

TYPE N3 CARRIER TELEPHONE SYSTEM
TERMINAL EQUIPMENT
POWER SUPPLY UNIT
TESTS AND ADJUSTMENTS

The power supply is an automatically regulated semiconductor-type unit. The plug-in power supply unit J87245A converts an input of nominal -48 volts dc to a regulated output of -21 volts dc. An alarm circuit is provided which causes an alarm (visual and audible) when variations in the -21 volt power supply exceed ± 0.8 volt. Power to the N3 terminal may be transferred to an alternate power supply unit by using the J99300AU switching set, as covered in Section 362-903-510.

The purpose of these tests is as follows:

- (a) To make voltage adjustment, check output ripple voltage, and make alarm test; at time of initial installation.
- (b) To make in-service voltage test and adjustment.
- (c) To make in-service output ripple voltage test.

This section is reissued to make various changes in the procedural steps. Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

APPARATUS:

- J99300AU N3 Switching Set
- KS-14510 Volt-Ohm-Milliammeter (VOM)
- Hewlett-Packard 400-type Vacuum Tube Voltmeter (VTVM)

A. Initial Installation Tests and Adjustments

STEP	PROCEDURE
1	<p><i>Note:</i> Perform these steps before plugging in the unit.</p> <p>Check that the proper size bay fuse and individual distribution fuse are provided at the top of the bay.</p>

STEP	PROCEDURE
2	Check that a 5-ampere PROTECTION fuse is provided in the power supply unit.
3	Check that the N3 terminal is equipped with all plug-in units, except for the power supply unit. (See Section 362-902-300 for minimum complement.)
4	On the N3 switching set, operate the ALT switch to TEST, the LOAD switch to REGULAR, and the VM & RIPPLE switch to ALTERNATE.
5	Plug the power supply unit into the N3 switching set and set the ADJ VOLTS potentiometer fully counterclockwise.
6	Remove one of the two shorting plugs from the TEST POWER jacks on the combining and switching unit.
7	Connect the switching set cord to the vacant TEST POWER jack on the combining and switching unit.
8	Adjust the ADJ VOLTS potentiometer on the power supply unit for a reading of -21.0 volts as indicated on the N3 switching set meter. Turn the potentiometer clockwise to increase or counterclockwise to decrease the voltage. <i>Caution: An output voltage of 25 volts or more will cause operation of the automatic protection circuit in the power supply unit, in which case the ADJ VOLTS potentiometer should be set fully counterclockwise and the power supply unit removed and then reinserted to restore the protection circuit. If the PROTECTION fuse is blown (a normal condition), replace it with a new fuse.</i>
9	<i>Note: If it is not possible to set the output voltage to 21 volts, check the dc input voltage across ripple test jacks -48V and G using the VOM. If the input voltage is 43 to 52 volts, the power supply unit is defective and not suitable for use in the system.</i> Connect the VTVM to the N3 switching set ripple test jacks -21V and G. (Bottom VTVM post to jack G.)
10	Measure the output ripple voltage. <i>Requirement: 0.012 volt maximum.</i>
11	If the output ripple voltage requirement cannot be met, measure the input ripple voltage at the ripple test jacks -48V and G with the VTVM. <i>Requirement: 0.30 volt maximum.</i>
12	<i>Note: If the input ripple voltage requirement is met and the output ripple voltage exceeds the requirement, the power supply unit is defective and not suitable for use in the system.</i> Operate the test switch on the switching set to the FULL LOAD position. <i>Requirement: The switching set voltmeter should indicate -21.0 ± 0.2 volts and the ammeter should read approximately 4 amperes.</i>

STEP	PROCEDURE
13	<p>Operate the test switch to the NO LOAD position.</p> <p>Requirement: The switching set voltmeter reading should go to less than 5 volts, indicating that the automatic protection circuit in the power supply unit is functioning. The PROTECTION fuse may blow, which is a normal condition.</p> <p>If this requirement is not met the power supply unit is not suitable for use in the system.</p> <p>Note: To restore the protective circuit, operate the test switch to the 1/4 LOAD position, then remove and reinsert the power supply unit. If the PROTECTION fuse is blown, replace it with a new fuse (this fuse may be very warm).</p>
14	<p>To test the 21-volt alarm circuit in the power supply unit, operate the test switch on the switching set to the FULL LOAD position and slowly turn the ADJ VOLTS potentiometer on the power supply unit in a clockwise direction until the ALM TST lamp on the switching set just lights.</p> <p>Requirement: The voltmeter should read 21.8 ± 0.1 volts.</p> <p>If this requirement is not met, adjust the HV ALM potentiometer on the side of the power supply, as necessary to meet the requirement.</p>
15	<p>With the test switch again in the FULL LOAD position, slowly turn the ADJ VOLTS potentiometer counterclockwise until the ALM TST lamp on the switching set extinguishes and then just lights.</p> <p>Requirement: The voltmeter should read 20.2 ± 0.1 volts.</p> <p>If this requirement is not met, adjust the LV ALM potentiometer on the side of the power supply unit, as necessary to meet the requirement.</p>
16	<p>Adjust the ADJ VOLTS potentiometer for a reading of -21.0 volts on the switching set meter.</p>
17	<p>Remove the power unit from the switching set and place the power supply unit in the terminal.</p>
18	<p>Readjust the voltage per Test B.</p> <p>Note: If the requirements of this procedure cannot be met the power supply unit is not suitable for use in the system. See Table A for possible causes of the trouble.</p>

B. In-Service Voltage Test and Adjustment

STEP	PROCEDURE
1	<p>Set the N3 switching set LOAD switch to REGULAR, the ALT switch to TEST, and the VM & RIPPLE switch to REGULAR.</p>

STEP	PROCEDURE
2	Remove one of the two shorting plugs from one of the TEST POWER jacks on the combining and switching unit.
3	Connect the switching set cord to the vacant TEST POWER jack on the combining and switching unit.
4	Read the voltmeter on the N3 switching set. <i>Requirement:</i> -21 ± 0.5 volts.
5	If this requirement is not met, adjust the ADJ VOLTS potentiometer on the power supply unit for a reading of -21.0 volts as indicated on the N3 switching set meter. Turn the potentiometer clockwise to increase or counterclockwise to decrease the voltage.
6	Disconnect the N3 switching set and replace the shorting plug in the vacant TEST POWER jack. <i>Note:</i> If the requirements of this procedure cannot be met, see Table A for possible causes of the trouble. If the unit is defective, replace it using the procedures of Section 362-903-510.

C. In-Service Output Ripple Voltage Test

STEP	PROCEDURE
1	Connect the VTVM to terminal 1 GRD and terminal 11 $-21V$ of the power supply unit jack at the rear of the bay. (Bottom VTVM post to terminal 1 GRD.) <i>Requirement:</i> 0.012 volt maximum. <i>Note:</i> If the requirement of this procedure cannot be met, see Table A for possible causes of the trouble. If the unit is defective, replace it using the procedures of Section 362-903-510.

TABLE A

TROUBLE	POSSIBLE CAUSES
No output voltage	Failure or disconnection of the input power Blown supply fuse and/or PROTECTION fuse in the power supply Defective components within the unit
Low output voltage	Low input voltage ADJ VOLTS potentiometer incorrectly set Automatic protection circuit operated Defective components within the unit
High output voltage	High input voltage ADJ VOLTS potentiometer incorrectly set Low external load Defective components within the unit
Erratic output voltage	Loose or broken pins in the plug of the unit Defective components within the unit
High output ripple voltage	High input ripple voltage Defective components within the unit
PROTECTION fuse or supply fuse blown	Output shorted Output voltage adjusted to over -25 volts dc Defective components within the unit