

J86440A POWER SUPPLY
24 VOLTS, 6 AND 12 AMPERES

1. GENERAL

1.01 This section describes the operation of the J86440A 24-volt, 6- and 12-ampere power supply which was designed originally for use in the TD2 radio relay system. The plant has a continuous rating of 22 to 24 volts ± 0.5 volt from no-load to 6 or 12 amperes depending on whether one or two rectifier units are provided. For intermittent loads the rating is 9 or 18 amperes.

1.02 This section is reissued to delete references to the boost charge timer. Newer plants are not equipped with a timer and require manual operation of a CHG-FLT key for a boost charge and to return to the floating voltage condition.

1.03 Routine checks should preferably be made during a period when they will cause the least unfavorable reaction.

1.04 The instructions in this section are based on drawing SD-81091-01.

1.05 Additional information on the operation and maintenance of individual pieces of apparatus, such as keys, relays, etc., is given in other sections, and the attendant should be familiar with them. All relays, etc., are assumed to have been adjusted in accordance with these sections and the circuit requirements table on the drawing. Refer also to such sections as:

A301.005 Continuous Float Charge
A301.335 J86243 Rectifier
A401.001 Storage Batteries
A401.562 Meters and Instruments
A462.005 Voltage Relays

1.06 Information in this section is arranged under the following headings:

1. GENERAL

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2. OPERATION

Description

2.01 One or two regulated metallic rectifier units J86243 are used to convert

60-cycle single-phase power to direct current for charging and floating an 11-cell battery. The rectifier units are rated at 9 amperes each and are permanently connected to the power service and the battery with no disconnecting equipment other than the a-c and d-c fuses. The plant is rated at 6 amperes of steady load or 9 amperes of intermittent load for each rectifier unit. The battery reserve may be increased by connecting two 11-cell strings in parallel. The voltage during power failure depends on the load and size of the battery reserve, no emergency cells or voltage maintaining equipment being provided.

2.02 The battery can be charged by manual operation of key CHG-FLT to CHG which causes relay OC to operate. Operation of relay OC removes a short circuit around rheostats OC1 and OC2 which are each in series with the regulating leads of a rectifier unit. Insertion of this resistance lowers the voltage on the regulating leads and causes an increase in the output of each rectifier unit for charging the battery. When key CHG-FLT is operated to FLT, relay OC is released and the rectifier outputs are restored to the floating adjustment.

2.03 A voltmeter and ammeter are provided to indicate the plant load current and voltage. A floating voltage relay and a high-low voltage relay cause suitable alarms when either the high or low voltage limit is reached. The discharge fuses are the alarm type or an alarm type in parallel with a larger fuse and when blown give an alarm. The charge fuses, while of the alarm type, are not connected to the alarm system; a blown fuse being indicated only indirectly by the low voltage alarms.

Preparing to Start Initially

2.04 When putting the plant into service, check to see that:

(a) The correct a-c and d-c fuses are available.

(b) The rheostats OC1 and OC2 are turned completely counter-clockwise.

(c) Each rectifier unit has been adjusted in accordance with Section A301.335 for floating at 23.8 volts.

Initial Adjustments

2.05 The plant adjustments, other than those required by individual pieces of apparatus, are to secure the proper setting of rheostat OC1 for charging, and if two rectifier units are provided, to adjust for division of the load and the proper setting of rheostat OC2. Put the d-c fuses in place first and then the a-c supply fuses to the rectifier units. With each rectifier unit adjusted as outlined in Section A301.335 to obtain a floating voltage of 23.8 volts, if two rectifier units are provided, make an adjustment with rheostat ADJ VOLTS to divide an 18-ampere load equally, as nearly as practicable. If the voltage is high, reduce the higher of the two outputs. If the voltage is low, increase the lower of the two outputs. It is not necessary that the output currents should be equal at smaller loads. Neither rectifier output current should exceed 10 amperes while floating the load. To adjust for charging, operate key CHG-FLT to CHG. This will cause the operation of relay OC which will remove the short circuits around rheostats OC1 and OC2. Slowly turn those rheostats clockwise keeping the output current below 7 amperes on each rectifier unit until a charging voltage of 25.3 volts is obtained. If two rectifiers are provided, adjust the rheostats to obtain, as nearly as practicable, equal output currents from the two rectifier units at a total load of below 14 amperes. Operate key CHG-FLT to FLT.

Routine Adjustments (Normal Operation)

2.06 Once the a-c and d-c fuses are in place for the rectifier units, plant operation is entirely automatic and the units are continuously in service. Periodically check the floating voltage (read on the plant voltmeter). To take a rectifier unit out of service, remove the a-c fuses and then the d-c charge and regulation fuses associated with the unit.

2.07 Periodically, give the battery a boost charge at 25.3 volts in accordance with Section A301.005. Operate key CHG-FLT to CHG to charge the battery, and restore to FLT when charging is done. Maintain the battery and battery records in accordance with Sections A301.005 and A401.001

3. ROUTINE CHECKS

3.01 Such routine checks of the power plant relays as are consistent with operating conditions should be made periodically or whenever operation indicates doubtful adjustment or trouble conditions.

3.02 Discharge fuse alarms may be checked by inserting a blown alarm fuse in a spare fuse holder. This should light lamp FA and connect ground to the alarm circuits to give audible and visual alarms. The ABS fuse alarm may be checked by using a blown alarm-type fuse in place of the alarm-type fuse in parallel with the ABS fuse.

3.03 The float alarm may be checked by removing the charge fuses of one or both rectifier units to let the battery voltage decrease and close the low contacts of the floating voltage relay FLOAT. At the low limit, relay H1 should operate and cause the operation of time-delay relay TD2 in 1-1/2 to 3-1/2 minutes. At the end of the delay, lamp FLOAT should be lighted and ground should be connected to the alarm circuits causing audible and visual alarms. The local audible alarms may be cut off by operation of key ACO, leaving the float lamp lighted. Replace any charge fuses removed for this check.

3.04 The high-low voltage alarm may be checked by strapping terminals C and L on the high-low voltage relay VR2. This should cause lamp HLV to light and cause ground to be connected to the alarm circuits to cause audible and visual alarms. Remove strap on relay VR2.

4. TROUBLES

4.01 As no switching is involved in this plant, any troubles should be limited to individual pieces of equipment for which there are BSP sections. Time-delay relay TD2 and the rheostats OC1 and OC2 require no maintenance. If they become defective in any way, they should be replaced with new units. In case of high or low voltage, check the rectifier adjustments and the regulation lead fuse. Low voltage may be due to rectifier troubles or a blown charge fuse. Possible troubles in the alarm circuit should be located by following the information in Part 3, on routine checks.