
L MULTIPLEX TERMINALS
L3 CARRIER AND PILOT SUPPLY
PILOT GENERATOR CIRCUITS
REGULAR AND STANDBY PILOT GENERATOR OUTPUT TESTS

The purpose of this test is to measure and, if necessary, adjust the output power, meter relay, and rectifier current in both the regular and standby pilot generators. The pilot generator and pilot transfer and control units are illustrated in Fig. 1.

The six circuits which produce the pilot frequencies are all basically alike, each consisting of a driver amplifier, a stabilized harmonic generator, a narrowband filter, and a stabilized output amplifier. The output amplifier gain is adjustable over a range of ± 0.75 dB. An adjustable pad follows the amplifier to provide an additional loss of 5 dB in 1-dB steps. The pilot frequencies are fed through the pilot transfer and control circuits to the distributing circuits and then to the pilot combining circuits and to the meter relays on the transfer and control panel. The meter relay designated WKG GEN always indicates the condition of the generator feeding the pilot combining circuits, regardless of the position of the MAN CON switch.

This section is reissued to clarify the test procedure. Arrows indicate significant changes. *Equipment Test Lists are not affected.*

APPARATUS

Receiving Test Equipment (RTE)

Frequency range: 300 to 8500 kHz

Impedance: 75 ohms

Power: 0 to -35 dBm

Example: 27B Receiving Console

P2BJ Cord

KS-14510, L5 Volt-Ohm-Milliameter (VOM) built out to 6000 ohms

1000-ohm Resistor (106- or 107-type)

5000-ohm Resistor (106- or 107-type)

Nonmetallic Screwdriver

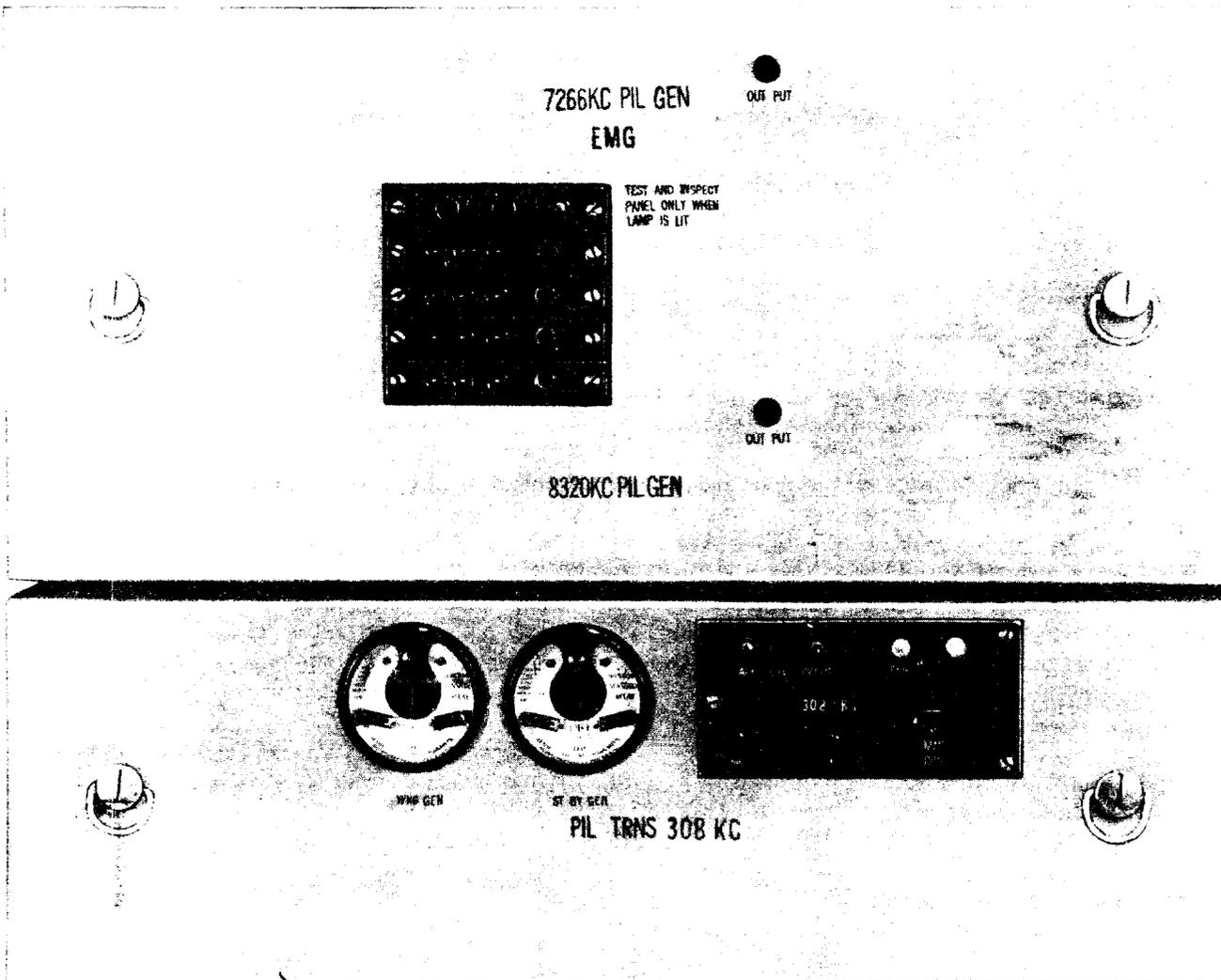


Fig. 1—Typical Pilot Generator, Pilot Transfer, and Control Panels

STEP

PROCEDURE

Note: The following steps apply to all pilot generator panels.

Caution 1: Transfer of a pilot supply will cause hits on superimposed telegraph; therefore, it is important that the number of transfers be kept at a minimum.

Caution 2: Do not make this test until the green lamp associated with the pilot generator to be tested is lighted.

STEP	PROCEDURE
Regular Pilot Generator	
1	Set the MAN CON switch to the REG position.
2	Connect the RTE to the PIL TST jack [patch (1), Fig. 2].
	Note: Connections are shown for 8320 kHz. For other frequencies, make corresponding connections.
3	Measure the power at the PIL TST jack.
	Requirement: -32.8 ± 0.1 dBm
4	If the requirement of Step 3 is not met, proceed to (a) or (b), as applicable.
	(a) RTE indication is within ± 0.3 dB of the requirement.
	(1) Adjust the OUTPUT control of the regular pilot generator under test to meet the requirement; use a nonmetallic screwdriver.
	Caution: <i>This adjustment is made without removing the can cover while the pilot generator is in-service. The adjustment should be made very carefully and slowly, since all lines fed by this supply will be affected. After the adjustment is completed, all lines fed by the supply should be checked.</i>
	(2) If the adjustment in Step 4(a) cannot be made, proceed to Step 4(b).
	(b) RTE indication is greater than ± 0.3 dB of the requirement, or the adjustment of Step 4(a) cannot be accomplished.
	(1) Set MAN CON switches on the PIL TRNS panels (for both pilot frequencies listed on the pilot generator can covers) to the EM positions.
	Requirement: Green lamp must be lighted on REG pilot generator panel under test before proceeding with adjustment.
	(2) Remove patch (1), Fig. 2.
	(3) Remove can covers from pilot generator and pilot transfer panels under test.
	(4) Perform electron tube tests, as described in Section 356-150-501, on regular pilot generators.
	Caution: <i>Before performing next step be aware that removal of Cable A will cause service interruption.</i>
	(5) In the pilot transfer panel for the pilot frequency being adjusted, remove the B cable from the B jack of the transfer switch (Fig. 2), while watching the STBY GEN meter relay.
	Requirement: The STBY GEN meter relay armature should fall to the left (–) side.

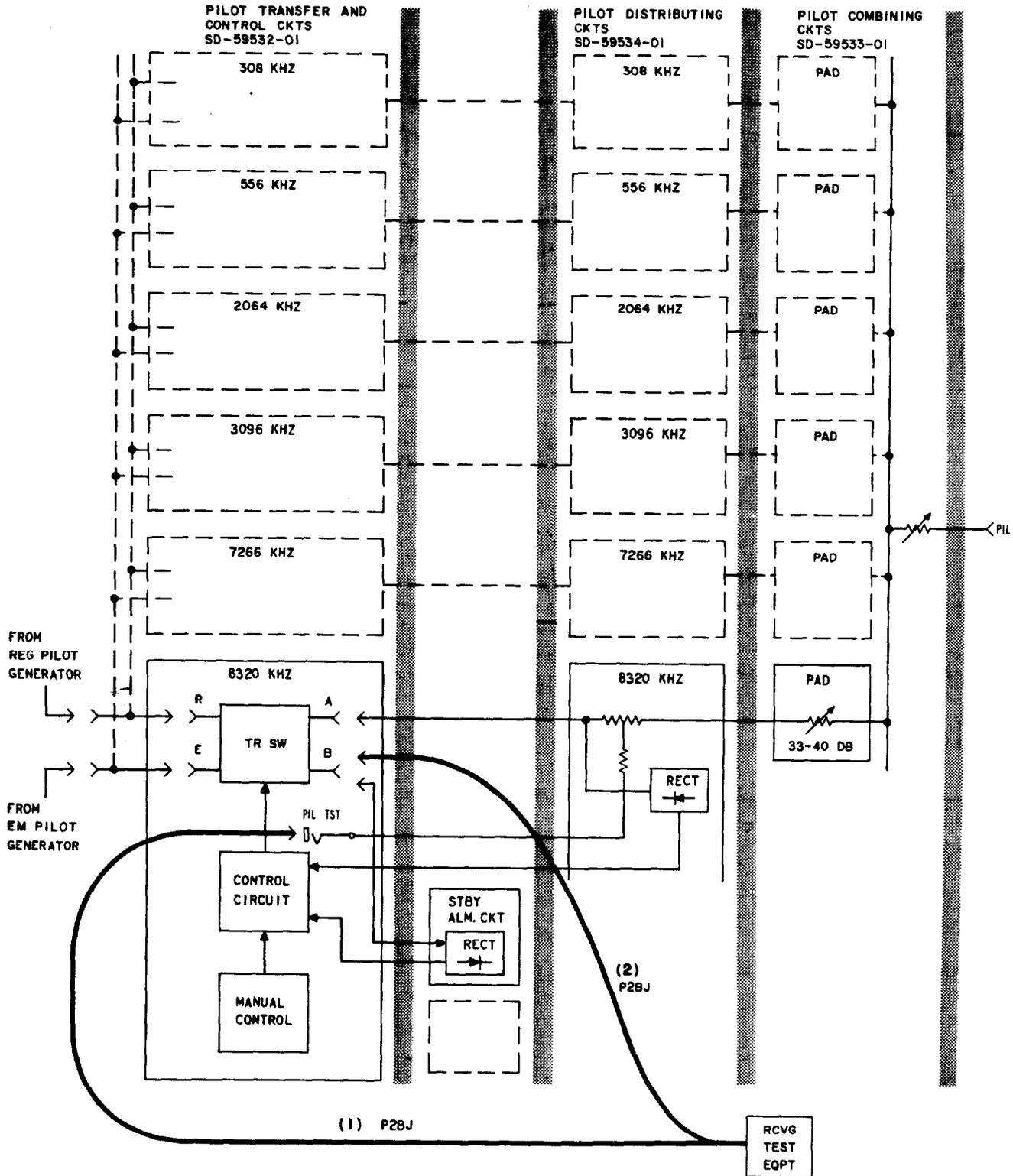


Fig. 2—Test Connections for Regular or Standby Pilot Generator Adjustments

STEP

PROCEDURE

- (6) Connect the RTE to the B jack [patch (2), Fig. 2].
- (7) Set the OUTPUT control (using nonmetallic screwdriver) of the regular pilot generator under test to the center of its range.
- (8) Strap the output pad in the regular pilot generator under test to provide a power at the B jack as close as possible to the recorded power.

Note 1: The recorded power is the power recorded during initial lineup as required at the B jack to produce -32.8 dBm at the PIL TST jack.

Note 2: Due to differences in frequency loss and varistor circuit loss, a maximum variation of ± 0.8 dB may exist between the six B jacks for an output of -32.8 dBm at the corresponding PIL TST jacks. Thus, accurate records must be kept.

- (9) Remove patch (2), Fig. 2.
- (10) Reconnect the B cable to the B jack (on the transfer switch).
- (11) Replace can covers on PIL GEN and PIL TRNS panels.
- (12) Operate the RESET button.

Requirement: STBY GEN meter relay should remain off either contact (float).

- (13) Set MAN CON switch to the REG position.
- (14) Reconnect patch (1), Fig. 2.
- (15) Adjust the OUTPUT control (using nonmetallic screwdriver) of the regular pilot generator for an indication of -32.8 dBm on the RTE.
- (16) Remove patch (1), Fig. 2.

5 Adjust the zero adjustment screw on the WKG GEN meter relay to obtain a 0 indication on the meter relay.

6 If Step 5 cannot be accomplished,

- (a) Disconnect the AA lead associated with the WKG GEN meter relay.

Note: This lead is connected to terminal 9 of the varistor circuit associated with the regular pilot distribution circuit.

- (b) Set the VOM to the .06 MA DC scale (built out to 6000 ohms).
- (c) Connect the VOM between the AA and GA terminals.

STEP

PROCEDURE

(d) Measure the current.

Requirement: 30.0 ± 8 microamperes

Note: Power must be applied to the temperature control circuit continuously for at least 24 hours before this current measurement is made.

(e) If the requirement of Step 6(d) is not met,

(1) Replace the varistor.

(2) Repeat Step 6(d).

(f) Remove the VOM test leads from terminals AA and GA.

(g) Reconnect the AA lead to terminal 9.

Standby (EMG) Pilot Generator

7 Set the MAN CON switch to the EM position.

8 Connect RTE to PIL TST jack [patch (1) Fig. 2].

9 Measure the power at the PIL TST jack.

Requirement: -32.8 ± 0.1 dBm

10 If the requirement of Step 8 is not met, proceed to (a) or (b), as applicable.

(a) **RTE indication is within ± 0.3 dB of the requirement.**

(1) Adjust the OUTPUT control of the standby pilot generator under test to meet the requirement (using nonmetallic screwdriver).

Caution: *This adjustment is made without removing the can cover while the pilot generator is in-service. The adjustment should be made very carefully and slowly, since all lines fed by this supply will be affected. After the adjustment is completed, all lines fed by the supply should be checked.*

(2) If the adjustment in Step 9(a) cannot be made, proceed to Step 9(b).

(b) **RTE indication is greater than ± 0.3 dB of the requirement, or the adjustment of Step 9(a) cannot be accomplished.**

(1) Set MAN CON switches on the PIL TRNS panels (for both pilot frequencies listed on the pilot generator can covers) to the REG positions.

Requirement: Green lamp must be lighted on EMG pilot generator panel under test before proceeding with adjustment.

STEP

PROCEDURE

- (2) Remove patch (1), Fig. 2.
- (3) Remove can covers from PIL GEN and PIL TRNS panels under test.
- (4) Perform tube tests on EMG generator as described in Section 356-150-501.

Caution: Before performing next step, be aware that removal of cable A will cause service interruption.

- (5) In the pilot transfer panel for the pilot frequency being adjusted, remove the B cable from the B jack of the transfer switch (Fig. 2), while watching the STBY GEN meter relay.

Requirement: The STBY GEN meter relay armature should fall to the left (–) side.

- (6) Connect RTE to the B jack [patch (2), Fig. 2].
- (7) Set the OUTPUT (using nonmetallic screwdriver) of the EMG pilot generator under test to the center of its range.
- (8) Strap the output pad in the EMG pilot generator under test to provide a power at the B jack as close as possible to the recorded power.

Note 1: The recorded power is the power recorded during initial lineup as required at the B jack to provide –32.8 dBm at the PIL TST jack.

Note 2: Due to differences in frequency loss and varistor circuit loss, a maximum variation of ± 0.8 dB may exist between the six B jacks for an output of –32.8 dBm at the corresponding PIL TST jacks. Thus, accurate records must be kept.

- (9) Remove patch (2), Fig. 2.
- (10) Reconnect the B cable to the B jack (on the transfer switch).
- (11) Operate the RESET button.

Requirement: STBY GEN meter relay should remain off either contact (float).

- (12) Set MAN CON switch to the EM position.
- (13) Reconnect patch (1), Fig. 2.
- (14) Adjust the OUTPUT control (using nonmetallic screwdriver) of the emergency generator for an indication of –32.8 dBm on the RTE.
- (15) Remove patch (1), Fig. 2.◆

- 11 Adjust the zero adjustment screw on the STBY GEN meter relay to obtain a 0 indication on the meter relay.

STEP	PROCEDURE
12	<p>If Step 10 cannot be accomplished,</p> <ul style="list-style-type: none"><li data-bbox="257 459 1149 480">(a) Disconnect the AB lead associated with the STBY GEN meter relay. <p>Note: This lead is connected to terminal 11 of the varistor circuit associated with the standby pilot alarm circuit.</p> <ul style="list-style-type: none"><li data-bbox="257 619 1075 640">(b) Set the VOM to the .06 MA DC scale (built out to 6000 ohms).<li data-bbox="257 683 968 704">(c) Connect the VOM between the AB and GB terminals.<li data-bbox="257 746 571 768">(d) Measure the current. <p>Requirement: 30.0 \pm 8 microamperes</p> <p>Note: Power must be applied to the temperature control circuit continuously for at least 24 hours before this current measurement is made.</p> <ul style="list-style-type: none"><li data-bbox="257 970 844 991">(e) If the requirement of Step 11(d) is not met,<ul style="list-style-type: none"><li data-bbox="307 1034 621 1055">(1) Replace the varistor.<li data-bbox="307 1098 588 1119">(2) Repeat Step 11(d).<li data-bbox="257 1161 1001 1183">(f) Remove the VOM test leads from terminals AB and GB.<li data-bbox="257 1225 786 1247">(g) Reconnect the AB lead to terminal 11.
13	Remove patch (1), Fig. 2.
14	Repeat Steps 1 through 12 for the five other pilot frequencies.
15	Restore the MAN CON switch to the NORM position.
