

III. SYSTEM STARTUP AND SHUTDOWN

GENERAL

The GE 225 System is turned on at the beginning of a shift; the entire system is then normally left on while any part of the system is being used. Power is turned off under three circumstances: (1) When operators go off duty at sites which do not operate continuously; (2) During regular or unscheduled maintenance by the service engineer; and (3) During emergencies. The system should never be left unattended when power is on.

Power Sources

The operator will be aware of four stages of power supply: the substation, main power panel, the AC circuit breakers in individual equipment, and the DC power supplies to individual equipment.

1. Power is controlled, transformed, and regulated by the substation which supplies electric power to the system. This is of no immediate concern to the operator.
2. Power enters the room of the system through the main power panel, usually a wall panel, where power is distributed through individual circuit breakers labelled for each piece of equipment in the system.
3. AC circuit breakers are installed in the central processor and in peripheral controllers. In addition to turning blowers on and off, the breakers allow current to pass to the DC power supplies that run the processor, controllers, and peripherals. These blowers are contained in each controller and in the central processor and force air through the equipment in which installed. AC circuit breakers are normally left on by the service engineer. They must not be touched by the operator, for they are inside of cabinets which are to be entered only by service personnel.

4. DC power supplies for the console typewriter, paper tape reader/punch, and the card punch are contained in the cabinets of the individual equipment concerned. DC power for the 400 card per minute reader is located in the central processor. Each peripheral controller contains the DC power supply for that controller and attached peripherals.

Responsibility

The service engineer is primarily responsible for turning on and shutting off power to the system. However, the operator is usually given some freedom in this area and may be allowed to handle this duty. If the service engineer is not on duty when a normal shutdown is required, the operator must then turn power off. The operator will always be responsible for emergency shutdown when the service engineer is not immediately available.

STARTUP PROCEDURES

The principle of turning on power to the GE-225 System is to start with the main power, then proceed through the central processor, to individual controllers, and then to peripheral equipment. Startup procedures include the following steps:

1. Turn on each switch or circuit breaker at the main power panel, starting with the switch for the central processor.
2. At the central processor:
 - a. Set INSTR/WORD switch to the WORD position.
 - b. Set AUTO/MANUAL switch to the MANUAL position.
 - c. Be sure blowers are operating, then press the PWR ON switch. If blowers

are not heard and it is verified that the wall switch is on, notify the service engineer.

3. For each peripheral that does not have a controller, turn power on at the peripheral in any order desired. These peripherals and their power controls are:
 - a. Typewriter: Set the switch underneath the right side to the on position (white will show in the viewing window).
 - b. 400 card per minute reader: Set the power switch to the ON position and the STOP/ENABLE switch to the ENABLE position.
 - c. 1000 card per minute reader:
 1. Set the AUTO/MANUAL switch on the computer console to the MANUAL position.
 2. Depress the power ON switch on the card reader's control and indicator panel (will glow amber).
 3. If the READ ERROR indicator on the control and indicator panel is lit, depress the READ ERROR switch.
 - d. Card punch: Depress the POWER ON switch on the control and indicator panel. (will glow green).
 - e. Paper tape reader/punch:
 1. Depress the POWER ON switch on the control and indicator panel (will glow green).
 2. Depress the OPERABLE switch on the control and indicator panel (will glow white).
4. For each peripheral that has a controller, insure that the blower is operating in the controller cabinet; turn on power to controller, then to the peripheral (if it has separate power switch). These peripherals and their power sources are:
 - a. Magnetic tape subsystem:
 1. Depress the POWER ON switch on the controller (will glow red).
 2. Depress the POWER ON switch on the tape handler (will glow red).
 - b. High Speed printer:
 1. Depress the POWER ON switch on controller panel, then quickly proceed to step 2.
 2. Depress the MANUAL CLEAR switch to prevent a runaway printer. This switch will turn off any alert lights that came on abnormally.
 - c. Mass random access data storage: (It is assumed that the circuit breakers in each of the three units are on.)
 1. Depress the POWER ON pushbutton on the electronic unit's control and indicator panel (will glow green).
 2. Depress the PWR ON pushbutton on the controller's control and indicator panel (glows white).
 3. Notice whether the discs in the disc file unit are turning.
 4. Wait for the OPERABLE light on the electronic unit's control and indicator panel to be lit (glows green). This takes about 6 minutes. (The DISC ALARM indicator light goes off when the OPERABLE light comes on.)
 - d. Auxiliary arithmetic unit:
 1. Depress the DC ON pushbutton on the AAU maintenance panel.
 2. Depress the appropriate MODE switch on the control and indicator panel.
 3. If a red ALERT light is on, depress CLEAR ALERTS on the control and indicator panel.
 - e. Document handler (1200 documents per minute):
 1. For on-line operation, turn on power to the central processor. This turns on power to the document handler adapter. (Steps 2 through 6 following apply to both on-line and off-line operation).
 2. Turn the circuit breaker switch on the document handler to the on position (up).
 3. Check to see that the POWER indicator on the handler's control and indicator panel is on (will

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glow green). This places the document handler's electronics in a standby condition.

4. Depress the MOTOR ON pushbutton on the control and indicator panel (will glow green).
 5. Depress the ON-LINE, OFF-LINE MODE pushbutton on the control and indicator panel for the desired setting. (The ON-LINE or OFF-LINE portions of the switch light alternately each time it is depressed).
 6. The document handler is not ready for use until the FEED READY light is illuminated; this occurs after a delay of about a minute following the depression of the MOTOR ON pushbutton. (step 4).
- f. Document handler (750 documents per minute):
1. For on-line operation, turn on power to the central processor. This turns on power to the document handler adapter and the 'Z' rack. (Steps 2 through 6 apply to both on-line and off-line operation).
 2. Turn the circuit breaker switch on the document handler to the on position (up).
 3. Check to see that the MAIN CIRCUIT BREAKER indicator on the document handler's control and indicator panel is lit.
 4. Depress the POWER ON pushbutton on the control and indicator panel (glows when lit).
 5. Position the function switch on the control and indicator panel to PROCESS for on-line operation and to SEQUENCE for off-line operation.
 6. The document handler is not ready for use until the FEED READY indicator is illuminated; this occurs after a delay of about a minute following the depression of the POWER ON pushbutton.

The operator will now be ready to set up the individual peripherals for on-line operation. Directions for loading input and output media and setting up individual

peripherals are contained in sections of this manual under headings of the specific peripherals.

SHUTDOWN PROCEDURES

The procedures for turning power off and thereby shutting down the GE-225 System are the opposite of those for turning power on. Start with the switches most distant, electronically, from the main power and work toward main power. That is, turn off power to a peripheral, then to the controller, then to the central processor, and last of all, turn off the main power switches.

Peripherals may be turned off in any sequence desired. The most convenient order will depend on physical arrangement of the equipment. If paper tape and magnetic tape are to be removed and stored, the operator may wish to start with these units. The following sections describe procedures for both normal shutdown and emergency shutdown.

Normal Shutdown

The following procedures are to be followed any time operators go off duty and whenever service engineers perform routine maintenance. These procedures are designed to save data in the central processor core memory and to prevent runaway peripherals.

1. Magnetic tape system:
 - a. Set the REMOTE/LOCAL switch to LOCAL.
 - b. Rewind and de-thread magnetic tapes (remove and store if desired), relieve tension on tension arms, and close all dust covers and doors on tape handlers.
 - c. Depress the POWER ON switch on each tape handler (light goes out).
 - d. Depress the POWER OFF switch on the tape controller.
2. Paper tape reader and punch:
 - a. Remove and store punched tape.
 - b. Depress the OPERABLE switch on control panel if either READER ON or PUNCH ON indicators are on.
 - c. Depress the POWER ON switch (light goes off).

3. High speed printer:
 - a. Depress the OFF LINE switch on the controller.
 - b. Depress the POWER OFF switch on the controller.
4. Card punch:
 - a. Unload cards from input hopper.
 - b. Depress the MANUAL CYCLE switch until the punch is clear of cards.
 - c. Depress the POWER OFF switch.
5. 400 Card per minute reader: Set the Power switch to the OFF position and the STOP/ENABLE switch to the STOP position.
6. Typewriter: Put the power switch under right side to OFF position (white will disappear in viewing window and OFF will appear).
7. 1000 card per minute reader:
 - a. Depress the power OFF switch on the card reader's control and indicator panel.
8. Mass random access data storage:
 - a. Depress the POWER OFF pushbutton on the electronic unit's control and indicator panel.
 - b. Depress the PWR OFF pushbutton on the controller's control and indicator panel.
9. Auxiliary arithmetic unit:
 - a. Depress the DC OFF pushbutton on the AAU maintenance panel.
10. Document handler (1200 documents per minute):
 - a. Depress the MOTOR OFF pushbutton on the control and indicator panel.
- b. Turn the circuit breaker switch to the off position (down).
11. Document handler (750 documents per minute):
 - a. Depress the POWER OFF pushbutton on the control and indicator panel.
 - b. Turn the circuit breaker switch to the off position (down).
12. Central processor: After all peripherals are turned off,
 - a. Put the AUTO, MANUAL switch in the MANUAL position.
 - b. Put the INSTR. WORD switch in the WORD position.
 - c. Depress the PWR OFF switch on the control panel.
13. Turn off all individual circuit breakers at the main power panel. (The master circuit breaker is normally left on).

Before going off duty, the operator would normally have all output media stored or distributed to persons concerned and would remove and file all input material.

Emergency Shutdown

In emergencies, equipment is shut down for protection of both the equipment and the personnel in the system room. In grave emergencies, such as fire, flood, or a malfunctioning power system, the system is less likely to suffer heavy damage if the power is turned off at the main power panel. In minor emergencies, such as runaway tape units, jammed tape, or shorts in equipment, the operator will normally be required to turn off power only to the equipment and controller concerned. The gravity of the emergency will govern operator action. Whenever main power fails, main power switches should be turned off to prevent damage to the system when power is restored. Section II of this manual contains more specific information on operator action under various conditions of emergency.