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

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 µf or 7 µf (par. 85d).
      (3) Capacitors C123 and C120 are each 62 µf.
      (4) Capacitors C121 and C127 are each 200 µf.
      (5) Capacitor C103 is 390 µf.
      (6) Capacitor C101 is 800 µf.
      (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>
<thead>
<tr>
<th>Control</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>BREAK-IN OFF-ON toggle switch on receivers procured on Order No. 25635-Phila-53</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.
      BREAK-IN OFF-ON switch ON.
      (on receivers with serial numbers 1 and above (Order No. 25635-Philadelphia-53)).

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-Philadelphia-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-Philadelphia-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

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item</th>
<th>Action or condition</th>
<th>Normal indication</th>
<th>Corrective measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>12</td>
<td>CALIBRATE OFF-ON switch (Order No. 25635-Philadelphia-53 only)</td>
<td>Turn to OFF.</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

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 μF.

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 300 μF.

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 μF; C123 AND C124 ARE EACH 62 μF.

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-53), FIXED CAPACITOR C214B (0.1 μF) IS CONNECTED IN PARALLEL WITH C214A.

TAGO 17T44A
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 con-
ected. 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 µF
OR 7 µF TO FULFILL THE REQUIREMENT
OF THE INDIVIDUAL RECEIVER.

53. Power Supply

The receiver power * * * for 230-volt opera-
tion.

a. The power transformer * * * and On pos-
tions. 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 recti-
fied 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 9,100
OHMS.
2. IN RECEIVERS WITH SERIAL NUMBERS
361 AND ABOVE ON ORDER NO. 25087-PHILA-
54-55-(51), R181 IS 1,400 OHMS; R185 (1,800
OHMS) IS CONNECTED BETWEEN THE JUN-
CTION OF R181 and B+ FOR V113 AND THE
JUNCTION POINT OF L122 AND L123. CA-
PACITOR C239 (5 µF) IS CONNECTED BE-
TWEEN 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 ex-
cessive, 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 µF, replace it
with a 5-µF capacitor. In Radio Receivers
R-388/URR with serial numbers 1 and higher, on
Order No. 25635-Phila-53, one each 5-µF and
7-µF capacitors are included and are located be-
neth 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 µF) 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. 25655-PHILA-53), CAPACITORS C123 AND C129 ARE EACH 62 µF; CAPACITORS C121 AND C127 ARE EACH 200 µF; CAPACITOR C103 IS 390 µF; CAPACITOR C101 IS 800 µF; JACK J102 IS DELETED; RESISTOR R181 IS 3,100 OHMS; CAPACITOR C206 IS EITHER 5 µF OR 7 µF; AND BREAK-IN OFF-ON (SPOF) 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 1671 THROUGH 1184 AND 1691 AND HIGHER (ORDER NO. 25655-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-54-55-514), R181 IS 1,400 OHMS.

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

MAXWELL D. TAYLOR,
General, United States Army,
Chief of Staff.

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

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11-557R, Sig Base Maint Co (2)
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11-557R, Sig Base Depot Co (2)

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USAR: None.

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

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