

673A (J86915) CONVERTER POWER PLANT

+130 VOLTS, 0.5 AMPERE

OPERATING METHODS

CONTENTS	PAGE
1. GENERAL	1
2. LIST OF TOOLS AND TEST APPARATUS	2
3. OPERATION	2
4. ROUTINE CHECKS	3
5. TROUBLES	6

Figures

1. 673A Converter Plant—Two-Converter Configuration	2
2. 70-Type Alarm Fuse With Alarm Test Point	4
3. Fuse Alarm Testing Cord—Tool Connection	4

1. GENERAL

1.01 This section describes the operation of the 673A converter power plant which provides conversion from -24 volts dc to +130 volts dc. The plant employs pulse width controlled converters (PWC). Each converter has an output rating of 0.5 ampere. Two converters may be operated in parallel in a plant configuration. The plant is intended for use in a TD 2 radio station to provide power for the C1 Alarm System.

1.02 Whenever this section is reissued, the reason for reissue will be given in this paragraph. This issue affects the Equipment Test List.

1.03 The 673A converter power plant is a single plant unit equipped with discharge and control circuitry, positions for two load fuses, and one or two converters (121C1). The second converter, operating in parallel, may be provided for redundancy.

1.04 The plant control circuit provides an LED converter fail indicator and test jacks for checking both plant output voltage and plant load current.

1.05 Alarm indications are generated by the release of normally operated relays associated with each of the converters and with the plant fuse alarm. Standard power alarm outputs are provided to the radio station office alarm circuit, centralized alarm lamp panel, and status input or alarm sending circuit. Failure of one converter in a two-converter configuration will initiate minor alarm indications. Failure of both converters (one in a single converter configuration) or plant fuse operation will initiate major alarm indications. Removal of failed converters from their connectors will cut off the alarms and initiate an alarm cutoff visible (ACOV). Removal of any converter will initiate or retain the ACOV. A status indication is also provided which remains until the trouble condition is cleared.

1.06 The converter panel (Fig. 1) mounts two converters and their associated alarm relays and output resistors as well as the fuse and fuse alarm features. The two-converter positions on the panel, including associated apparatus, are designated A and B. When only one converter is equipped, it will normally occupy position A. Position B may be used as an alternative if the input feeder is wired to position B.

1.07 Routine checks should be performed during a period when they will cause the least service reaction.

NOTICE

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

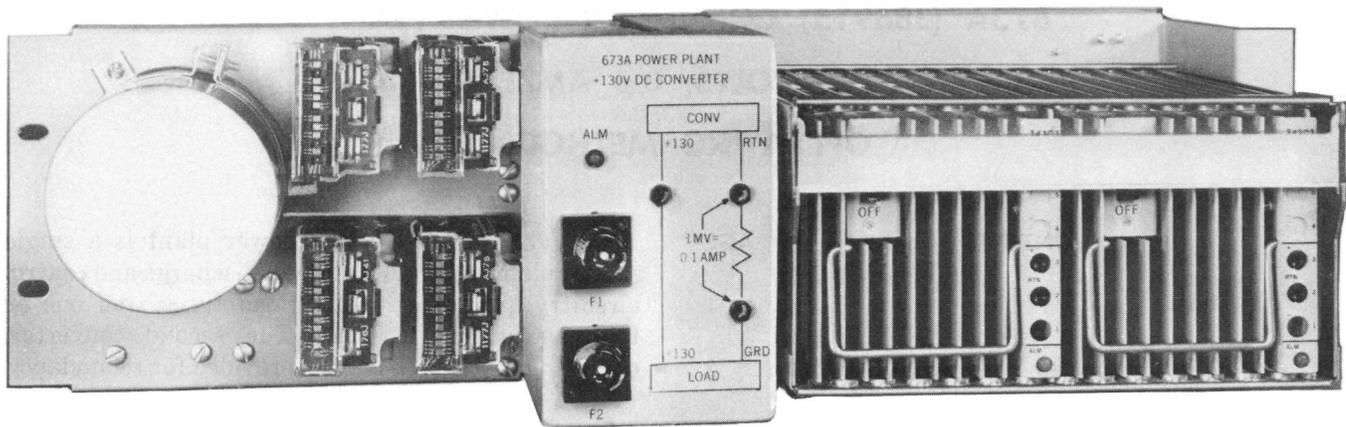


Fig. 1—673A Power Plant—Two-Converter Configuration

1.08 This issue of the section is based on the following drawings:

SD-82485-01, Issue 1, for the 673A Converter Power Plant

SD-82261-02, Issue 1, for the 121C1 Converter Power Unit

For a detailed description of the circuit operation, refer to the corresponding circuit description (CD). If this section is to be used with equipment or apparatus reflecting later issues of the drawings, reference should be made to the SD and CD to determine the extent of the changes and the manner in which the section may be affected.

2. LIST OF TOOLS AND TEST APPARATUS

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
—	Testing Cord (equipped with a KS-6780 connecting clip on each end)
W1AF	Testing Cord (equipped with a 360A tool at each end)
W1AP	Testing Cord
141	Cord Tip

411C	Test Pick
720A	Battery Pickup Tool (or one KS-6278 Connecting Clip)

TEST APPARATUS

KS-20599, L4	Digital Multimeter (or equivalent, with millivolt capability)
--------------	---

3. OPERATION

3.01 **Preparing to Start:** When preparing to put the power plant in service, check the following:

- (1) All external connections are made in accordance with the schematic drawing which covers the associated circuits.
- (2) No fuses are installed in their respective fuse holders including the input fuse at the battery distribution fuse board (BDFB).

3.02 **Starting:** To place the plant in service, proceed as follows:

- (1) Insert the converter (121C1 power unit) into its cage and assure that it is fully engaged with the connector.
- (2) Install the input fuse at the BDFB.

Requirement: ALM lamps on converter unit and plant panel are lighted and associated alarm relay (A or B) is released.

- (3) Raise latch to turn converter on, then lower plastic designation strip.

Requirement:

- ALM lamps on converter unit and plant panel are extinguished.
 - Associated alarm relay A or B on converter panel is operated.
- (4) Measure the plant voltage across the 130(+) and RTN(-) test jacks located on the front of the control and discharge panel. Use a KS-20599, L4, digital multimeter (DMM) set to 1K DCV scale.

Requirement: The DMM indicates between 133 and 139 volts dc.

- (5) Perform (1) through (4) for the other converter, if equipped.
- (6) Install associated load fuses in their respective fuse holders.
- (7) Measure the current across the GRD(+) and RTN(-) test jacks located on the front of the control and discharge panel. Use the DMM set to 1 DCV scale.

Requirement: The DMM will indicate 1 millivolt per 0.1 ampere of converter load.

Note: The maximum plant current is 0.5 ampere.

- (8) Disconnect the digital multimeter.

3.03 Stopping: To remove the power plant from service, perform the following:

- (1) Raise the plastic designation strip and lower the latch to turn the first converter off.

Requirement:

- **Two-Converter Configuration**—An audible visible alarm will occur when one converter is cut off or a major audible/visible

alarm will occur when both converters are off.

- **Single-Converter Configuration**—A major audible/visible alarm will occur.

- (2) Unplug the converter from its connector.

Requirement: The alarms are cut off.

- (3) Remove the input fuse from the BDFB.
- (4) Perform (1) through (3) for the other converter, if equipped.

4. ROUTINE CHECKS

4.01 Electrolytic capacitors should be maintained in accordance with Section 031-110-701.

4.02 Routine checks are made on this plant to determine whether the features, indications, and alarms are in proper operating condition. The plant should be checked periodically in accordance with the Equipment Test List. It should also be checked after any troubles have been corrected, or if the plant has been out of service.

4.03 Output Voltage Check: To verify that the plant is supplying the required output voltage to the load, periodically check the output voltage as follows:

- (1) Connect the KS-20599, L4, digital multimeter (DMM), set to 1K DCV scale, across the 130(+) and RTN(-) test jacks located on the front control and discharge panel.

Requirement: The DMM indicates between 133 and 139 volts dc.

- (2) Disconnect the digital multimeter.

4.04 Output Current Check: Periodically check output current as follows:

- (1) Connect the KS-20599, L4, digital multimeter (DMM), set to 1 DCV scale, across the GRD(+) and RTN(-) test jacks located on the front of the control and discharge panel.

Requirement: The DMM will indicate 1 millivolt per 0.1 ampere of converter load.

Note: The maximum plant current is 0.5 ampere.

(2) Disconnect the digital multimeter.

4.05 Load Fuse Failure Alarm Check: To verify that a major alarm occurs in the event of a load fuse failure, proceed as follows:

Note: A test point is provided at the front of the fuse cap for 70-type fuses (Fig. 2). This test point should be used to test the fuse alarm.

(1) Prepare an alarm test cord (Fig. 3) by connecting one end of a W1AF testing cord to a 141 cord tip and a 720A voltage pickup tool. (The KS-6278 connecting clip may be used to replace the 720A voltage pickup tool.) On the opposite end of the W1AF testing cord, connect a 411C test tool.

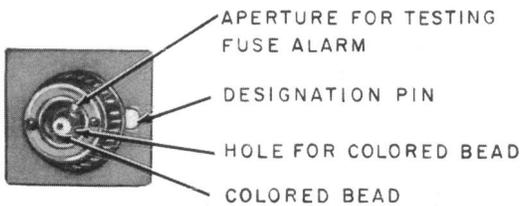


Fig. 2—70-Type Alarm Fuse With Alarm Test Point

(2) Install the 720A voltage pickup tool in a spare 70-type fuse position. (If a spare fuse position is not available, obtain the same magnitude voltage supply by connecting the KS-6278 connecting clip with the W1AF test cord to the fuse block bus bar.)

Caution: Test only the fuses associated with the same magnitude voltage supply.

(3) With the tip of the 411C test pick (attached to the battery connected W1AF cord), touch the exposed alarm test point on the fuse cap (Fig. 2) for one fuse.

Requirement: The fuse alarm relay releases, the panel alarm lamp lights, and an audible/visible alarm is activated.

(4) Remove the test pick from the fuse cap.

Requirement: The fuse alarm relay operates, the panel alarm lamp extinguishes, and the audible alarm is silenced.

(5) Repeat (3) and (4) for each fuse.

(6) Remove the 720A tool from the spare fuse position. (If the KS-6278 connecting tool is used, disconnect the clip from the bus bar.)

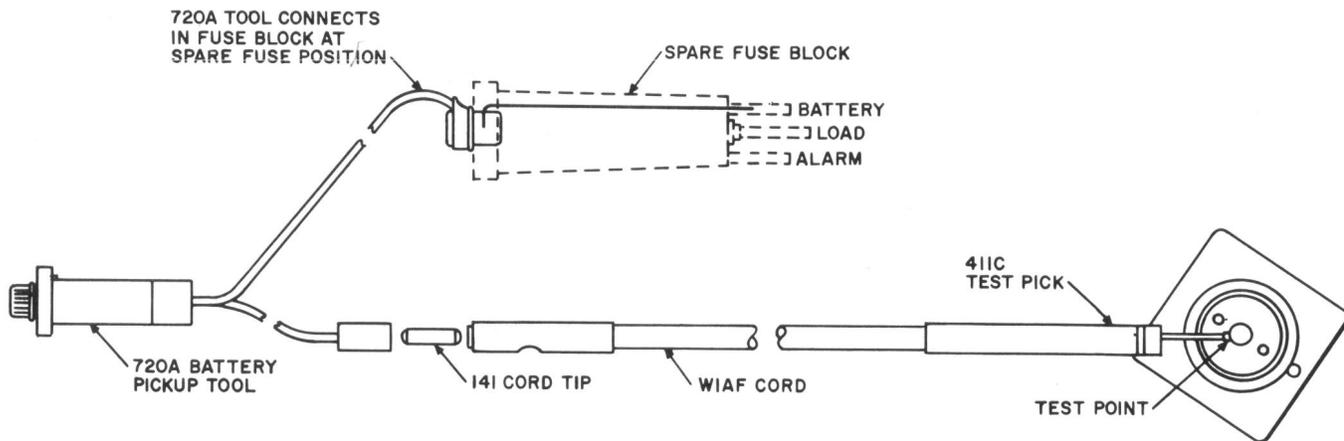


Fig. 3—Fuse Alarm Testing Cord—Tool Connection

4.06 Converter Failure Alarm: Perform the following check to verify that a minor

alarm is activated if one converter fails (two-converter configuration), and a major alarm is activated if

one converter fails (single-converter configuration), or both converters fail (two-converter configurations).

- (a) **Single-Converter Plant:** To check the converter fail alarms for a single-converter configuration, proceed as follows:

Note: Use "B" designations to replace "A" designations if converter is located in position B.

- (1) At the rear of the converter panel on connector A, connect the W1AP test cord across terminals 14 (grd) and 13.

Requirement: The A relay releases, ALM relay operates, and the audible and visible major alarms turn on.

- (2) At converter A, disconnect the test cord from terminals 13 and 14.

Requirement: Audible and visible alarms are extinguished.

Caution: For a single-converter plant, all output voltage will be lost to the plant loads when the converter is turned off.

Note: To check the office ACO alarm lamp, the converter must be turned off and disconnected from the connector. If the office can withstand a temporary loss of converter output voltage, continue with (3) through (5).

- (3) At converter A, raise the plastic designation strip and lower the latch to turn the converter off.

Requirement: The A relay releases, ALM relay operates, and the audible and visible major alarms turn on.

- (4) Unplug converter A from its connector.

Requirement: The ALM relay releases and audible and visible major alarms are extinguished. The ACO lamp at office alarm circuit lights.

- (5) Insert converter A in its connector, raise latch to turn converter on and lower the plastic designation strip.

Requirement: The ACO lamp at office alarm circuit is extinguished.

- (b) **Two-Converter Plant:** To check the converter fail alarms for a parallel connected converter configuration, proceed as follows:

Note: For a parallel connected converter plant, no service will be lost when only one converter is turned off.

- (1) At converter A, raise the plastic designation strip and lower the latch to turn the converter off.

Requirement: The A relay releases, the ALM relay operates, and the audible and visible minor alarms turn on.

- (2) Unplug converter A from its connector.

Requirement: The ALM relay releases and audible and visible minor alarms are extinguished. The ACO lamp at office alarm circuit lights.

- (3) Insert converter A in its connector, raise latch to turn converter on, and lower the plastic designation strip.

Requirement: The ACO lamp at office alarm circuit is extinguished.

- (4) At converter B, raise the plastic designation strip and lower the latch to turn the converter off.

Requirement: The B relay releases, the ALM relay operates, and the audible and visible minor alarms turn on.

- (5) Unplug converter B from its connector.

Requirement: The ALM relay releases and audible and visible minor alarms are extinguished. The ACO lamp at the office circuit lights.

Note: Converter B should not be reinstalled at this time.

- (6) At the rear of converter panel on connector A, connect the W1AP test cord across terminals 14 (grd) and 13.

Requirement: The A relay releases, ALM relay operates and the audible and visible major alarms occur.

- (7) At connector A, disconnect test cord from terminals 13 and 14.

Requirement: Audible and visible alarms are extinguished.

- (8) Insert converter B into its connector, raise latch to turn converter on and lower the plastic designation strip.

by the individual converters. If the plant malfunctions, determine which converter or converters are malfunctioning and perform the corrective action as outlined in the appropriate Bell System Practices and CD/SD-82485-01 covering the converter.

5.02 Various troubles which may be encountered in the power plant are given in the following list. If the trouble is not found, check for loose or open connections or short circuits due to foreign matter lying across wiring terminals. This list is not all inclusive and is meant only as an aid in locating possible trouble conditions that might occur.

5. TROUBLES

5.01 Because of the arrangement of the 673A power plant, most troubles will be caused

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
Minor office alarm	Failure of one converter in a two-converter configuration	Replace faulty converter
Major office alarm	Two-converter configuration: Failure of two or more converters Single-converter configuration: Failure of one converter Plant fuse operation	Replace faulty converters Replace faulty converters Replace operated fuse.