

TYPE L3 CARRIER SYSTEM PILOT AND POWER LINE-UP FOR PS1 AND PS2 POWER SYSTEMS

This section describes the tests and adjustments necessary to make initial and subsequent pilot and power line-ups on the type L3 carrier system. It is assumed that the initial tests and adjustments have been made on the 505D power plant in accordance with Section 167-671-326.

This section does not apply to subsequent line-ups on the earlier (PS1) power systems where power-loading information has not been computed. For such tests, reference should be made to Section 359-020-512.

This section describes pilot and power line-up procedures at the power control panel, auxiliary repeaters, equalizing repeaters, and main and terminal repeaters.

This section consists of four tests as follows:

A. Preparation for Line-Up

This test describes preliminary procedures to be performed on the power section prior to turning on power. Open location measurements are made on each coaxial conductor to each repeater so that office records may be obtained for location of opens in the future. A final loop resistance check is made to show continuity of the inner conductors through the dc testing path. Resistance measurements are made with the pilot alarm location circuit to give resistance records for locating pilot alarms. Certain checks are made of wiring and options, and repeaters are equipped with amplifiers and regulators. This work may all be done in one trip over the power section. By the time the above work is completed, the office supplying power should have been checked to ensure that line pilots will be available for transmission over the line when power is turned on.

B. Power Turnup

This test includes the procedure for turning on power at the power source and adjusting line current to a specific value at the last power loaded auxiliary repeater in the power section. After the line is thus brought into operating condition, the transmission circuit is looped so that the main repeater may check continuity of the loop as indicated by reception of the 7266-kc pilot. The measurements made in this part are approximate only and are used to check the continuity of the power section; measurements may vary from the required value by several db.

C. Preliminary Pilot and Power Measurements

This test describes current and voltage measurements used to determine whether an adjustment of line current is required. Included in this test are measurements and adjustments of pilots at each auxiliary repeater even though the pilots are available from only one direction. This test also describes power control bay adjustments necessary to regulate the line current on a constant-current basis. The procedures described in this test prepare the power section for pilot and power survey measurements on a switching-section basis.

D. Pilot and Power Survey Measurements

This test describes the pilot and power measurements and adjustments which are made on the switching section. The procedure utilizes the regular line pilots from each direction and adjusts the line pilots and auxiliary repeater power supplies to their correct values. At the completion of this test, the switching section is ready for the equalization line-up as described in the 359-076- plant series.

This section is reissued to include a procedure for determining (a) line current distribution and (b) the change in loading necessary to provide a more nearly constant line current value. Due to the general revision, marginal arrows normally used to denote changes have been omitted.

The purpose of this section is to provide the procedures for pilot and power line-ups.

APPARATUS:**Auxiliary Repeaters:**

- 2 — J64001AL(1AL) Power Test Sets
- 2 — J64007A(7A) Pilot Indicator Sets
- 1 — J64037B Transmission Measuring Set (37B TMS)
- 1 — J64001AM(1AM) Power Supply
- 1 — KS-14510 Volt-Ohm-Milliammeter (VOM), or equivalent
- 1 — J68815F Artificial Power Load
- 1 — J68815K Regulator Change Load

For
Trouble
Locating

Main or Terminal Repeaters:

- 1 — J68827A(27A) Sending Console
- 1 — J68827B(27B) Receiving Console
- 1 — J64001AL(1AL) Power Test Set
- 1 — KS-14510 Volt-Ohm-Milliammeter (VOM), or equivalent
- 1 — J64057A(57A) Pilot Frequency Oscillator (optional)

Caution: The tests described in this section must be made on an out-of-service basis. The line voltage on the L3 system is dangerous to personnel. All safety precautions which are described in this section must be observed so as to protect personnel working on the coaxial cable conductors or power supply equipment.

STEP	PROCEDURE
1	A. Preparation for Line-Up Before applying power to a power section, perform the preliminary operations (see Fig. 1) in Steps 2 through 17.

STEP	PROCEDURE
2	Familiarize all personnel thoroughly with all safety precautions and procedures as described in Section 359-020-500.
3	Check that coaxial cable conductors have been tested in accordance with Section E31.081.
4	Dispatch crew to first repeater in power section and perform Steps 5 through 12.
5	Check wiring options to confirm that correct equipment has been provided. Adjust loading coil taps, if necessary, and variable loading coils to specific values and settings shown on repeater and power section layout drawing. The job may be facilitated if inspection can be made before equipment bays are permanently set in place by installation forces.
6	Equip each amplifier and regulator position with correct type of amplifier or regulator. See Section 359-020-500 for cautions to be observed when handling amplifiers or regulators.
7	Set LOAD ADJ switch to position specified on layout information card.
8	For office trouble records, record open location in spills and dc loop resistance measurements, looking into cable terminals at power supply office, to each auxiliary repeater before auxiliary repeater is connected to cable terminals.
9	Connect coaxial cable conductors on side of auxiliary repeater toward power supply office LINE A and LINE D, or LINE B and LINE C. For office trouble records, measure and record open location and dc resistance measurements to side of auxiliary repeater away from power supply office.
10	Connect coaxial cable conductors on side of auxiliary repeater away from power supply office.
11	Cross-connect pilot alarm units to pilot alarm cable pairs assigned on circuit orders, or cross-connect buried thermistor units to repeater local pairs assigned locally and terminated in the order-wire cabinet.
	Note: Before connecting the buried thermistors to the local cable pairs, check for absence of crosses and grounds. Resistance of thermistors (about 800 ohms) is variable and decreases as current through the thermistor increases.
12	At pilot regulated auxiliary repeaters, insert pilot alarm units and measure loop resistance from office in which pilot alarm pairs are terminated. After making loop resistance measurements, remove pilot alarm units so measurements can be made to other auxiliary repeaters.
13	After completing Steps 5 through 12 at first auxiliary repeater, dispatch crew to next auxiliary repeater in power section and repeat Steps 5 through 12. Continue this procedure for each auxiliary repeater in power section until all auxiliary repeaters have been checked.

STEP	PROCEDURE
13 (cont)	Note 1: At equalizing auxiliary or terminal main (constant current feed) repeaters, the 416A plug should be in place in the DYN EQ1 jack and the 416B plug should be in place in the DYN EQ2 jack. These plugs must be in place to stabilize the load on the 190-volt power supply.
	Note 2: At the last auxiliary repeater which is supplied power from the power section, make the high-frequency looping connection as shown in either Fig. 3 or 4. This returns the pilot to the main or terminal repeater as soon as the power is turned on.
14	At main or terminal repeater, make a direct current continuity check on coaxial cable inner conductors between LINE A and LINE D, or LINE B and LINE C, jacks depending upon the direction in which power is to be applied.
15	At main or terminal repeater, check same cable conductors for foreign potential or ground.
16	At main or terminal repeater, check initial adjustment of T5 transformer in accordance with SD-81152-01.
17	At main or terminal repeater, check that 7266-kc pilot measures -16 dbm at AMP OUT jack. At this time, check dc continuity between inner conductors of LINE IN jacks in transmission and control panel to the appropriate PSF panel, LINE A and LINE D, or LINE B and LINE C.
	Note: The regulated 230-volt supply (505D power plant) should be made available to power the local power supplies so that the tests described above can be made prior to dispatching the power line-up crews. This is necessary so that the line pilots will be available for the initial pilot and power line-up.
18	Proceed to Part B, as power section is now ready for initial application of power.
B. Power Turnup	
1	Have power line-up crew at last power loaded auxiliary repeater in power section, or at auxiliary repeater nearest main repeater supplying power if none of the repeaters requires power loading.
	Note: Line-up crew should be equipped with a 1AL power test set, a 7A pilot indicator set, and P2BJ patch cords of assorted lengths. See apparatus list for additional test equipment which should be available for locating and clearing trouble.
2	Turn on power at main or terminal repeater as described in Steps 3 through 7. Caution: This procedure must not be performed until after the completion of each job for which the power was turned off and all power disconnect-restoration cards have been removed from the power control bay.

STEP	PROCEDURE								
3	Observe that TURN DOWN lamp on control bay is lighted. Control keys should be positioned as follows: <table> <tr> <th>CONTROL KEY</th><th>POSITION</th></tr> <tr> <td>MANUAL-AUTO</td><td>MANUAL</td></tr> <tr> <td>RAISE-LOWER</td><td>NORMAL</td></tr> <tr> <td>FINE CONTROL</td><td>OFF</td></tr> </table>	CONTROL KEY	POSITION	MANUAL-AUTO	MANUAL	RAISE-LOWER	NORMAL	FINE CONTROL	OFF
CONTROL KEY	POSITION								
MANUAL-AUTO	MANUAL								
RAISE-LOWER	NORMAL								
FINE CONTROL	OFF								
4	Observe that DISC lamps are lighted on PSF panels involved. Replace cable terminal plugs on PSF panels designated LINE A and LINE D, or LINE B and LINE C, to cable terminals bearing the same designation.								
5	Remove MEN WORKING ON CABLE tag and place safety fuse unit in its receptacle on power control bay.								
6	Place warning tag on power control bay to display the CABLE IN SERVICE side.								
7	Operate RAISE-LOWER key to RAISE position for a few seconds, then to the NORMAL position for a few seconds. Repeat this procedure, a few seconds RAISE and a few seconds NORMAL, until line current meters indicate approximately 1 ampere. Note: This procedure is used to limit the value of plate voltages to a safe value while the electron tube heaters in the auxiliary repeaters and regulators are warming up. The line current may rise slightly after the RAISE-LOWER key is released, but should stabilize within 30 seconds. During this period observe that the ODD and EVEN line currents read approximately the same. The ODD and EVEN line current difference should not exceed 50 ma for a power section with 15 or less auxiliary repeaters, or exceed 75 ma for a power section with over 15 auxiliary repeaters. If the ODD and EVEN line current difference is greater, or the line voltage differs substantially from 75 percent of the expected line voltage for PS1 (65 percent for PS2), the power should be turned off and the line inspected for faults. Caution: <i>If there is an equalizing auxiliary repeater or a terminal main repeater (constant current feed) in the power section under test, and power is turned off for any reason, do not turn power on again for at least 5 minutes. At these locations, a plate voltage limiter circuit is provided to limit the plate supply voltage during power turn-up. If power is turned on too soon after being turned off, an excessive voltage is applied to the repeater equipment.</i>								
8	After about 30 seconds, manually operate RAISE-LOWER key on power control panel to RAISE position until average of ODD and EVEN line currents is 1.52 amps in PS2 power systems or 1.33 amps in PS1 power systems at last power loaded auxiliary repeater, or at first repeater if none of the repeaters requires power loading. Note: The value of 1.33 or 1.52 amps is a nominal value for initial adjustments and may be subject to small changes later.								
9	At main or terminal repeater, check that 7266-kc pilot measures -16.0 ± 1.0 dbm at FLAT AMP T OUT jack. Note: The 7266-kc pilot for this test should be obtained from the regular pilot supply, if available. If the regular pilot supply is not available, another pilot source such as the emergency pilot supply or 57A oscillator may be used.								

STEP	PROCEDURE
10	At main or terminal repeater, measure received 7266-kc pilot at LINE AMP OUT jack using the 27B receiving console. Note 1: The 7266-kc pilot indicator may also show the presence of the received pilot. The reading obtained may differ by several db from the normal pilot level of -16.0 dbm, as the line amplifiers and regulators have not been adjusted. This measurement is made to check the continuity of the transmission path on the power loop. Note 2: If the 7266-kc pilot is not received at the main or terminal repeater, the line may contain a defective amplifier, defective power supply, or trouble in the transmission path. The trouble may be isolated by measuring the 7266-kc pilot at the auxiliary repeaters with the 7A pilot indicator test set. The pilot may also be looped at auxiliary repeaters nearer the terminal point by making the patch as shown in Fig. 3 and measuring the received pilot at the main or terminal repeater. Caution: <i>Trouble should be cleared before proceeding with the power line-up. Since the nature of the trouble on the line is unknown, it is suggested that the power be turned off at the conclusion of the work day. This procedure should be followed until the looped pilot is received at the main or terminal repeater.</i>
11	As soon as the looped pilot is received at the main or terminal repeater, proceed to Part C to make preliminary pilot and power survey measurements.
C. Preliminary Pilot and Power Measurements	
1	Have a power line-up crew at first auxiliary repeater in power section. Note: Each line-up crew should be equipped with a 1AL power test set, a 7A pilot indicator set, and P2BJ patch cords of assorted lengths. See apparatus list for additional test equipment which should be available for locating and clearing trouble.
2	At main or terminal repeater manually adjust power, if necessary, until the ODD line current measures 1.33 amps for PS1 or 1.52 amps for PS2 power systems at first auxiliary repeater. Record ODD and EVEN line currents and LINE voltage in designation strips on power control panel.
3	At main or terminal repeater supplying power, make initial adjustment of regulated 230 volts as described in Steps 4 and 5.
4	Operate switch on power control panel to UNREG position and adjust alternator voltage to as near 230 volts as possible as read with voltmeter on power control bay. Caution: <i>If the UNREG voltage is under 230 volts, operate the RAISE-LOWER key to the LOWER position until it is possible to raise the alternator voltage to 230 volts without exceeding the line currents which were obtained in Step 2.</i>
5	Operate switch to REG position and read voltage. Requirement: (For this initial adjustment only) Voltage should not exceed 245 volts. If this requirement cannot be met, adjust T5 transformer (see SD-81152-01) until REG voltage does not exceed 245 volts. Note: The procedure in Steps 6 through 11 outlines the preliminary setting of the 7266-kc pilot and the measurement of the power supply voltages at the first auxiliary repeater in the power section. The power line-up procedure requires adjusting the 7266-kc pilot to substantially the correct power so that the current drain of the regulators will be approximately that which will exist after the equalization line-up.

STEP	PROCEDURE
6	At first auxiliary repeater adjacent to main or terminal repeater supplying power, make measurements and adjustments in Steps 7 and 8.
7	Use procedure described in Section 359-025-500 to measure and adjust 7266-kc pilot on amplifier which receives its pilot normally (see Fig. 2).
8	Measure and adjust amplifier associated with other direction of transmission (see Fig. 3). Note: Fig. 3 shows a method of looping the pilot which can be used during initial line-up so that the regulators operating in both directions of transmission may be adjusted to give substantially correct 7266-kc pilot levels though, at the time of adjustment, the pilot is being received from only one direction.
9	Remove pilot looping cord and replace parallel plugs to restore transmission path.
10	Measure auxiliary repeater power supply voltages as described in Section 359-020-514.
11	At pilot regulated auxiliary repeaters, adjust pilot alarm units as described in Section 359-025-500.
12	Repeat tests as described in Steps 6 through 11 for each succeeding auxiliary repeater in power section under test. Start with auxiliary repeater adjacent to the one already adjusted and continue measurements to end of power section. If there is an intervening equalizing auxiliary repeater, perform Steps 18 through 33 of Part D.
13	If all requirements are met, proceed with Step 19; otherwise, proceed with Step 14.
14	If, for majority of the repeaters in power section, the LOAD ADJ switch settings are either higher or lower than those shown on repeater and power section layout drawing, change line current accordingly. If LOAD ADJ switch settings are low, decrease line current. Requirement: The maximum change in line current should not exceed ± 3 percent (± 40 ma for PS1, ± 50 ma for PS2). Failure to meet the HTR 1 voltage requirements at any repeater after adjustment of line current probably indicates trouble in either the repeater, power supply, or loading coils. When this trouble is cleared, proceed with Step 19. Note: If LOAD ADJ switch settings are randomly higher and lower than those shown on the repeater and power section layout drawing for majority of repeaters in power section and the change in line current exceeds ± 3 percent, a change of loading is necessary to provide a more nearly constant current. The LOAD ADJ switch setting and the HTR 1 voltage are clues to the line current level and the required amount of loading readjustment. The individual deviations of the heater voltage and LOAD ADJ switch setting are not critical in the determination of the change in loading; what is important is the determination of the maximum deviation of the average value of these items. The procedure in Steps 15 through 18 (including Notes 1, 2, and 3) should be used to determine the maximum of the average deviation (which may be higher or lower than the nominal) to make the necessary change.

STEP	PROCEDURE
15	If necessary, readjust LOAD ADJ switch setting to obtain a more normal heater voltage.
16	Plot heater voltage and LOAD ADJ switch setting versus repeater station location as indicated in the example in Fig. 5.
17	Plot a visual estimate of average heater voltage and of average LOAD ADJ switch setting.
18	Compare maximum deviation of average of each plot with nominal values on each plot. Both deviations are used in determining required change of loading. (See Notes 1, 2, and 3.) Note 1: In the example in Fig. 5, the maximum deviation of the average heater voltage is 5.92 volts, which is 3.7 percent lower than the nominal of 6.15 volts. The maximum deviation of the average LOAD ADJ switch setting is 9, which is 4 steps above the nominal setting of 5. The change in loading is 1 percent for each step deviation from the nominal switch setting. Since the heater voltage is lower than nominal, the line current is also lower. LOAD ADJ switch settings higher than nominal indicate low line current. Therefore, both deviations in Fig. 5 indicate low line current. The combined loading change for <i>every</i> repeater station with loading would be $-3.7\% + (-4\%) = -7.7\%$ change in loading. A lower-than-nominal line current indicates too much loading. To correct this, the computed loading at <i>every</i> repeater station with loading should be decreased by 7.7 percent in this example. Assume that the computed loading at Station 9 was 530 mh. Since the actual inductance appears to be 7.7 percent high, the loading should be set 7.7 percent lower, or at 489.2 mh, to ensure obtaining the computed 530 mh. Note 2: In a few cases, the range available from the loading already installed is adequate; a maximum or minimum position would be satisfactory. Any remaining error in inductance can be compensated for at an adjacent repeater. Note 3: Readjustment of the average line current may be necessary if the heater voltage or LOAD ADJ switch setting indicates a higher- or lower-than-nominal value. A single change in loading should be sufficient to bring the operating conditions within limits; however, if the initial conditions deviated by a large amount from nominal, a second plotting and readjustment of the loading may be necessary. This is because the power drain of the repeaters may have been changed sufficiently between the two conditions to require further readjustment.
19	After preliminary pilot and power adjustments have been completed, proceed to Steps 20 through 23 to adjust power control circuit at main or terminal repeater supplying power in order to regulate line current automatically.
20	Adjust power control circuit in accordance with Section 167-671-326 to regulate automatically the ODD and EVEN line currents to values previously determined in this section.
21	Operate switch to UNREG position and adjust alternator voltage to as near 230 volts as possible as read on voltmeter in power control bay.

STEP	PROCEDURE
22	Operate switch to REG position and read voltage on power control bay voltmeter. Requirement: Voltage with switch in REG position should read 230 ± 5 volts. If requirement is not met, adjust T5 transformer (see SD-81152-01) until REG voltage is as near 230 volts as possible. Under some conditions of line current, the ± 5 volt requirement may not be met. Under these conditions, select T5 transformer setting which is the closest to 230 volts.
23	Post ODD and EVEN line currents and LINE voltage readings in the designation strips on power control panel.
D. Pilot and Power Survey Measurements Note 1: After all the power sections within a switching section have been given preliminary pilot and power adjustments, as described in the preceding tests, the switching section is ready for pilot and power survey measurements (see Fig. 1). Note 2: Starting with the repeater adjacent to one of the pilot sources, the pilots are progressively adjusted. This will give the correct pilot levels in one direction of transmission and approximate levels in the other direction of transmission. The HTR 1 voltage is measured and readjusted, if necessary. On the return trip, detailed pilot and power survey measurements and adjustments are made, starting with the repeater adjacent to the other pilot source. These adjustments will correct the pilot levels in the opposite direction of transmission.	
1	Apply regular pilots from each end of switching section as described in Sections 359-035-500 and 359-035-505.
2	Remove pilot looping connections at auxiliary repeaters within switching section.
3	Make progressive pilot and HTR 1 and HTR 2 BIAS measurements and adjustments at auxiliary, main, and terminal repeaters from one end of switching section, using references in Steps 5 through 15. Note: The purpose of heater 2 BIAS test is to detect a shorted filtering capacitor in the HTR 2 leads of an amplifier.
4	Proceed to Steps 5 through 15 to make progressive pilot and power supply measurements at auxiliary, main, and terminal repeaters, starting with repeater adjacent to other pilot source. Auxiliary Repeater:
5	Measure and adjust 3096-kc and 7266-kc pilots in both ODD and EVEN directions of transmission as described in Section 359-025-500.
6	Make power supply voltage measurements as described in Section 359-020-514.
7	Make electron tube tests as described in Section 359-025-500.

STEP	PROCEDURE
8	At pilot regulated repeaters, adjust pilot alarm units as described in Section 359-025-500.
	Equalizing Auxiliary Repeaters:
9	Adjust pilots as described in Step 18.
10	Make power supply voltage measurements as described in Section 359-020-515.
11	Make electron tube tests as described in Sections 359-035-500 and 359-035-505.
	Terminal Main Repeaters — Constant Current Feed — Power Feed from Cable:
12	Make power supply voltage measurements as described in Section 359-020-516.
13	Make electron tube tests as described in Sections 359-035-500 and 359-035-505.
	Main and Terminal Repeaters — Constant Voltage Feed:
14	Make power supply voltage measurements as described in Section 359-020-517.
15	Make electron tube tests as described in Sections 359-035-500 and 359-035-505.
16	After pilot and power survey has been completed, repeat line current check described in Step 2 of Test C. If line currents cannot be manually adjusted within ± 3 percent of nominal, Steps 15 through 18 (including Notes 1, 2, and 3) in Test C should be repeated until the line currents are within limits.
17	Make equalization line-up on switching section as described in Section 359-075-500.
18	Proceed to Steps 19 through 27 to make pilot adjustments at equalizing auxiliary and equalizing main repeaters. Measurements should be made with one of the following transmission measuring sets.
	Equalizing Main:
19	Using J68827B receiving console, adjust sensitivity to -36.0 db for 3096 kc and -16.0 db for 7266 kc for bridging measurement; measure through an 11B attenuator.
	Equalizing Auxiliary:
20	Use a 7A pilot indicator, and check that the 416A and 416B plugs are in place in the DYN EQ1 and DYN EQ2 jacks.
21	Proceed to Steps 21 through 28 to measure 3096 kc and 7266 kc.
22	Bridge the TMS at parallel LINE AMP OUT jacks.
23	Measure 3096-kc pilot.
	Requirement: 0 ± 0.1 db.
	If requirement is not met, adjust line amplifier GAIN control to meet requirement.

STEP	PROCEDURE
24	Measure 7266-kc pilot. Requirement: Preliminary pilot adjustment: 0 ± 1.0 db. Final pilot adjustment: 0 ± 0.1 db. If requirement is not met, adjust 7266-kc GAIN ADJ control in pilot indicator or alarm panel to meet requirement.
25	Repeat 3096-kc and 7266-kc pilot measurements and adjustments until both meet their requirements. Note: There will be some interaction between the 3096-kc and 7266-kc adjustments. When a line amplifier is replaced on a trouble basis, adjust the 7266-kc and 3096-kc pilots to zero level. If the range of the GAIN ADJ control is insufficient to bring the 3096-kc pilot to zero with the 7266-kc pilot at zero, trouble at a preceding repeater point is indicated and must be cleared before final adjustment of the replaced amplifier.
26	Disconnect TMS from LINE AMP OUT jacks.
27	Adjust manual controls on EQ A1 and EQ A2 to read 5 on the dial.
28	Bridge the TMS at PIL HY OUT jack and measure 7266-kc pilot. Requirement: Preliminary pilot adjustment: 0 ± 1.0 db. Final pilot adjustment: 0 ± 0.1 db. If requirement is not met, adjust FLAT network dial to obtain required reading on TMS. If FLAT network control is not between positions 1 and 9 or the requirement cannot be met with FLAT control, set FLAT control on position 5 and adjust GAIN ADJ control on FLAT AMP A and/or FLAT AMP B. If requirement is not met with GAIN ADJ control, adjust dials on EQ A1 to obtain required reading on TMS.
29	When making the initial 7266-kc pilot adjustments at equalizing auxiliary repeaters or equalizing main repeaters, and the 7266-kc pilot is not available from both directions, proceed to Steps 30 through 33 to loop the pilot and to make adjustments (see Fig. 4).
30	Make 7266-kc pilot measurements and adjustments as described in Steps 19 through 28.
31	Remove parallel plugs from LINE OUT — AMP IN jacks on equipment in both directions of transmission.
32	Patch from LINE OUT jacks of line from which pilot is being received to AMP IN jacks associated with equipment in other direction of transmission.
33	Perform tests as described in Steps 19 through 28 on equipment which has been patched to receive the pilot. Note: After the power section has been lined up in accordance with the procedures described in this section, the ODD and EVEN line currents and the LINE voltage readings should be posted in the designation strips on the power control panel. These posted values should be used as a reference when making power adjustments.

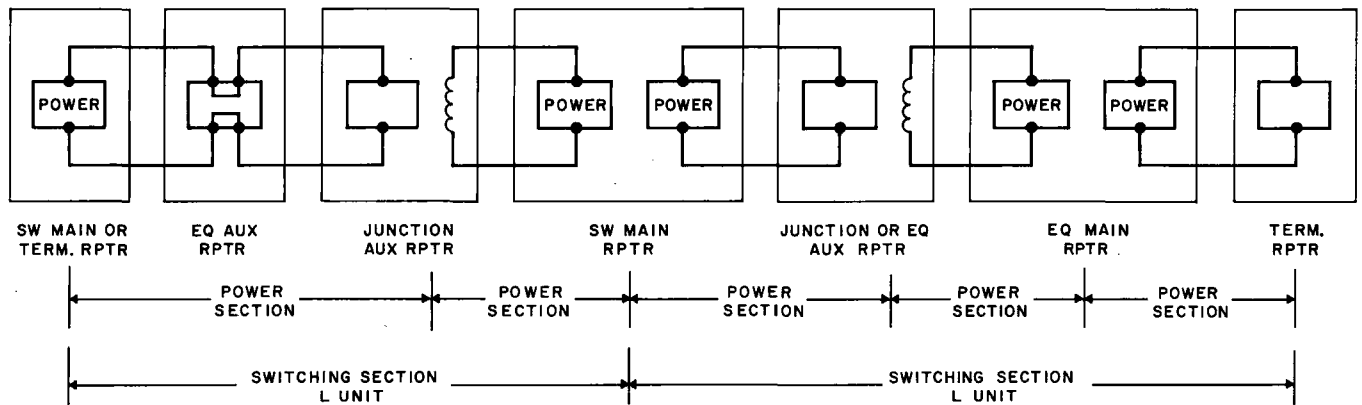


Fig. 1 — Typical Power Feeds

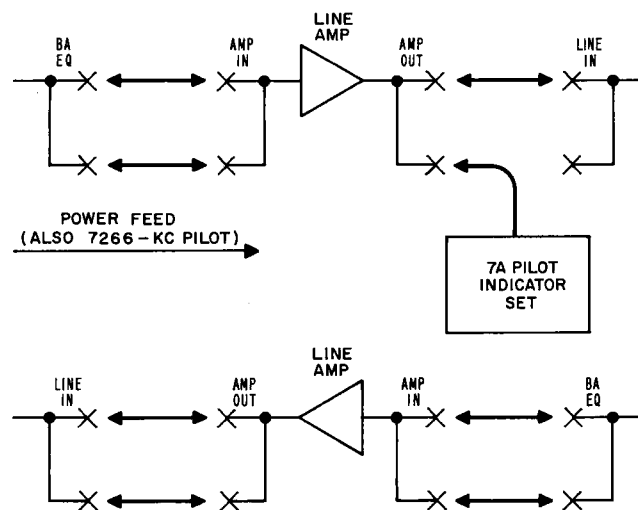


Fig. 2 — Pilot Measurement at Auxiliary Repeaters

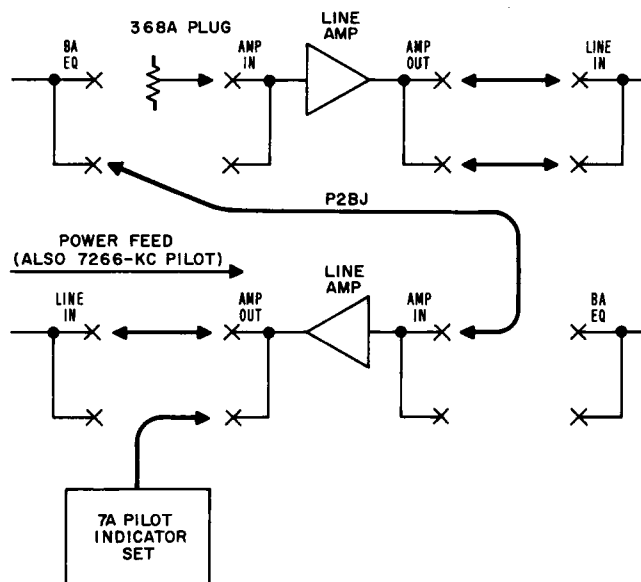


Fig. 3 — Pilot Looping at Auxiliary Repeaters

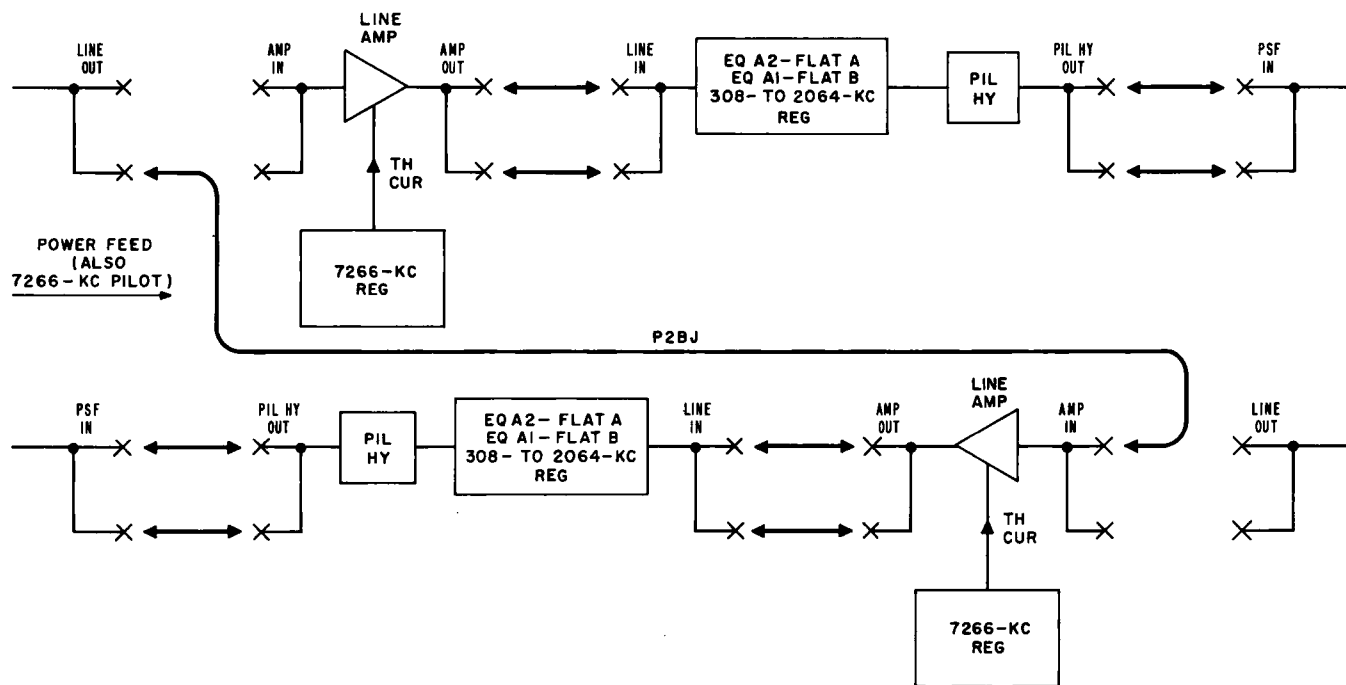


Fig. 4 — Pilot Looping at Equalizing Auxiliary and Equalizing Main Repeaters

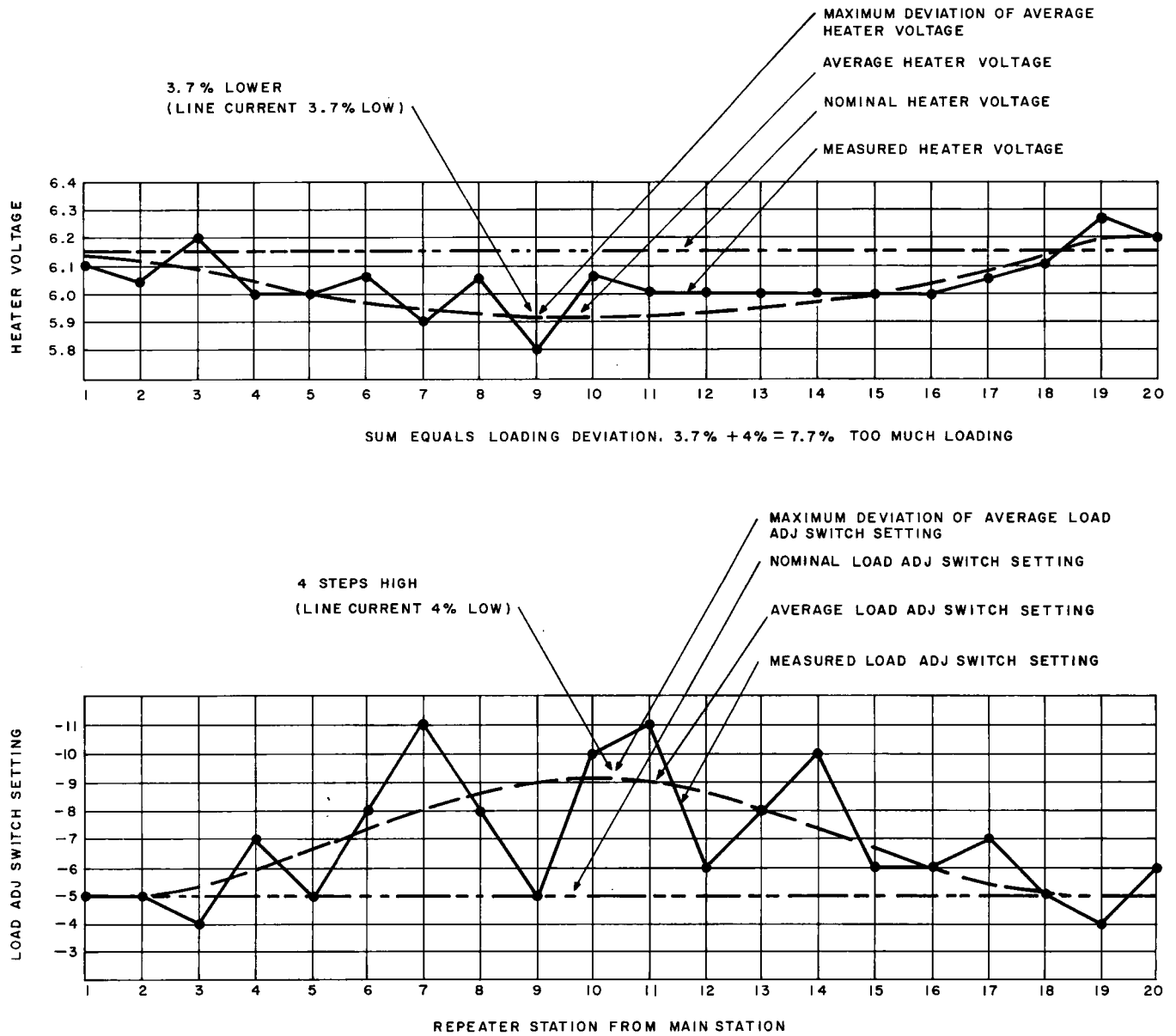


Fig. 5 — L3 Power Loading — Procedure for Readjusting the Computed Loading