

**MULTIFREQUENCY (MF) SIGNALING-RECEIVING CIRCUIT SD-95536-01**  
**ADJUSTING PROCEDURE USING**  
**ADJUSTING CIRCUIT SD-95779-01**

**1. GENERAL**

**PAGE**

**1.01** This section describes a method of adjusting the limiter, variable bias, and signal-present circuits of the signaling-receiver circuit SD-95536-01. The signaling-receiver adjusting circuit SD-95779-01 is used in offices where the multifrequency current supply is not available. Tests are also made to verify that the pulse-corrector circuit is functioning properly.

**C. Adjustment of MF Receiver Equipped With Electron Tubes (ZP Option):** This adjustment procedure is used to compensate for deterioration of the electron tubes in the volume limiter, variable bias, and signal-present circuits and replacement of these tubes.

**8**

**1.02** This section is reissued for the reasons listed below. Since this reissue is a general revision, change arrows have been omitted. The Equipment Test List will be affected.

**D. Test and Adjustment of MF Receiver Equipped With Hybrid Integrated Networks (ZQ Option):** This procedure is used to test and compensate for the initial variations of the hybrid integrated networks (HINs) in the volume limiter, variable bias, and signal-present circuits. The P potentiometer in the volume limiter is no longer used and must be turned fully clockwise before the HINs are installed. The fixed value of the limiter is recorded and used in Table A to set the variable bias.

**11**

- (a) To change Tests A, B, and C to C, D, and E
- (b) To add a new Test A to check the output frequency of the SD-95779-01 adjusting circuit
- (c) To add a new Test B to check the output level of the SD-95779-01 adjusting circuit
- (d) To clarify procedures and to change steps.

**E. Test of Pulse Corrector Leads (ZM Option):** This test checks the pulse corrector CR1, CR4, CR5 and CR6 diodes, C1 capacitor, and Q1 transistor.

**14**

**1.03** The tests covered are:

**PAGE**

**A. Test of Output Frequency of SD-95779-01 Adjusting Circuit:** This test verifies that the output frequency of the adjusting circuit is set at 1000 Hz

**4**

**1.04** All options referred to in this section are per SD-95779-01, Issue 6-B.

**1.05** Before the MF receiver is converted from electron tube to HIN operation, adjusting circuit SD-95779-01 Option R must be installed.

**B. Test of Output Level of SD-95779-01 Adjusting Circuit:** This test verifies that the 1000-Hz output level of the adjusting circuit is set at -12.0 ±0.4 dBm.

**5**

**1.06** When the MF receiver is initially converted from electron tube to HIN operation, follow the procedure outlined in the modification kit.

**NOTICE**

Not for use or disclosure outside the  
Bell System except under written agreement

**Caution:** *If the MF receiver is equipped with HINs, the +130 Vdc and -48 Vdc fuses (in that order) must be removed before replacing HINs. After replacing the HINs, reverse the order of replacing the fuses (-48 Vdc fuse first).*

**1.07** Adjustment of the volume limiter can only be made when there is no shunt path on the input. Examine the drawing of the associated circuit (such as a sender register or test circuit) to determine if there is a shunt path on or across the T and R leads. Remove the shunt by blocking apparatus, insulating contacts, or by operating appropriate test circuit keys.

**1.08** If the MF receiver is equipped with HINs, the P potentiometer is no longer used and should be in the fully clockwise position. At the time of conversion to HIN operation, it is recommended that an application of glyptol or orange stamping ink, such as WECO R-2883, be applied to keep the P potentiometer in this position.

**1.09 Lettered Steps:** A letter a, b, c, etc, added to a step number in Parts 3 and 4 of this section, indicates an action which may or may not be required depending on local conditions. The condition under which a lettered step or a series of lettered steps should be made is given in the ACTION column, and all steps governed by the same condition are designated by the same letter within a test. Where a condition does not apply, all steps designated by that letter should be omitted.

**2. APPARATUS**

**2.01** Signaling-receiver adjusting circuit SD-95779-01, which is associated with the signaling-receiving circuit only in offices not equipped with the multifrequency current supply circuit.

**3. PREPARATION**

**STEP**

**ACTION**

**VERIFICATION**

**All Tests and Adjustments**

1 Make busy the circuit associated with signaling-receiving circuit requiring adjustment.

**2.02** One 3P6E cord assembly, consisting of one P3E cord, 8 feet long, equipped with a 310 plug at each end.

**2.03** One 3P17B cord assembly, consisting of one P3N cord, 6 feet long, equipped with a 241A plug on one end and a 310 plug on the other end.

**2.04** One 3P6D cord assembly, consisting of one P3E cord, 6 feet long, equipped with a 310 plug at each end.

**2.05** J64072A-1 frequency meter or equivalent which will be referred to as 72A frequency meter.

**2.06** J94021A transmission measuring set or equivalent which will be referred to as 21A TMS.

**2.07** KS-14510,L1 meter (VOM), with a pair of KS-14510,L2 test leads and a pair of KS-14510, L3 test leads.

**2.08** External 600Ω 1-milliwatt supply, if required.

**2.09** Patching cord assembly, required if external milliwatt supply is used. A 310 plug is required on the end patched to IN jack.

**2.10** Blocking and insulating tools, as required. Use tools and apply as covered in Section 069-020-801.

**2.11** One 32A test set, for use where there is a VAR B, SP CAL, or SP RLS jack on the signaling-receiving adjusting unit.

**2.12** One 141 cord tip.

**2.13** Two KS-6278 connecting clips.

**2.14** Testing cord, W3M cord, 6 feet long, equipped with one 310 plug and three 360 tools (3W4A cord).

STEP	ACTION	VERIFICATION
2	Verify at the beginning of each adjustment that no patching or testing cords are connected to the signaling-receiving circuit and that no keys are operated on the signaling-receiving adjusting unit.	
3a	If power supply has been disconnected, or if the L1, L2, or BR tube has been replaced with another electron tube (ZP Option)— Allow receiver to warm up for at least 10 minutes.	
4b	If external milliwatt supply is used and is not hardwired to adjusting circuit— Patch it to 1000~ IN jack of SD-95779-01 adjusting circuit.	

**Test A**

- 5 At 72A frequency meter—  
Connect AC power cord to 115 volts, 60-Hz power source.
- 6 Operate 115-volt power switch to ON position.  
  
*Note:* Allow approximately 10 minutes warm-up time for the vacuum tubes in the 72A frequency meter.
- 7 Rotate the INTENSITY control clockwise until trace is visible on the CRT.
- 8 Operate the CAL, MEAS, SEARCH control to MEAS position.
- 9 Adjust the FOCUS control for sharp trace on CRT.
- 10 Operate the FREQUENCY CPS controls for a readout of 1000 CPS.

**Test B**

- 11 At 21A TMS—  
Connect 115-volt, 60-Hz power cord to 115-volt, 60-Hz power source.
- 12 Operate ON OFF switch to ON position.  
  
*Note:* Allow approximately 10 minutes for tubes in 21A TMS to warm up and stabilize.

**SECTION 179-612-702**

<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
13	Connect 241A plug of 3P17B cord to DET IN 600Ω jack.	

**Tests and Adjustments C and D**

*Note:* See 1.08.

- 5 At MF receiver—  
Remove covers from KP1, KP2, and LK relays and block relays nonoperated.
- 6 At J95779-01 adjusting circuit—  
Connect one end of 3P6E cord to VOL L VAR B jack.
- 7 At MF receiver—  
Connect other end of 3P6E cord to IN jack.

**4. METHOD**

<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
-------------	---------------	---------------------

**A. Test of Output Frequency of SD-95779-01 Adjusting Circuit**

- 11 At 72A frequency meter—  
Connect 241A plug of 3P17B cord to 600Ω IN jack.
- 12 At J95779-01 adjusting circuit—  
Connect 310 plug of 3P17B cord to VOL L VAR B jack.
- 13 At 72A frequency meter—  
Adjust VERTICAL GAIN and HORIZONTAL GAIN controls until all of trace is visible on CRT.
- 14c If CRT trace is not a circle, adjust frequency output of 1000 Hz, 1 milliwatt supply until circle is obtained.
- 15 At SD-95779-01 adjusting circuit—  
Disconnect 310 plug of 3P17B cord from VOL L VAR B jack.
- 16 At 72A frequency meter—  
Rotate INTENSITY control fully counterclockwise.
- 17 Operate 115-volt power switch to OFF position.

A circle should be formed by the trace on the CRT.

STEP	ACTION	VERIFICATION
<b>B. Test of Output Level of SD-95779-01 Adjusting Circuit</b>		
14	At 21A TMS— Operate DET INPUT switch to -20 position.	
15c	If R option is used— At SD-95779-01 adjusting circuit— Connect 310 plug of 3P17B cord to VOL L VAR B jack.	At 21A TMS— Meter should indicate $-12.0 \pm 0.4$ dBm.
16c	Disconnect 3P17B cord at VOL L VAR B jack.	
17c	At 21A TMS— Operate DET INPUT switch to -30 position.	
18c	At SD-95779-01 adjusting circuit— Connect 310 plug of 3P17B cord to SP CAL jack.	At 21A TMS— Meter should indicate $-26.6 \pm 0.4$ dBm.
19d	If VAR B SP CAL or SP RLS key is provided at SD-95779-01 adjusting circuit— Set VAR B SP CAL or SP RLS key to operate position.	At 21A TMS— Meter should indicate $-27.6 \pm 0.4$ dBm.
	<b>Note:</b> Key is in operate position when white line on key is in horizontal position.	
20d	Set VAR B SP CAL or SP RLS key to nonoperate position.	At 21A TMS— Meter should indicate $-26.6 \pm 0.4$ dBm.
21e	If VAR B SP CAL or SP RLS key is not provided but SP RLS jack is provided— Connect 32A test set to SP RLS jack:	
22e	At 32A test set— Depress and lock white button.	At 21A TMS— Meter should indicate $-27.6 \pm 0.4$ dBm.
23e	Release white button on 32A test set.	At 21A TMS— Meter should indicate $-26.6 \pm 0.4$ dBm.
24e	Disconnect 32A plug from SP RLS jack.	
25c	Disconnect plug from SP CAL jack.	
26f	If Y option is used— At 21A TMS— Operate DET INPUT switch to -20 position.	
27f	At SD-95779-01 adjusting circuit— Connect 310 plug of 3P17B cord to VOL L VAR B jack.	At 21A TMS— Meter should indicate $-15 \pm 0.4$ dBm.

SECTION 179-612-702

STEP	ACTION	VERIFICATION
28f	Disconnect 3P17B cord from VOL L VAR B jack.	
29f	At 21A TMS— Operate DET INPUT switch to -30 position.	
30f	At SD-95779-01 adjusting circuit— Connect 310 plug of 3P17B cord to SP CAL jack.	At 21A TMS— Meter should indicate $-26.6 \pm 0.4$ dBm.
31d	If VAR B SP CAL or SP RLS key is provided— Set VAR B SP CAL or SP RLS key to operate position.  <b>Note:</b> Key is in operate position when white line on key is in horizontal position.	At 21A TMS— Meter should indicate $-27.6 \pm 0.4$ dBm.
32d	Set VAR B SP CAL or SP RLS key to nonoperate position.	At 21A TMS— Meter should indicate $-26.6 \pm 0.4$ dBm.
33e	If VAR B SP CAL or SP RLS key is not provided but SP RLS jack is provided— At SD-95779-01 adjusting circuit— Connect 32A test set to SP RLS jack.	
34e	At 32A test set— Depress and lock white button.	At 21A TMS— Meter should indicate $-27.6 \pm 0.4$ dBm.
35e	Release white button on 32A test set.	At 21A TMS— Meter should indicate $-26.6 \pm 0.4$ dBm.
36e	Disconnect 32A test set from SP RLS jack.	
37f	Disconnect plug from SP CAL jack.	
38g	If Z option is used— At 21A TMS— Operate DET INPUT switch to -10 position.	
39g	At SD-95779-01 adjusting circuit— Connect 310 plug of 3P17B cord to VOL L VAR B jack.	At 21A TMS— Meter should indicate $-8.5 \pm 0.4$ dBm.
40g	At 21A TMS— Operate DET INPUT switch to -20 position.	
41d	If VAR B SP CAL or SP RLS key is provided at SD-95779-01 adjusting circuit— Set VAR B SP CAL or SP RLS key to operate position.	At 21A TMS— Meter should indicate $-18.0 \pm 0.4$ dBm.

STEP	ACTION	VERIFICATION
	<b>Note:</b> Key is in operate position when white line on key is in horizontal position.	
42d	Set VAR B SP CAL or SP RLS key to nonoperate position.	At 21A TMS— Meter should indicate $-8.5 \pm 0.4$ dBm.
43e	If VAR B SP CAL or SP RLS key is not provided but SP RLS jack is provided— At SD-95779-01 adjusting circuit— Connect 32A test set to SP RLS jack.	
44e	At 32A test set— Depress and lock white button.	At 21A TMS— Meter should indicate $-18.0 \pm 0.4$ dBm.
45e	Release white button on 32A test set.	At 21A TMS— Meter should indicate $-8.5 \pm 0.4$ dBm.
46g	At SD-95779-01 adjusting circuit— Disconnect 310 plug from VOL L VAR B jack.	
47g	At 21A TMS— Operate DET INPUT switch to -30 position.	
48g	At SD-95779-01 adjusting circuit— Connect 310 plug of 3P17B cord to SP CAL jack.	At 21A TMS— Meter should indicate $-25.4 \pm 0.4$ dBm.
49d	If VAR B SP CAL or SP RLS key is provided— Set VAR B SP CAL or SP RLS key to operate position.	At 21A TMS— Meter should indicate $-26.4 \pm 0.4$ dBm.
	<b>Note:</b> Key is in operate position when white line on key is in horizontal position.	
50d	Set VAR B SP CAL or SP RLS key to nonoperate position.	At 21A TMS— Meter should indicate $-25.4 \pm 0.4$ dBm.
51e	If VAR B SP CAL or SP RLS key is not provided but SP RLS jack is provided— At SD-95779-01 adjusting circuit— Connect 32A test set to SP RLS jack.	
52e	At 32A test set— Depress and lock white button.	At 21A TMS— Meter should indicate $-26.4 \pm 0.4$ dBm.
53e	Release white button on 32A test set.	At 21A TMS— Meter should indicate $-25.4 \pm 0.4$ dBm.
54g	At SD-95779-01 adjusting circuit— Disconnect 32A test set from SP RLS jack.	
55g	Disconnect 310 plug from SP CAL jack.	

SECTION 179-612-702

STEP	ACTION	VERIFICATION
<b>C. Adjustment of MF Receiver Equipped With Electron Tubes (ZP Option)</b>		
8	At KS-14510 VOM— Select AC volts scale setting as follows:  If Y option is provided—12 If Z option is provided—60 If R option is provided—12	
9	At MF receiver LEV test points— Connect + lead of VOM to T and - lead to R.	
10c	If Y option is provided— Adjust P potentiometer for meter indication of approximately 11.1 volts.	
11d	If Z option is provided— Adjust P potentiometer for meter indication of approximately 15.7 volts.	
12e	If R option is provided— Adjust P potentiometer for meter indication of approximately 11.0 volts.	
13	At KS-14510 VOM— Select 60 on DC volts scale.	
14	At MF receiver LEV test points— Connect - lead of VOM to T and + lead to GRD.	
15f	If VAR B SP CAL, or VAR B SP RLS jack is provided on the J95779-01 adjusting circuit— Connect 32A test set to this jack.	
16f	At 32A test set— Lock operate white button.	
17g	If VAR B SP CAL key is provided on J95779-01 adjusting circuit— Operate VAR B key.	
18c	If Y option is provided— At MF receiver— Adjust BIAS potentiometer for meter indication of approximately 27.3 volts.	
19d	If Z option is provided— At MF receiver—	

STEP	ACTION	VERIFICATION
	Adjust BIAS potentiometer for meter indication of approximately 24.0 volts.	
20e	If R option is provided— At MF receiver— Adjust BIAS potentiometer for meter indication of approximately 33.0 volts.	
21	At MF receiver— Disconnect meter leads.	
22	At J95779-01 adjusting circuit— Disconnect 3P6E cord from VOL L VAR B jack.	
23	At MF receiver— Disconnect other end of 3P6E cord from IN jack.	
24	Remove blocking tools from KP1, KP2, and LK relays.	
25	At J95779-01 adjusting circuit— Connect one end of 3P6E cord to SP CAL jack.	
26	At MF receiver— Connect other end of 3P6E cord to IN jack.	
27	Block operated KP1 and KP2 relays.	
28	Block nonoperated LK relay.	
29h	If MF receiver is associated with No. 4 crossbar senders SD-68575-01 or SD-68551-01— At No. 4 crossbar sender— Block operated the MS and LS relays.	
30	At MF receiver— Remove cover from SP relay.	
31f	If VAR B SP CAL or VAR B SP RLS jack is provided on J95779-01 adjusting circuit— At 32A test set— Release white button.	At MF receiver— SP relay operated.
32f	At 32A test set— Lock operated white button.	SP relay released.
33i	If verifications in Step 31f and/or 32f are not met— At MF receiver—	

SECTION 179-612-702

STEP	ACTION	VERIFICATION
	Adjust SP potentiometer so that SP relay is just operated with white button on 32A test set released and SP relay released with white button on 32A test set operated.	
34g	If VAR B SP CAL key is provided on J95779-01 adjusting circuit— Operate SP CAL key.	At MF receiver— SP relay released.
35g	Restore SP CAL key.	SP relay operated.
36j	If verifications in Step 34g and/or 35g are not met— At MF receiver— Adjust SP potentiometer so that SP relay is just operated with the SP CAL key released and SP relay released with the SP CAL key operated.	
37f	If VAR B SP CAL or VAR B SP RLS jack is provided on J95779-01 adjusting circuit— Disconnect 32A test set.	
38b	If external milliwatt supply is used— Remove patch to 1000~IN jack of SD-95779-01 adjusting circuit.	
39	At MF receiver— Replace cover on SP relay.	
40h	If MF receiver is associated with No. 4 crossbar senders SD-68575-01 or SD-68551-01— At No. 4 crossbar sender— Remove blocking tool from MS and LS relays.	
41i	If no other test or adjustments are to be performed— At MF receiver— Disconnect 3P6E cord from IN jack.	
42i	At J95779-01 adjusting circuit— Disconnect other end of 3P6E cord from VOL L VAR B jack.	
43	At MF receiver— Remove blocking tools from KP1, KP2, and LK relays.	

STEP	ACTION	VERIFICATION
<b>D. Test and Adjustment of MF Receiver Equipped With Hybrid Integrated Networks (ZQ Option)</b>		
8	At KS-14510 VOM— Select 60 on AC volts scale.	
9	At MF receiver LEV test points— Connect + lead of VOM to T and - lead to R.	At KS-14510 VOM— Meter indicates 12.75 ±3.75 volts.
10c	If the indication in Step 9 is less than 9.0 or greater than 16.5 Vac— At fuse bay— Remove +130 Vdc and -48 Vdc fuses associated with MF receiver. See Caution, paragraph 1.06.	
11c	At MF receiver— Replace KS-21078 HIN in L1 socket.	
12c	At fuse bay— Replace -48 Vdc and +130 Vdc fuses removed in Step 10c.	
13c	At KS-14510 VOM— Observe meter indications.	Meter indicates 12.75 ±3.75 volts.
14d	If meter indication is still less than 9.0 or greater than 16.5 Vac— At fuse bay— Remove +130 Vdc and -48 Vdc fuses associated with MF receiver. See Caution, paragraph 1.06.	
15d	At MF receiver— Replace KS-21078 HIN in L2 socket.	
16d	At fuse bay— Replace -48 Vdc and +130 Vdc fuses removed in Step 14d.	
17	At KS-14510 VOM— Observe and record meter indication. (This is the VOLUME LIMITER voltage which will be used in Step 22 with Table A.)	
18	At MF receiver— Disconnect meter leads.	
19	Remove blocking tools from KP1, KP2, and LK relays.	

**SECTION 179-612-702**

STEP	ACTION	VERIFICATION
20	At KS-14510 VOM— Select 60 on DC volts scale.	
21	At MF receiver LEV test points— Connect the - lead of VOM to R and + lead to GRD.	
22	Adjust the BIAS potentiometer for voltage reading associated with volume limiter voltage obtained in Step 17.	
23	Disconnect VOM leads.	
24	At KS-14510 VOM— Select 60 on AC volts scale.	
25	At MF receiver LEV test points— Connect + lead of VOM to T and - lead to R.	At KS-14510 VOM— Meter indicates volume limiter voltage used in Step 22.
26e	If limiter voltage has changed— Repeat Steps 20 through 22 and proceed to Step 27.	
27	At MF receiver LEV test points— Disconnect VOM leads.	
28	At MF receiver— Disconnect 3P6E cord from IN jack.	
29	At J95779-01 adjusting circuit— Disconnect other end of 3P6E cord from VOL L VAR B jack.	
30	At J95779-01 adjusting circuit— Connect one end of 3P6E cord to SP CAL jack.	
31	At MF receiver— Connect other end of 3P6E cord to IN jack.	
32	Block operated the KP1 and KP2 relays and block nonoperated the LK relay.	
33f	If MF receiver is associated with No. 4 crossbar senders SD-68575-01 or SD-68551-01— At No. 4 crossbar sender— Block operated the MS and LS relays in sender.	
34	At MF receiver— Remove cover from SP relay.	

STEP	ACTION	VERIFICATION
35g	If J95779-01 adjusting circuit is equipped with SP RLS jack— Connect 32A test set to it.	At MF receiver— SP relay operated.
36g	At 32A test set— Lock operated white button.	At MF receiver— SP relay released.
37h	If verifications in Step 35g and/or 36g are not met— At MF receiver— Adjust SP potentiometer so that the SP relay is released when white button on 32A test set is just operated and SP relay is operated when white button on 32A test set is released.	
38i	If SP CAL key is provided on J95779-01 adjusting circuit— Operate SP CAL key.	At MF receiver— SP relay released.
39j	If verification of Step 38i is not met— At MF receiver— Adjust SP potentiometer so that the SP relay is released when the SP CAL key is operated and SP relay is just operated when SP CAL key is released.	
40i	If SP CAL key is provided on J95779-01 adjusting circuit— Restore SP CAL key.	
41	At J95779-01 adjusting circuit— Disconnect 3P6E cord from SP CAL jack.	
42	At MF receiver— Disconnect 3P6E cord from IN jack.	
43	Remove blocking tools from KP1, KP2, and LK relays.	
44g	If J95779-01 adjusting circuit is equipped with SP RLS jack— Disconnect 32A test set from it.	
45	At MF receiver— Replace cover on SP relay.	
46f	If MF receiver is associated with No. 4 crossbar senders SD-68575-01 or SD-68551-01— At No. 4 crossbar sender— Remove blocking tool from MS and LS relays.	

SECTION 179-612-702

STEP	ACTION	VERIFICATION
47k	If external milliwatt supply is used and no further tests are to be performed— Remove cord from 1000~IN jack of J95779-01 adjusting circuit.	
<b>E. Test of Pulse Corrector Leads (ZM Option)</b>		
5c	If MF receiver is associated with No. 4 crossbar senders SD-68575-01 or SD-68551-01— At No. 4 crossbar sender— Block operated the MS and LS relay.	
6	At KS-14510 VOM— Select 60 on DC VOLTS scale.	
7	At MF receiver— Connect + meter lead to ground.	
8	Connect - meter lead to contact 4 of KP relay.  <b>Note:</b> Contacts 4 and 7 of KP relay must be made.	At KS-14510 VOM— Meter indicates 1.1V or less.
9	At KS-14510 VOM— Select 3 on DC VOLTS scale.	Meter indicates 0.7 ±0.4V dc.
10	At KS-14510 VOM— Select 60 on DC VOLTS scale.	
11	At MF receiver— Insert 310 plug of 3W4A cord into SP jack.	
12	Connect sleeve (red conductor) of 3W4A cord to 48V battery.	
13	Connect ring (black conductor) of 3W4A cord to ground.	At KS-14510 VOM— Meter indicates 45 ±5V dc.
14	At MF receiver— Remove plug of 3W4A cord from SP jack.	
15	Disconnect ring and sleeve of 3W4A cord from battery and ground.	
16	At MF receiver— Disconnect meter leads from ground and contact 4 of KP relay.	
17	Block operated KP1 relay.	
18	At KS-14510 VOM— Select 12 on DC VOLTS scale.	

STEP	ACTION	VERIFICATION
19	At MF receiver— Connect + meter lead to ground.	
20	Connect - meter lead to contact 4B of KP2 relay.	At KS-14510 VOM— Meter indicates 8.45 ±1.45 volts.
21	Connect the 310 tip plug (white conductor) of 3W4A cord to -48V battery.	
22	At KS-14510 VOM— Select 3 on DC VOLTS scale.	
23	At MF receiver— While carefully observing meter, touch the tip of 310 plug to the sleeve of the SP jack.	At KS-14510 VOM— Meter shows a momentary 0.7V deflection.  <b>Note:</b> This step may be repeated to verify deflection.
24	At MF receiver— Hold the tip of the 310 plug to the sleeve of the SP jack.	SP relay held operated.
25	Remove blocking tool from the KP1 relay.	
26	While carefully observing the meter, manually operate KP1 relay.	At KS-14510 VOM— Meter shows a 0.7V deflection.  <b>Note:</b> This step may be repeated to verify deflection.
27	At MF receiver— Disconnect meter leads connected to contact 4B of KP2 relay, and ground.	
28	Remove tip of 310 plug from sleeve of SP jack.	SP relay released.
29	Disconnect tip of 3W4A cord from battery.	
30	At MF receiver— Block operated KP1 and KP2 relays.	
31	At KS-14510 VOM— Select 12 on DC VOLTS scale.	
32	At MF receiver— Connect - meter lead to pin 6 of SP BIAS CONT socket.	
33	Touch + meter lead to ground.	At KS-14510 VOM— Meter indicates 8 ±1V dc.

SECTION 179-612-702

STEP	ACTION	VERIFICATION
34	At MF receiver— Remove both meter leads.	
35	Connect + meter leads to pin 6 of SP BIAS CONT socket.	
36	At J95779-01 adjusting circuit— Connect one end of 3P6E cord to VOL L VAR B jack.	
37	At MF receiver— Connect other end of 3P6E cord to IN jack.	
38	Touch - meter lead to ground.	At KS-14510 VOM— Meter indicates 3.75 ±0.75 volts.
39	Disconnect - meter lead.	
	<b>Caution: Do not remove plug from IN jack before disconnecting - meter lead.</b>	
40	At J95779-01 adjusting circuit— Disconnect 3P6E cord from VOL L VAR B jack.	
41	At MF receiver— Disconnect other end of 3P6E cord from IN jack.	
42c	If MF receiver is associated with No. 4 crossbar senders SD-68575-01 or SD-68551-01— At No. 4 crossbar sender— Remove blocking tool from MS and LS relays.	
43	At MF receiver— Remove blocking tools from KP1 and KP2 relays.	
44	Remove + meter lead from pin 6 of SP BIAS CONT socket.	
45b	If external milliwatt supply is used— At J95779-01 adjusting circuit— Remove patch from 1000~IN jack.	

TABLE A

WHEN VOLUME LIMITER INDICATION IS	ADJUST BIAS POTENTIOMETER TO
9.0 — 9.7 Vac	20.3 Vdc
9.7 — 10.1 Vac	21.2 Vdc
10.1 — 10.5 Vac	22.1 Vdc
10.5 — 10.9 Vac	23.0 Vdc
10.9 — 11.2 Vac	23.8 Vdc
11.2 — 11.6 Vac	24.5 Vdc
11.6 — 12.0 Vac	25.6 Vdc
12.0 — 12.5 Vac	26.5 Vdc
12.5 — 13.1 Vac	27.3 Vdc
13.1 — 13.7 Vac	28.2 Vdc
13.7 — 14.3 Vac	29.1 Vdc
14.3 — 14.9 Vac	29.9 Vdc
14.9 — 15.5 Vac	30.8 Vdc
15.5 — 16.5 Vac	31.8 Vdc