610A POWER PLANT

OPERATING METHODS

1. GENERAL

1.01 The 610A power plant is used for such applications as plate battery supply for N and O carrier equipment.

1.02 This section is reissued to revise adjusting procedures.

1.03 The 610A power plant is a small, relay-rack mounted power plant which provides +130 or −130 volt battery from a 48-volt battery input.

1.04 Routine checks are intended to detect defects, and insofar as possible, to guard against circuit failures liable to interfere with service. Checks and adjustments, other than those required by trouble conditions, should be made during a period when they will cause the least reaction to service.

1.05 The instructions are based on circuit drawing SD-81482-01. For a detailed description of the operation, see the corresponding circuit description.

1.06 Reference should be made to the standard index of BSPs for maintenance of the apparatus used in this equipment. All relays and other apparatus should be adjusted, when required, in accordance with these sections and the circuit requirement tables on the circuit drawings.

2. TOOLS AND TEST APPARATUS

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
—	3-Inch C Screwdriver
TEST APPARATUS	
KS-14510	Volt-Ohm-Milliammeter

3. OPERATION

Description

3.01 The 610A power plant consists of duplicate dc-to-dc converters and an automatic load transfer circuit to switch the load to the spare converter if the regular converter fails. Each converter is provided with a step voltage regulator to maintain the output voltage if the input battery falls below a selected value.

3.02 The MAN TRANS button is provided to manually transfer the load from the regular converter to the spare converter. The RST button is provided to transfer the load from the spare converter back to the regular converter.

3.03 ADJ VOLTS COARSE and FINE switches are provided on each converter to adjust the output voltage of the converter.

3.04 A minor alarm is provided to indicate failure of either converter and a major alarm to indicate failure of both converters.

Preparing to Start

3.05 Before putting the plant into service check that:

(1) All external connections are made in accordance with the SD- drawings covering the circuits associated with the plant.

(2) The proper size fuses are in place.

(3) The RST button has been momentarily depressed and released.

Initial Adjustments

3.06 The power plant has no disconnect switches and is connected to both the central office battery and the load when the associated fuses are in place. If it is necessary to take the plant out of service, remove the battery fuses. To restart, remount the fuses.

3.07 ***Output Voltage***

(1) Connect the KS-14510 meter across the OUTPUT POS and NEG test jacks of converter 1. With the plant operating at normal load, position the ADJ VOLTS COARSE and FINE switches of converter 1 so that the output as shown on the meter is approximately 130 volts. Disconnect the meter.

(2) Momentarily depress and release the MAN TRANS button. Adjust the output of converter 2 in a manner similar to that covered in (1). Disconnect the meter. Momentarily depress and release the RST button.

3.08 ***Voltage Regulation:*** Adjust the step voltage regulation of each converter as follows.

(1) Using the 3-inch C screwdriver, rotate the VR ADJ potentiometer fully clockwise.

(2) Connect the KS-14510 meter to the VR TEST and VR GRD jacks.

(3) Adjust the VR TEST potentiometer to obtain a reading of 48.0 volts on the meter.

(4) Slowly rotate the VR ADJ potentiometer counterclockwise until the VR relay operates.

(5) Readjust the VR TEST potentiometer slowly until the VR relay just releases. The meter should read about 47.5 volts.

(6) Rotate the VR TEST potentiometer fully clockwise. Check that the VR relay is operated. Disconnect the KS-14510 meter.

4. ROUTINE CHECKS

4.01 ***Output Voltage:*** Periodically check the output voltages as covered in 3.07.

4.02 ***Voltage Regulation:*** Periodically check the voltage regulation as covered in 3.08.

4.03 ***Alarms:*** Periodically check the alarms as follows.

(1) Remove the OUTPUT fuse from converter 1. The NV lamp of converter 1 should light, the TRANS lamp in the load transfer circuit should light, and a minor alarm should operate. The load is now transferred to converter 2.

(2) Replace the OUTPUT fuse of converter 1. The NV lamp of converter 1 should be extinguished and the minor alarm should be retired.

(3) Momentarily press and release the RST button. The TRANS lamp should be extinguished. The load is transferred back to converter 1.

(4) Remove the OUTPUT fuse from converter 2. The NV lamp of converter 2 should light and a minor alarm should operate.

(5) Block the NV relay of converter 2 nonoperated, replace the OUTPUT fuse of converter 2, and momentarily press and release the MAN TRANS button. A major alarm should operate.

(6) Momentarily press and release the RST button. The major alarm should be retired.

(7) Remove the block from the NV relay of converter 2. The NV lamp of converter 2 should be extinguished and the minor alarm should be retired.

5. TROUBLES

5.01 In general, the only items likely to become defective with use are the electrolytic capacitors and semiconductor devices.

5.02 If trouble develops, check the possible causes in the order given below. If the trouble is not apparent, check for loose or open connections or short circuits due to foreign matter lying across wiring terminals. If the trouble cannot be determined from the possible causes listed below, it is advisable to check all resistors for the resistance value shown on SD-81482-01.

TROUBLE	POSSIBLE CAUSE
No output voltage	Battery not connected
	Blown fuses
	Shorted capacitors
	Defective bridge transistors. (See 5.03.)

TROUBLE	POSSIBLE CAUSE
Low output voltage	Output voltage improperly adjusted (See 3.07.)
	Damaged capacitors
	Failure of semiconductor devices.
High output voltage	Output voltage improperly adjusted (See 3.07.)
	Step voltage regulator improperly adjusted
	Damaged capacitors.
Erratic output	Loose connections.

5.03 The following check may be made to determine whether a bridge transistor (Q1 through Q4) is shorted.

(a) Remove the plant from service.

(b) Remove the transistors from their sockets.

(c) Using the RX1 range, connect the KS-14510 meter across the collector and emitter of each transistor in turn. A reading of less than 50 ohms indicates a shorted transistor. Replace transistors as required.

(d) After mounting the transistors and before putting the plant back into service, check each transistor to make sure that its collector has not been accidentally grounded. To do this, connect the KS-14510 meter between one of the screws which mount the transistor and a mounting screw of the associated socket.