

## J99347 VF AMPLITUDE AND DELAY EQUALIZING EQUIPMENT, TEST PROCEDURES, AND MAINTENANCE

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**1. GENERAL**

**1.01** This section provides test procedures and maintenance information for the J99347AA VF amplitude and delay equalizer (hereafter referred to as the J-board equalizer). Procedures are provided for the 1 kHz gain adjustment and for determining the transmission level point (TLP). The gain adjustment procedure of the J-board equalizer varies slightly depending on bay or shelf use. The maintenance information contains philosophy and troubleshooting aids.

**1.02** Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

**1.03** The J68914TA test extender is required to gain access to the lines when the plug-in

J-board equalizer is used in a bay arrangement. The J68914TA is not required whenever the shelf arrangement is equipped with a jack panel.

**2. TEST EQUIPMENT**

**2.01** The following test equipment is required to establish a TLP and to perform the gain adjustment procedures:

- (a) 600 ohm oscillator
- (b) 600 ohm detector
- (c) Two cords with 310 plugs on one end and connector suitable for oscillator and detector at other end
- (d) Cord to connect oscillator and detector
- (e) One J68914TA test extender (required to access J99347B bay or the logic position of the 4A Echo Suppressor)—Fig. 1.

**2.02** See Section 314-410-500, Table A for a list of test equipment that may be used, depending on the required function. For example, an oscillator function may be provided by a 21A TMS, 25B voiceband gain and delay set, Hewlett-Packard 3550B portable test set, or other test equipment equivalents.

**3. TRANSMISSION LEVEL PROCEDURE**

**3.01** The following procedure is used to determine the *unknown* TLP of the facility where the J-board equalizer is inserted.

**NOTICE**

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Bell System except under written agreement

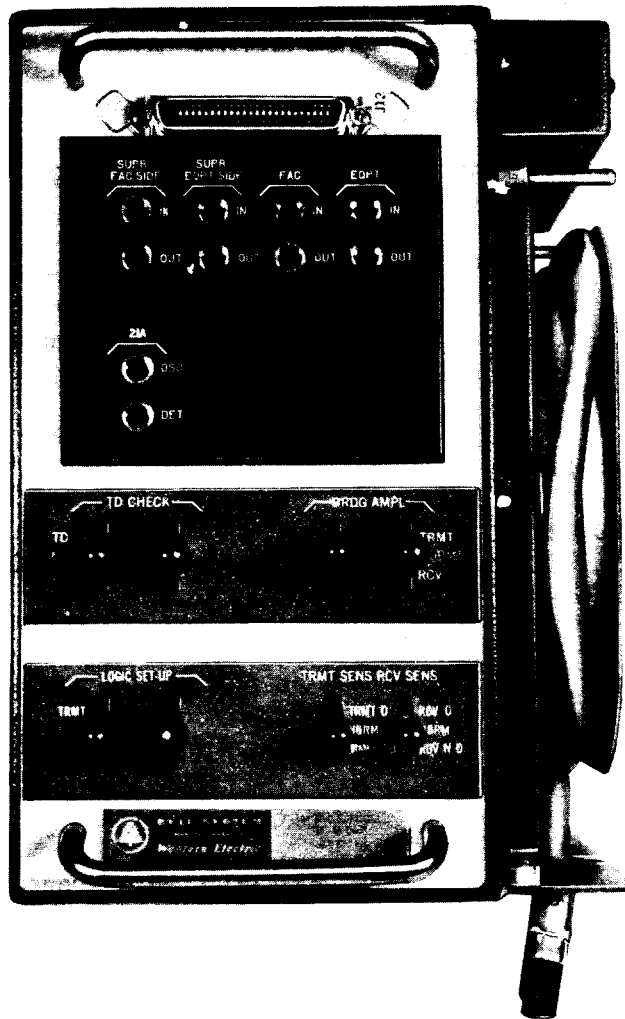


Fig. 1—J68914TA Test Extender

STEP	PROCEDURE
<b>At Receive End</b>	
1	Determine J-board equalizer arrangement. If bay mounted, proceed with Step 2. If shelf mounted, proceed with Step 6.
2	Remove the J-board equalizer that is being adjusted from the bay.
3	Plug the J-board equalizer into the test extender.
4	Plug test extender cord into proper position of bay.
5	Insure that all key switches on the test extender are in the NORM position.

STEP	PROCEDURE
6	Insert detector in FAC OUT jack of J68914TA test extender or in EQPT FAC OUT jack of J99347C shelf.
	<b>At Transmit End</b>
7	Establish voice contact with receive end of facility.
8	Transmit signal of 1 kHz at 13 dB below the central office TLP.
	<b>At Receive End</b>
9	Measure level in dBm and add 13 dB to determine TLP. See example in Step 10.
10	Set level adjust switch (S1) to +7, -2, or -16 depending on which setting is nearest to total level in Step 9.

**Note:** The following is an example of Steps 8, 9, and 10.

<u>TRANSMIT END</u>	<u>RECEIVE END</u>
C.O. TLP -16	—
Send level -29 dBm	Rec. level -6 dBm
—	C.O. TLP +7
—	Set switch S1 to +7

#### 4. GAIN ADJUSTMENT PROCEDURES

**4.01** The appropriate procedure in performing the 1 kHz gain adjustment is determined by using the J-board equalizer, either in the J99347B-L1 bay or J99347C-L1 shelf. The J-board shelf has a factory-wired jack panel which provides access to each position. The J-board bay requires use of a J68914TA test extender to provide appropriate access circuit jacks for an individual position.

**4.02** Care should be used when testing the J-board equalizer with a J68914TA test extender. Test equipment should *not* be connected to the jacks labeled 21A OSC and 21A DET. All level switches must be in NORM position.

**4.03** Before performing the gain adjustment, the following pretest items should be verified:

- The individual J-board equalizer to be adjusted
- The 950-type equalizer switch positions are in agreement with the circuit layout record card (CLRC)
- The level adjust switch and NORM/REV switch are properly positioned.

**A. J99347B-L1 Bay (or logic position of 4A Echo Suppressor shelf or bay)—Using J68914TA Test Extender—Fig. 2**

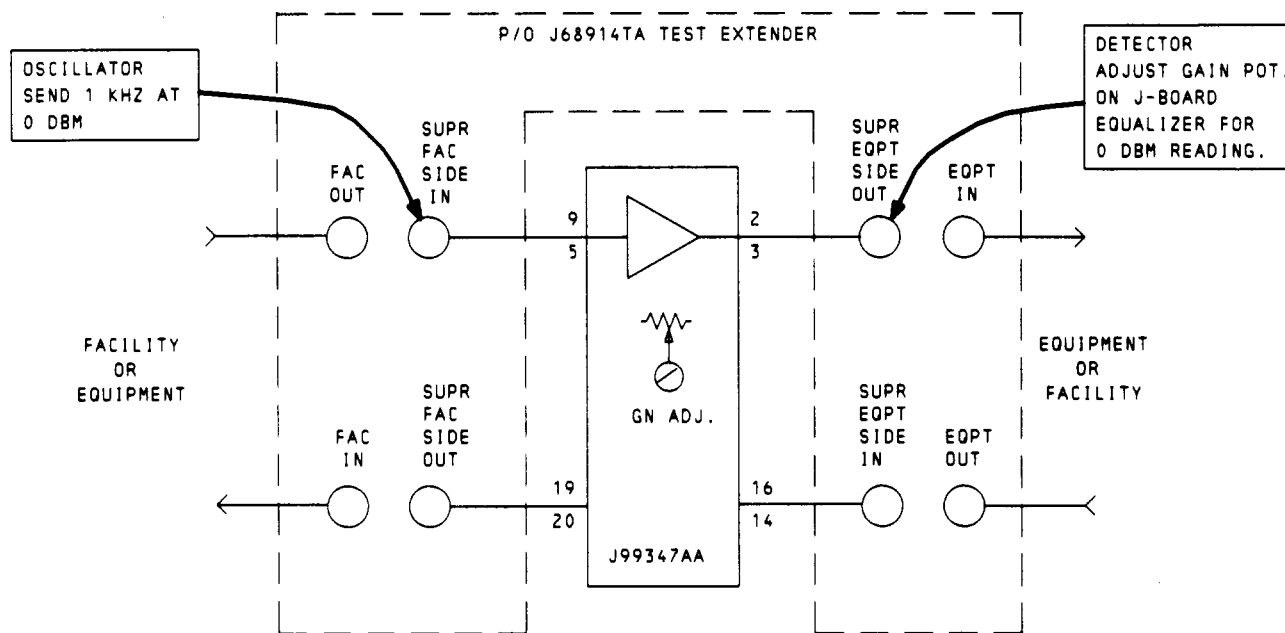


Fig. 2—Gain Adjustment Connections for J99347B Bay or Logic Position of 4A Echo Suppressor

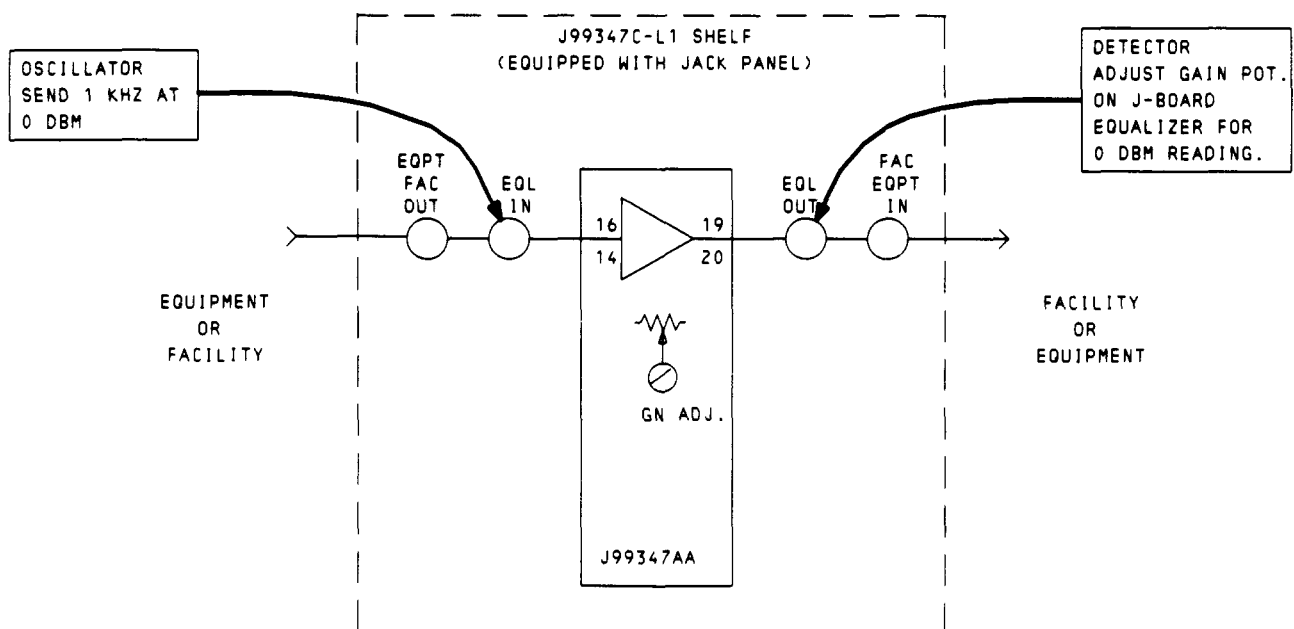
## STEP

## PROCEDURE

- 1 Remove the J-board equalizer that is being adjusted from the bay.
- 2 Plug test extender cord into proper position of bay.
- 3 Insure that all key switches on the test extender are in the NORM position.
- 4 Plug the J-board equalizer into the test extender.
- 5 Set oscillator and detector for 600 ohm impedance operation.
- 6 Connect oscillator to detector.
- 7 Adjust oscillator at 1 kHz signal for a 0-dBm reading at the detector.
- 8 Connect oscillator to the SUPR FAC SIDE-IN jack.
- 9 Connect detector to the SUPR EQPT SIDE-OUT jack.
- 10 Adjust GN ADJ at front of unit to provide a 0-dBm reading at the detector.
- 11 When adjustment cannot be made, refer to Part 5, Maintenance.
- 12 Remove the test extender cord from the bay.
- 13 Insert the J-board equalizer into its proper bay position.

**B. J99347C-L1 Shelf (equipped with jack panel)—Fig. 3**

STEP	PROCEDURE
1	Remove the J-board equalizer from the shelf that is being adjusted.
2	Set oscillator and detector for 600 ohm impedance operation.
3	Connect oscillator to detector.
4	Adjust oscillator at 1 kHz signal for a 0-dBm reading at the detector.
5	Connect oscillator output cord to the EQL IN jack corresponding to the proper shelf position.
6	Connect detector to the EQL OUT jack.
7	Adjust GN ADJ at front of unit to provide a 0-dBm reading at the detector.
8	When adjustment cannot be made, refer to Part 5, Maintenance.
9	Remove test cords and insert the J-board equalizer into the proper shelf position.



**Fig. 3—Gain Adjustment Connections for J99347C Shelf**

5. MAINTENANCE

A. Philosophy

5.01 No routine maintenance or realignment on the J-board equalizer, shelf, or bay is required.

5.02 Defective units may be located by successive substitution of good units. For example, begin substituting 950-type equalizers and then the J-board equalizer until the trouble disappears. The last unit substituted is defective and must be sent to the appropriate WE service center for repair.

B. Troubleshooting Aids

5.03 Troubles of a J-board equalizer are classified as a power failure or signal transmission failure. Signal failures are usually indicated by a customer complaint, and a power failure is indicated by a central office alarm or lamp. The lamp lights whenever a fuse blows. Fuses are located on the J99347C-L1 shelf for each J-board equalizer position. If the J99347B-L1 bay is utilized, a fuse is provided for each shelf but not for each J-board equalizer position.

5.04 Signal transmission failure is discussed as three distinct cases of trouble. Two cases pertain to troubles in properly adjusting the 1 kHz gain and are indicative of a defective J-board equalizer or 950-type equalizer. The third case arises when the overall circuit cannot meet the equalization requirements. The trouble may or may not involve the 950-type equalizers.

5.05 Verify that the test equipment is operating normally and is properly connected to the bay or shelf.

Case I: No signal is measured by detector when adjusting the 1 kHz gain.

Problem: An open circuit in the J-board equalizer or one of the 950-type equalizers.

Procedure: Remove the 950-type equalizers one at a time, beginning at the highest numbered position (5) until the signal appears at the detector. The last 950-type equalizer removed is defective. Replace with a good 950-type equalizer with exact switch settings. If all 950-type equalizers have been removed and the signal is still not present, the J-board equalizer is defective and should be replaced.

Case II: Unable to adjust the 1 kHz gain to 0 dB.

Problem: Improper operation of J-board equalizer or 950-type equalizer.

Procedure: Remove all 950-type equalizers from the J-board equalizer. Adjust the oscillator output for 0 dBm at 1 kHz. Check the range of adjustment using the J-board equalizer GN ADJ. Set the GN ADJ to the extreme counterclockwise position. The detector should read  $-4.0 \pm 0.5$  dB. Set the GN ADJ to the extreme clockwise position. The detector should now read  $+3 \pm 0.5$  dB. If this range cannot be achieved, the J-board equalizer is defective and should be replaced. If the J-board equalizer generates the proper range, begin replacing the 950-type equalizers starting with the number 1 position. After the insertion of *each* 950-type equalizer, attempt to adjust the gain to 0 dB. If the adjustment can be made, proceed by inserting the next 950-type equalizer. If the adjustment cannot be made, the 950-type equalizer inserted last is defective and should be replaced.

Case III: Unable to meet the circuit equalization requirements.

Problem: Several possibilities exist which include:

- (a) Improperly aligned carrier facilities
- (b) Poor quality carrier or cable facilities
- (c) Cable makeup is different from that specified on circuit layout record card
- (d) Improper switch setting on 950-type equalizers
- (e) Defective J-board equalizer or 950-type equalizers.

Procedure: The control central office of the circuit should direct facility verification and trouble sectionalization. If the J-board equalizer equipped with the 950-type equalizers is suspected of malfunction, the 950-type equalizers should be investigated first. (The J-board equalizer should have virtually no effect on amplitude and envelope delay equalization.) The defective 950-type equalizers should be located by substituting with good 950-type equalizers into the J-board equalizer.