

610D POWER PLANT
(J86807)
OPERATING METHODS

1. GENERAL

1.01 The 610D power plant provides a positive 48-volt, 1-, 1-1/2, or 3-ampere dc power supply from a negative 48-volt dc central office battery. The plant is used to provide tripping battery supply.

1.02 This section is reissued to add information for connection to Centralized Status, Alarm and Control System (CSACS). This reissue does affect the Equipment Test List.

1.03 Routine checks are intended to detect defects and 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 service reaction.

1.04 The instructions are based on SD-81571-01, Issue 12B. For a detailed description of the operation, see the corresponding circuit description.

1.05 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 requirements tables on the circuit drawings.

2. LIST OF TEST APPARATUS

CODE OR SPEC NO.	DESCRIPTION
KS-14510	Volt-Ohm-Milliammeter or Equivalent Digital Volt-Ohm- Milliammeter

3. OPERATION

Description

3.01 The 610D power plant is a small, relay-rack mounted plant having an optional output current capacity of 1, 1-1/2, or 3 amperes. It consists of a negative 48-volt to positive 48-volt dc-to-dc transistor converter circuit. The converter circuit includes a no-voltage alarm circuit to indicate failure of the plant. ♦Connections may be made to CSACS when B option is incorporated in the circuit of the power plant.♦

3.02 The converter circuit is designed to permit parallel operation of either two or three converters. The paralleled converters have an output current capacity of either 1, 1-1/2, or 3 amperes and operate simultaneously to share the connected load. If one of the converters fails to function, the other converter or converters will automatically increase their current output to carry the entire load.

3.03 Where only a single converter is provided, failure of the converter will cause a major alarm. Where paralleled plants are provided, failure of one converter will cause a minor alarm and failure of all converters will cause a major alarm.

Preparing to Start

3.04 Before putting the plant in service, check that:

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

(b) The proper size fuses are in place.

NOTICE

Not for use or disclosure outside the
Bell System except under written agreement

Starting

3.05 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.

3.06 Since the operation of this plant is entirely automatic and no voltage regulation is provided, no adjustments are required.

⚠**Caution:** Voltages on components inside the power plant exceed 48 volts to ground and 96 volts between components. Do not allow a test pick to touch two metal parts at the same time, as destructive or dangerous short circuits may occur.⚠

4. ROUTINE CHECKS

NV Alarm

4.01 Periodically check the NV alarm as covered in 4.02 for a single converter or as covered in 4.03 for parallel converters.

Caution: Do not attempt to check the alarm by applying voltage to the fuse as dangerous and destructive damage may occur.

4.02 **Single Converter:** Remove the F1 fuse. This should cause the NV lamp to light and the major alarm to sound. Remount the fuse.

Note: Performing this check will interrupt the voltage supply to the load; therefore, the check should be done when it will cause the least service reaction.

4.03 **Parallel Converters**

(a) Remove the F1 fuse in one of the converters. This should cause the associated NV lamp to light and the minor alarm to sound. Remount the fuse. Check the alarm for each converter.

(b) Block unoperated the NV relay in one of the converters. This should cause the associated NV lamp to light and the minor alarm to sound without interrupting the voltage supply to the load. If three converters are in parallel, block unoperated the NV relay in one of the remaining converters. Remove the F1 fuse from the remaining converter. This should cause the associated NV lamp to light and the major alarm to sound. Remount the fuse and remove the block(s).

4.04 Periodically check the output voltage, using the KS-14510 volt-ohm-milliammeter, set to the 60 VOLTS DC range, to determine that the output voltage is within the limits of +40 to +50 volts dc.

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 following possible causes in the order given. 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, it is advisable to check all resistors for the resistance values shown on SD-81571-01 using the KS-14510 volt-ohm-milliammeter.

TROUBLE CHART 1

NO OUTPUT VOLTAGE

PROBABLE CAUSE	TEST PROCEDURE	CORRECTIVE ACTION
A. Battery not connected	Check that battery voltage is applied to the -48 volt input terminal and ground.	Check to see that the power supply is connected to the source of -48 volts dc.
B. Broken leads	Check that the connecting wires are free of breaks and high resistance junctions.	Replace or repair broken leads.
C. Operated fuses	Check for operated fuses in the battery distribution fuse panel, -48 volt power distribution board, or power charge and discharge circuit.	Correct the cause of the fuse operation and replace operated fuses.
D. Defective fuse mounting	Check for good electrical and mechanical mounting for all fuses. Check for burn spots and high resistance contacts.	Clean and tighten fuse mountings.
E. Shorted capacitors	Check for shorted capacitors that cause fuses to open. Disconnect the suspected capacitors and test for shorts.	Replace defective capacitors.
F. Failure of semiconductor devices	<p>(1) Check for the presence of ac voltage on each winding of transformer Tf.</p> <p>(2) Remove transistors Q1 and Q2 from the power supply circuit and test them by KS-15920 or KS-19228.</p> <p>(3) Check resistance of diodes in both directions.</p>	<p>(1) Absence of ac voltage causes associated transistor to be suspect. Perform test 2.</p> <p>(2) Replace defective transistors.</p> <p>(3) Replace diodes that have forward-to-reverse resistance ratio less than 8 to 1.</p>

TROUBLE CHART 2

LOW OUTPUT VOLTAGE

PROBABLE CAUSE	TEST PROCEDURE	CORRECTIVE ACTION
A. Defective capacitors	Check for open capacitors that cause low voltage and excessive noise due to insufficient filtering. Disconnect suspected capacitors and test for open circuits, high internal resistance of conductors, leakage, and insufficient capacitance.	Replace defective capacitors.
B. Failure of semiconductor devices	(1) Check for failure of one of the two transistors Q1 or Q2 exhibited by a low-voltage in one of the windings of transformer Tf. Disconnect the transistors from the circuit and test.	(1) Replace defective transistors.
	(2) Check resistance of diodes in forward and reverse directions.	(2) Replace diodes that have forward-to-reverse resistance ratio less than 8 to 1.