RECEIVER-TRANSMITTERS RT–66/GRC, RT–67/GRC AND RT–68/GRC

TM 11–289
TO 31R2VRC9–1
CHANGES No. 1

DEPARTMENTS OF THE ARMY
AND THE AIR FORCE
WASHINGTON 25, D. C., *8 April 1955*

TM 11–289/TO 31R2VRC9–1, 3 December 1953, is changed as follows:

1. Scope

* * * * *

c. The following equipments are covered in this technical manual:

Model	Order No.
* *	* * *
RT–67/GRC	1759–Phila–51.
	2903–Phila–52.
	4230–Phila–53.
	16831–Phila–51.
	18651–Phila–49.
	21434–Phila–50.
	32111–Phila–51.
RT–68/GRC	* * *
	18651–Phila–49.
	21434–Phila–50.
	32114–Phila–51.
	* * *

2. Forms and Records

The following forms will be used for reporting unsatisfactory conditions of the Army Materiel and equipment and in performing preventive maintenance.

* * * * *

c. **DD Form 535,** Unsatisfactory Report, will be filled out and forwarded to Commanding General, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio, as prescribed in SR 700–45–5 and **AF TO 00–35D–54.**

* * * * *

6.1. Modifications of Equipment
(Added)

The modification work orders listed below give changes or modifications of the components or circuits of Receiver-Transmitters RT–66/GRC, RT–67/GRC, and RT–68/GRC. Equipment on which these modification work orders have been performed may differ in circuitry or parts from the equipment described in this manual.

a. MWO Sig 11–289–1, 28 October 1953, Modification of Receiver-Transmitters RT–66/GRC, RT–67/GRC, and RT–68/GRC to Reduce Feedback.

b. MWO Sig 11–289–2, 14 June 1954, Modification of Receiver-Transmitters RT–66/GRC, RT–67/GRC, and RT–68/GRC to Replace the Existing 9-pin Amphenol Connector J312 with an Improved Connector.

c. MWO Sig 11–289–3, 23 October 1953, Modification of Receiver-Transmitters RT–66/GRC, RT–67/GRC, and RT–68/GRC to Provide Improved Type Spring Locking Clips on Rf Coils.

d. MWO SIG 11–289–4, 30 October 1953, Modification of Receiver-Transmitters RT–66/GRC, RT–67/GRC, and RT–68/GRC to Install or Replace Capacitor C79.

e. MWO SIG 11–289–5, 21 December 1953, Modification of Receiver-Transmitters RT–66/GRC, RT–67/GRC, and RT–68/GRC to Prevent Breakage of the Transmitter Antenna Tuning Cam Assembly.

f. MWO SIG 11–289–6, 9 April 1954, Modification of Receiver-Transmitters RT–66/GRC, RT–67/GRC, and RT–68/GRC to Improve Retransmission Operation by Reducing Relay Flip-flop.

g. MWO SIG 11–289–7, 19 March 1954, Modification of Receiver-Transmitters RT–66/GRC, RT–67/GRC, and RT–68/GRC to Reduce Excessive Filament Voltages in the Rf and Driver Stages.

h. MWO SIG 11–289–8, 4 June 1954, Modification of Receiver-Transmitters RT–66/GRC, RT–67/GRC, and RT–68/GRC to Provide Connector Caps for the Audio Connectors.

Figure 4.

Note. (Added) In late models of equipment, the tube puller, shorting bar, and ALLEN wrenches are not supplied.

*** This change supersedes TB 11–289–1, 2 September 1953.**

Figure 5.

Note. (Added) In late models of equipment, the ALLEN wrenches are not supplied.

Figure 6.

Note. (Added) In RT–67/GRC units bearing Orders No. 2903–PHILA–52 and 21434–PHILA–50, R302 is a single-section potentiometer.

9. Spare Parts

In early models * * * with each component.

Note. Numbers in parenthesis indicate the number of each item supplied with RT–66/GRC **and RT–67/GRC** models bearing Order No. 21434–Phila–50. The last item is supplied with the **RT–66**/GRC model only. **The spare parts listed are not supplied with RT–67/GRC models bearing Order No. 4320–Phila–53 or Order No. 32111–Phila–51 with serial numbers 15525 through 19133.**

* * * * *

13. Tuning Arrangement (figs. 10, 11, 12, and 12.1)

* * * * *

g.1. (Added) *Adjustment of New Type MCS and TENTH MCS Knob.* In RT–67/GRC models bearing Order No. 2903–Phila–52 or Order No. 21434–Phila–50 with serial numbers 11410 through 14874 and in RT–68/GRC models bearing Order No. 21434–Phila–50, the MCS and TENTH MCS knobs have been redesigned. The new knobs have been designed so that adjustments in the preselecting assembly (flag arms) may be made without loosening the knob mounting screw. This eliminates the possibility of accidentally changing the setting of one flag arm when adjustments are being made on the other. The preselecting mechanism is controlled by means of two spring-loaded lever arms mounted on each knob (fig. 12.1). Each lever arm is color coded to match the flag arm it controls. One is green and the other is red. When the lever arms are in their normal position (turned upwards), the flag arms are locked in place. To adjust the setting of a flag arm, the corresponding lever arm must be turned outward. This releases the flag arm so that it may be rotated freely around the knob. When the desired setting is reached, the lever arm is released and locks the flag arm in its new position. When the dial is rotated until the flag arm hits the stop mounted on the dial plate, the dial will come to rest in the detent for the channel for which the flag was adjusted.

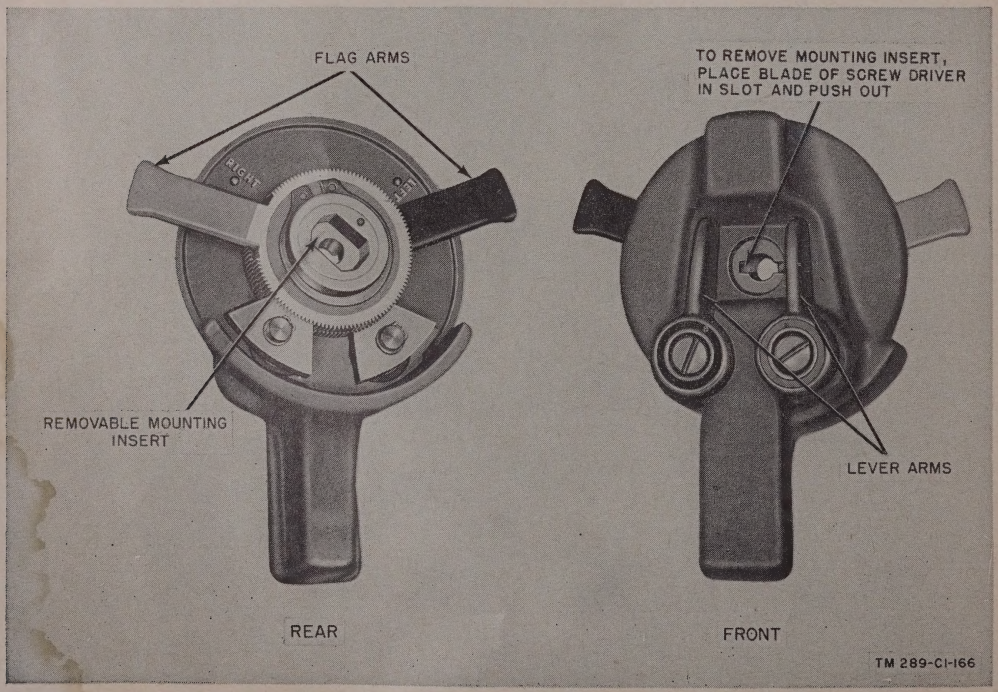


Figure 12.1. (Added) *Redesigned MC and TENTH MCS knob assembly.*

* * * * *

16. Receiver Circuits, Block Diagram

(fig. 9)

The receiver is * * * or other equipment.

* * * * *

j. Circuit Differences (figs. 33 through 35).

(1) In all RT–66/GRC models except those bearing Order No. 1759–Phila–51, the gain of receiver r-f amplifier V1 is controlled by squelch tube V103 instead of first limiter **V111** during squelch operation (*a* and *f* above). Therefore, during squelch * * * at reduced gain.

* * * * *

Figure 13. The following is added after "Order No. 1759–Phila–51" in note 2: 2903–PHILA–52, or 21434–PHILA–50.

21. Modulation

(fig. 13)

* * * * *

k. Circuit differences are as follows: In all RT–67/GRC models except those bearing Order No. 1759–Phila–51, **2903–Phila–52, or 21434–Phila–50** and in the following RT–66/GRC and RT–68/GRC models, capacitors C137 and C138, 24 $\mu\mu$f each are added between ground and pins 6 of V105 and V106, respectively.

* * * * *

Figure 16. "C36" in the plate circuit of tube V4 is changed to read: C26.

27. Transmitter Power Amplifier V11

(fig. 19)

* * * * *

d. Circuit Differences.

* * * * *

(2) In all RT–66/GRC * * * amplifier V115 (*b* above).

Order No.	Serial No.
4320–Phila–53	**All.**
16831–Phila–51	All.
* * *	* *
32111–Phila–51	1–13671
21434–Phila–50	**All.**

* * * * *

(6) In the RT–67/GRC * * * r-f amplifier V1.

Order No.	Serial No.
2903–Phila–52	**All.**
4320–Phila–53	**All.**
16831–Phila–51	All.
18651–Phila–49	Late models.
21434–Phila–50	**All.**
32111–Phila–51	Some models.

Figure 19. The symbol for a jack labeled "D, J106" is inserted on the lead between terminal 5 on relay 0 101 and terminal N of J309. The symbol for a plug labeled "13, P306" is inserted on the same lead to the right of D, J106.

Note 5. (Superseded) In the RT–68–GRC models bearing Order No. 16817–PHILA–51 with serial numbers 5975 through 13147 and in the following RT–67/GRC models, capacitor C306 (100 $\mu\mu$f for the RT–68/GRC models and 75 $\mu\mu$f for RT–68/GRC models) is added between ground and the wire joining J306 to J308.

Order No.	Serial No.
2903–PHILA–52	ALL.
4320–PHILA–53	ALL.
16831–PHILA–51	ALL.
18651–PHILA–49	LATE MODELS.
21434–PHILA–50	ALL.
32111–PHILA–51	SOME MODELS.

The following is added to the chart in note 6:

Order No.	Serial No.
4320–PHILA–53	ALL.
21434–PHILA–50	ALL.

Note 9. (Added) In the RT–67/GRC models listed below, L22 in the plate circuit of tube V11 is tuned by a shorted turn assembly.

Order No.	Serial No.
2903–PHILA–52	ALL.
4320–PHILA–53	ALL.
21434–PHILA–50	ALL.

28. Ringer Circuit

(fig. 20)

* * * * *

b. The ringer oscillator * * * transmitter oscillator (par. 20).

* * * * *

(2) Regenerative feedback from the plate to the grid (pin 3) is established partly by induction from winding 3–4 to wind-

ing 1–2 of T105, and partly by **capacitive coupling through capacitors C143 and C206.** The regenerative feedback * * * from being overloaded.

* * * * *

Figure 22. In note 1 "R3" is added after R1.

Note 3. (Superseded) In RT–68/GRC models bearing Order No. 16817–PHILA–51 with serial numbers 5975 through 13147 and in the following RT–67/GRC models, capacitor C306 (100 $\mu\mu$f in the RT–67/GRC models and 75 $\mu\mu$f in the RT–68/GRC models) is connected between ground and the wire joining J306 and J308.

Order No.	Serial No.
2903–PHILA–52	ALL.
4320–PHILA–53	ALL.
16831–PHILA–51	ALL.
18651–PHILA–49	LATE MODELS.
21434–PHILA–50	ALL.
32111–PHILA–51	SOME MODELS.

Figure 23.

Note 3. (Superseded) In RT–66/GRC models bearing Order No. 1759–PHILA–51 or Order No. 21434–PHILA–50 with serial numbers 19815 through 23631, the bottom of resistor R1 is connected directly to ground; resistors R54 and R55 and capacitor C76 are deleted, relay 0 1, terminals 4 of J4 and P304, terminals 12 of P308 and J108, and the label from squelch circuit are no longer associated with the control grid circuit of V1.

30. Receiver R-f Amplifier V1
(fig. 22)

* * * * *

f. Circuit differences (figs. 22 and 23) are as follows:

* * * * *

(2) In RT–66/GRC models bearing Order No. 1759–Phila–51 **or Order No. 21434–Phila–50 with serial numbers 19815 through 23631,** grid resistor R1 is returned directly to ground. Capacitor C76, resistors * * * and reception periods).

* * * * *

(6) In the RT–67/GRC * * * r-f amplifier V1.

Order No.	Serial No.
2903–Phila–52	**All.**
4320–Phila–53	**All.**
16831–Phila–51	All.
* * *	* *
21434–Phila–50	**All.**
32112–Phila–51	Some models.

Figure 25. The label for the lead from pin 1,5 of tube V107 is changed to read: TO SQUELCH OSC FIL PIN 1 V103 THRU L107. The word "NOTE" is changed to read: NOTES. The existing note is numbered 1.

Note 2. (Added) See appropriate main schematic for exact value of capacitors C156 and C160.

35. Fixed I-f Amplifier and Limiter Circuits
(fig. 27)

* * * * *

e. Circuit Differences.

(1) In the following * * * is not used.

Model	Order No.	Serial No.
*	* *	* *
RT–67/GRC	16831–Phila–51	All.
	18651–Phila–49	All.
	21434–Phila–50	**All.**
	32111–Phila–51	1–7249.
*	* *	* *

* * * * *

(3) The connection between the grid, pin 6, of first limiter V111 and the grid, pin 1, of r-f amplifier V1 is not used in RT–66/GRC models (par. 30*f*(1)). The gain of the r-f amplifier is controlled by the squelch circuit.

* * * * *

Figure 27. In the chart in note 2 the serial numbers for the RT–68/GRC models on Order No. 16817–Phila–51 are changed to read: 1–13147 and the following is added:

Model	Order No.	Serial No.
RT–67/GRC	21434–PHILA–50	ALL.

36. Discriminator Circuit, V113 and V114
(figs. 28 and 29)

* * * * *

f. When the input * * * circuit balancing resistors. The voltage drop across R168 provides a means for **determining** the output of the discriminator. **The voltage across this resistor is 1/26th of the total discrimiator output voltage.** Resistor R166, connected * * * to be made.

g. An important point * * * input of V112. For signals that are 30 kc above and below the 1.4-mc center frequency, the voltages measured between

pins 1 and 7 of X200 should be a minimum of **+.9 volt** and **−.9 volt.** The two voltages * * * the proper frequency.

* * * * *

Figure 28. The reference symbol "E301", for the dial lamp, is changed to read: E313.

37. First Audio Amplifier V115

(fig. 30)

a. (Superseded) The first audio amplifier stage uses a type 3Q4 pentode tube, V115, in a class A audio-amplifier circuit with transformer output. The output of the discriminator is brought to the grid (pin 3) of V115 through coupling capacitor C192, low-pass filter R175 and capacitor C199, VOLUME control R303, and dc blocking capacitor C198. The low-pass filter, R175 and capacitor C199, serve to block high-frequency noises from the input of the amplifier. Capacitor C199 also acts as a de-emphasis capacitor and reduces the amplitude of the higher audio frequencies. This is necessary because of the pre-emphasis of the signal (increasing the amplitude of the high frequencies) in the transmitter. Dc blocking capacitor C198 serves to isolate the dc voltages on the control grid of V115 from the VOLUME control circuit.

* * * * *

g. Capacitor C200, in series with R178, shunts the primary winding of **T114** to de-emphasize the h-f end of the audio band and to reduce the noise voltages which may be present at that end of the audio band. Capacitor C203 in the grid circuit bypasses squelch bias resistors R110 and R109 for audio signals.

h. Circuit differences are as follows:

* * * * *

(3) In all RT–66/GRC * * * and capacitor C198. C197 **provides additional de-emphasis of the signal** (*a* above).

Model	Order No.	Serial No.
RT–67/GRC	**2903–Phila–52**	**All.**
	16831–Phila–51	All.
* *	* *	*
RT–68/GRC	16817–Phila–51	9674 and down.
* *	* *	*
	18651–Phila–49	All.
	21434–Phila–50	**All.**

Figure 30. In note 3, the serial numbers for the RT–68/GRC models on Order No. 16817–Phila–51 are changed to read: 1–13147.

The following is added to the chart in note 3.

Model	Order No.	Serial No.
RT–67/GRC	2903–PHILA–52	ALL.
RT–68/GRC	21434–PHILA–50	ALL.

Note 4. (Superseded) Capacitor C208 is contained only in the following models.

Model	Order No.	Serial No.
RT–67/GRC	2903–PHILA–52	ALL.
	4320–PHILA–53	ALL.
	21434–PHILA–50	ALL.
	32111–PHILA–51	18233–19133.
RT–68/GRC	32114–PHILA–51	38051 AND UP.

Note 6. (Added) In RT–68/GRC models bearing Order NO. 21434–PHILA–50, pins 1 and 7 of V116 are connected. This places the two halves of the filament in parallel.

Figure 31.

Note 3. (Superseded) Capacitor C208 is used only in models bearing Order No. 1759–PHILA–51 or Order No. 21434–PHILA–50 with serial numbers 9408 through 13505 or 16578 through 17631.

38. Power Audio Amplifier V116

(fig. 30)

* * * * *

d. (Superseded) Capacitor C208 is used in the following models only:

Model	Order No.	Serial No.
RT–66/GRC	1759–Phila–51	All.
	21434–Phila–50	9408–13505 and 16578–17631.
RT–67/GRC	2903–Phila–52	All.
	4320–Phila–53	All.
	21434–Phila–50	All.
	32111–Phila–51	18233–19133.
RT–68/GRC	32114–Phila–51	38051 and up.

40. Squelch Circuit V103

(fig. 33)

a. The squelch circuit uses a type 1S5 tube V103. The tube combines a pentode and diode in one envelope. The pentode is arranged to form a modified **tuned-plate,** tuned-grid oscillator. The diode rectifies * * * described in *b* below.

* * * * *

g. Differences in RT–67/GRC and RT–68/GRC models (fig. 33) are as follows:

(1) In the models * * * not used (*b* above).

Model	Order No.	Serial No.
RT–67/GRC	* * * *	*
	18651–Phila–49	All.
	21434–Phila–50	**All.**
	32111–Phila–51	1–7249.
RT–68/GRC	16817–Phila–51	**1–13147.**
*	* *	* *

* * * * *

h. Differences in all RT–66/GRC models except early models bearing Order No. 18651–Phila–49 (fig. 34) are as follows:

* * * * *

(6) In RT–66/GRC models bearing Order No. 1759–Phila–51 **or Order No. 21434–Phila–50 with serial numbers 19815 through 23631,** resistors R54 and R55, and capacitor C76 are deleted. Resistor R1 is * * * by contact potential.

(7) In RT–66/GRC models bearing Order No. 1759–Phila–51 **or Order No. 21434–Phila–50 with serial numbers 19815 through 23631,** the circuit containing capacitor C78 and the contacts of relay 01 is connected to the grid, pin 3 of first audio amplifier V115 through terminals 4 of J4 and P304, terminals 12 of P308 and J108, and resistor R181, 470K, instead of to the junction of resistors R109 and R174 through the indicated terminals. Operation of the circuit is discussed in *d* above.

* * * *

Figure 33. In note 2, the serial numbers for the RT–68/GRC models on Order No. 16817–Phila–51 are changed to read: 1–13147.

The following is added to the chart in note 2:

Model	Order No.	Serial No.
RT–67/GRC	21434–PHILA–50	ALL

Figure 34. The following is added after "ORDER NO. 1759–PHILA–51" in note 4: OR ORDER NO. 21434–PHILA–50 WITH SERIAL NUMBERS 19815 THROUGH 23631.

Figure 36. The reference symbol "P4" for the plug on the lead to the receiver antenna circuit is changed to read: P6. Terminal 1 on the coil of relay 0 301 is changed to read: 2. Terminal 8 on the coil of relay 0 301 is changed to read: 1. Terminals are added to the leads of the coil of relay 0 1. The terminal on the lead connected to pin 1 of J4 is labeled: 1. The terminal on the lead connected to pin 13 of J4 is labeled: 8.

Note 3. (Added) In RT–68/GRC models bearing Order No. 16817–PHILA–51 with serial numbers 5975 through 13147 and in the following RT–67/GRC models, capacitor C306, 100 $\mu\mu$f (75 $\mu\mu$f in RT–68/GRC models), is added between terminal 3 of relay 0 301 and ground.

Order No.	Serial No.
2903–PHILA–52	ALL.
4320–PHILA–53	ALL.
16831–PHILA–51	ALL.
18651–PHILA–49	LATE MODELS.
21434–PHILA–50	ALL.
32111–PHILA–51	SOME MODELS.

Figure 37.

Note 2. (Superseded) In all RT–66/GRC and RT–67/GRC models, except those bearing Order No. 1759–PHILA–51, capacitor C64 (1,500 $\mu\mu$f for RT–66/GRC and 500 $\mu\mu$f for RT–67/GRC models) is added between the bottom of resistor R47 and ground: capacitor C63 (1,500 $\mu\mu$f for RT–66/GRC and 500 $\mu\mu$f for RT–67/GRC models) is added between the bottom of resistor R48 and ground.

43. Plate Supply Circuits
(fig. 38)

* * * * *

c. Circuit Differences.

(1) In all RT–66/GRC * * * a wire strap.

Model	Order No.	Serial No.
RT–67/GRC	* * *	* * *
	18651–Phila–49	All.
	21434–Phila–50	**All.**
	32111–Phila–51	1–7249.
*	* *	* *

(2) In all RT–66/GRC * * * energized (*a*(3) above).

Order No.	Serial No.
4320–Phila–53	**All.**
16831–Phila–51	All.
18651–Phila–49	All.
21434–Phila–50	**All.**
32111–Phila–51	1–13671.

* * * * *

Figure 38. Terminal E9J in the 450-volt supply line is changed to read: E9H. Terminal E9H is changed to read: E9J. Resistor R134, 56K, is connected across coil L118 in the plate circuit of tube V107. The value of resistor R4, in the plate circuit of tube V1, is changed to read: 1K. Resistor R3 is disconnected from pin 1 of tube V1 and connected to pin 6 of that tube.

The chart in note 2 is changed as follows:

Model	Order No.	Serial No.
RT–67/GRC	16831–PHILA–51	ALL.
	18651–PHILA–49	ALL.
	21434–PHILA–50	**ALL.**
	32111–PHILA–51	1–7249.
RT–68/GRC	16817–PHILA–51	**13147** AND DOWN
	16821–PHILA–51	16666 AND DOWN
	18651–PHILA–49	1–1882

The following is added to the chart in note 3:

Order No.	Serial No.
4320–PHILA–53	ALL.
21434–PHILA–50	ALL.

44. Measuring Circuit

(fig. 39)

* * * * *

e. Circuit differences are as follows:

* * * * *

(3) (Added) In the following RT–68/GRC models, capacitor C307 replaces resistor R306. Capacitor C307 acts as an rf filter and a voltage divider with C302. This limits the current through the rectifier and the meter.

Order No.	Serial No.
16821–Phila–51	9600–18572.
21434–Phila–50	All.
32114–Phila–51	38051–43300.
32127–Phila–51	9600–18572.

Figure 39. 1N34 is added to the type designations for rectifier CR301.

Note 5. (Added) In the following RT–68/GRC models, capacitor C307, 18 $\mu\mu$f, replaces resistor R306.

Order No.	Serial No.
16821–PHILA–51	9600–18572.
21434–PHILA–50	ALL.
32114–PHILA–51	38051–43300.
32127–PHILA–51	9600–18572.

Figure 42.

Note. (Added) For the following RT–68/GRC models, resistor R306 is replaced by capacitor C307.

Order No.	Serial No.
16821–PHILA–51	9600–18572.
21434–PHILA–50	ALL.
32114–PHILA–51	38051–43300.
32127–PHILA–51	9600–18572.

Figure 43.

Note. (Added) Wrenches, shorting bar, and tube puller, are not supplied with some models.

50. Performing Preventive Maintenance

Caution: Tighten screws, bolts, and nuts carefully. Fittings tightened beyond the pressure for which they are designed will become damaged or broken.

* * * * *

b. Performing Interior Preventive Maintenance.

Caution: Disconnect all power before performing the following operations. When the checks are completed, reconnect the power and check for satisfactory operation.

* * * * *

(9.1) (Added) Inspect to see that set screws on TRANS ANT COUPLING control stop mechanism are tight and check for proper operation of stop mechanism (par. 68*o*).

* * * * *

56. Operational Check Chart

Caution: Turn off power when making resistance or continuity measurements.

Item of check	Test condition or operation	Normal indication	Possible causes of trouble	Further checks
*	* *	*	* *	*
6. Receiver squelch operation.	Same * * * zero. Gradually advance **SQUELCH** control in clockwise direction. Listen in headphones or loudspeaker. Measure test signal input level.	Rushing * * * direction.	*a.* Defective squelch circuit. *b.* Poor receiver sensitivity.	*a.* Check * * *item 10). *b.* Check receiver stage gain (par. 57).
*	* *	*	* *	*

57. Receiver Trouble Sectionalization Chart

Item of check	Test condtions	Test signal connections	Level	Frequency	Meter connections	Meter readings	Further checks
*	*	*		*	*	*	*
3. Discriminator tuning.	Same* * *OFF.	Signal* * * chassis.	.5 volt rms.	1.4 mc.			If * * * checks:
*	*	*		*	*	*	*
					b. Bewteen* * * (M1).	*b.* **12 volts minimum.**	*b.* Check * * * V114.
4. Discriminator balance.	Same as above.	Same as above.	.5 volt rms.	1.43 mc.	*a.* **7** and **1** of X200 (M1).	*a.* **+.9-volt** minimum.	Readings A and B should be of opposite polarity and numerically equal to within .2 volt. If * * * par. 62).
				1.37 mc.	*b.* **7** and **1** of X200 (M1).	*b.* **−.9-volt** minimum.	
*	*	*		*	*	*	*

59. Receiver-Transmitter Tracking Check Chart

The readings obtained * * * normally operating transmitter.

* * * * * * *

c. Tracking Checks.

Circuit group	Item of check	Points of measurement (M1)	Minimum acceptable meter readings at any mc detent position	Remedy if reading is incorrect
*	*	*	* * *	*
Harmonic generator.	Grid drive of V4.	E4H and chassis.	−1.9 volts at following frequencies: RT–66/GRC–20 mc and 27 mc. RT–67/GRC–28 mc and 38 mc. RT–68/GRC–39 mc and 53 mc (**−.7 volts at 53 mc for RT–68/GRC models bearing Order No. 16817–Phila–51 with serial numbers 5975 through 13147**).	Readjust * * * stop.
	Output of V4.	E2L and chassis.	−1.17 volts (**1 to −1.1 volts for RT–68/GRC models bearing Order No. 16817–Phila–51 with serial numbers 5975 through 13147**).	Readjust L8, C26, or dial stop.
	Output of V5 and output of V6.	E6A (+) and E6B (−).	2.1 volts.	Readjust L9, C33, or dial stop. Readjust L12 and C1E.
*	*	*	* * *	*

The following is added to the second sentence of note 5 in paragraph 60: and order No. 16817–PHILA–51 with serial numbers 5975 through 13147.

Figure 65. The resistance reading for pin 1 of tube V1 is changed to read: 470K.

The voltage and resistance reading for pin 8 of tube V11 is changed to read: 0V, 0.

The resistance reading for terminal 4 of J4 is changed to read: 1.15 meg.

The resistance reading for pin 5 of tube V3 is changed to read: 82K.

The voltage reading for terminal 5 of J5 is changed to read: 0V.

The resistance reading for terminal 5 of J5 is changed to read: ∞.

Note 9. (Added) For RT–68/GRC models on Order No. 21434–PHILA–50, the voltage on pin 11 of J5 is 0(250)V.

Figure 66. Note, chart. For RT–66/GRC models bearing Order No. 21434–Phila–50, the resistance reading for pin 1 of tube V1 is changed to read: 100K.

Figure 68. The resistance reading on pin 6 of V112 is changed to read: 168K.

The type designation, 1U4, for V110 is changed to read: 1L4. "NC" on terminal 11 of J108 is changed to read: 0V. A resistance reading of 2.1 meg is added below the line for terminal 11 of J108.

The following is added to the chart in note 3:

Model	Order No.	Tube	Pin	Voltage	Resistance
RT–67/GRC	2903–PHILA–52	V104	2	(82)V	—
		V101	1	—	.2
		V113	5	NC	NC
		V114	5	NC	NC
		J108	11	0V	
		J106	12	—	18
RT–67/GRC	21434–PHILA–50	V104	2	0(82)V	—
		V110	2	67V	—
		V110	3	67V	—
		V111	2	82V	—
		V111	3	82V	—
		V113	2	—	345K
		V113	3	—	315K
		V113	5	NC	NC
		V113	6	—	345K
		V114	2	—	345K
		V114	3	—	315K
		V114	5	NC	NC
		V114	6	—	345K
		J106	12	—	18
		J108	6	3.2V	—
		J108	11	0V	780K
RT–68/GRC	21434–PHILA–50	J106	12	—	15
		J107	5	—	15

Figure 69. caption (Superseded). *Resistance and voltage data, if chassis, for RT–67/GRC models bearing Orders No. 16831–Phila–51, 32111–Philc–51, and 4320–Phila–53.*

The following note is added:

Note. For RT–67/GRC models bearing Order No. 4320–PHILA–53, the resistance from pin 6 of V103 to ground is 82K.

62. Resistance Measurements
(figs. 65 through 70)

These checks are * * * to be defective.

* * * * *

b. Make the pertinent * * * the preceding paragraphs.

Circuit or stage	Point of measurement	Normal reading (ohms)	Probable trouble
*	* * *	*	* *
Receiver second mixer (V109).	From term. 1 to term. 7 of X109. **V109 must be removed from the socket when making this measurement.**	150 (**470 in some models.**)	Defective R143.
*	* * *	*	* *
First limiter stage (V111).	From term. 1 to term. 6 of X111.	198,000	Defective R153 or R154.

Circuit or stage	Point of measurement	Normal reading (ohms)	Probable trouble
*	* * *	*	* *
	From term. 1 of X111 to term. 7 of X112.	0	Defective L131.
Second limiter stage (V112).	From term. 2 of term. 3 of X112.	0	Defective L132.
*	* * *	*	* *
First audio amplifier (V115).	Across R175.	270,000 (150,000 in some models.)	Defective R175.
*	* * *	*	* *
	From term. 3 of X115 to chassis.	1.61 meg	Defective contacts 1–2 of relay 0 101, R173, R174, R109, R110. **For early RT–66/GRC models, a defective R54 or R55 is also a probable trouble.**
* *	* *	*	* *
Receiver oscillator (V101).	From term. 2 to term. 3 of X101.	0	Wiring defective.
	From term. 1 to term. 7 of X101. **V101 must be removed from the socket when making this measurement.**	150	Defective R102.
* *	* *	*	* *
Crystal oscillator-harmonic generator (V3).	From term. 1 to term. 7 of X3.	0	Defective wiring.
	From term. 4 to term. 7 of X3. **V3 must be removed from the socket when making this measurement.**	150	Defective R14.
* *	* * *	*	*
Transmitter mixer (V6).	From term. 2 to term. 3 of X6.	41,420	Defective L12, R31, R30, or R29.
	From term. 3 of X6 to stand-off insulator 7F. *Note.* For RT–66/GRC and RT–67/GRC models, the normal reading is 41,200.	58,200	Defective R29 or R30. *Note.* For RT–68/GRC sets bearing Order No. 18651–Phila–49 **or 16817–Phila–51,** R29 is not used
* *	* * *	*	*
Transmitter r-f amplifier (V7 and V8).	From term. 2 of X7 to term. 2 of X8.	0	Defective wiring.
* *	* * *	*	*
	From term. 7 to term. 1 of X7. ***Note.* Tubes V7 and V8 must be removed from their sockets when making the above two measurements.**	27	Defective R34.
	From term. 7 of X7 to term. 7 of X8.	0	Defective wiring.
	From term. 1 of X7 to term. 5 of X9. *Note.* For all RT–68/GRC sets, and for the following RT–66/GRC and RT–67/GRC sets, normal reading is 10. RT–66/GRC–1759–Phila–51, RT–67/GRC–1759–Phila–51, **4320–Phila–53,** 32111–Phila–51.	7	Defective L14. *Note.* For sets listed in column 2, L14 is replaced by R56.
* *	* * *	*	*
Transmitter power amplifier (V11).	From plate cap of V11 to test point E9H.	4	Defective L22 or L21.
* *	* * *	*	*
	From term. 5 of X11 to test point E9F. *Notes:* 1. For the following * * * reading is 2,400. **18651–Phila–49.** 32138–Phila–51. **2. For RT–67/GRC models bearing Order No. 4320–Phila–53 and for** RT–68/GRC sets bearing Order No. 1759–Phila–51 and 18651–Phila–49 (early sets), normal reading is 10,000. **For all other RT–68/GRC models, the normal reading is 5,100.**	3,300	Defective R51 or test terminal.
* *	* * *	*	*

Figure 76.

Note 1. (Added) In RT–67/GRC models bearing Order No. 4320–PHILA–53, resistor R107 is connected between terminals 15 and 18 on the rear of the a board instead of the front of the a board.

Note 2. (Added) In the following models, C197 is connected between terminals 11 and 12 on the front of the a board.

Model	Order No.
RT–67/GRC	2903–PHILA–52
RT–68/GRC	16817–PHILA–51
	21434–PHILA–50

Note 3. (Added) In the models listed in note 2 above and in RT–67/GRC models bearing Order No. 21434–PHILA–50, resistor R176 is connected between terminals 17 and 18 on the front of the a board instead of the rear of the a board.

68. Special Repair Procedures
(figs. 12.1, 40 through 59, and 71 through 76.1)

Most of the *** replacement without disassembly.

* * * * *

1.1. (Added) *MCS and TENTH MCS Knobs (fig. 12.1).* RT–67/GRC models bearing Order No. 2903–Phila–52 or Order No. 21434–Phila–50 with serial numbers 11410 through 14874 and RT–68/GRC models bearing Order No. 21434–Phila–50, use a new type of tuning control knob. This knob may be used as either an MCS or TENTH MCS knob. The knob contains a removable mounting insert with a small round depression on the back of it. This round depression is used as an indicator. The back of the knob is marked with two dots, one labeled RIGHT and the other labeled LEFT. To use the knob as an MCS (left-hand) knob, the indicator on the mounting insert must be in line with the dot marked LEFT on the knob. To use the knob as a TENTH MCS (right-hand) knob, the indicator must be in line with the dot marked RIGHT. To change the mounting insert from one position to another, it must be removed from the knob. To remove it, place the blade of a screw driver in the slot in the front of the knob and push the insert out. It may then be placed in the desired position with the indicator opposite the desired dot. When the mounting insert is in the desired position, push it back into the knob.

* * * * *

o. (Added) *Adjustment of TRANS ANT COUPLING Control Stop Mechanism* (fig. 76.1). The stop for the TRANS ANT COUPLING control, located on the rear of the front panel, may fail to stop the rotation of this control at the proper point. This results in the shorting of movable antenna coil L23 to plate coil L22 and may also cause breakage of the coil support. The short causes resistor R53 to burn out. Generally, failure of the stop is due to incorrect positioning of the stop mechanism on the control shaft or loose setscrews in the stop mechanism or coupling. The operation of the mechanism should be checked in the following manner:

(1) Release the fasteners and remove the set from its case.

(2) Tighten the two setscrews in the TRANS ANT COUPLING stop mechanism behind the front panel. (A, fig. 76.1).

(3) Tighten the screws in the coupling (B, fig. 76.1).

(4) Locate metering socket J3 and insert one lead of an ohmmeter in test point E9H of the socket. Connect the other ohmmeter lead to a suitable ground point.

(5) With a screwdriver, turn the TRANS ANT COUPLING control to the maximum clockwise position. Apply *slightly* more than the normal amount of turning pressure when the control is at the maximum clockwise position. Observe the meter for an indication of continuity. If there is no indication of continuity, repeat the procedure several times by backing off slightly and again turning to the maximum clockwise position. If continuity is indicated on the meter, proceed as in (7), below.

(6) Tap the TRANS ANT COUPLING coil assembly (T9), when in a maximum clockwise position, with the butt end of a screwdriver to simulate conditions of vibration. Observe the ohmmeter for signs of continuity.

(7) Any sign of continuity observed during the procedure of (5) and (6) above indicates a short circuit caused by a faulty stop mechanism. In this case, the stop mechanism must be adjusted as in (*a*) and (*b*) below. If no signs of continuity were observed proceed to (8), below.

(*a*) Remove the if chassis from the equipment (par 66*a*).

(*b*) Remove the four screws that hold the sheet metal plate covering coil assembly T9 on the side of the rf chassis.

(*c*) Turn the TRANS ANT COUPLING control until there is a clearance of approximately one thirty-second of an inch between coils L22 and L23.

(*d*) Loosen the setscrews in the stop mechanism (A, fig. 76.1).

(*e*) Hold the coupling (B, fig. 76.1) and turn the stop mechanism in a clockwise direction until it engages and stops. Tighten the setscrews.

(*f*) Recheck the clearance between the coils. If it is less than that specified in (*c*) above, reset the stop assembly. Repeat the procedures in (5) and (6) above.

(8) Replace the plate that covers coil assembly T9.

(9) Replace the if chassis in its original position (par. 67*b*).

(10) Replace the equipment in its case and engage the fasteners.

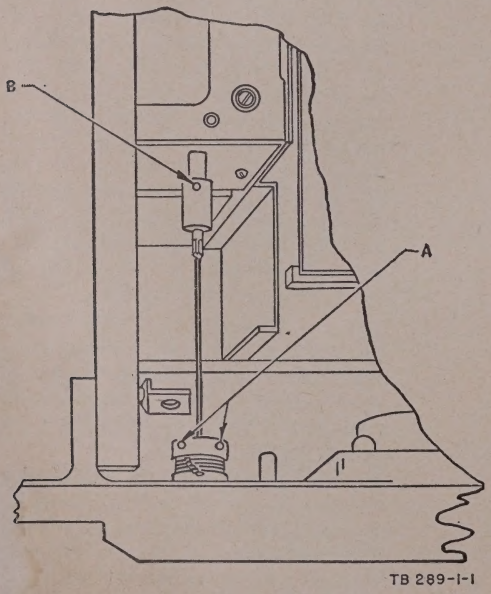


Figure 76.1 (Added). TRANS ANT COUPLING control assembly.

75. Receiver Alinement

a. Discriminator Alinement.

* * * * *

(9) Adjust the frequency *** opposite in polarity. The difference between the two meter readings should not be greater than .2 volt.

* * * * *

76. Transmitter Alinement

* * * * *

e. Transmitter H-f Circuit Tuning.

Note. If only partial *** through (18) below.

* * * * *

(6) Turn the MCS dial to the detent position which is 1 mc below the highest mc setting. Turn the TENTH MCS dial to detent position 0.

* * * * *

79. Variable I-f Selectivity

The variable i-f amplifier selectivity should be measured in accordance with the following procedure:

* * * * *

h. Raise the frequency of the signal generator to a frequency above 4.95 mc until the 50-μa limiter meter reading again is obtained. Note the frequency.

i. (Superseded) Tune the signal generator to a frequency below 4.95 mc until the same limiter meter reading again is obtained. *Note the frequency.*

i.1. (Added) Increase the signal generator output to 10 times the value obtained as indicated in *f* above, and then to 100 times the value obtained in *f*. Repeat the procedures given in *h* and *i* above for each setting of the signal generator.

Requirement: (Superseded). The amount that the test frequency was increased above 4.95 mc to obtain a 50-microampere limiter meter reading should be approximately equal to the amount that the test frequency was decreased below 4.95 mc to obtain that same reading. This requirement determines the symmetry of the selectivity curve of the if amplifiers. The amount that the frequency was increased should not differ by more than 10 kc from the amount that the frequency was decreased. The difference between the frequencies above and below 4.95 mc, when the signal generator output has been doubled, should be 85 $\pm$10 kc (80 $\pm$20 kc in RT–66/GRC models bear-

ing Order No. 18651–Phila–49 with serial numbers 1 through 1500). This determines the bandwidth of the amplifier at the point where the response is 6 db below the response at the center frequency. When the signal generator output has been increased to 10 times the initial value, the total bandwidth should be 120 ±25 kc (90 ±20 kc in RT–66/GRC models mentioned above). When the signal generator output has been increased to 100 times the initial value, the total bandwidth should not be greater than 185 kc.

* * * * *

81. Transmitter Frequency Calibration

A heterodyne type Frequency Meter TS–174/U (M5) is required for this test.

* * * * *

81.1. Receiver Oscillator Calibration (Added)

a. Loosely couple Frequency Meter Set SCR–211, or its equivalent, to the receiver oscillator. Use the following procedure. Insert one end of an insulated wire between the envelope and shield of tube V101 and connect the other end of the wire to the frequency meter input.

b. Connect the headphones to the frequency meter.

c. Adjust the frequency meter to approximately 3.05 mc.

d. Turn the TENTH MCS knob to detent position 0.

e. Readjust the frequency meter until an indication of zero beat is obtained in the headphones. Determine the frequency indicated on the frequency meter.

f. The frequency indicated should not be greater than 3.059 mc nor less than 3.041 mc.

g. Turn the TENTH MCS knob to detent position 4 and adjust the frequency meter to approximately 3.45 mc. Repeat procedures given in *e* above. The frequency indicated on the meter should not be greater than 3.459 mc nor less than 3.441 mc.

h. Turn the TENTH MCS knob to detent position 9 and adjust the frequency meter to approximately 3.95 mc. Repeat procedure given in *e* above. The frequency indicated on the meter should not be greater than 3.959 mc nor less than 3.941 mc.

Figure 79. The chart in note 9 is superseded by the following:

REF SYM	1759–PHILA–51	21434–PHILA–50	32137–PHILA–51	32138–PHILA–51
C63, C64	NOT USED			
C76	NOT USED SEE NOTE 10	NOT USED IN SERIAL NUMBERS 19815 THROUGH 23631.		
C137, C138	NOT USED	NOT USED.	NOT USED IN SERIAL NUMBERS 7075 AND UP.	
C208		2,000 IN SERIAL NUMBERS 9408–13505 and 16578–17631.	NOT USED	NOT USED
R3		15K IN SERIAL NUMBERS 10371 AND DOWN AND 13506–16577.		
R39				680 IN SERIAL NUMBERS 3,800 AND DOWN.
R40				2,700 IN SERIAL NUMBERS 3,800 AND DOWN.
R46				22K IN SERIAL NUMBERS 3,801 AND UP.
R47, R48	6,200			6,200
R51				1,800 IN SERIAL NUMBERS 3,800 AND DOWN.

REF SYM	1759–PHILA–51	21434–PHILA–51	32137–PHILA–51	32138–PHILA–51
R52				3,300 IN SERIAL NUMBERS 3,800 AND DOWN.
R54	NOT USED	NOT USED IN SERIAL NUMBERS 19815–23631.		100K IN SERIAL NUMBERS 2715 AND DOWN.
R55	NOT USED SEE NOTE 10	NOT USED IN SERIAL NUMBERS 19815–23631.		
R56, R57			REPLACED WITH COILS L14 AND L15, 5.3 UH EACH.	REPLACED WITH COILS L14 AND L15, 5.3 UH EACH.
R125, R142	6,800			6,800
R143	470	470 IN SERIAL NUMBERS 10952–13505 AND 16578–17638.		
R182, R183				NOT USED IN SERIAL NUMBERS 2715 AND DOWN. SEE NOTE 12.
L20			REPLACED WITH WIRE STRAP IN SERIAL NUMBERS 6840 AND UP.	

Note 10. (Superseded) In models bearing Order No. 1759–PHILA–51, or Order No. 21434–PHILA–50 with serial numbers 19815 through 23631, the bottom of resistor R1 is connected directly to ground; resistors R54 and R55 and capacitor C76 are not used; and the circuit consisting of relay 0 1, terminals 4 of J4 and P304, and terminals 12 of P308 and J108 is no longer associated with the control grid circuit (pin 1) of receiver RF amplifier V1.

Note 13. (Superseded) In models bearing Order No. 1759–PHILA–51, or Order No. 21434–PHILA–50 with serial numbers 19815 through 23631, the circuit containing capacitor C78, the contacts of relay 0 1, terminals 12 of J108 and P308, and terminals 4 of P304 and J4 is connected to the grid, pin 3 of first audio V115 through resistor R181, 470K (added), instead of to the junction of resistors R109 and R174.

Figure 81. Capacitor C17B, in the plate circuit of V4, is disconnected from ground and connected to the junction of capacitor C28 and coil L8. IN34 is added to the type designations below the reference symbol CR301 in the metering circuit. In the chart in note 9, the information opposite the reference symbol R143 in the column headed "Order No. 32111–Phila–51" is changed to read as follows:

470 IN SERIAL NO. 13636—13671 AND 14868–19133.

The following information and new columns are added to the chart in note 9:

Ref sym	32111–PHILA–51	4320–PHILA–53	2903–PHILA–52	21434–PHILA–50
C10			3,000	
C63, C64			1,500	
C70			1,500	
C137, C138			NOT USED.	NOT USED.
C156, C160	27 IN SERIAL NOS. 18747–19133.	27		
C197		NOT USED.		NOT USED.
R3		82K		82K
R23			1 MEG	
R51			10K 2 WATT	10K 2 WATT
R111				1 MEG
R143		470	470	470
R54			6,800	6,800

The following is added to the chart in note 11:

Order No.	Serial No.
21434–PHILA–50	All.

The following is added to the chart in note 12:

Order No.	Serial No.
4320–PHILA–53	All.
21434–PHILA–50	All.

Note 15. (Added) In the models listed below, coil L22 in the plate circuit of V11 is tuned by a shorted turn assembly.

Order No.	Serial No.
2903–PHILA–52	All.
4320–PHILA–53	All.
21434–PHILA–50	All.

Note 16. (Added) In the models listed below, capacitor C208, 2,000 $\mu\mu$f, is added between terminals 4 and 6 of T115.

Order No.	Serial No.
2903–PHILA–52	All.
4320–PHILA–53	All.
21434–PHILA–50	All.
32111–PHILA–51	18233–19133.

Note 17. (Added) In models bearing Order No. 2903–PHILA–52, the capacitor connected across L18, C1J, and C1K in the plate circuit of V9 and V10 is not used.

Figure 82. The reference symbol T105 is added above the transformer connected in the plate circuit of the 1,600-cps oscillator, V104.

L1, in the plate circuit of V6, is changed to read: L12. 1N34 is added to the type designations below the reference symbol CR301 in the metering circuit.

Terminal 6, between terminals 7 and 9 in the secondary of T114, is changed to read: 8

In the note 9 chart, the information opposite the reference symbol R113 in the column headed "Order No. 16817–PHILA–51" is changed to read: 470K IN SERIAL NUMBERS 13147 AND DOWN.

The following information and new column are added to the chart in note 9:

Ref sym	16817–PHILA–51	16821–PHILA–51	32114–PHILA–51	32127–PHILA–51	21434–PHILA–50
C73					3,300
C137, C138					NOT USED.
C156, C160		27 IN SERIAL NO. 12001–18572.		27 IN SERIAL NO. 12001–18572.	
C207		2,200 IN SERIAL NO.9600–18572.		2,200 IN SERIAL NO. 9600–18572.	
C208					NOT USED.
R51					2 WATT
R47, R48	5,100 IN SERIAL NO. 11775–13147.				
R125, R142	5,600 IN SERIAL NO. 11775–13147.				
R143		470 IN SERIAL NO. 9600–18572.	470 IN SERIAL NO. 38051–43300.	470 IN SERIAL NO. 9600–18572.	470

In the chart, note 10 "Serial No." column, "9675 AND DOWN is changed to read: 13147 AND DOWN.

Note 13. (Added) In models bearing Order No. 21434–PHILA–50 with serial numbers 30678 through 35270, coil L22 in the plate circuit of V11 is tuned by a shorted turn assembly.

Note 14. (Added) In models bearing Order No. 16817–PHILA–51 with serial numbers 5975 through 13147, capacitor C306, 75 $\mu\mu$f, is connected between ground and the lead joining J308 to J306.

Note 15. (Added) In the models listed below, resistor R306 is replaced by capacitor C307, 18 $\mu\mu$f.

Order No.	Serial Number
16821–PHILA–51	All.
21434–PHILA–50	All.
32114–PHILA–51	38051–43300.
32127–PHILA–51	9600–18572.

Note 16. (Added) For models bearing Order No. 16817–PHILA–51, change terminal 1 and 2 of L108B to read 2 and 1, respectively.

APPENDIX II.
IDENTIFICATION TABLE OF PARTS
(Rescinded)

[AG 413. 44 (25 Feb 55)]

BY ORDER OF THE SECRETARIES OF THE ARMY AND THE AIR FORCE:

M. B. RIDGWAY,
General, United States Army,
Chief of Staff.

OFFICIAL:
JOHN A. KLEIN,
Major General, United States Army,
The Adjutant General.

N. F. TWINING,
Chief of Staff, United States Air Force.

OFFICIAL:
E. E. TORO,
Colonel, United States Air Force,
Air Adjutant General.

DISTRIBUTION:
Active Army:

Tec Svc, DA (1)
Tec Svc Bd (1)
CONARC (5)
CONARC Bd (Incl ea Test Sec)
Army AA Comd (2)
OS Maj Comd (5)
OS Base Comd (5)
Log Comd (5)
MDW (1)
Armies (5)
Corps (2)
Tng Div (2)
Ft & Cp (2)
Gen & Br Svc Sch (5)
SigC Sch (25)
USMA (5)
Gen Depots (2)
Sig C Sec, Gen Depots (10)
SigC Depots (20)
POE (2)
OS Sup Agencies (2)
SigC Fld Maint Shops (3)
SigC Lab (5)
Mil Dist (1)
Units organized under following TOE:
3–266A, Hq&Hq Det, Cml Smoke Genr Bn (2)
3–267A, Cml Smoke Genr Co (2)
5–139A, Engr Pontoon Bridge Co (2)
5–167A, Engr Topo Co Corps (2)
5–215, Armd Engr Bn (2)
5–216, H&S Co, Armd Engr Bn (2)
5–217, Armd Engr Co, Armd Engr Bn (2)
5–218, Bridge Co, Armd Engr Bn (2)
5–225A, Abn Engr Bn (2)
5–226A, H&S Co, Abn Engr Bn (2)
5–227A, Abn Engr Co, Abn Engr Bn (2)
5–315A, Engr Cons Bn (2)
5–316A, H&S Co, Engr Cons Bn (2)
5–348A, Engr Base Survey Co (2)
5–525A, Engr Shore Bn (2)
5–526A, H&S Co, Engr Shore Bn (2)
6–100A, Div Arty, Inf Div (2)
6–101A, Hq&Hq Brty-Arty-Inf Div (2)
6–115A, FA Bn (75mm How Pack) (2)
6–116A, H&S Btry, FA Bn (75mm How, Pack) (2)
6–125A, FA Bn (105mm How, Towed) (2)
6–126, Hq&Hq Btry, FA Bn (105mm How, Towed) (2)
6–129, Svc Btry FA Bn (105mm How, Towed) (2)
6–135, FA Bn (155mm How, Towed) (2)
6–136, Hq&Hq Btry, FA Bn (155mm How, Towed) (2)
6–139,Svc Btry, FA Bn(155 mm How, Towed) (2)
6–200A, Div Arty, Abn Div (2)
6–201A, Hq&Hq Btry, Div Arty, Abn Div (2)
6–225A, Abn FA Bn (105mm How, Towed) (2)
6–226A, Hq&Hq Btry, Abn FA Bn (105mm How, Towed) (2)
6–229A, Svc Btry, FA Bn (155mm How, Towed) (2)
6–235A, Abn FA Bn (155mm How, Towed) (2)
6–236A, Hq&Hq Btry, Abn FA Bn (155mm How, Towed) (2)
6–300, Div Arty, Armd Div (2)
6–301A, Hq&Hq Btry, Div Arty, Armd Div (2)
6–315, FA Bn (105mm How, SP Armd) (2)
6–316, Hq&Hq Btry, Armd FA Bn (105mm How, SP, Div) (2)
6–319, Svc Btry, Armd FA Bn (2)
6–325, FA Bn (155mm How, SP Armd) (2)
6–326, Hq&Hq Btry, FA Bn (155mm How, SP Armd) (2)
6–327, FA Btry (155mm How, SP Armd) (2)
6–401, Hq&Hq Btry, GA Gp (2)
6–415A, FA Bn (Hv Towed 155mm How, 8 inch) (2)
6–416A, Hq&Hq Btry, FA Bn (Hv Towed or SP) (2)
6–417A, FA Btry (8 inch or 155mm Gun) (2)

6–419A, Svc Btry, FA Bn (155mm or 8 inch Gun) (2)
6–435A, FA Bn Hv SP (155mm-8 inch How) (2)
6–437A, FA Btry (155mm Gun SP) (2)
6–447A, FA Btry (8 inch How SP) (2)
6–501A, Hq&Hq Btry, Cor Arty or Abn Cor Arty (2)
6–515A, FA Bn (Very Hv Towed 240mm How) (2)
6–517A, FA Btry (240mm How) (2)
6–535A, FA Bn (280mm Gun) (2)
6–536A, H&S Btry, FA Bn (280mm Gun) (2)
6–537A, FA Btry (280mm Gun) (2)
6–538A, FA Rkt Btry (762mm) (2)
6–545A, FA Msl Bn, Cpl (2)
6–546A, Hq&Hq Btry, FA Msl Bn, Cpl (2)
6–549A, Svc Btry, FA Msl Bn, Cpl (2)
6–558A, FA Slt Btry (2)
6–575, FA Obsr Bn (2)
6–576, Hq&Hq Btry, FA Obsr Bn (2)
6–577, FA Obsr Btry (2)
6–615, FA Bn (4.5 inch Rkt, Towed) (2)
6–616, Hq&Hq Btry, FA Bn (4.5 inch Rkt Towed) (2)
6–617, FA Btry (4.5 inch Rkt, Towed) (2)
7A, Inf Div (2)
7–1, Hq, Inf Div (2)
7–2, Hq Co, Inf Div (2)
7–11A, Inf Regt (2)
7–12, Hq&Hq Co, Inf Regt (2)
7–14, Inf Hv Mort Co (2)
7–15, Inf Bn (2)
7–16, Hq&Hq Co, Inf Bn (2)
7–25, Armd Inf Bn (2)
7–26, H&S Co, Armd Inf Bn (2)
7–27, R Co, Armd Inf Bn (2)
7–31, Abn Inf Regt (2)
7–32A, Hq&Hq Co, Abn Inf Regt (2)
7–34A, Spt Co, Abn Inf Regt (2)
7–35A, Abn Inf Bn (2)
7–36A, Hq&Hq Co, Abn Inf Bn (2)
7–45, Inf Hv Mort Bn (2)
7–46, Hq&Hq Co, Inf Hv Mort Bn (2)
9–95A, Inf Bn, Sep (2)
7–96A, H&S Co, Inf Bn, Sep (2)
8–17, Med Co, Inf Regt (2)
8–37A, Med Co, Abn Inf Regt (2)
8–75, Armd Med Bn (2)
8–76, Hq&Hq Co, Armd Med Bn (2)
8–77, Co, Armd Med Bn (2)
9–45A, Ord Sp Wpn Spt or Depot Bn (2)
9–49, Ord Sp Wpn Dir Spt Co (2)
9–65, Armd Ord Bn (2)
9–66, Hq&Hq Co, Armd Ord Bn (2)
9–67, Co, Armd Ord Bn (2)
9–375, Ord Sp Wpns Depot Bn (2)
10–45, Armd QM Bn, Armd Div (2)
10–46, Hq&Hq Det, Armd QM Bn (2)
10–47, QM Sup Co, Armd QM Bn (2)
10–48, QM Fld Svc Co, Armd QM Bn (2)
11–7, Sig Co Inf Div (2)
11–16A, Hq&Hq Co, Sig Bn, Corps or Abn Corps (2)
11–57, Armd Sig Co (2)
11–127, Sig Rep Co (2)
11–128A, Sig Depot Co (2)
11–500A (AA thru AE), Sig Svc Org (2)
11–537A, Sig Co, Amph Spt Brig (2)
11–557A, Abn Sig Co (2)
11–587A, Sig Base Maint Co (2)
11–592A, Hq&Hq Co, Sig Base Depot (2)
11–597A, Sig Base Depot Co (2)
17A, Armd Div (2)
17–1, Hq Armd Div (2)
17–2, Hq Co, Armd Div (2)
17–17, Tk Co, 76mm Gun, Sep, Sp (2)
17–22A, Hq&Hq Co, CC (2)
17–25A, Tk Bn, 90mm Gun (2)
17–26, H&S Co, Tk Bn, 90mm Gun (2)
17–27A, Tk Co, 90mm Gun (2)
17–32A, Hq&Hq Co, Armd Gp (2)
17–35, Tk Bn, 120–90mm Gun (2)
17–36, H&S Co, Tk Bn, 120–90mm Gun (2)
17–37, Tk Co, 120–90mm Gun (2)
17–45, Recon Bn, Armd Div (2)
17–46, H&S Co, Recon Bn, Armd Div (2)
17–51, Armd Cav Regt (2)
17–52A, Hq&Hq Co, Armd Cav Regt (2)
17–53A, Svc Co, Armd Cav Regt (2)
17–55, Armd Cav Recon Bn (2)
17–56A, Hq&Hq Co, Armd Cav Recon Bn (2)
17–57, Recon Co (2)
17–62A, Hq&Hq Co, Armd Div, Tn (2)
17–115A, Amph Tk Bn (2)
17–116A, H&S Co, Amph Tk Bn (2)
17–117A, Amph Tk Co (2)
17–125A, Amph Trac Bn (2)
17–126A, H&S Co, Amph Trac Bn (2)
17–127A, Amph Trac Co (2)
19–27, MP Co, Div (2)
19–35A, MP Bn A (2)
19–37, MP Co, Corps or Abn Corps, A (2)
19–55A, MP Bn (2)
19–77A, MP Scty Co (2)
19–97A, MP Co, Abn Div (2)
20–46A, Hq&Hq Det, Scout Bn A, NG (2)
20–300A, Amph Spt Brig (2)
20–511, Amph Spt Regt (2)
20–512, H&S Co, Amph Spt Regt (2)
44–35A, AAA Bn Lt, 75mm Mbl (2)
44–36A, Hq&Hq Btry, AAA Bn Lt, 75mm, Mbl (2)
44–37A, AAA Btry Lt, 75mm, Mbl (2)
44–75, AAA Auto Wpn Bn, Sp (2)
44–76, Hq&Hq Btry, AAA AW Bn, Sp (2)
44–77, AAA Auto Wpn Btry, Sp (2)
44–275A, Abn AA Bn (2)
44–276A, Hq&Hq Btry, Abn AA Bn (2)
44–277A, AW Btry, Abn AA Bn (2)
51–2, Hq Co, A (2)
52–2, Hq Co, Corps or Abn Corps (2)
55–9A, T Harcft Co, Amph Spt Brig (2)
55–16A, Hq&Hq Co, T Trk Bn A-Comz (2)
55–37, T Amph Trk Co (2) (A or Comz)

55–56, Hq&Hq Det, Hcptr Bn, A (2)
55–515A, T Boat Bn (2)
55–516A, Hq&Hq Co, T Boat Bn (2)
55–555A, T Boat Maint Bn (2)
55–556A, H&S Co, T Boat Maint Bn (2)
57, Abn Div (2)
57–2A, Hq Co, Abn Div (2)
57–57, Recon Co, Abn Div (2)

NG: Same as Active Army except allowance is one copy to each unit.
USAR: None.
For explanation of abbreviations used, see SR 320–50–1.

TECHNICAL MANUAL

RECEIVER-TRANSMITTERS RT–66/GRC, RT–67/GRC, AND RT–68/GRC

TM 11–289
CHANGES No. 7

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *16 July 1963*

TM 11–289, 3 December 1953, is changed as follows:

Note. The parenthetical references to previous changes (example: "page 3 of C 4") indicates that pertinent material was published in that Changes.

Page 7. Add paragraph 1.1 after paragraph 1.

1.1. Index of Publications

Refer to the latest issue of DA Pam 310–4 to determine whether there are new editions, changes, or additional publications pertaining to your equipment. DA Pam 310–4 is a current index of technical manuals, technical bulletins, supply bulletins, lubrication orders, and modification work orders that are available through publications supply channels. The index lists the individual parts (–10, –20, –35P, etc.) and the latest changes and revisions of each equipment publication.

Paragraph 2 (page 1 of C 1). Delete paragraph 2 and substitute:

2. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment forms and records in accordance with instructions in TM 38–750.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700–58 (Army), NAVSANDA Publication 378 (Navy), and AFR 71–4 (Air Force).

c. Comments on Manual. Forward all comments on this publication direct to: Commanding Officer, U.S. Army Electronics Materiel Support Agency, ATTN: SELMS–MP, Fort Monmouth, N.J. DA Form 1598 (Record of Comments on Publications), DA Form 2496 (Disposition Form), or letter may be used.

Page 166, appendix I. Add the following references:

DA Pam 310–4—Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.

TM 38–750—The Army Equipment Record System and Procedures.

Add appendix II. (Page 15 of C 1).

APPENDIX II

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

1. General

a. This appendix assigns maintenance functions to be performed on components, assemblies, and subassemblies by the lowest appropriate maintenance echelon.

b. Columns in the maintenance allocation chart are as follows:

(1) *Part or component.* This column shows only the nomenclature or standard item name. Additional descriptive data are included only where clarification is necessary to identify the component. Components, assemblies, and subassemblies are listed in top-down order. That is, the assemblies which are part of a component are listed immediately below that

*These changes supersede that portion of TM 11–5820–283–20P, 23 July 1959, as pertains to maintenance allocation.

component, and the subassemblies which are part of an assembly are listed immediately below that assembly. Each generation breakdown (components, assemblies, or subassemblies) is listed in disassembly order or alphabetical order.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the echelons.

(*a*) *Service.* To clean, to preserve, and to replenish lubricants.

(*b*) *Adjust.* To regulate periodically to prevent malfunction.

(*c*) *Inspect.* To verify serviceability and to detect incipent electrical or mechanical failure by scrutiny.

(*d*) *Test.* To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(*e*) *Replace.* To substitute serviceable components, assemblies, or subassemblies, for unserviceable components, assemblies, or subassemblies.

(*f*) *Repair.* To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes but is not limited to welding, grinding, riveting, straightening, and replacement of parts other than the trial and error replacement or running spare type items such as fuses, lamps, or electron tubes.

(*g*) *Aline.* To adjust two or more components of an electrical system so that their functions are properly synchronized.

(*h*) *Calibrate.* To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.

(*i*) *Overhaul.* To restore an item to *completely serviceable* condition as prescribed by serviceability standards. This is accomplished through employment of the technique of "Inspect and Repair Only as Necessary" (IROAN). Maximum utilization of diagnostic and test equipment is combined with minimum disassembly of the item during the overhaul process.

(*j*) *Rebuild.* To restore an item to a standard as near as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through the maintenance technique of complete disassembly of the item, inspection of all parts or components, repair or replacement of worn or unserviceable elements using original manufacturing tolerances and/or specifications and subsequent reassembly of the item.

(3) *1st, 2d, 3d, 4th, 5th echelons.* The symbol X indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by X are authorized to perform the indicated operation.

(4) *Tools required.* This column indicates codes assigned to each individual tool equipment, test equipment, and maintenance equipment referenced. The grouping of codes in this column of the maintenance allocation chart indicates the tool, test, and maintenance equipment required to perform the maintenance function.

(5) *Remarks.* Entries in this column will be utilized when necessary to clarify any of the data cited in the preceding column.

c. Columns in the allocation of tools for maintenance functions are as follows:

(1) *Tools required for maintenance functions.* This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

(2) *1st, 2d, 3d, 4th, 5th echelon.* The dagger (†) indicates the echelons normally allocated the facility.

(3) *Tool code.* This column lists the tool code assigned.

2. Maintenance by Using Organizations

When this equipment is used by signal services organizations organic to theater headquarters or communication zones to provide theater communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

SECTION II. MAINTENANCE ALLOCATION CHART

PART OR COMPONENT	MAINTENANCE FUNCTION	ECHELON 1	2	3	4	5	TOOLS REQUIRED	REMARKS
RECEIVER-TRANSMITTER RT-66/GRC, RT-67/GRC AND RT-68/GRC	service		X				18	
	adjust		X				18	
				X			16	
	inspect	X						
	test		X				9,15,18	
				X			2,4,11,12,13,15,16	
					X		2,3,7,8,10,11,13,15, 16,19	
						X	1,2,3,7,8,10,11,13, 14,16,19	
	replace		X				18	
	repair			X			16,17	
	align			X			2,10,11,13,15,16	
					X		2,5,7,8,10,11,13,15, 16,17	
	calibrate				X		6	
	overhaul					X	17,18	Plus shop facilities

SECTION III. ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	ECHELON 1	2	3	4	5	TOOL CODE	REMARKS
RT-66/GRC, RT-67/GRC, AND RT-68/GRC (continued)							
ANALYZER SPECTRUM TS-723/U					†	1	
AUDIO OSCILLATOR TS-382/U			†	†	†	2	
FREQUENCY METER AN/TSM-16				†	†	3	
FREQUENCY METER AN/URM-32			†			4	
FREQUENCY METER AN/URM-79				†	†	5	
FREQUENCY METER AN/URM-80				†	†	6	
GENERATOR, SIGNAL AN/URM-48				†	†	7	
METER, MODULATION ME-57/U				†	†	8	
MULTIMETER AN/URM-105		†				9	
MULTIMETER ME-26/U				†	†	10	
MULTIMETER TS-352/U			†	†	†	11	
POWER SUPPLY PP-1243/U			†			12	P/O AN/URM-32
TEST FACILITIES KIT, RADIO MK-153/GRC			†	†	†	13	
TEST SET, ELECTRON TUBE TV-2/U					†	14	
TEST SET, ELECTRON TUBE TV-7/U		†	†	†		15	
TOOL KIT, RADAR AND RADIO REPAIR TK-87/U			†	†	†	16	
TOOL KIT, SUPPLEMENTARY, RADAR AND RADIO REPAIR TK-88/U			†	†	†	17	
TOOL KIT, RADIO REPAIR TK-115/G		†				18	
VOLTMETER, ME-30/U				†	†	19	

By Order of the Secretary of the Army:

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

Official:
J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

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USA CD Agcy (1)
USCONARC (5)
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USAECOM (5)
USAMICOM (4)
ARADCOM (2)
ARADCOM Rgn (2)
OS Maj Comd (3)
OS Base Comd (2)
LOGCOMD (2)
MDW (1)
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Corps (2)
Div (2)
Bde (2)
Corps Arty (2)
Div Arty (2)
Avn Bn (2)
Avn Co (2)
Avn Det (2)
FA Gp/Bg (2)
FA Bn (2)
FA Btry (2)
FA Det (2)
Inf Gp/Bg (2)
Inf Bn (2)
Inf Co (2)
Inf Det (2)
Instl (2) except
Ft Monmouth (63)
USATC AD (2)
USATC Armor (2)
USATC Engr (2)
USATC Inf (2)
USASTC (2)
USMA (5)
Svc Colleges (2)
Br Svc Sch (2) except
USAIS (25)
USAADS (25)
GENDEP (OS) (2)
Sig Sec, GENDEP (5)
Sig Dep (OS) (12)
Army Dep (2) except
Lexington (12)
Sacramento (28)
Tobyhanna (12)
Ft Worth (8)
USA Elct RD Actv (Ft Huachuca) (2)
USA Elct RD Actv (White Sands) (13)
WRAMC (1)
BAMC (5)
USAPRDC (2)
USAINTCA (2)
USAAMC (25)
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USA Mbl Spt Cen (1)
Edgewood Arsenal (2)
USA Trans Tml Comd (1)
Army Tml (1)
POE (1)
USAOSA (1)
AFIP (1)
AMS (1)
USA Elct Mat Agcy (12)
Chicago Proc Dist (1)
USASCC (4)
USARCARIB Sig Agcy (1)
Sig Fld Maint Shops (3)
USA Corps (3)
Units organized under following TOE's (2 copies each):
3–7
3–32
3–147
3–266
3–267
3–510
5–5
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8–127
8–137
8–500 (AA–AH)
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9–66
9–67
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9–87
9–127
9–217
9–227
9–377
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9–510
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11–86
11–87
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11–98
11–117
11–155
11–156
11–157
11–237
11–500 (AA–AC)
11–500 (RM–RU)
11–555
11–556

11–557	17–55	29–5	30–17	44–16	55–16
11–558	17–56	29–7	30–18	44–17	55–17
11–587	17–57	29–21	30–19	44–85	55–18
11–592	17–62	29–25	30–25	44–86	55–38
11–597	17–65	29–26	30–28	44–87	55–47
11–608	17–66	29–27	30–29	44–235	55–56
12–7	17–77	29–35	30–500 (AA–AE)	44–236	55–57
17–2	17–85	29–36	32–67	44–435	55–75
17–4	17–86	29–37	33–77	44–436	55–76
17–17	17–100	29–51	33–105	44–437	55–78
17–22	17–102	29–52	33–106	44–445	55–109
17–25	17–105	29–53	37–42	44–446	55–117
17–26	17–106	29–55	37–100	44–447	55–157
17–27	17–107	29–56	37–102	44–448	55–500 (AA–AE)
17–32	17–108	29–57	39–51	44–535	55–510
17–35	17–408	29–65	39–52	44–536	57–4
17–36	19–27	29–67	39–62	44–537	57–5
17–37	19–29	29–307	39–65	44–544	57–6
17–42	19–35	29–500 (AA–AE)	44–2	44–545	57–42
17–45	19–37	30–14	44–12	44–546	57–100
17–46	20–45	30–15	44–15	44–547	57–102
17–51	20–46			44–548	
17–52	29–1				

NG: State AG (3) ; units—same as Active Army except allowance is one copy to each unit.
USAR: None.
For explanation of abbreviations used, see AR 320–50.

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