988S).  SECURE THE LATCH.

> 2.     PRESS “PCB TEST" KEY(f4) TO BEGIN TEST.
--------------------------------------------------------------------------------
                      - TO ABORT NOW -

> 1.     PRESS 'ABORT" KEY(f8).
```

STEP 4: Install test program flexible disk FD47D255706 in Flexible Disk Drive (lA9) (see Figure 2-56) as instructed by display message.

CAUTION
Do <u>not</u> install IAB in ZIF connector until directed to do so by a display message.

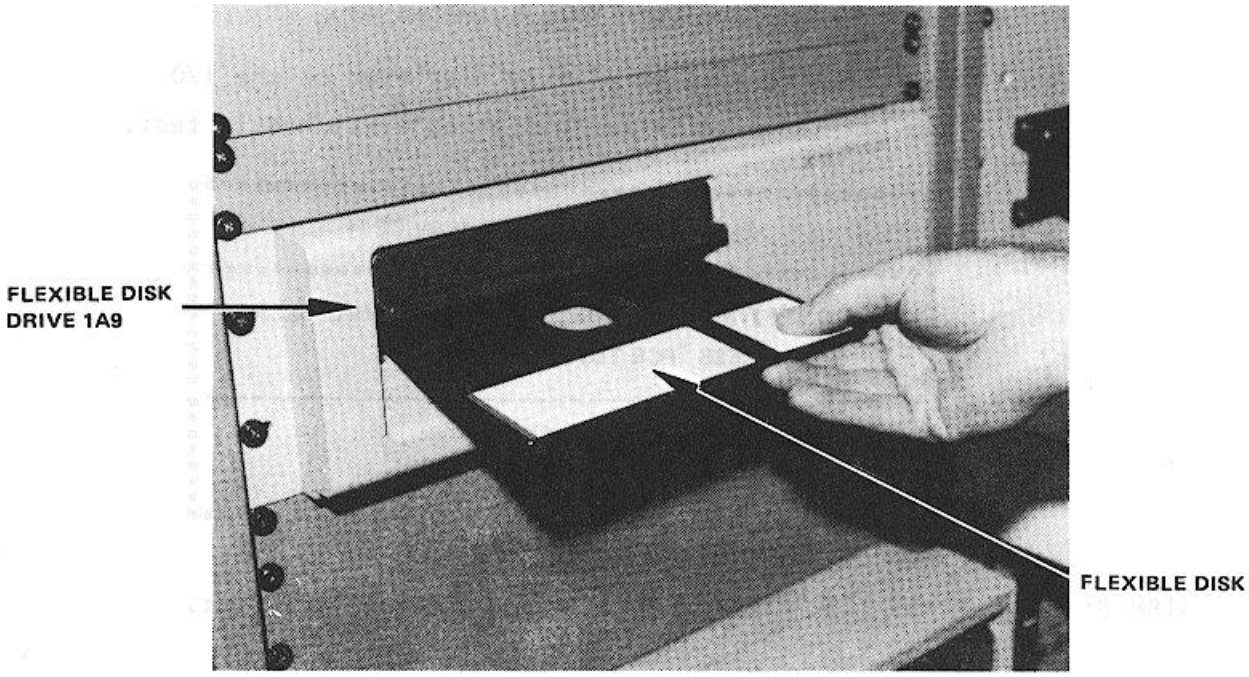


Figure 2-56. Installing Flexible Disk in Flexible Disk Drive (1A9)

STEP 5: Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS-1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

STEP 6: When directed by a display message, insert IAB/PCB/Module assembly in Programmable Switch (2A7) ZIF connector (see Figure 2-57). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

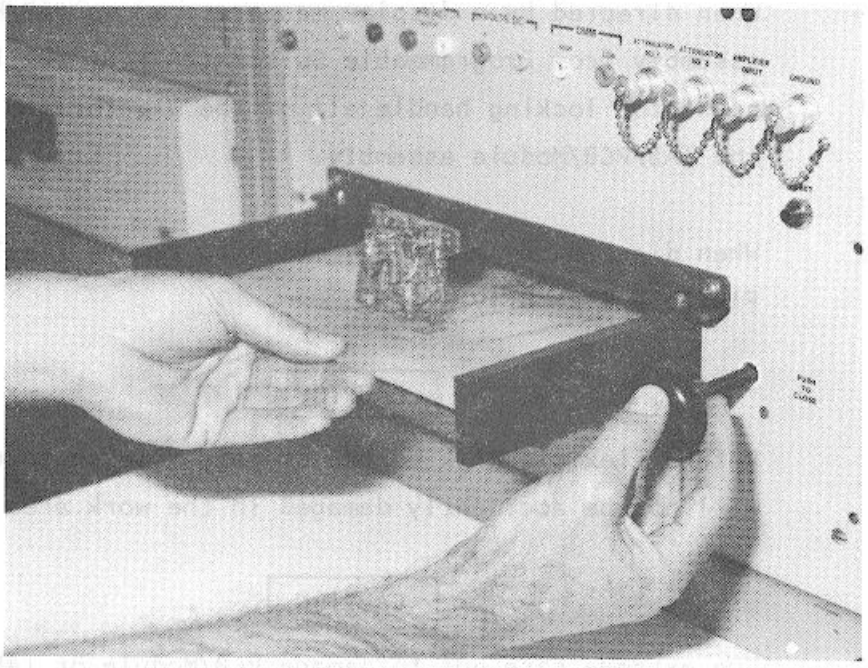


Figure 2-57. Inserting the IAB/PCB/Module in ZIF Connector

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

STEP 7: Lock ZIF connector by pushing ZIF locking handle in all the way.

STEP 8: As instructed by the display message, press PROCEED key (f5) to continue.

NOTE

When the PROCEED key (f5) is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:
(1) The operator has installed the wrong IAB, in which case, a display message will instruct him to select the correct disk/IAB combination.
(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.

STEP 9: When directed by a display message, remove IAB/PCB/Module assembly from Programmable Switch (2A7) by pulling the ZIF connector locking handle all of the way forward and removing the IAB/PCB/Module assembly.

STEP 10: When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

CAUTION

Return flexible disk to the storage file so that it will not be accidentally damaged in the work area.

CAUTION

Use extreme care not to damage PCB/Module or IAB while separating the two parts.

STEP 11: Disconnect PCB/Module from test IAB.

STEP 12: Store IAB.

2.5.5.15 10668853 Relay Assembly PCB/Module

This paragraph supplements the GETS-l000 I/O Terminal (3A6) display - directed instructions for testing the 10668853 Relay Assembly PCB/Module. Information in this paragraph includes the identifying numbers for test program flexible disk and lAB's that are required for initiating the relay assembly test; notes and cautions associated with test preparation and PCB/Module test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.15.1 Preparation for Testing

General notes and cautions relating to preparation for testing the Relay Assembly PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by an I/O Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing, or can disrupt the entire GETS-1000 system operation.

CAUTION

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

NOTE

See Paragraph 2.5.4 for a description of the eight special function keys on the I/O Terminal (3A6) keyboard. Some of these keys will be actuated during voltage regulator testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in Paragraph 2.6.

CAUTION

Do not install flexible disk in Flexible Disk Drive (1A9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the 10668853 Relay Assembly PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk Number	IAB Number
10668853	Relay Assembly	FD47D255713	ASSY 47D255713G1

2.5.5.15.2 Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the I/O Terminal (3A6) display.

CAUTION
Use extreme care not to damage IAB or the PCB/ Module when connecting these two parts.

STEP 1: Connect the Relay Assembly PCB/Module to IAB as shown in Figure 2-58. Check that the PCB/Module connector pins align with holes in IAB. Bend pins slightly, if necessary, to ensure proper alignment.

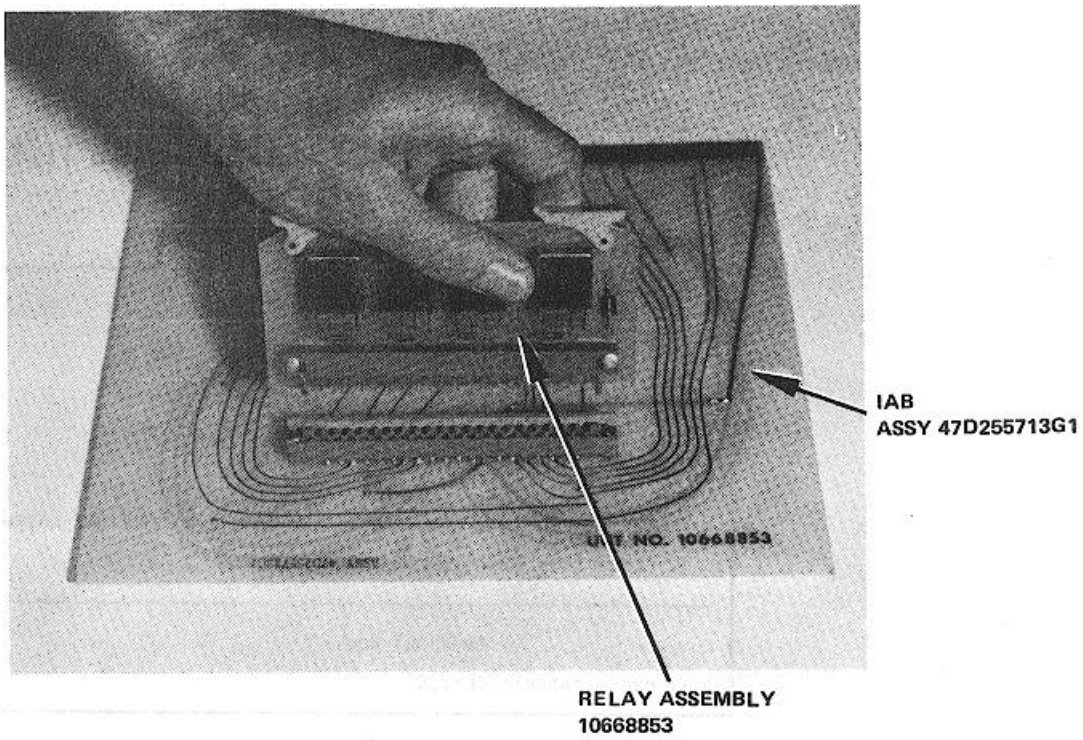


Figure 2-58. Connecting the Relay Assembly PCB/Module to the IAB

STEP 2: Verify that no IAB is installed in the ZIF connector.

NOTE The following message will be displayed on the I/O Terminal (3A6) prior to initiating a PCB/Module test.

****

!! GETS - 1000 AT YOUR SERVICE !!

****

TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE) *
I. PRESS "PCB TEST" KEY (f 4)

TO RUN GETS- 1000 SELF TEST
I. PRESS "SELF TEST"KEY (f 2)

****

STEP 3: Press PCB TEST key (f4) to start PCB/Module test.

NOTE
The following message is displayed when PCB TEST key (f4) is pressed:

- TO TEST PCB MODULE -

CAUTION
Do not handle test program flexible disks unless you are completely familiar with the disk handling instructions contained in section II of the operator's manual.

> 1. INSERT PROPER FLEXIBLE DISK (FLOPPY) INTO THE 1A9 FLEXIBLE DISC DRIVE (HP988S). SECURE THE LATCH.

> 2. PRESS 'PCB TEST" KEY(f4) TO BEGIN TEST.

- TO ABORT NOW -

> 1. PRESS 'ABORT" KEY(f8).

STEP 4: Install test program flexible disk FD47D255713 in Flexible Disk Drive (1A9) (see Figure 2-59) as instructed by display message.

CAUTION
Do <u>not</u> install IAB in ZIF connector until directed to do so by a display message.

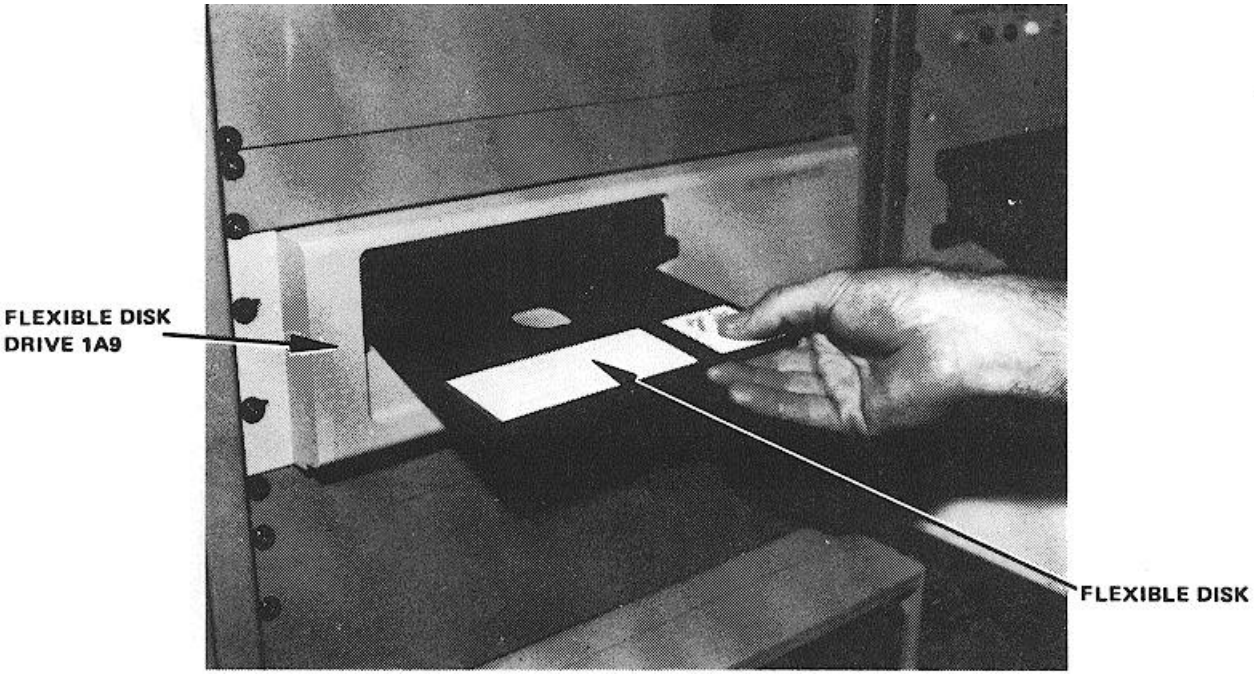


Figure 2-59. Installing Flexible Disk in Flexible Disk Drive (1A9)

STEP 5: Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS-1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

STEP 6: When directed by a display message, insert IAB/PCB/Module assembly in Programmable Switch (2A7) ZIF connector (see Figure 2-60). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

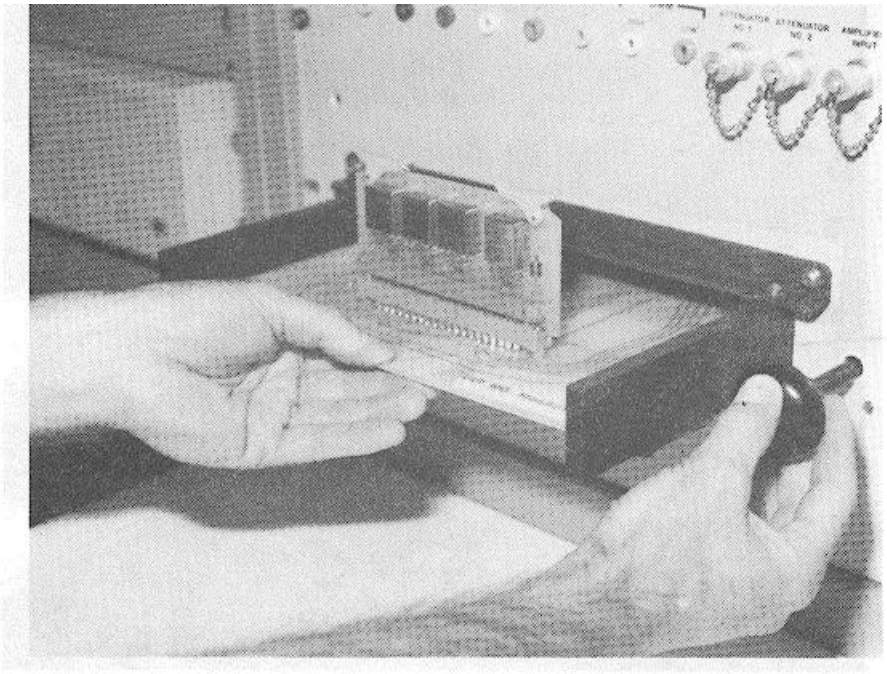


Figure 2-60. Inserting IAB/PCB/Module in ZIF Connector

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

STEP 7: Lock ZIF connector by pushing ZIF locking handle in all the way.

STEP 8: As instructed by the display message, press PROCEED key (f5) to continue.

NOTE

When the PROCEED key (f5) is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:
(1) The operator has installed the wrong IAB, in which case, a display message will instruct him to select the correct disk/IAB combination.
(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.

STEP 9: When directed by a display message, remove IAB/PCB/Module assembly from Programmable Switch (2A7) by pulling the ZIF connector locking handle all of the way forward and removing the IAB/PCB/Module assembly.

STEP 10: When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

CAUTION

Return flexible disk to the storage file so that it will not be accidentally damaged in the work area.

CAUTION

Use extreme care not to damage PCB/Module or IAB while separating the two parts.

STEP 11: Disconnect PCB/Module from test IAB.

STEP 12: Store IAB.

2.5.5.16 10669389 Audio Frequency Oscillator PCB/Module

This paragraph supplements the GETS-1000 I/O Terminal (3A6) display - directed instructions for testing the 10669389 Audio Frequency Oscillator PCB/Module. Information in this paragraph includes the identifying numbers for the test program flexible disk and IAB's that are required for initiating the voltage regulator test; notes and cautions associated with test preparation and PCB/Module test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.16.1 Preparation for Testing

General notes and cautions relating to preparation for testing the Audio Frequency Oscillator PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by an I/O Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing - or can disrupt the entire GETS-1000 system operation.

CAUTION

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

NOTE

See paragraph 2.5.4 for a description of the eight special function keys on the I/O Terminal (3A6) keyboard. Some of these keys will be actuated during relay assembly testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in paragraph 2.6.

CAUTION Do not install flexible disk in Flexible Disk Drive (1A9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the 10669389 Audio Frequency Oscillator PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk Number	IAB Number
10669389	Audio Frequency Oscillator	FD47D255722	ASSY 47D255722G1

2.5.5.16.2 Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the I/O Terminal (3A6) display.

CAUTION
Use extreme care not to damage IAB or the PCB/Module when connecting these two parts.

Step 1: Connect the Audio Frequency Oscillator PCB/Module to IAB as shown in Figure 2-61. Check that the PCB/Module connector pins align with holes in IAB. Bend pins slightly if necessary to ensure proper alignment. Also, check to see that pins are free of solder.

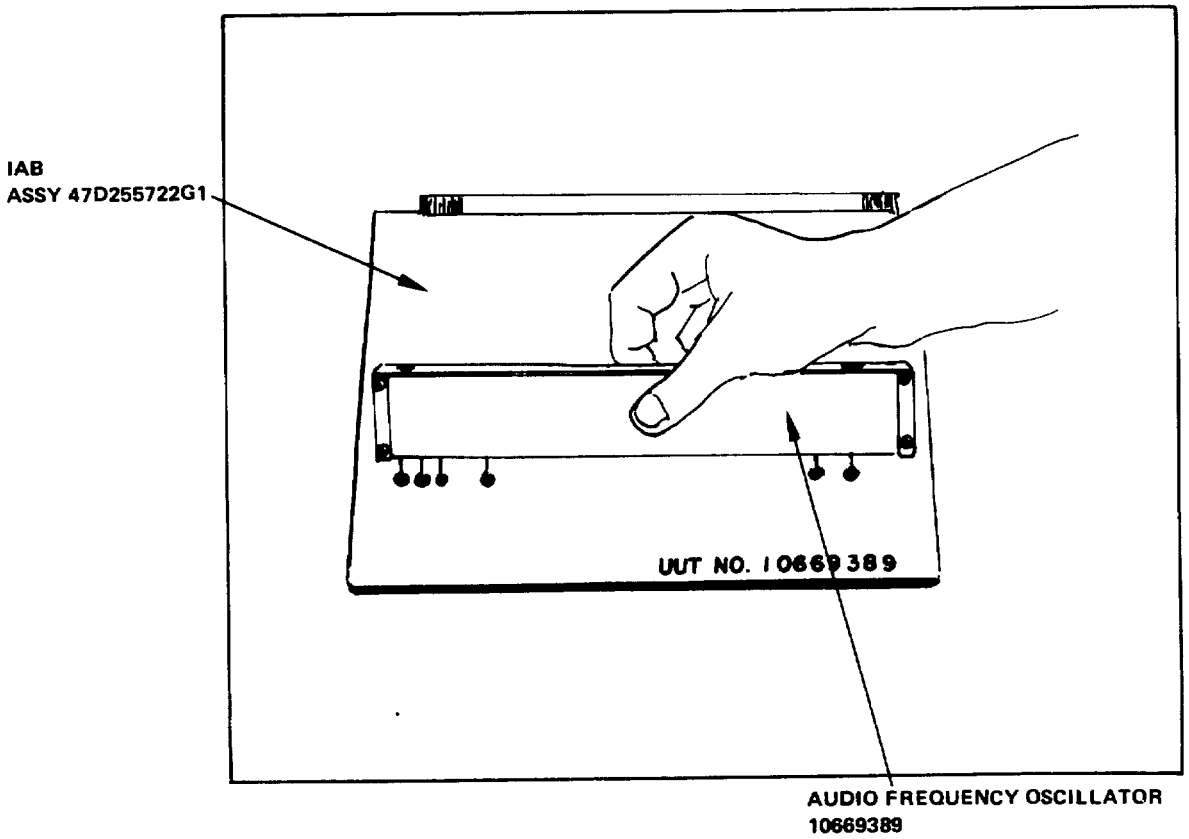


Figure 2-61. Connecting the Audio Frequency Oscillator PCB/Module to the IAB

Step 2: Verify that no IAB is installed in the ZIF connector.

NOTE
The following message will be displayed on the I/O Terminal (3A6) prior to initiating a PCB/Module test.

****
!! GETS - 1000 AT YOUR SERVICE !!
****

TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE) *
I. PRESS "PCB TEST" KEY (f4)

--
TO RUN GETS- 1000 SELF TEST
I. PRESS "SELF TEST"KEY (f 2)

****

Step 3: Press PCB TEST key (f4) to start PCB/Module test.

NOTE
The following message is displayed when PCB TEST key (f4) is pressed:

- TO TEST PCB MODULE -
CAUTION Do not handle test program flexible disks unless you are completely familiar with the disk handling instructions contained in section II of the operator's manual. > 1. INSERT PROPER FLEXIBLE DISK (FLOPPY) INTO THE 1A9 FLEXIBLE DISC DRIVE (HP988S). SECURE THE LATCH. > 2. PRESS 'PCB TEST" KEY(f4) TO BEGIN TEST.
- TO ABORT NOW - > 1. PRESS 'ABORT" KEY(f8).

Step 4: Install test program flexible disk FD47D255722 in Flexible Disk Drive (1A9) (see Figure 2-62) as instructed by display message.

CAUTION
Do <u>not</u> install IAB in ZIF connector until directed to do so by a display message.

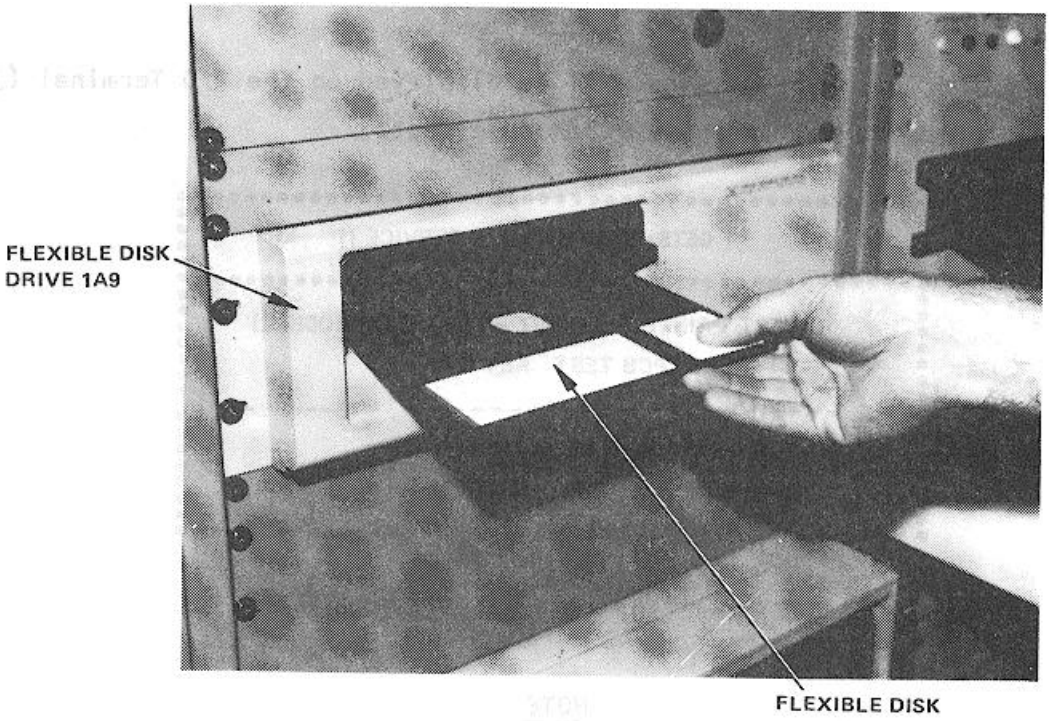


Figure 2-62. Installing Flexible Disk in Flexible Disk Drive (1A9)

Step 5 Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS-1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

Step 6: When directed by a display message, insert the IAB/PCB/Module assembly into the Programmable Switch (2A7) ZIF connector (see Figure 2-63). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

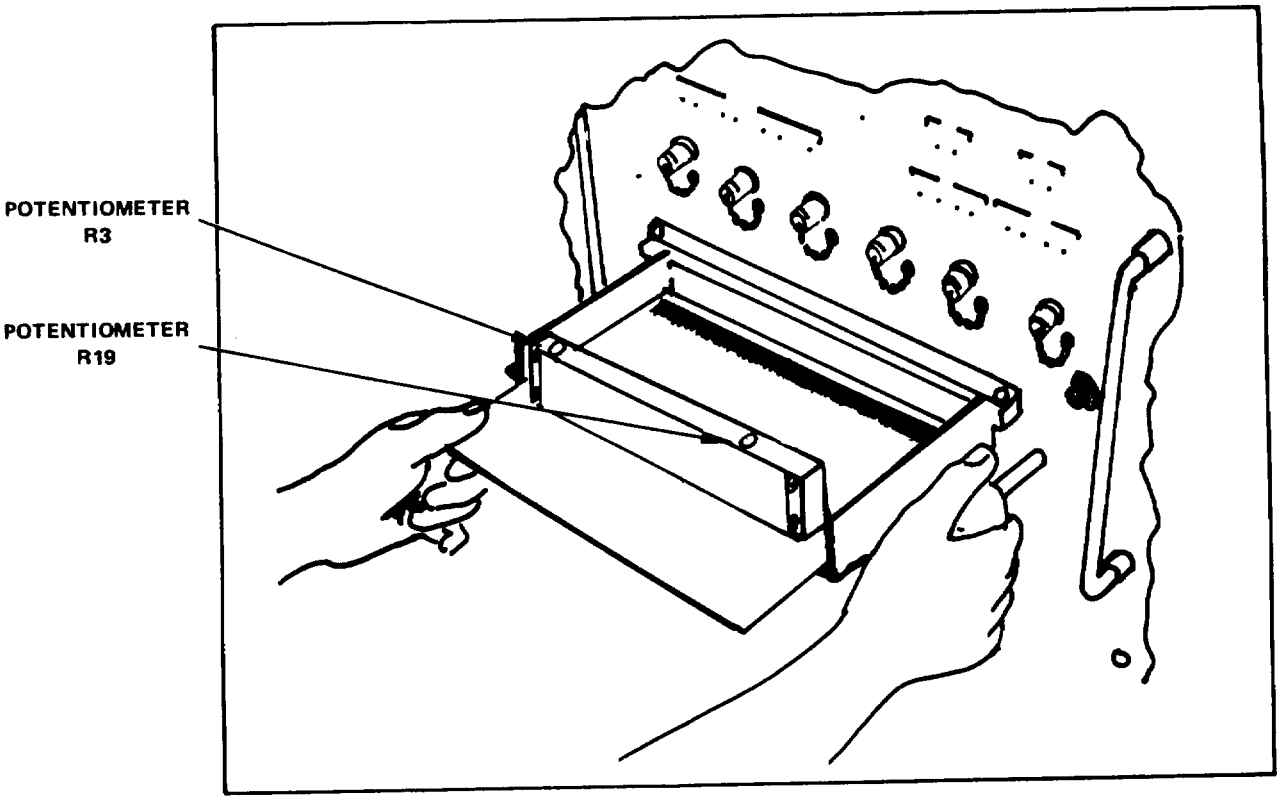


Figure 2-63. Inserting IAB/PCB/Module in ZIF Connector

Step 7: Lock ZIF connector by pushing ZIF locking handle in all of the way.

Step 8: As instructed by the display message, press PROCEED key (f5) to continue.

NOTE

When the PROCEED key (f5) is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:
(1) The operator has installed the wrong IAB, in which case a display message will instruct him to select the correct disk/IAB combination.

(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.
(3) Potentiometers R3 and R19 on the PCB/Module fails the test, in which case a display message will direct the operator to manually adjust the potentiometer.

Step 9: If directed by a display message to manually adjust potentiometers R3 and R19 on the Audio Frequency Oscillator PCB/Module, observe the GETS-1000 instrument identified on the display message while making the potentiometer adjustment through the access holes shown in Figure 2-63.

Step 10: When directed by a display message, remove IAB/PCB/Module assembly from Programmable Switch (2A7) by pulling the ZIF connector locking handle all of the way forward and removing the IAB/PCB/Module assembly.

Step 11: When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

CAUTION
Return flexible disk to the storage file so that it will not be accidentally damaged in the work area.

CAUTION
Use extreme care not to damage PCB/Module or IAB while separating the two parts.

Step 12: Disconnect PCB/Module from test IAB.

Step 13: Store IAB.

2.5.5.17 10670519 Logic Gate Threshold Detector (Recycle) PCB/Module

This paragraph supplements the GETS-1000 I/O Terminal (3A6) display - directed instructions for testing the 10670519 Logic Gate Threshold Detector (Recycle) PCB/Module. Information in this paragraph includes the identifying numbers for the test program flexible disk and IAB's that are required for initiating the voltage regulator test; notes and cautions associated with test preparation and PCB/Module test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.17.1 Preparation for Testing

General notes and cautions relating to preparation for testing the Logic Gate Threshold Detector (Recycle) PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by an I/O Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing or can disrupt the entire GETS-1000 system operation.

CAUTION

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

NOTE

See paragraph 2.5.4 for a description of the eight special function keys on the I/O Terminal (3A6) keyboard. Some of these keys will be actuated during relay assembly testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in paragraph 2.6.

CAUTION

Do not install flexible disk in Flexible Disk Drive (1A9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the 10670519 Logic Gate Threshold Detector (Recycle) PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk No.	IAB Number
10670519	Logic Gate Threshold Detector (Recycle)	FD47D255705	ASSY 47D255705G1

2.5.5.17.2 Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the I/O Terminal (3A6) display.

CAUTION
Use extreme care not to damage IAB or the PCB/ Module when connecting these two parts.

Step 1: Connect the Logic Gate Threshold Detector PCB/Module to IAB as shown in Figure 2-64. Check that the PCB/Module connector pins align with holes in IAB. Bend pins slightly, if necessary, to ensure proper alignment. Also check to see that pins are free of solder.

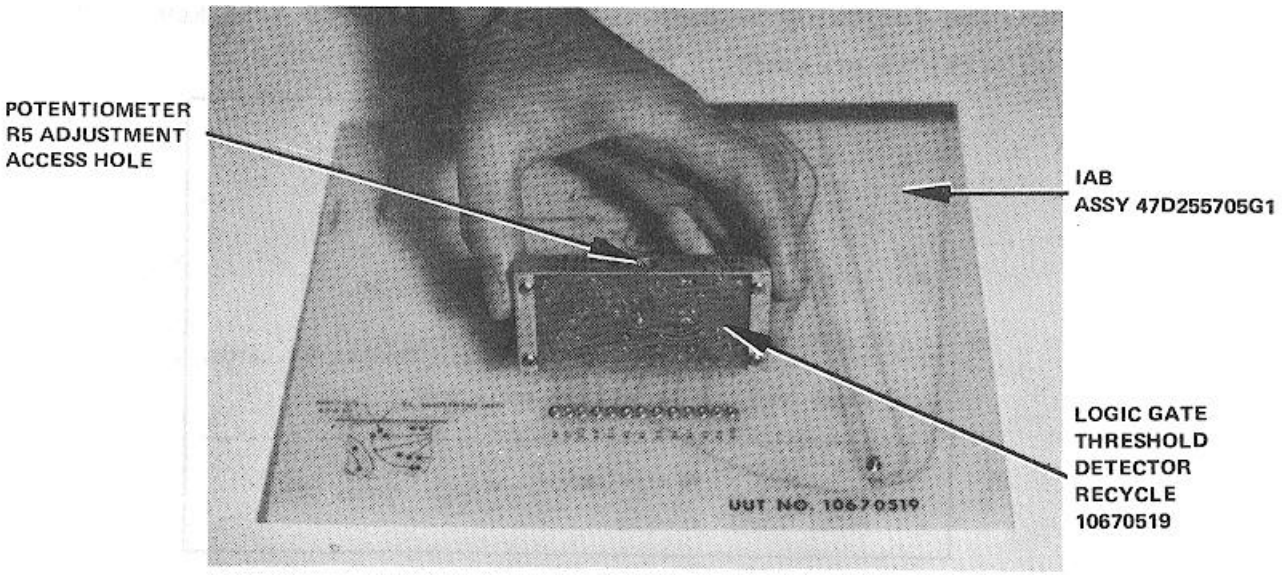


Figure 2-64. Connecting the Logic Gate Threshold Detector (Recycle) PCB/Module to the IAB

Step 2: Verify that no IAB is installed in the ZIF connector.

NOTE
The following message will be displayed on the I/O Terminal (3A6) prior to initiating a PCB/Module test.

****
!! GETS - 1000 AT YOUR SERVICE !!
****

TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE) *
I. PRESS "PCB TEST" KEY (f4)

--
TO RUN GETS- 1000 SELF TEST
I. PRESS "SELF TEST"KEY (f 2)

****

Step 3: Press PCB TEST key (f4) to start PCB/Module test.

NOTE
The following message is displayed when PCB TEST key (f4) is pressed:

- TO TEST PCB MODULE -
CAUTION Do not handle test program flexible disks unless you are completely familiar with the disk handling instructions contained in section II of the operator's manual. > 1. INSERT PROPER FLEXIBLE DISK (FLOPPY) INTO THE 1A9 FLEXIBLE DISC DRIVE (HP988S). SECURE THE LATCH. > 2. PRESS 'PCB TEST" KEY(f4) TO BEGIN TEST.
- TO ABORT NOW - > 1. PRESS 'ABORT" KEY(f8).

Step 4: Install test program flexible disk FD47D255705 in Flexible Disk Drive (1A9) (see Figure 2-65) as instructed by display message.

CAUTION
Do <u>not</u> install IAB in ZIF connector until directed to do so by a display message.

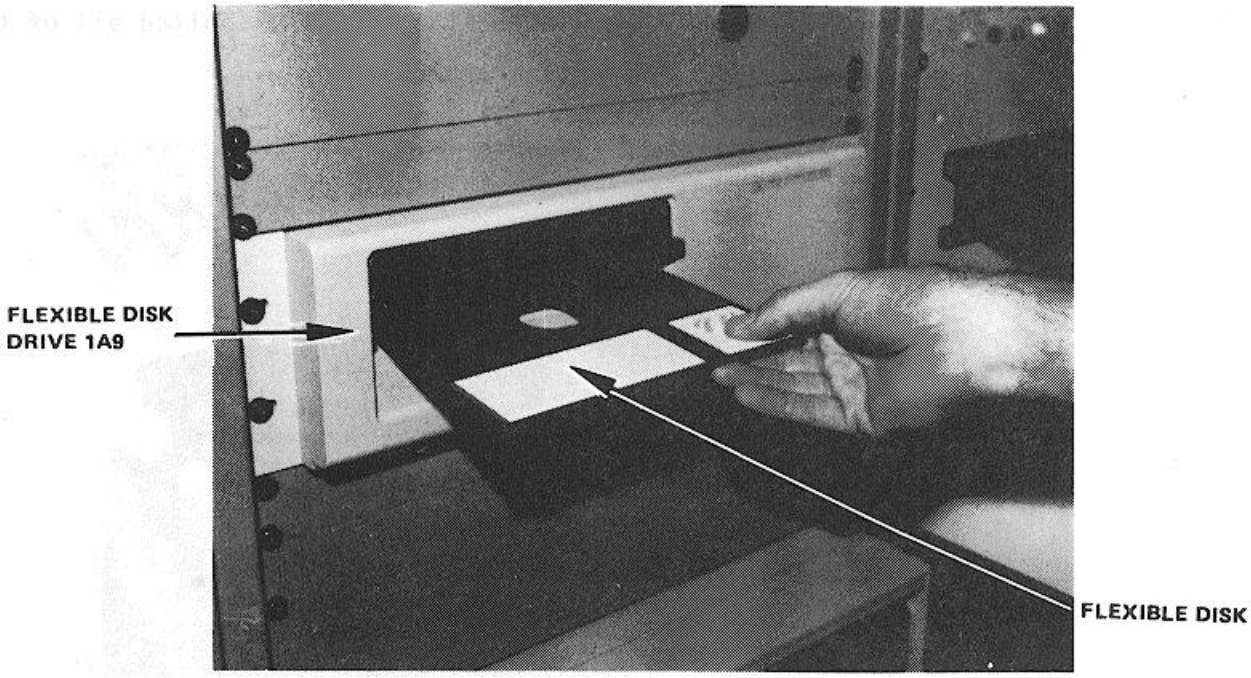


Figure 2-65. Installing Flexible Disk in Flexible Disk Drive (1A9)

Step 5: Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS-1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

Step 6: When directed by a display message, insert IAB/PCB/Module assembly into the Programmable Switch (2A7) ZIF connector (see Figure 2-66). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

Figure 2-66). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

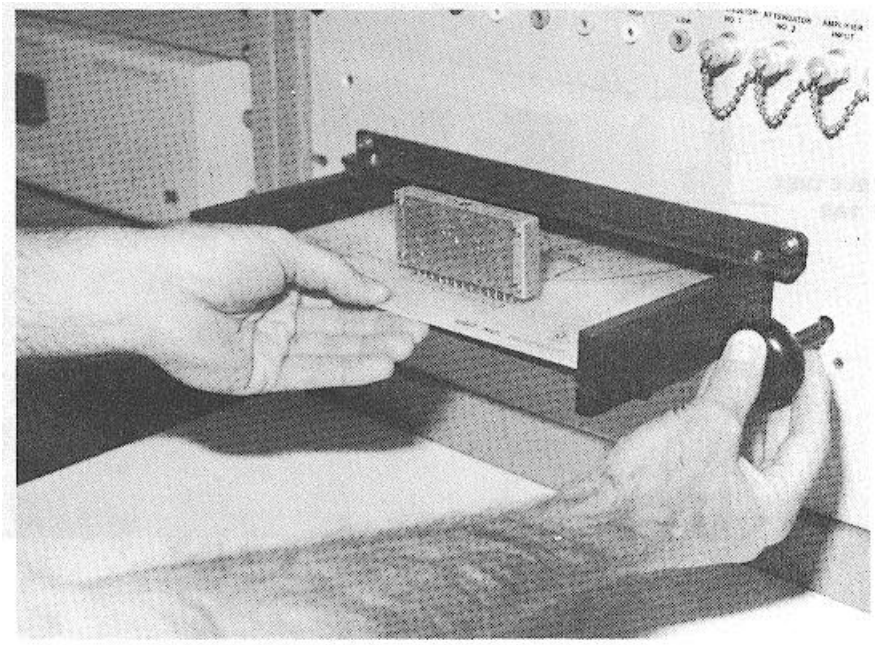


Figure 2-66. Inserting IAB/PCB/Module in ZIF Connector

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

Step 7: Lock ZIF connector by pushing ZIF locking handle in all of the way.

Step 8: As instructed by the display message, press PROCEED key (f5) to continue.

NOTE

When the PROCEED key (f5) is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:

(1) The operator has installed the wrong IAB, in which case a display message will instruct him to select the correct disk/IAB combination.
(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.
(3) Potentiometer R5 on the PCB/Module fails the test, in which case a display message will direct the operator to manually adjust the potentiometer.

Step 9: If directed by a display message to manually adjust potentiometer R5 on the Logic Gate Threshold Detector (Recycle) PCB/Module, observe the GETS-1000 instrument identified on the display message while making the potentiometer adjustment through the access hole shown in Figure 2-64.

Step 10: When directed by a display message, remove IAB/PCB/Module assembly from Programmable Switch (2A7) by pulling the ZIF connector locking handle all of the way forward and removing the IAB/PCB/Module assembly.

Step 11: When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

CAUTION

Return flexible disk to the storage file so that it will not be accidentally damaged in the work area.

CAUTION

Use extreme care not to damage PCB/Module or IAB while separating the two parts.

Step 12: Disconnect PCB/Module from test IAB.

Step 13: Store IAB.

2.5.5.18 10673996 Control Oscillator Frequency - Speedgate PCB/Module

This paragraph supplements the GETS-1000 I/O Terminal (3A6) display directed instructions for testing the 10673996 Control Oscillator Frequency Speedgate PCB/Module. Information in this paragraph includes the identifying numbers for the test program flexible disk and lAB's that are required for initiating the voltage regulator test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.18.1 Preparation for Testing General notes and cautions relating to preparation for testing the Control Oscillator Frequency Speedgate PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by an I/O Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing or can disrupt the entire GETS-1000 system operation.

CAUTION

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

NOTE

See paragraph 2.5.4 for a description of the eight special function keys on the I/O Terminal (3A6) keyboard. Some of these keys will be actuated during relay assembly testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in paragraph 2.6.

CAUTION

Do not install flexible disk in Flexible Disk Drive (1A9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the Control Oscillator Frequency Speedgate PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk Number	IAB Number
10673996	Control Oscillator Frequency - Speedgate	FD47D255711	ASSY 47D255711G1

2.5.5.18.2 Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the I/O Terminal (3A6) display.

CAUTION

Use extreme care not to damage IAB or the PCB/Module when connecting these two parts.

Step 1: Connect the Control Oscillator Frequency Speedgate PCB/Module to IAB as shown in Figure 2-67. Note that the PCB/Module is attached on the underside of the IAB (see Figure 2-68). Check that the PCB/Module connector pins align with holes in IAB. Bend pins slightly, if necessary, to ensure proper alignment. Also, check to see that pins are free of solder.

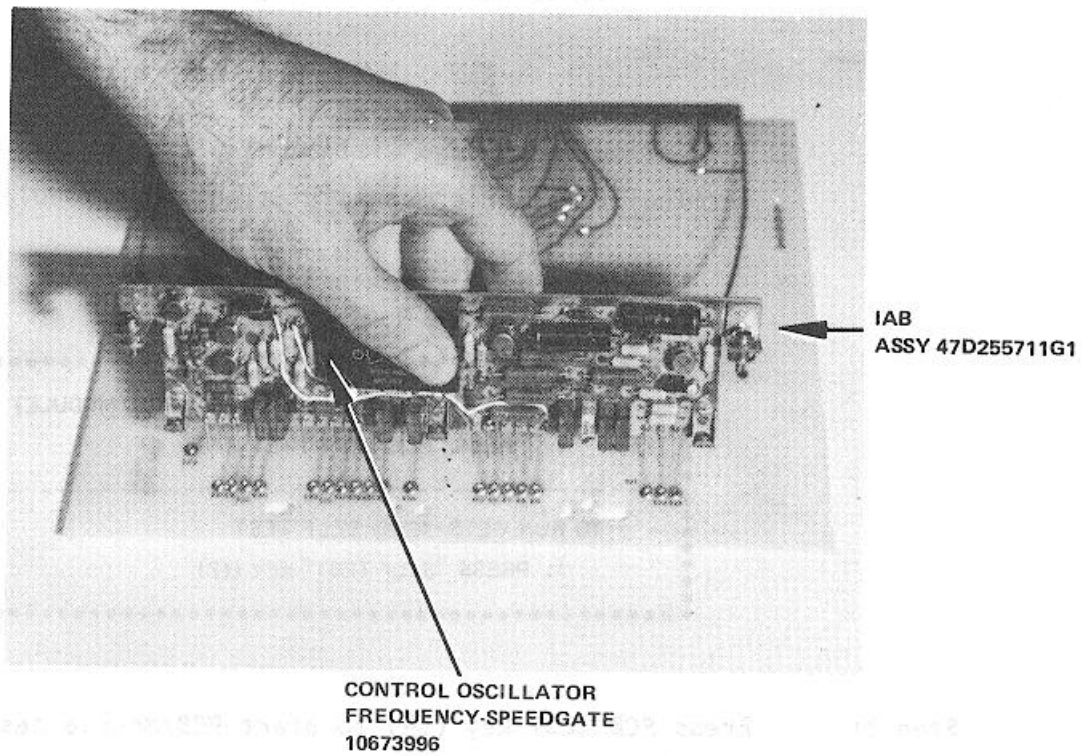


Figure 2-67. Attaching the Control Oscillator Frequency - Speedgate PCB/Module to the IAB

Step 2: Verify that no IAB is installed in the ZIF connector.

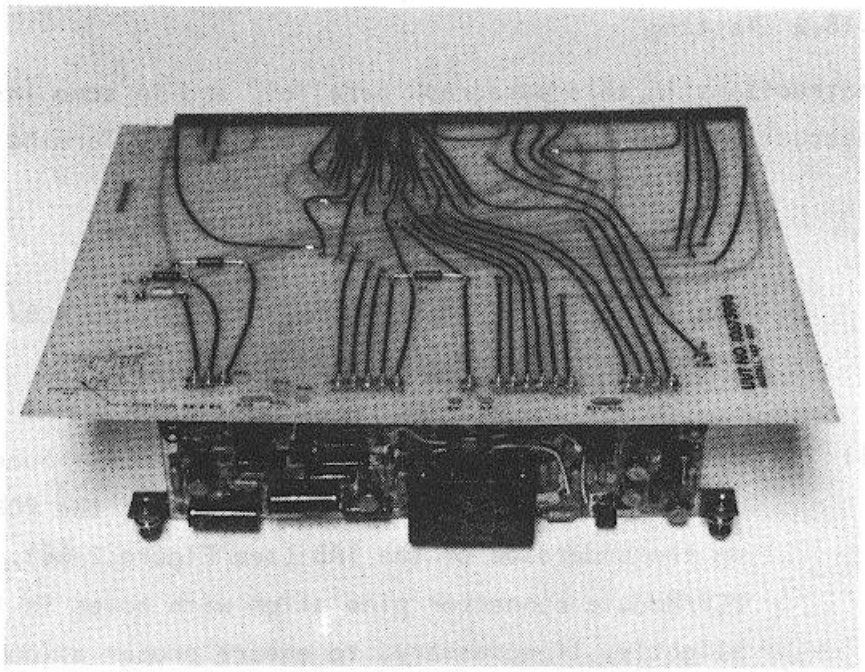


Figure 2-68. Control Oscillator Frequency - Speedgate PCB/Module Connected to the IAB

NOTE

The following message will be displayed on the I/O Terminal (3A6) prior to initiating a PCB/Module test.

! ! GETS-1000 AT YOUR SERVICE ! !
TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE) I. PRESS "PCB TEST" KEY (f4) TO RUN GETS- 1000 SELF TEST I. PRESS "SELF TEST" KEY (f2)

Step 3: Press PCB TEST key (f4) to start PCB/Module test.

NOTE

The following message is displayed when PCB TEST key (f4) is pressed:

```
                    - TO TEST PCB MODULE -

                          CAUTION

|       Do not handle test,  program
|       flexible disks unless you are
|       completely familiar with the
|       disk handling instructions
|       contained in section II of the
|       operator's manual.

>       INSERT PROPER FLEXIBLE DISK (FLOPPY) INTO
>       THE 1A9 FLEXIBLE DISC DRIVE (HP9BSS).  SECURE THF LATCH.

> 2.  PRESS 'PCB TEST' KEY(f4) TO BEGIN TEST.
```

```
                    - TO ABORT NOW -

   > 1.  PRESS “ABORT” KEY(f8).
```

Step 4: Install test program flexible disk in Flexible Disk Drive (1A9) (see Figure 2-69) as instructed by display message.

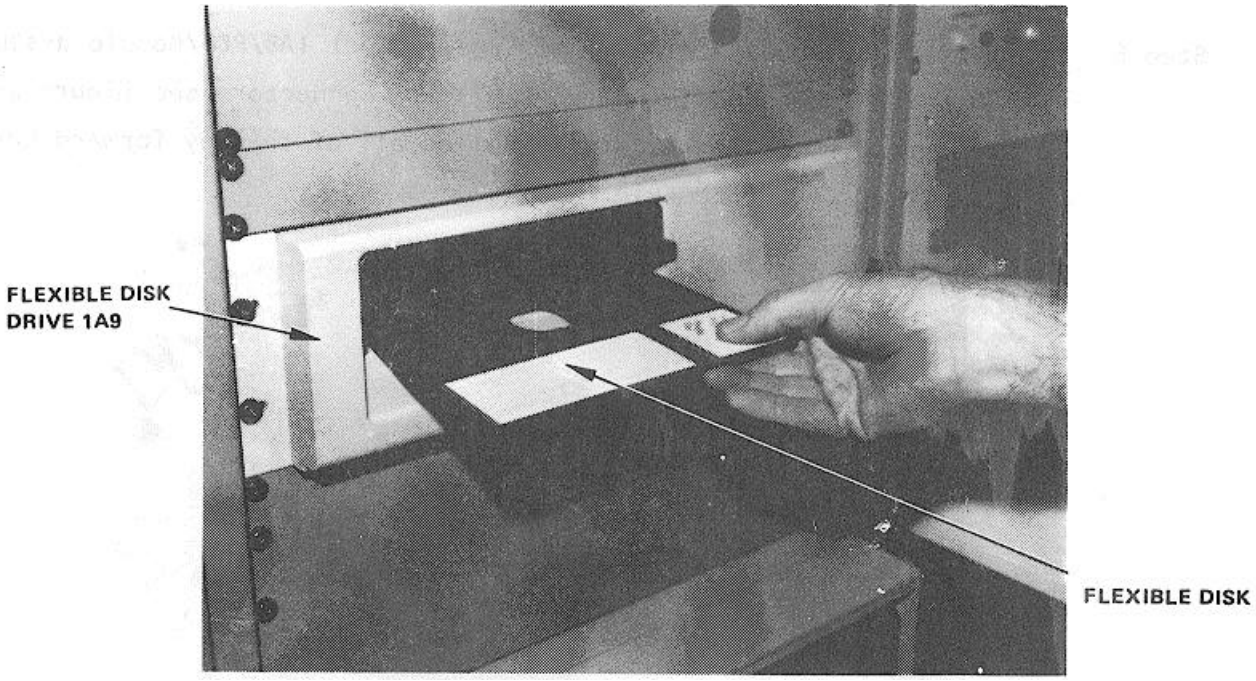


Figure 2-69. Installing Flexible Disk in Flexible Disk Drive (lA9)

CAUTION

Do not install IAB in ZIF connector until directed to do so by a display message.

Step 5 Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS-1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

Step 6 When directed by a display message, insert IAB/PCB/Module assembly into the Programmable Switch (2A7) ZIF connector (see Figure 2-70). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

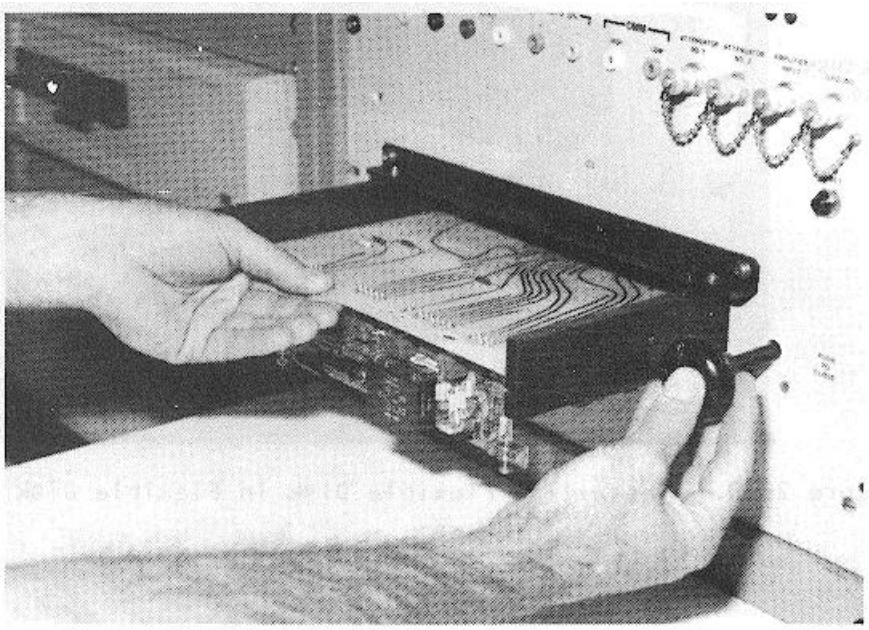


Figure 2-70. Installing IAB/PCB Assembly in ZIF Connector

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

Step 7: Lock ZIF connector by pushing ZIF locking handle in all of the way.

Step 8: As instructed by the display message, press PROCEED key (f5) to continue.

NOTE

When the PROCEED key (f5) is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:

(1) The operator has installed the wrong IAB, in which case a display message will instruct him to select the correct disk/IAB combination.

(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.

(3) Any one of six potentiometers on the PCB/Module fails the test, in which case a display message will direct the operator to manually adjust the potentiometer.

Step 9: If directed by a display message to manually adjust a potentiometer on Control Oscillator Frequency Speedgate, observe the GETS-1000 instrument identified on the display message while making the potentiometer adjustment. Refer to Figure 2-71 for the location of the six potentiometers.

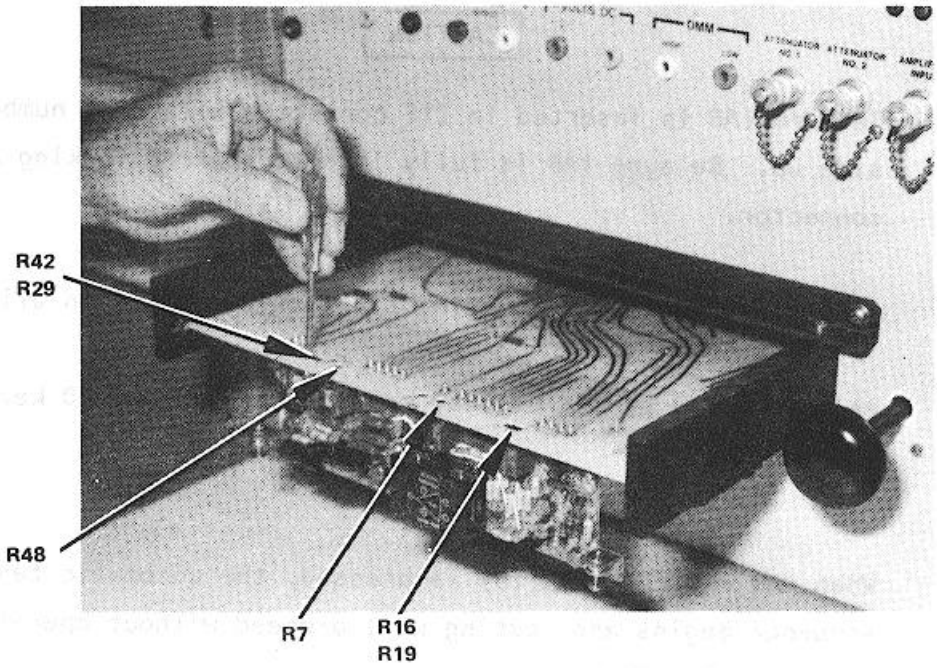


Figure 2-71. Potentiometer Access Holes

Step 10: When directed by a display message, remove IAB/PCB assembly from Programmable Switch 2A7 by pulling the ZIF connector locking handle all of the way forward and removing the IAB/PCB assembly.

Step 11: When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

CAUTION

Return flexible disk to the storage file so that it will not be accidentally damaged in the work area.

CAUTION

Use extreme care not to damage PCB/Module or IAB while separating the two parts.

Step 12: Disconnect PCB/Module from test IAB.

Step 13: Store IAB.

2.5.5.19 10678094 Filter Gate, AGC PCB/Module

This paragraph supplements the GETS-1000 I/O Terminal (3A6) display directed instructions for testing the 10678094 Filter Gate, AGC PCB/Module.

Information in this paragraph includes the identifying numbers for the test program flexible disk and lAB's that are required for initiating the voltage regulator test; notes and cautions associated with test preparation and PCB/Module test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.19.1 Preparation for Testing General notes and cautions relating to preparation for testing the Filter Gate, AGC PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by an I/O Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing or can disrupt the entire GETS-1000 system operation.

CAUTION

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

NOTE

See paragraph 2.5.4 for a description of the eight special function keys on the I/O Terminal (3A6) keyboard. Some of these keys will be actuated during relay assembly testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in paragraph 2.6.

CAUTION

Do not install flexible disk in Flexible Disk Drive (1A9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the Filter Gate, AGC PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk Number	IAB Number
10678094	Filter Gate, AGC	FD47D255714	ASSY 47D255714G1

2.5.5.19.2 Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the I/O Terminal (3A6) display.

CAUTION

Use extreme care not to damage IAB or the PCB/Module when connecting these two parts.

Step 1: Connect the Filter Gate, AGC PCB/Module to IAB as shown in Figure 2-72. Check that the PCB/Module connector pins align with holes in IAB. Bend pins slightly if necessary to ensure proper alignment. Also, check to see that the pins are free of solder.

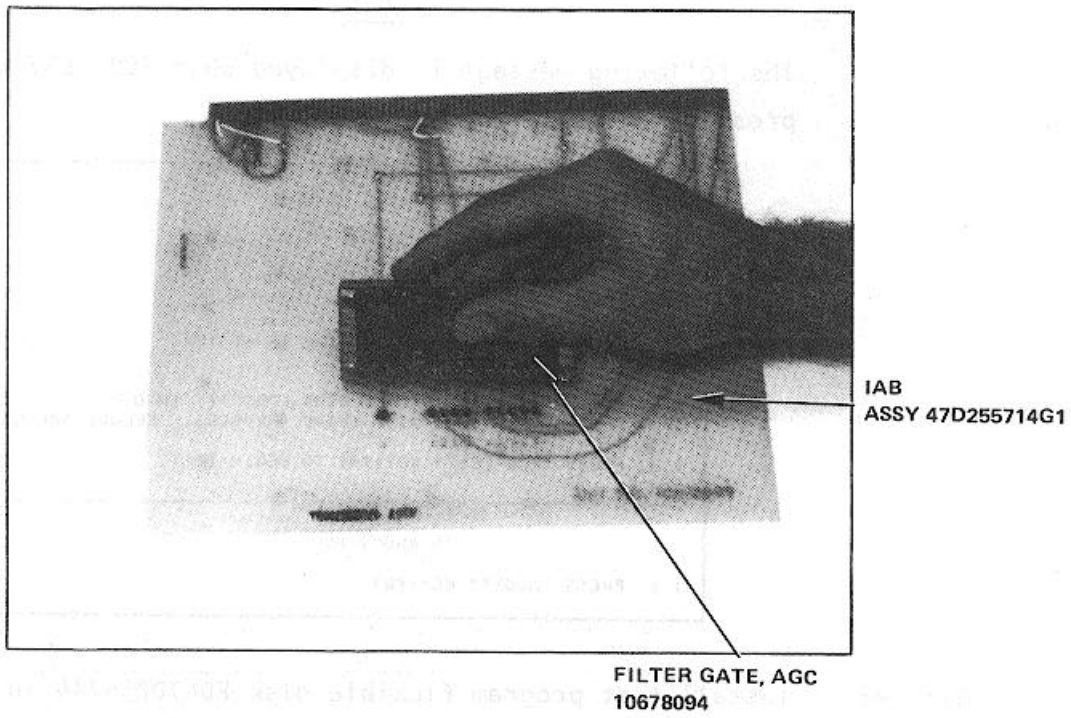


Figure 2-72. Connecting the Filter Gate, AGC PCB/Module to the IAB

Step 2: Verify that no IAB is installed in the ZIF connector.

NOTE

The following message will be displayed on the I/O Terminal (3A6) prior to initiating a PCB/Module test.

```
! ! GETS- 1000 AT YOUR SERVICE I !

TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE) ,

I.  PRESS "PCB TEST" KEY (f4)

TO RUN GETS- 1000 SELF TEST

I.  PRESS "SELF TEST" KEY (f2)
```

Step 3: Press PCB TEST key (f4) to start PCB/Module test.

NOTE

The following message is displayed when PCB TEST key (f4) is pressed:

```
                    - TO TEST PCB MODULE -

|                          CAUTION
|
|                    Do not handle 1tex program
|                    flexible disks .unl1s you ore
|                    completely familiar with the
|                    disk handling instructions
|                    contained in section II of the
I                    operator's manual.

> 1.    INSERT PROPER FLEXIBLE DISK (FLOPPY) INIO
>       THE IA& FLEXIBLE DISC DRIVE (HP9885).  SECURE THF LATCH.

> 2.    PRESS "PCB TEST' KEY(f4) TO BEGIN TEST.

-------------------------------------------------------------------
                                        - TO ABORT NOW -
> 1.  PRESS “ABORT” KEY(fB).
```

Step 4: Install test program flexible disk FD47D255714 in Flexible Disk Drive (1A9) (see Figure 2-73) as instructed by display message.

CAUTION

Do not install IAB in ZIF connector until directed to do so by a display message.

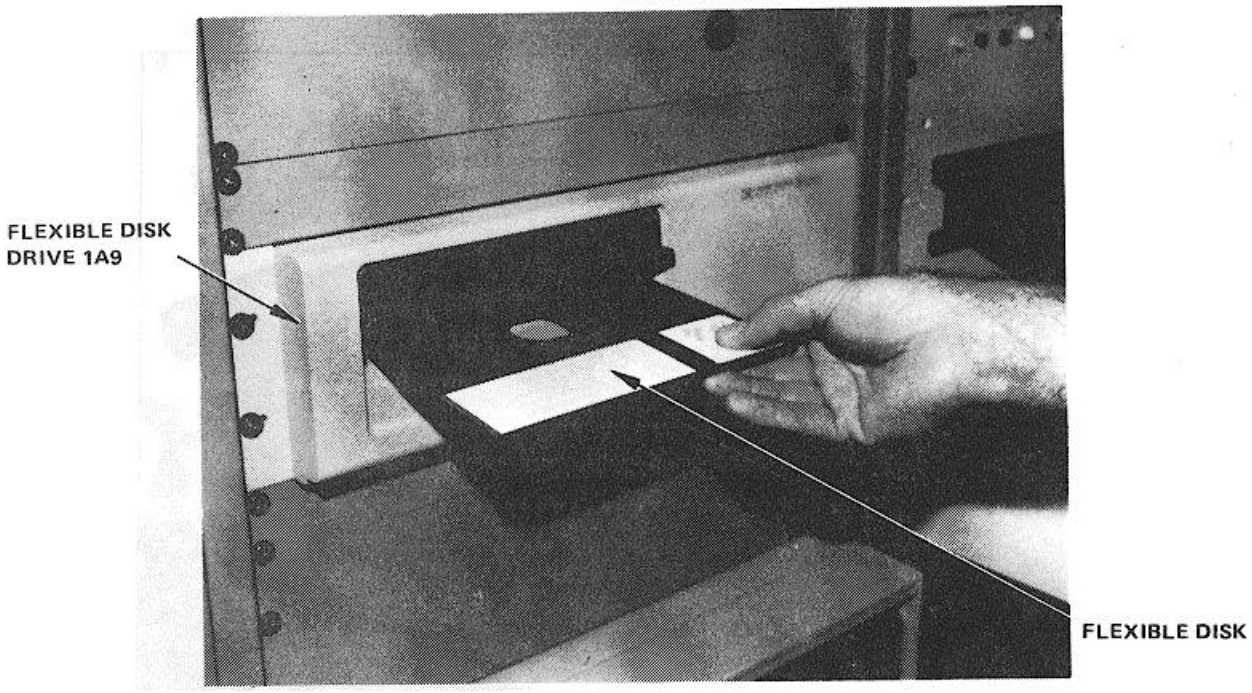


Figure 2-73. Installing Flexible Disk in Flexible Disk Drive (lA9)

Step 5: Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS-1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

Step 6: When directed by a display message, insert the IAB/PCB/Module assembly into the Programmable Switch (2A7) ZIF connector (see Figure 2-74). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

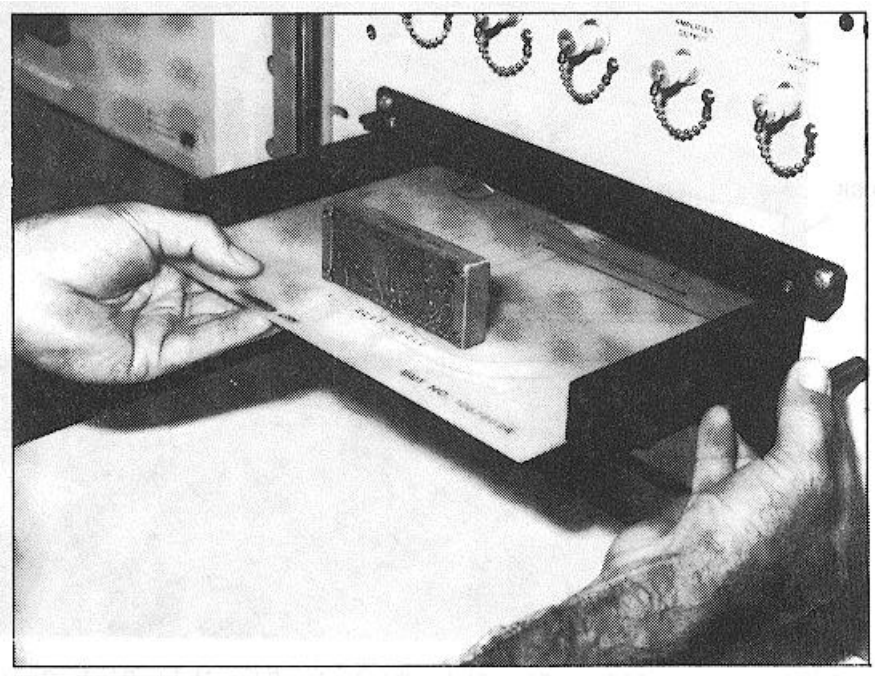


Figure 2-74. Inserting IAB/PCB/Module in ZIF Connector

Step 7: Lock ZIF connector by pushing ZIF locking handle in all of the way.

Step 8: As instructed by the display message, press PROCEED key (f5) to continue.

NOTE

When the PROCEED key (f5) is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:

(1) The operator has installed the wrong IAB, in which case a display message will instruct him to select the correct disk/IAB combination.

(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.

Step 9: When directed by a display message, remove IAB/PCB/Module assembly from Programmable Switch (2A7) by pulling the ZIF connector locking handle all of the way forward and removing the IAB/PCB/Module assembly.

Step 10: When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

CAUTION

Return flexible disk to the storage file so that it will not be accidentally damaged in the work area.

CAUTION

Use extreme care not to damage PCB/Module or IAB while separating the two parts.

Step 11: Disconnect PCB/Module from test IAB.

Step 12: Store IAB.

2.5.5.20 11568145 Relay and Diode Assembly PCB/Module

This paragraph supplements the GETS-1000 I/O Terminal (3A6) display directed instructions for testing the 11568145 Relay and Diode Assembly PCB/Module. Information in this paragraph includes the identifying numbers for the test program flexible disk and lAB's that are required for initiating the voltage regulator test; notes and cautions associated with test preparation and PCB/Module test; reference to information located elsewhere in this section which must be thoroughly understood by the operator before attempting to run a PCB/Module test; and verbal or graphic instructions that either supplement instructional messages displayed on the CRT, or describe required operator action not directed by display commands.

2.5.5.20.1 Preparation for Testing

General notes and cautions relating to preparation for testing the Relay and Diode Assembly PCB/Module are as follows:

CAUTION

Do not operate GETS-1000 equipment switches or controls unless instructed to do so as part of the procedures included in the operator's manual, or as directed by an I/O Terminal (3A6) display message. Unauthorized operation of equipment switches and controls can cause an equipment failure indication during system power-up, system self test, or PCB/Module testing or can disrupt the entire GETS-1000 system operation.

CAUTION

Use care when handling flexible disks as they are easily damaged. Be completely familiar with the flexible disk handling and storage instructions (see Paragraph 2.5.2) before attempting to run a PCB/Module test.

2.5.5.20.2 Testing

The instructions in this paragraph parallel, and in some instances, expand on the instructions the operator will get from the I/O Terminal (3A6) display.

CAUTION

Use extreme care not to damage IAB or the PCB/Module when connecting these two parts.

Step 1: Connect the Relay and Diode Assembly PCB/Module to IAB as shown in Figure 2-75. Check that the PCB/Module connector pins align with holes in IAB. Bend pins slightly if necessary to ensure proper alignment.

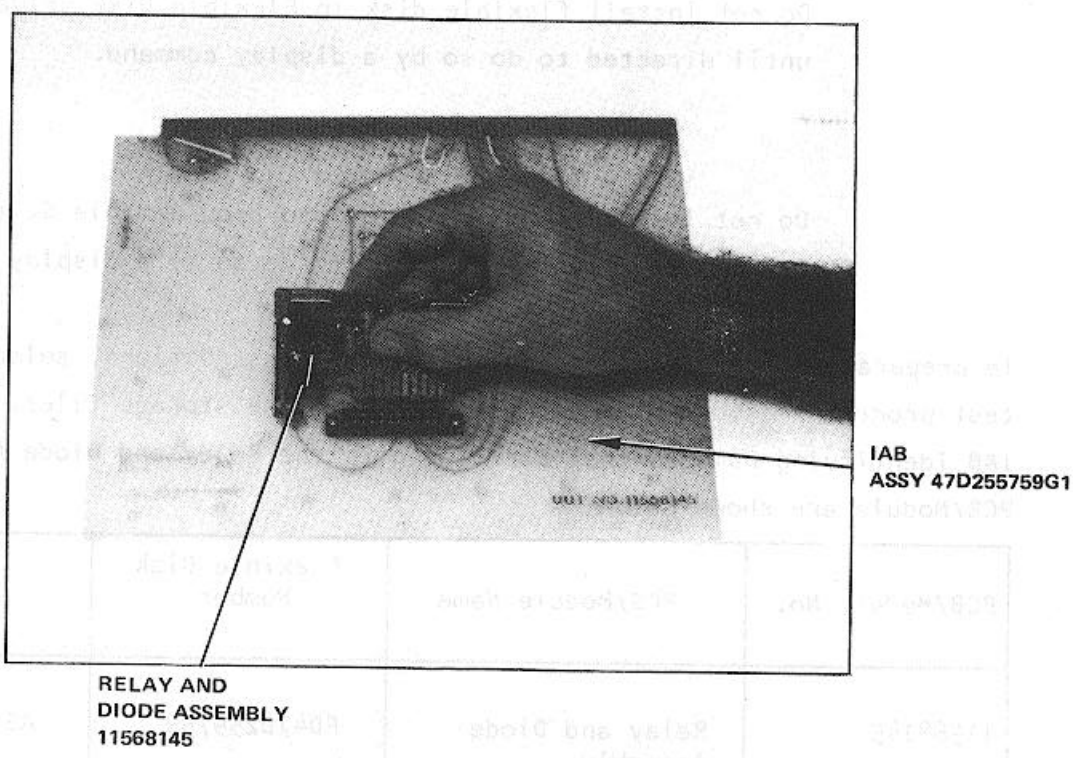


Figure 2-75. Connecting the Relay and Diode Assembly PCB/Module to the IAB

Step 2: Verify that no IAB is installed in the ZIF connector.

NOTE

See paragraph 2.5.4 for a description of the eight special function keys on the I/O Terminal (3A6) keyboard. Some of these keys will be actuated during relay assembly testing.

NOTE

Paragraph 2.6 provides a discussion and listing of three types of system software error messages that could occur during the test procedure. The technique for recovering from many of the problems represented by the error messages is also included in paragraph 2.6.

CAUTION

Do not install flexible disk in Flexible Disk Drive (1A9) until directed to do so by a display command.

CAUTION

Do not insert IAB/PCB/Module into Programmable Switch (2A7) ZIF connector until directed to do so by a display command.

In preparation for the display-directed test instructions, select the proper test program flexible disk and test IAB from the storage files. The disk and IAB identifying numbers that correspond to the Relay and Diode Assembly PCB/Module are shown below:

PCB/Module No.	PCB/Module Name	Flexible Disk Number	IAB Number
11568145	Relay and Diode Assembly	FD47D255759	ASSY 47D255759G1

NOTE

The following message will be displayed on the I/O Terminal (3A6) prior to initiating a PCB/Module test.

! ! GETS-1000 AT YOUR SERVICE ! !
TO TEST PRINTED CIRCUIT BOARD (PCB/MODULE) I. PRESS "PCB TEST" KEY (f4)
TO RUN GETS- 1000 SELF TEST I. PRESS "SELF TEST" KEY (f2)

Step 3: Press PCB TEST key (f4) to start PCB/Module test.

NOTE

The following message is displayed when PCB TEST key (f4) is pressed:

- TO TEST PCB MODULE -

| **CAUTION**
| Do not handle test program
| flexible disks unless you are
| completely familiar with the
| disk handling instructions
| contained in section TI of the
| operator's nonuq1.

> 1. INSERT PROPER FLEXIBLE DISK (FLOPPY) IN10
> THE iA9 FLEXIBLE DISC DRIVE (HP9865). SECURE THF LATCH.
> 2. PRESS 'PCB TEST' KEY(f4) TO BEGIN TEST.

- TO ABORT NOW -

> 1. PRESS “ABORT” KEY(fB).

Step 4: Install test program flexible disk FD47D255759 in Flexible Disk Drive (1A9) (see Figure 2-76) as instructed by display message.

CAUTION

Do not install IAB in ZIF connector until directed to do so by a display message.

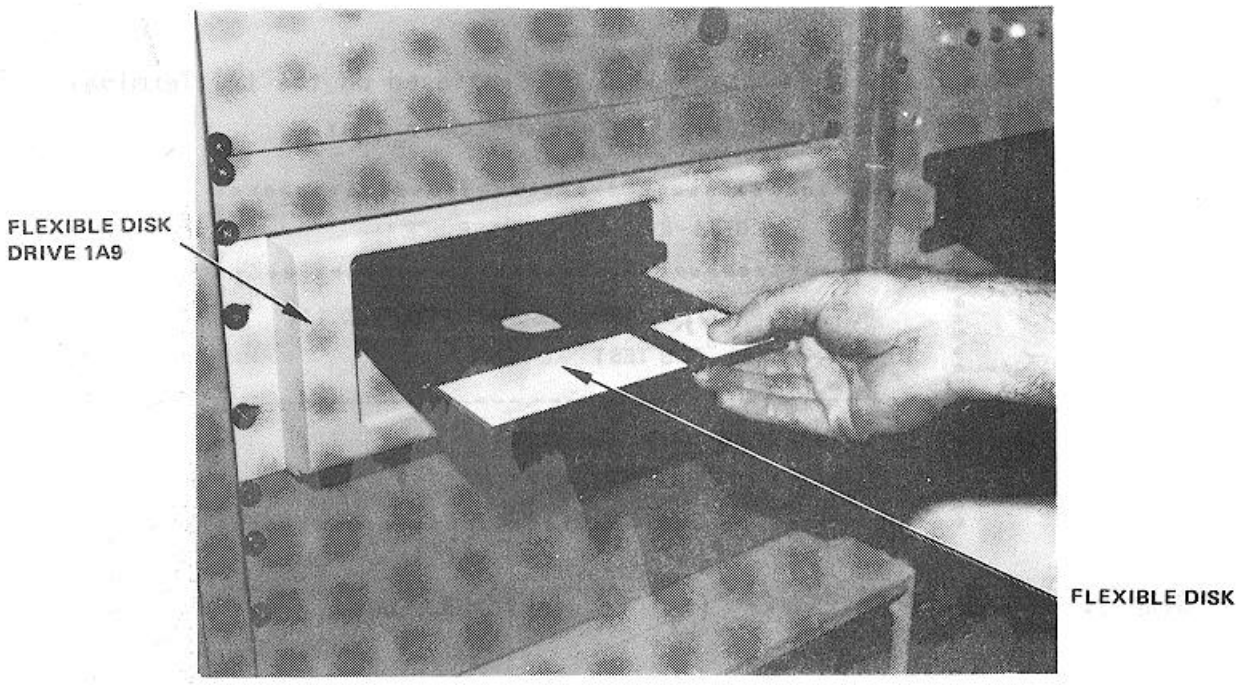


Figure 2-76. Installing Flexible Disk in Flexible Disk Drive (1A9)

Step 5: Press PCB TEST (f4) as instructed by the display message.

NOTE

When PCB TEST key (f4) is pressed, the test program starts loading into the CPU; this takes approximately 15 seconds. Once the program is loaded, GETS-1000 conducts a survey test to determine if the instruments, required to accomplish the selected PCB/Module test, are functioning properly. If any instrument fails the survey test, a CRT message will identify the defective instrument and direct the operator to discontinue this particular PCB/Module test.

Step 6: When directed by a display message, insert the IAB/PCB/Module assembly into the Programmable Switch (2A7) ZIF connector (see Figure 2-77). Be sure ZIF locking handle is pulled all of the way forward before inserting IAB/PCB/Module.

CAUTION

Be sure IAB is inserted in ZIF connector with part number side up. Be sure IAB is fully inserted before locking ZIF connector.

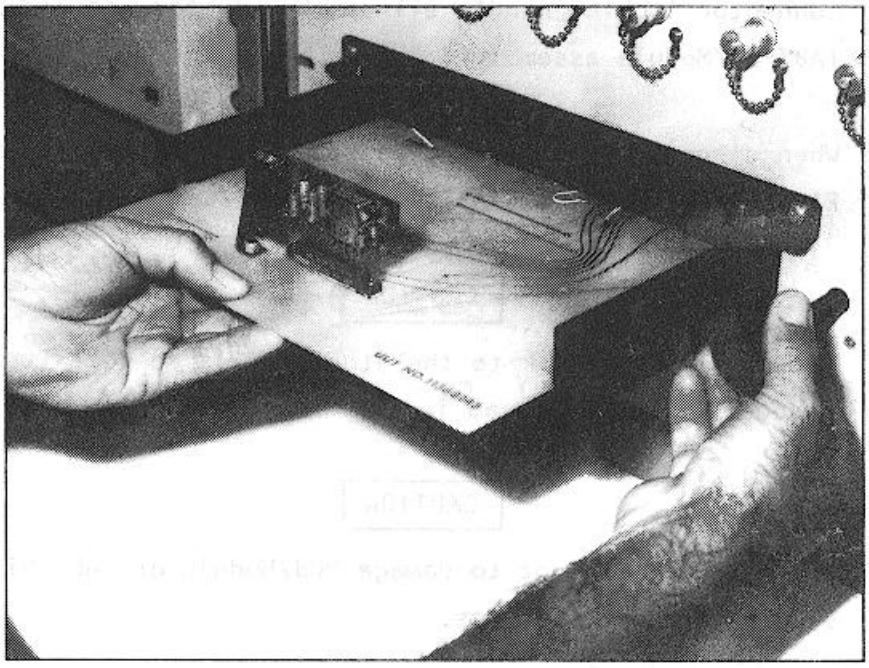


Figure 2-77. Inserting IAB/PCB/Module in ZIF Connector

Step 7: Lock ZIF connector by pushing ZIF locking handle in all of the way.

Step 8: As instructed by the display message, press PROCEED key (f5) to continue.

NOTE

When the PROCEED key (f5) is pressed, the automatic test sequence begins and testing will proceed without operator interaction unless:

(1) The operator has installed the wrong IAB, in which case a display message will instruct him to select the correct disk/IAB combination.

(2) The PCB/Module fails some part of the test, in which case, the operator will be instructed, by display messages, how to terminate the test.

Step 9: When directed by a display message, remove IAB/PCB/Module assembly from Programmable Switch (2A7) by pulling the ZIF connector locking handle all of the way forward and removing the IAB/PCB/Module assembly.

Step 10: When directed by a display message, remove flexible disk from Flexible Disk Drive (1A9).

CAUTION

Return flexible disk to the storage file so that it will not be accidentally damaged in the work area.

CAUTION

Use extreme care not to damage PCB/Module or IAB while separating the two parts.

Step 11: Disconnect PCB/Module from test IAB.

Step 12: Store IAB.

2.6 GETS-lOO0 SYSTEM SOFTWARE ERROR MESSAGES AND RECOVERY TECHNIQUES

The GETS-1000 system error messages, that could be displayed on the I/O Terminal (3A6) CRT, are of three types. The first type emanates from the operating system software program; the second type is associated with the instrument system software program; and the third type involves the microprocessor-based I/O Terminal (3A6) software program. Paragraphs 2.6.1 through 2.6.3 identify the error messages in each of the three categories and provide instructions for possible recovery from the problem represented by the various error messages.

2.6.1 OPERATING SYSTEM ERROR MESSAGES

The possibility exists for one of several operating system software error messages to be displayed when running either the GETS-1000 self test, or a PCB/Module test. Table 2-4 provides an alphanumeric list of these error messages, together with their probable cause and recovery technique.

2.6.2 INSTRUMENT SYSTEM SOFTWARE ERROR CODES

Error codes emanating from instrument system software may appear during the execution of either the self test or a PCB/Module test procedure. A typical instrument system software error message is:

ERROR SFAMP 10 IN LINE 150

where "SFAMP" is the error name, which can be associated with a particular instrument, and "10" is the error code which identifies a particular type of failure. Table 2-5 lists all of the error names and identifies the instrument that corresponds to each error name. The information in Table 2-5 is included here to provide the operator with a general understanding of the meaning of the error names; however, the information is not essential to an attempt at recovery unless the error message contains an error code "12." Error codes have not been included in the table because, with the exception of code "12" (which signifies that the instrument in question is not responding), error codes are not used by the operator in attempting a recovery procedure.

The recovery technique from instrument error messages is as follows:

STEP 1: Make a note of the error message so that it may be passed on to the maintenance personnel.

Table 2-4. GETS-1000 Operating System Error Messages

ERROR MESSAGE	REASON FOR MESSAGE DISPLAY	RECOVERY TECHNIQUE
FMGR (000 thru 121 except FMGR 010)	Operating System File Manager Error	Verify that correct flexible disk was inserted in Flexible Disk Drive (1A9) when error occurred. To attempt recovery, perform GETS-1000 System Shut Down Procedure (Para. 2.3) then perform GETS-1000 System Power-Up Procedure (Para. 2.2). NOTE Notify support maintenance of any FMGR error except FMGR-010 regardless of whether or not the recovery technique was successful.
FMGR-010	Operator entered nonvalid input.	Enter correct input. If after multiple attempts the input is not accepted, perform the standard FMGR error recovery technique.
I/O NR L2 El SO	Fixed hard disk not responding.	Verify that the Main Disk Drive (1A12) and the Disk Drive Power Supply (1A14) power switches are in the "On" position. If either
I/O NR LIO El S1	Removable hard disk not responding.	switch is found in the "Off" position, DO NOT TURN ON. Perform shutdown procedure (para. 2.3) then perform power-up procedure (para. 2.2). If recovery technique does not correct problem make note of error message and notify support maintenance.
I/O NR L20 E3 SO	Flexible Disk Drive 1A9 hung.	1. Verify that the Flexible Disk Drive (1A9) power is in the "On" position. 2. Verify that proper flexible disk is installed correctly and that "Write Tab" is on flexible disk. 3. Perform procedure in Note 1. Press "RETURN" key. Then enter UP, 3 and press "RETURN" key.

Table 2-4 GETS-1000 Operating System Error Messages (Continued)

	REASON FOR MESSAGE DISPLAY	RECOVERY TECHNIQUE
I/O NR L24 E6 SO	Instrument bus controller not responding.	Notify support maintenance.

NOTE 1

(1) Remove the probable cause of the problem; for example, if the problem is with Flexible Disk Drive (1A9), verify that the proper disk is correctly installed.

(2) For messages of the type I/O NR Lx Ey Sz (where x, y and z represent the various numerical values at these locations in the error messages) first press the reset one time and then press the RETURN key one time. The prompt O1 > should appear on the CRT. If O1 > does not appear, then try pressing the RESET terminal key one time, then press return. If the O1 > prompt still does not appear, then make a note of the error message and the operation being performed at the time the error occurred. Then notify support maintenance.

If the prompt 01 > does appear on the CRT, then enter UP, plus the "y" value corresponding to the error message. For example, if the error message was I/O NR L4 E2 S1, the entry would be UP, 2. Then press RETURN key.

NOTE 2

If, during testing, the operator accidentally presses a key on the input/ output terminal keyboard (3A6), the operating system will be prompted and a "017" prompt will appear on the Cathode Ray Tube (CRT). All CRT input/ output's will be stopped until the operating system releases the CRT.

To clear the above condition, press the "RESET TERMINAL" key (see Figure 2-XX) one time and then the "RETURN" key (see Figure 2-XX) one time. The blinking cursor (-) should move down one line and testing will continue normally.

If this recovery technique does not correct the problem, perform system shutdown procedure (para. 2.3). Then perform system power-up procedure (para. 2. 2).

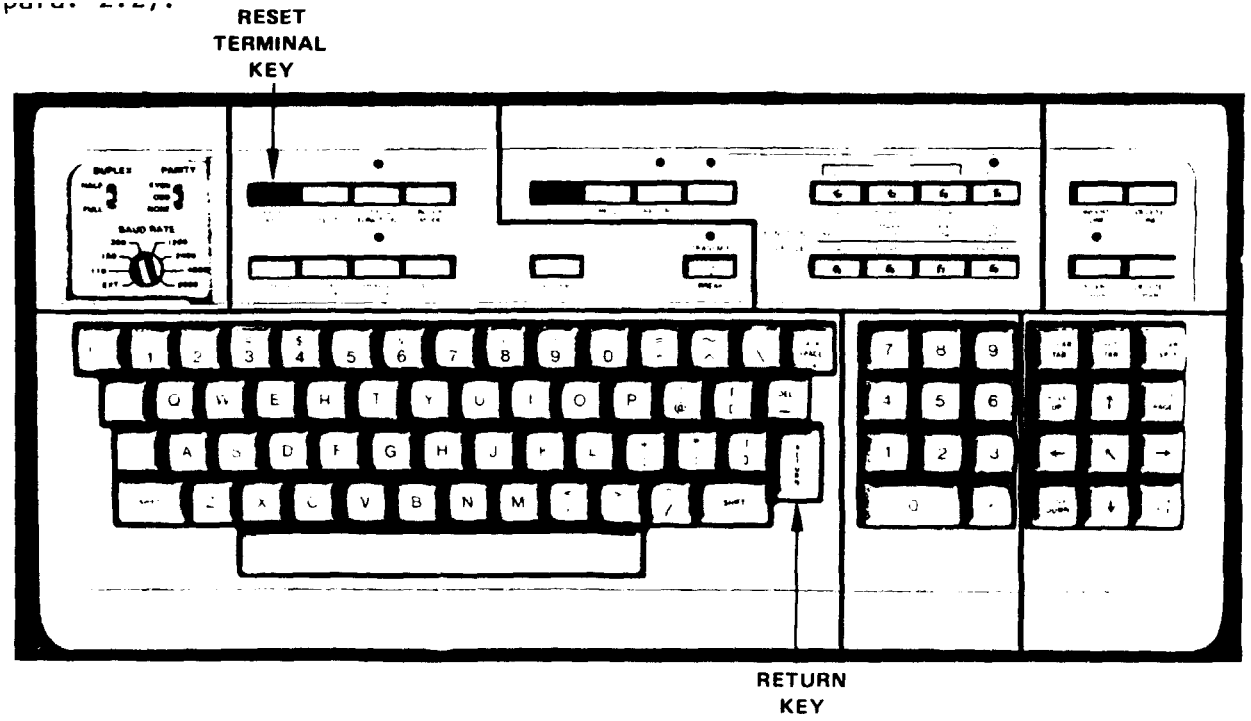


Figure 2-78. Input/Output Terminal Keyboard (3A6)

Table 2-5. Instrumentation System Software Error Names

ERROR NAME	ASSOCIATED DEVICE(S)
DVMMU DVMSU DVMEP DVMST	2A2 Digital Voltmeter (HP3455A)
CTRRE CTRST CTRTL CTRTE	2A3 Universal Time Interval Counter (HP5370A)
SFGMY SFGEN SFSWP SFAMP SFGMD SFFUN SFTES	1A6 Synthesizer/Function Generator (HP3325A)
IBGSC XBGSC IBGSD XBGSD IBGSR XBGSR	2A8 Multiprogrammer Interface (HP59500A) and 2A9 Multiprogrammer (HP694OB)
PSP	Programmable DC Power Supplies: • 2A10, 2All, 2A13 (HP6294A) • 2A12 (HP6209B) • 2A14 (HP6113A)
PGNSA XGNSA PGNSR XGNSR PGNSD XGNSD	3A2 Pulse Generator (HP8015A)

Table 2-5. Instrumentation System Software Error Names (Continued)

ERROR NAME	ASSOCIATED DEVICE(S)
ATTEN RFSNT RFSWT	1A4 or 1A5 Attenuator Switch Driver (HP11713A)
PSPIB	1A3 Power Supply Programmer (HP59501A) 2A12 Programmable DC Power Supply (HP6209B)
SGNBU SGNLS SGNMD SGNMY SGNSU SGNSW SGNTE	3A4 Programmable Signal Source (HP8165A)
GEMS GESDO GESDI	2A7 Programmable Switch (GE 47E255678G2)
NICST NICWR NICRE NICLP	2A5 Digital Oscilloscope (Nicolet 2090-3A)
TIM	"TIM" indicates a system software error has occurred. Data held in memory has become erroneous either through a memory "glitch" or faulty software. The system must be rebooted. Any "TIM" errors must be reported to maintenance personnel immediately.

STEP 2 If the error message includes a code "12," refer to Table 2-6 and identify the instrument that corresponds to the error message name. For example, in the error message:

ERROR DVMMU ....12.... IN LINE 99

the error name DVMMU refers to the Digital Voltmeter (2A2) (HP3455A). Once the instrument has been identified, check that the power switch on the affected instrument is on. If the fault is corrected by switching the instrument power on, continue testing. If the problem is not corrected, go to Step 3.

If the error message does not include an error code "12," perform the following power interrupt procedure: Momentarily interrupt Computer (1A2) system power by using a key to open the CPU door and then moving the CPU POWER ON/OFF switch to OFF momentarily. If the following message is displayed, continue testing after performing Step 3:

------ SYSTEM BOOT UP -----

WAIT 2 MINUTES FOR THE DISK PACKS TO WARM UP.

CAUTION
Do not handle self test flexible disk unless you art completely familiar with the disk handling and storage instructions contained in section II of the operator's manual.

WHILE WAITING,INSERT THE "SELF TEST" FLEXIBLE
DISK INTO THE 1A9 FLEXIBLE DISK DRIVE (HP9885). SECURE THE LATCH.
WHEN READY PRESS THE "GO" KEY (f5) TO PROCEED.

STEP 3 For any instrument error message (except those containing error code "12" and which can be corrected by turning on the instrument power) notify support maintenance of the error message even though recovery was accomplished.

2.6.3 I/O TERMINAL (3A6) SOFTWARE ERROR MESSAGES

The I/O Terminal (3A6) is equipped with its own microprocessor and associated software. Several possible error messages, either internally or externally (operator) induced, could occur during the GETS-1000 system self test procedure or PCB/Module self test procedure.

I/O Terminal (3A6) error messages will all be in the form I/O ERROR followed by a numeral. To attempt recovery from I/O Terminal (3A6) problems represented by error messages, proceed as follows:

1. Press RESET key twice in rapid succession. A TERMINAL READY message should then be displayed.
2. Press RETURN key several times in an attempt to get a colon (:) prompt to appear on the CRT; then:
   (a) If the : prompt appears, enter EX on the terminal keyboard, then press the RETURN key twice. The message FMSO1 should appear, then another : prompt. Enter TR, *MENU, then press the RETURN key. The test menu should appear on the CRT and normal system operation may then be attempted.
   (b) If no : prompt appears, enter GO on the I/O Terminal (3A6) keyboard, then press RETURN. If there is still no response, use the key to open the CPU door and momentarily disrupt CPU power by switching the POWER switch to OFF and then quickly back to ON. If this corrective action is successful, the SYSTEM BOOT UP message will appear and the operator may attempt to proceed with normal operation from this point.

SECTION 3

INSTALLATION AND MAINTENANCE

3.1 GENERAL

Maintenance procedures authorized for the GETS-1000 system operator consists of general cleaning of exterior surfaces, cleaning of permanent air filters, limited lubrication, and replacing instrument fuses.

3.2 CLEANING OF TEST SYSTEM EXTERIOR SURFACES

Damp towel cleaning of the exterior surfaces of the three electrical cabinets should be done monthly.

3.3 CLEANING OF CABINET FILTERS

All six cabinet filters should be cleaned every 30 days. Procedures for filter removal, cleaning and installation follow in Paragraphs 3.3.1 through 3.3.3.

3.3.1 FRONT CABINET FILTERS (UNITS 1 AND 3)

3.3.1.1 Removal

Using crosshead screwdriver, remove four filter panel attaching screws (see Figure 3-1) and remove filter panel from cabinet.

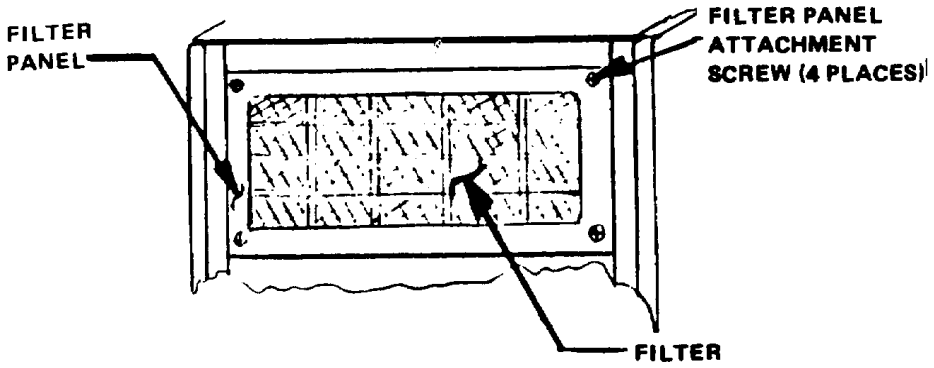


Figure 3-1. Front Cabinet Filter - Units 1 and 3

3.3.1.2 Cleaning

Wash filter panel in mild detergent solution. Shake panel assembly to remove excess water from filter, then allow filter to air dry.

3.3.1.3 Installation

Locate filter panel in cabinet opening and install four filter panel attaching screws (see Figure 3-1).

3.3.2 UNIT 2 CABINET DOOR TOP FILTER

3.3.2.1 Removal

STEP 1: Open Unit 2 cabinet door.

STEP 2: Using crosshead screwdriver, loosen two lower filter holddown clamps and allow clamps to rotate 180 degrees (see Figure 3-2).

STEP 3: Put light pressure on filter with one hand while using a crosshead screwdriver to loosen two top holddown clamps.

STEP 4 Lower filter free of top holddown clamps as top clamps are loosened.

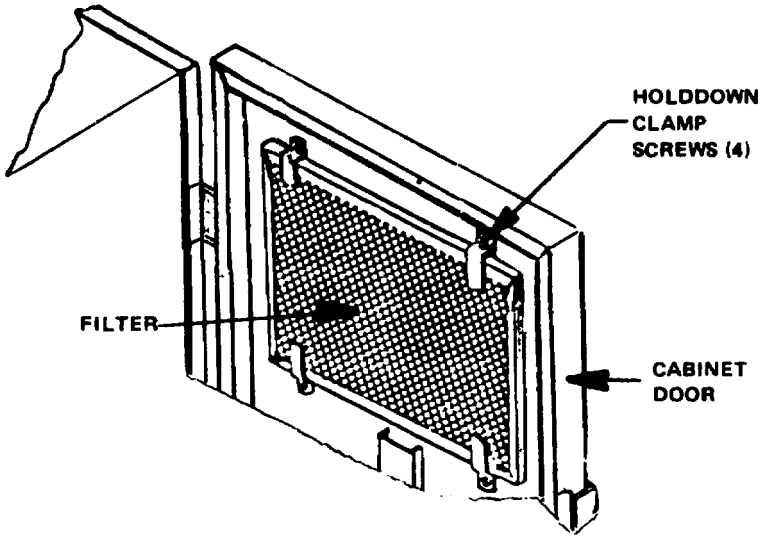


Figure 3-2. Unit 2 Filter Installation

3.3.2.2 Cleaning

STEP 1: Wash filter in mild detergent solution.

STEP 2: Shake filter to remove excess water, then allow filter to air dry.

3.3.2.3 Installation

STEP 1 Install filter under two upper holddown clamps and, using a crosshead screwdriver, tighten clamp screws until filter is held in place (refer to Figure 3-2).

STEP 2 Rotate two lower filter holddown clamps 180 degrees and tighten clamp screws until clamps contact the filter frame.

NOTE

If filter shifts in the panel after having tightened the clamp screws, remove loose clamp(s) and increase the clamp bend angle slightly using vice grips or pliers--then reinstall holddown clamps.

STEP 3 Close cabinet door and push latch downward to latch door.

3.3.3 UNITS 1, 2, AND 3 LOWER CABINET DOOR FILTERS

3.3.3.1 Removal

CAUTION

Use care not to damage filter during removal. Filter fits snugly in filter frame and can be damaged if excessive upward pressure is used during removal.

STEP 1 Place a hand at both the top left and top right of filter and pull filter upward out of frame (see Figure 3-3). If element binds when partially removed, use one hand to push up from bottom edge of filter while jogging filter from left to right in the frame with other hand.

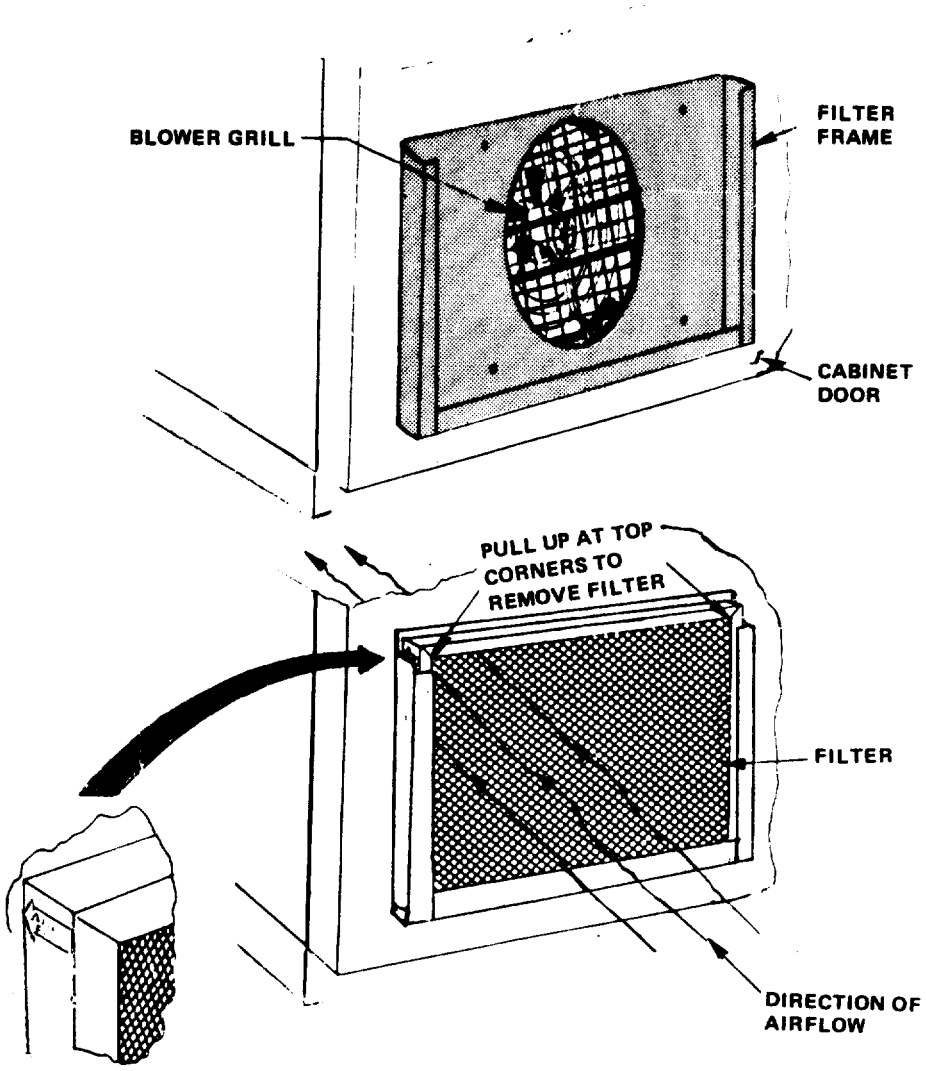


Figure 3-3. Cabinet Door Filter Installation - Units 1, 2, and 3

3.3.3.2 Cleaning

STEP 1: Wash filter in a mild detergent solution.

STEP 2: Shake filter to remove excess water, then allow filter to air dry.

STEP 3: Inspect grill behind filter and blower motor housing (see Figure 3-3) for dust accumulation. Use small soft brush to remove dust.

3.3.3.3 Installation

STEP 1: Position filter such that the air flow arrow on filter frame (see Figure 3-3) points toward interior of cabinet.

CAUTION

Use care not to damage filter during installation. Filter fits snugly in frame and can be damaged if excessive pressure is applied during installation.

STEP 2: Slide filter into filter frame. If filter binds during installation, jog it gently from left to right while tapping the top edge downward.

3.4 LUBRICATION THREE MONTH INTERVALS

Using commercial grade silicone spray lubricant, lubricate cabinet door hinges and latch mechanism at points indicated in Figure 3-4. Hold spray nozzle (equipped with nozzle extender tube) approximately two inches from point of desired application and apply in short spurts. Avoid excessive spray in the area of electrical equipment.

3.5 CHANGING INSTRUMENT FUSES

Instrument failure, when caused by blown fuses, can be corrected by the operator. Replace the blown fuse with one of the same size and type. If the fuse blows again, when the instrument is turned on, notify support maintenance.

3.6 INSTALLATION AND TRANSPORTATION

Installation, movement (short distances), and transportation will be accomplished under the supervision of support maintenance personnel.

3.7 INPUT POWER CONNECTIONS

Power connections between the prime power source and the GETS-1000 system are normally made by support maintenance personnel at the time the system is installed.

stalled. If circumstances require changing the prime power source, support maintenance personnel should be notified to assure that proper connections are made at the GETS-1000 power entrance.

3.8 Main Disc Drive and Flexible Disc Drive Maintenance

Contact the General Electric Technical Representative for periodic maintenance on Hewlett Packard Flexible Disc Drive (1A9) and Hewlett Packard 7900 disc Drive (1A12).

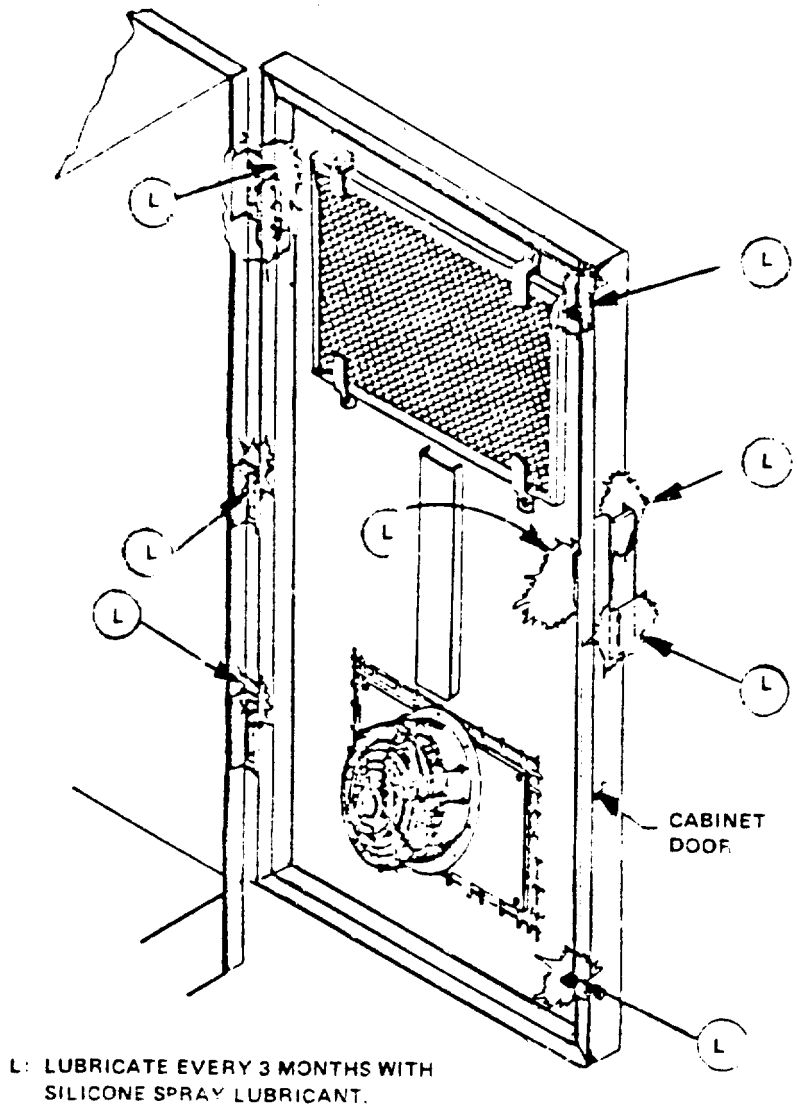


Figure 3-4. Cabinet Door Lubrication.

APPENDIX A

GETS-1000 ABBREVIATIONS

A/D	Analog-to-Digital
ADC	Analog-to-Digital Converter
APL	Assembled Program Listings
ATLAS	Abbreviated Test Language for All Systems
ATP	Automatic Test Programs
CDRL	Contract Data Requirements List
CMRS	Calibration/Measurement Requirement
CPU	Central Processing Unit
CRT	Cathode Ray Tube
D/A	Digital-to-Analog
DAC	Digital-to-Analog Converter
DC	Direct Current
DMM	Digital Multimeter
DSU	Direct Support Units
DVM	Digital Volt Meter
ELTD	English Language Test Design
EPROM	Erasable Programmable Read Only Memory
FREQ	Frequency
GE	General Electric
GETS	General Electric Test System
GETS-1000	General Electric Test Systems - 1000
HP	Hewlett Packard
HP-IB	Hewlett Packard Interface Bus
Hz	Hertz (cycles per second)
IC	Integrated Circuit
IEEE	Institute of Electrical and Electronic Engineers
I-HAWK ATE	Improved HAWK Automatic Test Equipment
I/O	Input/Output
LED	Light Emitting Diode
M	Mega (10^6)
m	Milli (10^3)

APPENDIX A

GETS-1000 ABBREVIATIONS (Continued)

MIS	Missile Interim Specification
PCB/Module	Printed Circuit Board/Module
RF	Radio Frequency
RAM	Random Access Memory
RTE	Real-Time Executive
SOW	Scope of Work
SQAP	Supplemental Quality Assurance Provisions
TMDE	Test, Measurement and Diagnostic Equipment
TDP	Technical Data Package
TRA	Test Requirements Analysis
TRS	Test Requirements Specification
UHF	Ultra High Frequency
ZIF	Zero Insertion Force

APPENDIX B

GETS-1000 REFERENCE DESIGNATORS

REFERENCE DESIGNATOR	EQUIPMENT DESCRIPTION	MANUFACTURER PART/MODEL NO.
UNIT 1		
1A1	Filter Panel	EQUIPTO 20-0512-62
1A2	Computer	HP2113B
1A3	Power Supply Programmer	HP59501A
1A4	Attenuator/Switch Driver	HP11713A
1A5	Attenuator/Switch Driver	HP11713A
1A6	Synthesizer/Function Generator	HP3325A
1A7	Feed-Through Panel	GE 47D255852G1
1A8	Blank Panel	EQUIPTO 21-0112-41
1A9	Flexible Disk Drive	HP9885M
1A10	Blank Panel	EQUIPTO 21-0112-41
1A11	Blank Panel	GE 47D255925
1A12	Main Disk Drive	HP7900A
1A13	Blank Panel	EQUIPTO 21-0512-41
1A14	Disk Drive Power Supply	HP13215A
1A15	Attenuator	HP8494G
1A16	Attenuator	HP8494G
1A17	Attenuator	HP8496G
1A18	Attenuator	HP8496G
1A19	Thermostat	BUD TS-15
UNIT 2		
2A1	Blank Panel	EQUIPTO 21-0512-41
2A2	Digital Voltmeter	HP3455A
2A3	Time Interval Counter	HP5370A
2A4	Feed-Through Panel	GE 47D255839G1
2A5	Digital Oscilloscope	NICOLET 2090-3A
2A6	Feed-Through Panel	GE 47D255657G1
2A7	Programmable Switch	GE 47E255678G2
2A8	Multiprogrammer Interface	HP59500A
2A9	Multiprogrammer	HP6940B
2A10	Programmable DC Power Supply (0-60 V)	HP6294A
2A11	Programmable DC Power Supply (0-60 V)	HP6294A
2A12	Programmable DC Power Supply(0-320 V)	HP6209B
2A13	Programmable DC Power Supply (0-60 V)	HP6294A
2A14	Programmable DC Power Supply (0-10 V)	HP6113A
2A15	Equipment Shelf	GE 47D255686G1
2A16	Bus Bar	GE 47D255671

APPENDIX B

GETS-1000 REFERENCE DESIGNATORS (CONTINUED)

REFERENCE DESIGNATOR	EQUIPMENT DESCRIPTION	MANUFACTURER PART/MODEL NO.
UNIT 3		
3A1	Filter Panel	EQUIPTO 20-0512-62
3A2	Pulse Generator	HP8015A
3A3	Power Panel	GE 47D255695Gl
3A4	Programmable Signal Source	HP8165A
3A5	Blank Panel	EQUIPTO 21-0112-41
3A6	Input/Output Terminal (Display - Terminal and Keyboard)	(HP2645A)
3A7	Power Converter	TOPAZ 1647
3A8	Blank Panel	EQUIPTO 21-0112-41
3A9	Transformer (Step Down)	Signal 1600-OF
3A10	Terminal Board Assembly	GE 47C255867G1

APPENDIX C
GETS-1000 PCB/MODULE AND RELATED ITEM
IDENTIFICATION NUMBERS

ITEM NO.	PCB/MODULE NUMBER	PCB/MODULE TITLE	*REF., NO. FOR IAB'S, ELTD'S AND FLEXIBLE DISKS	TEST PARAGRAPH NUMBER
1	0110343	NETWORK, METER SENSITIVITY	47D255716	2.5.5.1
2	10112008	OSCILLATOR, AUDIO FREQUENCY	47D255716	2.5.5.2
3	10112391	AMPLIFIER, DETECTOR	47D255716	2.5.5.3
4	10181564	AMPLIFIER, DC LAMP DRIVER	47D255725	2.5.5.4
5	10182877	AMPLIFIER, LOGARITHMIC	47D255708	2.5.5.5
6	10182878	GATE LOGIC (TOJ) (NOR)	47D255702	2.5.5.6
7	10182881	AMPLIFIER, DIFFERENTIAL CONICAL SCAN	47D255739	2.5.5.7
8	10183153	AMPLIFIER, NULL AND RANGE OUTPUT	47D255707	2.5.5.8
9	10183154	CONTROL, OSCILLATOR FREQUENCY	47D255718	2.5.5.9
10	10183604	DETECTOR, RECEIVER FAILURE	47D255703	2.5.5.10
11	10288745	AMPLIFIER, AUDIO FREQUENCY	47D255748	2.5.5.11
12	10288847	POWER SUPPLY INTERCONNECTING BOARD	47D255704	2.5.5.12
13	10292709	AMPLIFIER, DETECTOR	47D255701	2.5.5.13
14	10292715	VOLTAGE REGULATOR (+3V)	47D255706	2.5.5.14
15	10668853	RELAY ASSEMBLY	47D255713	2.5.5.15
16	10669389 (C)	OSCILLATOR, AUDIO FREQUENCY (HOJ)	47D255722	2.5.5.16
17	10670519	LOGIC GATE THRESHOLD DETECTOR (RECYCLE)	47D255705	2.5.5.17

☆ NOTE: USE THE FOLLOWING PREFIXES TO THE ABOVE REFERENCE NUMBERS WHEN REFERRING TO IAB'S, ELTD'S, AND FLEXIBLE DISKS RELATING TO A PCB /MODULE:

IAB'S - USE PREFIX "ASSY" AND FOLLOW NUMBER WITH "G1" (EXAMPLE: ASSY 47D255716G1)
ELTD - USE PREFIX "EL" (EXAMPLE: EL47D255716)
FLEXIBLE DISK - USE PREFIX "FD" (EXAMPLE: FD47D255716)

APPENDIX C
GETS-1000 PCB /MODULE AND RELATED ITEM
IDENTIFICATION NUMBERS (CONTINUED)

ITEM NO.	PCB/MODULE NUMBER	PCB/MODULE TITLE	*REF., NO. FOR IAB'S, ELTD'S AND FLEXIBLE DISKS	TEST PARAGRAPH NUMBER
18	10673996	CONTROL OSCILLATOR FREQUENCY - SPEEDGATE	47D255711	2.5.5.18
19	10678094	FILTER GATE, AGC	47D255714	2.5.5.19
20	11568145	RELAY AND DIODE ASSEMBLY	47D255759	2.5.5.20

☆ NOTE: USE THE FOLLOWING PREFIXES TO THE ABOVE REFERENCE NUMBERS WHEN REFERRING TO IAB'S, ELTD'S, AND FLEXIBLE DISKS RELATING TO A PCB /MODULE:

IAB'S - USE PREFIX "ASSY" AND FOLLOW NUMBER WITH "G1" (EXAMPLE: ASSY 47D255716G1)
ELTD - USE PREFIX "EL" (EXAMPLE: EL47D255716)
FLEXIBLE DISK - USE PREFIX "FD" (EXAMPLE: FD47D255716)

APPENDIX D

REFERENCES

References for the Improved HAWK Air Defense Guided Missile System are contained in TM 9-1425-525-L.

APPENDIX E

MAINTENANCE ALLOCATION CHART

To be provided at a later date.

APPENDIX F

REPAIR PARTS AND SPECIAL TOOL LIST

There are no repair parts and special tools identified for the GETS-1000. Maintenance support will be provided by the contractor.

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-32, Section II, Direct and General Support Maintenance requirements for Improved HAWK Missile System.

☆U.S. GOVERNMENT PRINTING OFFICE: 1981 -740-031/2310 REGION NO. 4

U.S. GOVERNMENT PRINTING OFFICE 1988/532-443/60520

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN...JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL.

SOMETHING WRONG WITH PUBLICATION

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE

BE EXACT PIN-POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.

IN THIS SPACE, TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT.

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER	SIGN HERE

TEAR ALONG PERFORATED LINE

DA FORM 1 JUL 79 **2028-2**

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

THE METRIC SYSTEM AND EQUIVALENTS

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3.2808.8 feet

Weights

1 *centigram = 10 milligrams = .15 grain*
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu in.
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Square measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. in.
1 sq. decimeter = 100 sq. centimeters = 15.5 inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 feet
1 sq. dekameter (are) = 100 sq. meters = 1.076.4 sq. ft.
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 hectometers = .386 sq. miles

Liquid Measure

1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons
1 liter = 10 deciliters = 33.81 fl. ounces
1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3 38 fl. ounces
1 metric ton = 10 quintals = 1.1 short tons

Approximate Conversion Factors

To change	To	Multiply by
inches	centimeters	2.540
feet	meters	.305
yards	meters	.914
miles	kilometers	1.609
sq. inches	sq. centimeters	6.451
sq. feet	sq. meters	.093
sq. yards	sq. meters	.836
sq. miles	sq. kilometers	2.590
acres	sq. hectometers	.405
cubic feet	cubic meters	.028
cubic yards	cubic meters	.765
fluid ounces	milliliters	29.573
pints	liters	.472
quarts	liters	.946
gallons	liters	3.785
ounces	grams	28.349
pounds	kilograms	.454
short tons	metric tons	.907
pound inches	newton-meters	.11296

To change	To	Multiply by
ounce inches	newton-meters	.0070062
centimeters	inches	.394
meters	feet	3.280
meters	yards	1.094
kilometers	miles	.621
sq. centimeters	sq. inches	.155
sq. meters	sq. yards	10.764
sq. kilometers	sq. miles	1.196
sq. hectometers	acres	2.471
cubic meters	cubic feet	35.315
milliliters	fluid ounces	.034
liters	pints	2.113
liters	quarts	1.057
grams	ounces	.035
kilograms	pounds	2.205
metric tons	short tons	1.102
pound-feet	newton-meters	1.356

Temperature (Exact)

°F Fahrenheit temperature — 5/9 (after subtracting 32) — Celsius Temperature °C

PIN: 048132-000