

REPLACING PAGE ADDENDUM

Filing Instructions:

1. REMOVE FROM THE SECTION THE PAGES NUMBERED THE SAME AS THOSE ATTACHED TO THIS PINK SHEET.
2. INSERT THE ATTACHED PAGES INTO THE SECTION IN THEIR PLACE.
3. PLACE THIS PINK SHEET AHEAD OF PAGE 1 OF THE SECTION.

TD-3 MICROWAVE RADIO
J68386G AND J68386H TRANSMITTER-RECEIVER BAYS
TESTS
70A DETECTOR, 27A OR 28A INTEGRATED CIRCUIT
REPLACEMENT

1. GENERAL

1.001 This addendum supplements Section 411-502-505, Issue 1. The attached pages must be inserted in the section in accordance with the filing instructions above.

1.002 This addendum is issued to add a caution to be observed when working on systems equipped with Hot Standby/Space Diversity Switching. This addendum does not affect the Equipment Test List.

Attached:

Page 1 dated May 1974, revised
Page 2 dated May 1974, reissued

TD-3 MICROWAVE RADIO
J68386G AND J68386H TRANSMITTER-RECEIVER BAYS
TESTS
70A DETECTOR, 27A OR 28A INTEGRATED CIRCUIT
REPLACEMENT

This section contains the procedures to be followed in checking and replacing, if necessary, the 70A detector, the 27A integrated circuit, or the 28A integrated circuit when trouble is experienced with one of these units. The tests in Section 411-502-500, Common Equipment Tests—Preliminary Checks should be made before performing any of the procedures given in this section.

Begin the tests with Charts 1, 2, or 3 depending upon which circuit exhibits the trouble condition.

Note 1: The tests and procedures of this section are to be performed only when a trouble condition cannot be cleared with normal routine maintenance procedures. Some of the adjustments called for in this section involve redoing factory adjustments which are not normally meant to be field adjustable.

Note 2: Spares are not normally provided for the circuits tested in this section.

This issue affects the Equipment Test List.

Caution 1: *These tests are to be performed on an out-of-service basis. Obtain a release from the designated control office, and remove the channel from service as directed by local practice.*

Caution 2: *On Hot Standby/Space Diversity equipped bays, consult Section 411-600-500 for forced switching procedures to remove service from BOTH the transmitter and receiver. Exercise extra caution during the tests since service will be present in some waveguide and IF cabling within this bay.*

Caution 3: *When removing and replacing waveguide units, care should be exercised to prevent foreign matter from entering the waveguide. Handle all types of waveguide carefully in order to prevent damage to the mating surfaces. When connecting waveguide units, flange mating surfaces must be carefully aligned, and all screws tightened securely to prevent RF leakage.*

Warning: *DO NOT leave energized waveguides unterminated. The RF power density that may be encountered is potentially hazardous to the eyes and body tissue.*

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CHART 1
70A DETECTOR TESTS

APPARATUS:

1—J688392A Transmitter-Receiver Test Set

STEP	PROCEDURE
1	Remove the receiver modulator—IF preamplifier from the bay as directed in Chart 4 of Section 411-504-503 (Steps 1 through 4).
2	Connect test apparatus to the exposed part of the 1348-type filter in accordance with Fig. 1.
3	Set the RCVR PWR switch on the bay to the ON position.
4	Using the ATT 2 control on the 28A integrated circuit (main station bay) or the PWR ADJ control on the 40-MHz oscillator (repeater station bay), adjust the BO power for a power meter indication of +6 dBm minus the loss of the calibrated cable if used.
5	Read the SHIFT MOD OUT (repeater station bay) or MWV GEN OUT (RCVR) (main station bay) indication on the meter panel. Requirement: 70 ± 10 If the requirement is met, proceed to Step 8; otherwise proceed with Step 6.
6	Adjust the calibration control on the 70A detector for a SHIFT MOD OUT or MWV GEN OUT (RCVR) meter indication of 70. If the requirement is met, proceed to Step 8; otherwise proceed with Step 7. Note: The calibration control may have been secured at the factory with Glyptol; if so, it will be necessary to break the seal.
7	Replace the 70A detector as directed in Chart 4. Recalibrate the replacement by repeating Steps 4 and 6. Note: Before replacing the detector, make sure that the problem does not lie in the meter circuit or bay wiring.
8	Set the RCVR PWR switch on the bay to the OFF position, and remove the test apparatus connected to the bay.
9	Reinstall the receiver modulator—IF preamplifier by reversing the procedure called for in Step 1.

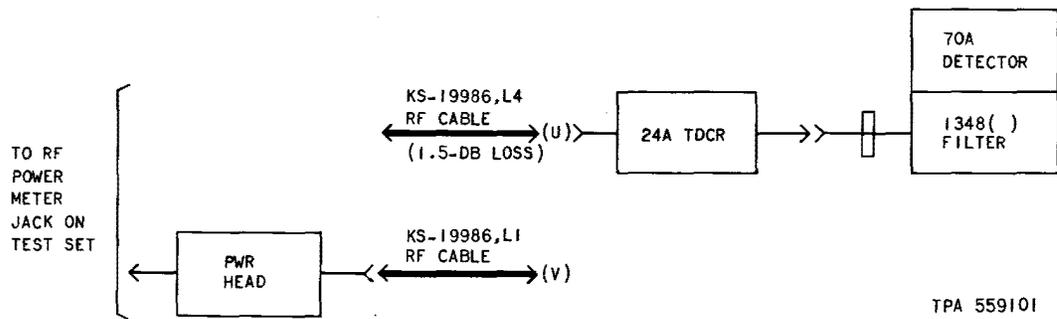


Fig. 1—70A Detector—Test Arrangement

PREPARATION FOR TEST

- 1 Operate the POWER RANGE dBm control on the power meter to -25 and the INPUT CHANNEL control to RF.
- 2 With the power meter input disconnected, adjust the METER ZERO control for an indication of ZERO.
- 3 Set the POWER RANGE dBm control to the $+10$ position.
- 4 Connect option (U) or (V).

Note: Option (U) is used when an internal power head is provided in the test set; option (V), when an external power head is provided.

CHART 2

27A INTEGRATED CIRCUIT TESTS

APPARATUS:

1—J68392A Transmitter-Receiver Test Set

1—AT-7825 Screwdriver

STEP	PROCEDURE
1	Remove the IF driver amplifier—transmitter modulator from the bay as directed in Section 411-506-503.
2	Connect test apparatus to the exposed port on the 27A integrated circuit in accordance with Fig. 2, option (X).
3	Set the RCVR PWR switch on the bay to the ON position.
4	Using the LEV ADJ control on the microwave generator, adjust the BO power for a power meter indication of +18 dBm minus the calibrated loss of the 20-dB RF pad and, if option (U) is used, the calibrated loss of the RF cable. If unable to make the adjustment proceed to Step 14; otherwise proceed with Step 5.
5	Read the MWV GEN OUT indication on the meter panel. Requirement: 70 ± 10 If the requirement is met, proceed to Step 7; otherwise proceed with Step 6.
6	Adjust the MON ADJ control on the 27A integrated circuit for a MWV GEN OUT meter indication of 70. If unable to make the adjustment proceed to Step 14; otherwise proceed with Step 7. Note: The MON ADJ control may have been secured at the factory with Glyptol; if so, it will be necessary to break the seal.
7	Set the RCVR PWR switch on the bay to the OFF position, and remove the test apparatus connected to the bay.
8	Reinstall the IF driver amplifier—transmitter modulator by reversing the procedure called for in Step 1.
9	Remove the 40-MHz oscillator—shift modulator from the bay as directed in Section 411-502-503.
10	Connect test apparatus to the exposed part on the 27A integrated circuit in accordance with Fig. 2, option (Y).

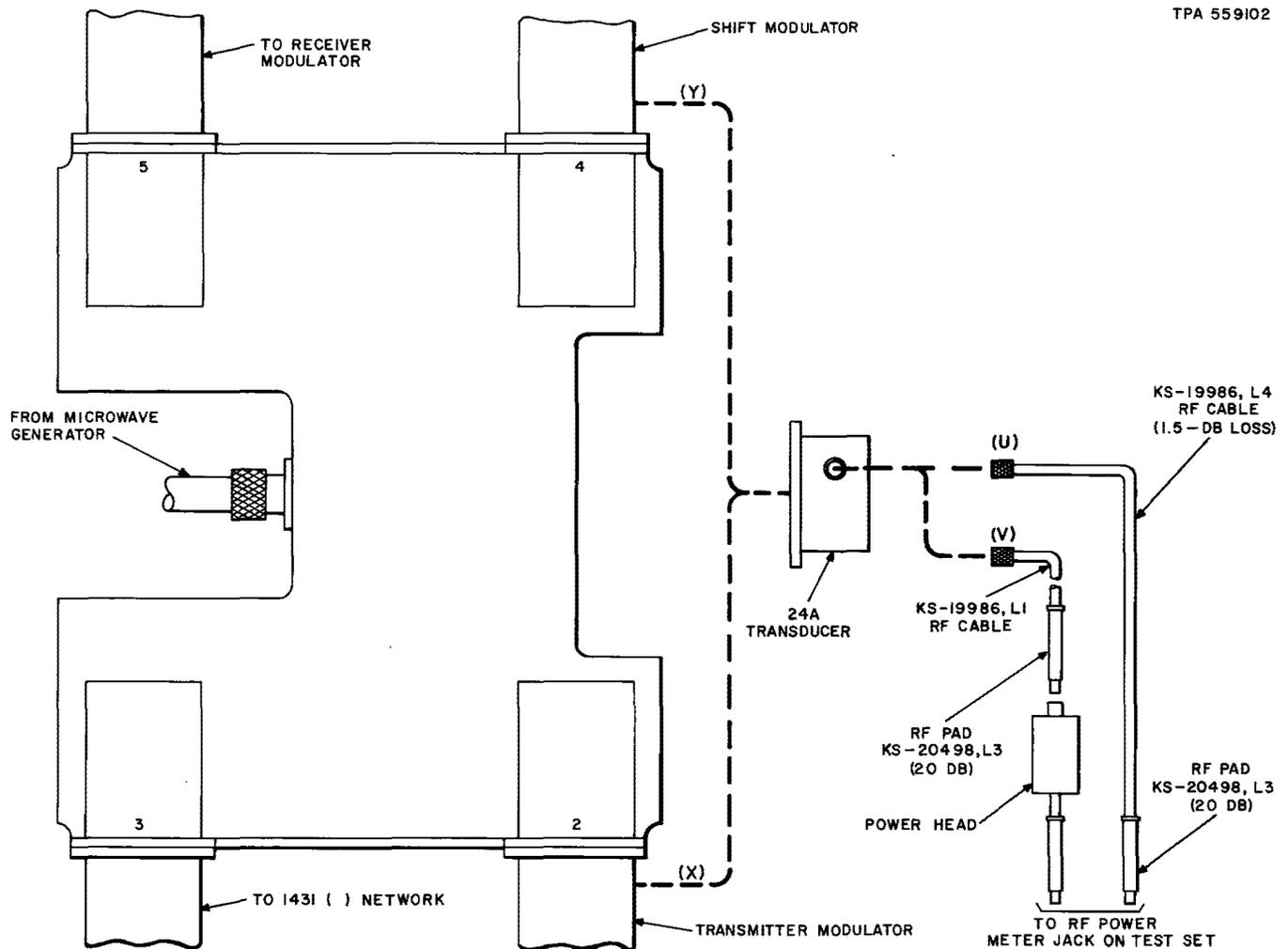


Fig. 2—27A Network—Test Arrangement

PREPARATION FOR TEST

- 1 Operate the POWER RANGE dBm control on the power meter to -25 and the INPUT CHANNEL control to RF.
- 2 With the power meter input disconnected, adjust the METER ZERO control for an indication of ZERO.
- 3 Set the POWER RANGE dBm control to the 0 position.
- 4 Connect option (U) or (V).

Note: Option (U) is used when an internal power head is provided in the test set; option (V), when an external power head is provided.

CHART 2 (Cont)

STEP	PROCEDURE
11	<p>Set the RCVR PWR switch on the bay to the ON position, and read the RF power meter.</p> <p>Requirement: +18.0 dBm \pm1 dB minus the calibrated loss of the 20-dB RF pad and, if option (U) is used, the calibrated loss of the RF cable.</p> <p>If the requirement is met, proceed to Step 15; otherwise continue with Step 12.</p>
12	<p>Read and record the MWV GEN OUT meter reading.</p>
13	<p>Adjust the PWR SPLIT control on the 27A integrated circuit and the LEV ADJ control on the microwave generator to meet the requirement in Step 11 while maintaining the MWV GEN OUT indication recorded in Step 12. (Some interplay between the two controls will probably be necessary.)</p> <p>Note: The PWR SPLIT control may have been secured at the factory with Glyptol; if so, it will be necessary to break the seal.</p> <p>If able to perform the adjustment, proceed to Step 15; otherwise continue with Step 14.</p>
14	<p>Replace the 27A integrated circuit as directed in Chart 4. Recalibrate the replacement circuit by repeating Steps 1 through 13.</p> <p>Note: Before replacing the 27A integrated circuit, make sure that the problem does not lie elsewhere in the bay, such as in the following:</p> <ul style="list-style-type: none"> (a) Meter circuit or bay wiring (b) Semirigid cable connecting the microwave generator to the integrated circuit (c) Microwave generator.
15	<p>If able to meet the requirements and make the adjustments called for in this chart, the 27A integrated circuit is operating satisfactorily, and the trouble is elsewhere in the bay.</p>
16	<p>Set the RCVR PWR switch on the bay to the OFF position, and remove the test apparatus connected to the bay.</p>
17	<p>Reinstall the 40-MHz oscillator—shift modulator by reversing the procedure called for in Step 9.</p>
18	<p>Before returning the bay to service, it should be routined as outlined in the following sections.</p> <p>411-502-500 Preliminary Checks</p> <p>411-504-501 Receiver Tests—Transmission</p> <p>411-506-501 Transmitter Tests—Transmission</p>

CHART 3

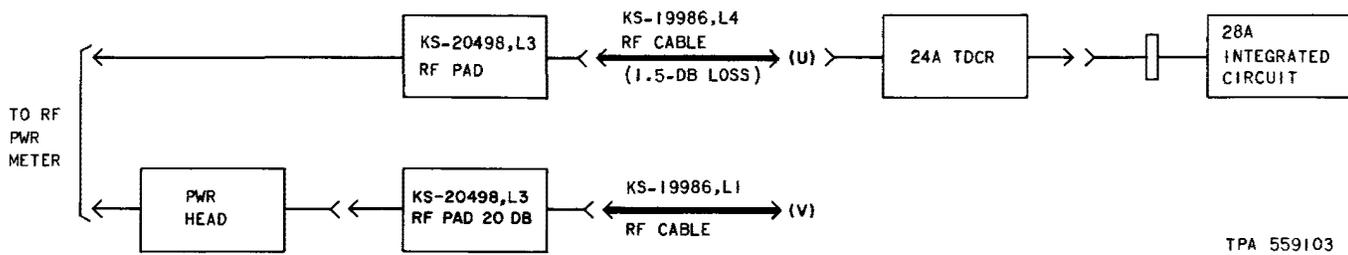
28A INTEGRATED CIRCUIT TESTS

APPARATUS:

1—J68392A Transmitter-Receiver Test Set

1—AT-7825 Screwdriver

STEP	PROCEDURE
	<p><i>Note:</i> If the trouble is associated with the main station receiver, begin with Step 7. If associated with the main station transmitter, begin with Step 1.</p>
1	Remove the IF driver amplifier—transmitter modulator from the bay as directed in Section 411-506-503.
2	Connect test apparatus to the exposed port on the 28A integrated circuit in accordance with Fig. 3.
3	Set the TRMTR PWR switch on the bay to the ON position.
4	<p>Using the ATT 1 control on the 28A integrated circuit, adjust the BO output power for a power meter indication of +18.0 dBm minus the calibrated loss of the 20 dB RF pad and, if option (U) is used, the calibrated loss of the RF cable.</p> <p>If unable to make the adjustment, proceed to Step 11; otherwise proceed with Step 5.</p>
5	<p>Read the MWV GEN OUT (TRMTR) indication on the meter panel.</p> <p><i>Requirement:</i> 70 ± 10</p> <p>If the requirement is met, proceed to Step 12; otherwise proceed with Step 6.</p>
6	<p>Adjust the MON ADJ control on the 28A integrated circuit for a MWV GEN OUT (TRMTR) meter indication of 70.</p> <p><i>Note:</i> The MON ADJ control may have been secured at the factory with Glyptol; if so, it will be necessary to break the seal.</p> <p>If unable to make the adjustment proceed to Step 11; otherwise go to Step 12.</p>
7	Remove the receiver modulator—IF preamplifier from the bay as directed in Section 411-504-503.
8	Connect test apparatus to the exposed port of the 1348-type filter in accordance with Fig. 1.
9	Set the RCVR PWR switch on the bay to the ON position.



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Fig. 3—28A Integrated Circuit—Test Arrangement

PREPARATION FOR TEST

- 1 Operate the POWER RANGE dBm control on the power meter to -25 and the INPUT CHANNEL control to RF.
- 2 With the power meter input disconnected, adjust the METER ZERO control for an indication of ZERO.
- 3 Set the POWER RANGE dBm control to the 0 position.
- 4 Connect option (U) or (V).

Note: Option (U) is used when an internal power head is provided in the test set; option (V), when an external power head is provided.

CHART 3 (Cont)	
STEP	PROCEDURE
10	<p>Using the ATT 2 control on the 28A integrated circuit, adjust the BO power for a power meter indication equal to the +6 dBm minus the loss of the calibrated cable if used.</p> <p>If able to make the adjustment, proceed to Step 12; otherwise proceed with Step 11.</p>
11	<p>Replace the 28A integrated circuit as directed in Chart 4. Recalibrate the replacement by repeating Steps 1 through 6.</p> <p>Note: Before replacing the 28A integrated circuit, make sure that the problem does not lie elsewhere in the bay, such as in the following:</p> <ul style="list-style-type: none"> (a) Meter circuit or bay wiring (b) Semirigid cables connecting the microwave generators to the integrated circuit (c) Microwave generators.
12	If able to meet the requirements and make the adjustments called for in this chart, the 28A integrated circuit is operating satisfactorily, and the trouble is elsewhere in the bay.
13	Set the RCVR PWR and TRMTR PWR switches on the bay to the OFF position, and remove the test apparatus connected to the bay.
14	Reinstall the receiver modulator—IF preamplifier and IF driver amplifier—transmitter modulator by reversing the procedures called for in Steps 1 and 7.
15	<p>Before returning the bay to service, it should be routined as outlined in the following sections.</p> <p>411-502-500 Preliminary Checks</p> <p>411-504-501 Receiver Tests—Transmission</p> <p>411-506-501 Transmitter Tests—Transmission</p>
CHART 4	
70A, 27A OR 28A CIRCUIT REPLACEMENT	
APPARATUS:	
1—0X1-8 Wrench (Waveguide Wrench)	
1—Soldering Iron	
1—AT-7825 Screwdriver	

CHART 4 (Cont)

STEP	PROCEDURE
	70A Detector
1	Set the RCVR PWR switch on the bay to the OFF position.
2	Unsolder the leads connected to the A and G terminals.
3	Remove the screws connecting the 70A detector to the 1348-type filter, and remove the unit from the bay.
4	To replace, reverse the above procedure.
	27A or 28A Integrated Circuit
5	Set the RCVR PWR (repeater and main station bays) and TRMTR PWR (main station bay only) switches to the OFF position.
6	Disconnect the coaxial connector attached to the rear of the integrated circuit.
7	Remove the IF driver amplifier—transmitter modulator from the bay as directed in Section 411-506-503.
8	(Repeater station bay only) Remove the 40-MHz oscillator—shift modulator from the bay as directed in Section 411-502-503.
9	Remove the screws connecting the integrated circuit to the 1431-type network.
10	Remove the screws connecting the integrated circuit to the 2-inch piece of flexible waveguide.
11	(Main station bay only) Remove the screws connecting the integrated circuit to the 24C transducer.
12	Remove the four screws connecting the integrated circuit to the supporting bracket.
	Note: Support will have to be provided at this point to avoid dropping the unit.
13	Move the integrated circuit toward the front of the bay, and position it so as to provide access to the leads connected to the A and G terminals.
14	Unsolder the leads to the A and G terminals, and remove the integrated circuit from the bay.
15	To replace, reverse the above procedure.