

DEPARTMENT OF THE ARMY TECHNICAL MANUAL
DEPARTMENT OF THE AIR FORCE TECHNICAL ORDER

RADIO RECEIVER R-388/URR

TM 11-854
TO 31R1-2URR-121
CHANGES No. 2

DEPARTMENTS OF THE ARMY AND
THE AIR FORCE
WASHINGTON 25, D. C., 29 September 1955

TM 11-854/TO 31R1-2URR-121, 23 April 1952, is changed as follows:

6. Description of Receiver

(figs. 4 and 5)

c. Headphone and speaker * * * of the chassis. The receivers procured on Order No. 25635-Phila-53 do not have a speaker jack on the front panel.

Figure 4. The following note is added:

NOTE: ON ORDER NO. 25635-PHILA-53, THE BREAK-IN OFF-ON SWITCH REPLACES THE SPEAKER JACK ON THE FRONT PANEL.

8.1. Differences in Models Procured on Order No. 3470-Phila-52

The following changes * * * Order No. 3470-Phila-52.

8.2. Differences in Models Procured on Orders No. 25635-Phila-53 and 3357-Phila-52

(Added)

a. The following changes are made in equipment procured on Order No. 25635-Phila-53:

- (1) Resistor R181 is 3,100 ohms.
- (2) Capacitor C206 is either 5 μmf or 7 μmf (par. 85d).
- (3) Capacitors C123 and C129 are each 62 μmf .
- (4) Capacitors C121 and C127 are each 200 μmf .
- (5) Capacitor C103 is 390 μmf .
- (6) Capacitor C101 is 800 μmf .
- (7) BREAK-IN OFF-ON switch S119 replaces SPEAKER jack J102 on the front panel.

b. The following changes are made in equipment procured on Order No. 3357-Phila-52:

- (1) Resistor R173 is 1,800 ohms.
- (2) Resistor R182 is 220 ohms.
- (3) The positive terminals of capacitor C214A and C214B are connected by a short bus wire.

12. Connections

When the radio * * * (figs. 3 and 9) as follows:

c. Speaker Connection.

- (1) A speaker or * * * of the receiver. Radio Receiver R-388/URR, with serial numbers 1 and above, on Order No. 25635-Phila-53, do not have a SPEAKER jack (J102) on the front panel.

14. Controls and Their Uses

(fig. 10)

Table I lists the controls of the radio receiver and indicates their functions.

Table I. Controls

Control	Function
BFO PITCH control	Adjusts * * * ON).
BREAK-IN OFF-ON toggle switch on receivers procured on Order No. 25635-Phila-53)	In OFF position, opens coil circuit of disabling relay K101. In ON position, closes coil circuit of disabling relay K101.

Figure 10. The following note is added:

NOTE: ON RADIO RECEIVERS R-388/URR, SERIAL NUMBERS 1 AND ABOVE (ORDER NO. 25635-PHILA-53), A BREAK-IN OFF-ON SWITCH REPLACES THE SPEAKER JACK ON THE FRONT PANEL.

15. Starting Procedure

a. *Preliminary.* Set the front panel controls as follows:

Control	Position
CRYSTAL FILTER PHASING control.	Aligned with mark on panel.
BREAK-IN OFF-ON switch (on receivers with serial numbers 1 and above (Order No. 25635-Phila-53)).	ON.

20. Operating Precautions and Notes

The following notes will aid the operator in securing maximum performance from the receiving equipment.

d. (Added) The BREAK-IN OFF-ON switch on receivers procured on Order No. 25635-Phila-53, should be in the ON position for nearly all modes of operation. The switch is operated to OFF to disable the break-in facilities of the equipment.

29. Performing Preventive Maintenance

The following preventive operation dictate otherwise.

Caution: Screws, bolts, and damaged or broken.

c. *Monthly.* Remove receiver from necessary and clean.

- (10) Check PHONES and SPEAKER jacks J103 and J102 for tight fit and good contact. Radio Receivers R-388/URR, serial numbers 1 and above (Order No. 25635-Phila-53), do not have the front-panel SPEAKER jack (J102).

30. Lubrication Instructions

a. (Superseded) Cover the tuning gear train teeth, cam edges, and the slug table riders with a light grease film (AN-G-25 viscosity). The bfo capacitor is located inside of T106 (fig. 33), and is varied by means of a steel extension shaft. This shaft passes through a bearing hole in the aluminum gear panel. Lubricate the shaft at the bearing point every 6 months, as follows:

- (1) Loosen the setscrew in the flexible coupling at the capacitor.
- (2) Pull the stainless-steel extension shaft forward until the portion that rotates in

the aluminum gear panel hole is exposed. Remove corrosion with No. 000 sandpaper, and then lubricate that portion with Grease, Aircraft and Instrument (GL).

36. Equipment Performance Checklist

	Item No.	Item	Action or condition	Normal indications	Corrective measures
PREPARATORY	*	*	*	*	*
	12	CALIBRATE OFF-ON switch (Order No. 25635-Phila-53 only).	Turn to OFF.	---	---
	*	*	*	*	*

38. Radio-Frequency Amplifier V101

The r-f amplifier uses single conversion.
a. *Tuning Step 1.* With the BAND (high-frequency) end. Capacitor C101 is large so that the effect of tube input capacitance changes (Miller effect) in frequency will be negligible. The tuned r-f interstage coupling capacitors.

Figure 13. The following note is added:

NOTE: ON RADIO RECEIVERS R-388/URR, SERIAL NUMBERS 1 AND ABOVE (ORDER NO. 25635-PHILA-53), CAPACITOR C101 IS 800 μ F.

Figure 14. The following note is added:

NOTE: ON RADIO RECEIVERS R-388/URR, SERIAL NUMBERS 1 AND ABOVE (ORDER NO. 25635-PHILA-53), CAPACITOR C103 IS 390 μ F.

Figure 15. The following note is added:

NOTE: ON RADIO RECEIVERS R-388/URR, SERIAL NUMBERS 1 AND ABOVE (ORDER NO. 25635-PHILA-53), CAPACITORS C121 AND C127 ARE EACH 200 μ F; C123 AND C129 ARE EACH 62 μ F.

Figure 23. The following note is added:

NOTE: ON RADIO RECEIVERS R-388/URR WITH SERIAL NUMBERS 1408 THROUGH 1447 (ORDER NO. 3470-PHILA-52) AND WITH SERIAL NUMBERS 1 THROUGH 1670 (ORDER NO. 3357-PHILA-52), FIXED CAPACITOR C214B (0.1 μ F) IS CONNECTED IN PARALLEL WITH C214A.

50. Noise Limiter and A-F Amplifier

* * * * *

c. *A-F Power Amplifier V113.* The a-f power * * * or SPEAKER jack. A SPEAKER jack does not appear on the equipment with serial numbers 1 and above (Order No. 25635-Phila-53). Located at the * * * can be connected. The SPEAKER jack (not on Radio Receivers R-388/URR with serial numbers 1 and above (Order No. 25635-Phila-53)) and PHONES jack are connected across the 600-ohm winding of the transformer. Screen voltage for * * * equalize audio output.

Figure 26. The following notes are added:

NOTES:

1. SPEAKER JACK (J102) DOES NOT APPEAR ON RADIO RECEIVERS R-388/URR WITH SERIAL NUMBERS 1 AND ABOVE ON ORDER NO. 25635-PHILA-53.
2. IN RADIO RECEIVERS R-388/URR WITH SERIAL NUMBERS 1408 THROUGH 1447 ON ORDER NO. 3470-PHILA-52 AND SERIAL NUMBERS 1 THROUGH 1670 ON ORDER NO. 3357-PHILA-52, R173 IS 1,800 OHMS AND R182 IS 220 OHMS.

Figure 27. The following note is added:

NOTE: CAPACITOR C206 IS EITHER 5 $\mu\mu\text{F}$ OR 7 $\mu\mu\text{F}$ TO FULFILL THE REQUIREMENT OF THE INDIVIDUAL RECEIVER.

53. Power Supply

The receiver power * * * for 230-volt operation.

a. The power transformer * * * and On positions. Transformer T108 has * * * receiver tube filaments.

54. Input-Output Meter

A 0- to * * * the meter connections.

b. *Output Meter.* When the INPUT-OUTPUT * * * T107 secondary winding. On Order No. 3357-Phila-52, meter loading resistor R182 is connected in parallel with meter M101. The rectified voltage * * * across resistor R182.

Figure 29. The following notes are added:

NOTES:

1. IN RADIO RECEIVERS R-388/URR WITH SERIAL NUMBERS 1 AND ABOVE ON ORDER NO. 25635-PHILA-53, RESISTOR R181 IS 3,100 OHMS.
2. IN RECEIVERS WITH SERIAL NUMBERS 361 AND ABOVE ON ORDER NO. 25067-PHILA-54-55-(51), R181 IS 1,400 OHMS; R185 (1,800

OHMS) IS CONNECTED BETWEEN THE JUNCTION OF R181 and B+ FOR V113 AND THE JUNCTION POINT OF L122 AND L123. CAPACITOR C239 (8 μF) IS CONNECTED BETWEEN THE JUNCTION POINT OF R181 AND R185 AND TERMINAL 1 OF CAPACITOR C217.

75. Removal of VFO

a. When trouble occurs in the vfo unit, replace the entire unit. To begin this task, remove the V001 and V002 tube shields, then the tubes.

78. Replacement of Dial Cables

(fig. 39)

c. *Drum Cable.* To replace the drum cable, a 27-inch length of nylon-covered string is required.

- (1) Turn the BAND CHANGE shaft to tuning step 30 (29.5 to 30.5 mc) position, thus causing pulley B to reach its counter-clockwise stop.
- (2) Tie a loop in the end of the cable and attach it to pulley B and wind it around as shown in figure 39.

85. BFO Adjustment

(Superseded)

Before performing the bfo adjustment procedure, check for optimum output of bfo input signal to the detector. To check the output, operate the METER INPUT-OUTPUT toggle switch to INPUT, turn the BFO switch to ON, and rotate the BFO PITCH control throughout its range. A noticeable change in the reading of the input-output meter, when the BFO PITCH control is rotated, indicates that excessive bfo signal is being applied to the detector. When the reading is excessive, check the value of capacitor C206 (fig. 37). This capacitor is in the output circuit of the bfo. If the value of this capacitor is 7 $\mu\mu\text{f}$, replace it with a 5- $\mu\mu\text{f}$ capacitor. In Radio Receivers R-388/URR with serial numbers 1 and higher, on Order No. 25635-Phila-53, one each 5- $\mu\mu\text{f}$ and 7- $\mu\mu\text{f}$ capacitors are included and are located beneath the chassis for use in the bfo output circuit. The unused capacitor is stored by connecting it to two grounded lugs.

a. Turn the BFO switch to ON. Connect the signal generator between the grid (pin 7) of V106 and chassis. Set the BFO PITCH capacitor to midrange.

b. With a Bristo wrench, loosen the BFO

PITCH knob, and match the index line to the line on the chassis. Tighten the knob.

c. Adjust the tuning core in T106 for zero beat; use an insulated screwdriver.

Figure 42. The line connection between the junction point of R181 and terminal 2 of T107, and the junction point of L122 and L123 is deleted. Resistor R185 (1,800 ohms) is inserted in place of the line.

Capacitor C239 (8 μ f) is added between the junction point of R181 and R185 and terminal 1 of C217.

The word NOTE is changed to read: NOTES. The numerals 1 and 2 are placed before the two existing notes, respectively. The following notes are added:

3. IN RADIO RECEIVERS R-388/URR WITH SERIAL NUMBERS 1 AND ABOVE (ORDER NO. 25635-PHILA-53), CAPACITORS C123 AND C129

[AG 413.44 (15 Aug 55)]

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

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11-16R, Hq & Hq Co, Sig Bn,
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11-57R, Armd Sig Co (2)

11-127R, Sig Rep Co (2)

11-128R, Sig Depot Co (2)

11-500R (AA-AE), Sig Svc Org
(2)

11-557R, Abn Sig Co (2)

11-587R, Sig Base Maint Co (2)

11-592R, Hq & Hq Co, Sig Base
Depot (2)

11-597R, Sig Base Depot Co (2)

NG: State AG (6); units—same as Active Army except allowance is one copy to each unit.

USAR: None.

For explanation of abbreviations used, see SR 320-50-1.

ARE EACH 62 μ F; CAPACITORS C121 AND C127 ARE EACH 200 μ F; CAPACITOR C103 IS 390 μ F; CAPACITOR C101 IS 800 μ F; JACK J102 IS DELETED; RESISTOR R181 IS 3,100 OHMS; CAPACITOR C206 IS EITHER 5 μ F OR 7 μ F; AND BREAK-IN OFF-ON (SPST) SWITCH (S119) IS ADDED IN THE COIL CIRCUIT OF DISABLING RELAY K101.

4. IN RADIO RECEIVERS R-388/URR WITH SERIAL NUMBERS 1 THROUGH 1670 (ORDER NO. 3357-PHILA-52), RESISTOR R173 IS 1,800 OHMS; RESISTOR R182 IS 220 OHMS; AND THE POSITIVE TERMINALS OF C214A AND C214B ARE CONNECTED BY BUS WIRE.

5. IN RADIO RECEIVERS R-388/URR WITH SERIAL NUMBERS 885 THROUGH 1184 AND 1601 AND HIGHER (ORDER NO. 25635-PHILA-53), THE RATING OF T108 IS 700 V CT, .125 AMP.

6. IN RADIO RECEIVERS R-388/URR WITH SERIAL NUMBERS 361 AND HIGHER (ORDER NO. 25067-PHILA-54-55-(51)), R181 IS 1,400 OHMS.