

V4 TELEPHONE REPEATER

F58122 AMPLIFIER

TESTS AND ADJUSTMENTS

1. GENERAL

1.01 This section describes adjusting and testing the operation of the F58122 amplifier, which has automatic gain control (AGC).

1.02 The gain of the F58122 amplifier is continuously adjustable from -10 dB to $+25$ dB. It has the ability to insert losses in the transmit leg, if necessary, when interfacing with customer-provided facilities. The clamped output power of the amplifier is adjustable from -20 dBm to 0 dBm. Refer to Section 332-104-100 for a description of the F58122 amplifier.

1.03 The F58122 amplifier is normally adjusted to clamp at a power level 13 dB below the test level point (TLP). When the output is at 0 TLP, the protection criteria permit an inband average output power of -13 dBm for 3 seconds. If an input signal to the amplifier should increase to a level that might produce an instantaneous signal greater than -7 dBm at output of the amplifier, the AGC action changes the output to -7 dBm after 20 milliseconds and then to -13 dBm after 300 to 500 milliseconds. If an input signal to the amplifier should increase to a level that might produce an instantaneous signal between -7 and -13 dBm, the AGC action changes the output level to -13 dBm after an interval of 0.25 to 3 seconds.

2. ADJUSTMENTS

2.01 The LEV ADJ potentiometer and screw switch S1 provide a range of -10 to $+25$ dB gain. The setting of the AGC ADJ potentiometer determines the points at which clamping of the amplifier output begins. The range of the AGC ADJ control is from 0 to -20 dBm.

2.02 The following steps and a typical example describe the method that should be used to adjust the F58122 amplifier:

- (a) Refer to the circuit layout record (CLR) card or equivalent to determine the TLP at the input and output of the amplifier.
- (b) Set the input signal from a transmission measuring set (TMS) 13 dB below the input TLP and connect the OSC jack to the AMPL IN jack associated with the amplifier. Connect the DET jack to the AMPL OUT jack associated with the amplifier.
- (c) Turn the AGC ADJ control clockwise to the 0 dBm setting.
- (d) Adjust the LEV ADJ as required to provide an output level that is 13 dB below the output TLP for the amplifier.
- (e) Increase output of TMS 6 dB and slowly adjust AGC ADJ control counterclockwise until a reading of 13 dB below the output TLP is obtained.

Example:

- (a) Assume that CLR card shows an input TLP of -3 and output TLP of $+5$.
- (b) Open switch S1 to the turned-out position (since the gain required is less than 10 dB). Turn the LEV ADJ control to the $+8$ position. Turn the AGC ADJ control fully clockwise to the 0 dBm position. The amplifier is set for a $+8$ dB gain, the amount required to raise the TLP from -3 to $+5$.
- (c) Adjust the oscillator test level of a 21A TMS or equivalent to -16 dBm at 1000 Hz (13 dB below input TLP).

- (d) Connect the OSC jack of the 21A TMS to the AMPL IN jack associated with the F58122 amplifier on the 24V4A repeater. Connect the DET jack of the 21A TMS to the AMPL OUT jack associated with the amplifier on the 24V4A repeater.
- (e) Adjust the LEV ADJ control for a detector reading of -8 dBm on the 21A TMS (13 dB below output TLP).
- (f) Increase output of 21A TMS 6 dB. **Slowly** adjust AGC ADJ control counterclockwise until a detector reading of -8 dBm on the 21A TMS is obtained (13 dB below output TLP).
- (g) The amplifier is now adjusted to clamp the output power to a level 13 dB below TLP (-8 dBm at $+5$ TLP).
- (h) As a check for proper clamping action in the amplifier, decrease the oscillator test level 6 dB (-16 dBm). The detector reading should still be approximately -8 dBm.
- (i) Disconnect the 21A TMS from the 24V4A repeater.



Use the preceding method to adjust the F58122 amplifier for other TLPs. When end-to-end tests are made on systems using the F58122 amplifier, the usual test tone level cannot be used. (Normally, the test tone is applied at a power level in dBm corresponding to the TLP. For example, -16 dBm would normally be applied at a -16 TLP.) In the case of the F58122 amplifier, however, test tones must be applied at least 13 dB below the TLP; otherwise, AGC action will reduce the tone to that level. This will produce false lineup or improper circuit lineup. For example, at a -16 TLP the tone would have to be applied at least as low as -29 dBm (or -30 dBm, if more convenient). Any subsequent readjustment that is made in the gain setting of the amplifier will require a readjustment of the threshold of limiting so that, in the example given, the output power remains clamped at a level of 13 dB below the output TLP. In other words, repeat the complete lineup procedure if the gain must be readjusted.