AIR PUBLICATION

**2555F**

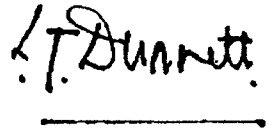
**VOLUME 5**

2nd EDITION

# RECEIVERS TYPE R1392B, D, E AND J

## BASIC SERVICING SCHEDULES

**By Command of the Defence Council**



**(Ministry of Defence)**

**FOR USE IN THE ROYAL AIR FORCE**

**(Prepared by the Ministry of Technology)**

*(AL5 April 67)*

# LIST OF APPENDICES

# APPENDIX A

## TUNING AND SETTING UP INSTRUCTIONS

### Initial checks and precautions

**1.** Ensure that the power unit mains switch is set to OFF.

**2.** Select the correct mains voltage as follows:—

(a) Unscrew the two wing nuts which retain the fuse panel in the power unit.

(b) Withdraw the fuse panel.

(c) Ensure that the mains voltage selector is set to the voltage of the available mains supply.

**3.** Ensure that the selector switch on the fuse panel is set to "R1392".

**4.** (a) Ensure that fuses of the correct value are fitted.

(i) HT fuses—150mA (red) 10H/95.

(ii) MAINS fuses—1 amp (blue) 10H/9613.

(b) Replace the fuse panel and tighten the wing nuts.

**5.** Check or make the following external connections:—

(a) Aerial plug to receiver SK2 socket.

(b) LT. HT cable between P1 of the receiver and P2 of the power unit.

(c) Mains input cable to P1 of the power unit.

(d) Line output from pins 11 and 12 of receiver P1.

(e) Telephone headset to receiver monitor jack.

**Note . . .**

*If no meter is fitted, perform the checks detailed in para. 6(c) and 7, by connecting an external meter to the sockets on the blanking plate.*

**6.** (a) Switch on mains supply to the power unit.

(b) Set the power unit mains switch to ON.

(c) Ensure that the voltmeter on the power unit indicates the correct voltage for the available mains supply.

(d) Check that the indicator lamp on the power unit has lit.

**7.** Ensure that the voltmeter on the power unit indicates between 250 and 260 volts, when the meter switch is pressed to the right.

**8.** Allow at least 15 minutes to elapse after switching on in order that the receiver may reach its normal operating temperature.

### Crystal

**9.** (a) Insert a crystal of the correct frequency into the receiver ST1 socket.

(b) The frequency of the crystal may be obtained from the following formula:—

$$\text{Crystal freq (Mc/s)} = \frac{\text{(Signal Freq} - 4{\cdot}86)\ \text{Mc/s}}{18}$$

### Controls

**10.** Unlock both tuning dials, then set the receiver controls as follows:—

(a) Meter switch to OSC.

(b) System switch to AGC.

(c) RF GAIN and LF GAIN controls to maximum.

(d) Set TUNE OSC and TUNE SIGNAL dials to the required frequency.

**11.** Tune the oscillator as follows:—

(a) Rock the TUNE OSC control gently either side of the dial calibration point to find the dip in the tuning meter reading.
(b) Set the control at the point which gives minimum reading in the tuning meter. This point must not be more than ± 3 Mc/s from the dial calibration point, and produce a dip of at least 0·2mA in the meter reading.

(c) Lock the TUNE OSC control at this setting, checking that the meter reading does not vary.

**12.** Tune the signal circuits to a local transmission as follows:—

(a) Reset the meter switch to SIGNAL.

(b) Rock the TUNE SIGNAL control gently either side of the dial calibration point to find the dip in the tuning meter reading.

(c) Set the control at the point which gives minimum reading in the tuning meter. The dial setting must be similar to that of the TUNE OSC dial.

(d) Lock the TUNE SIGNAL control at this setting, checking that the meter reading does not vary.

(e) Switch off the local transmission.

**13.** When no local transmission or other incoming signal is available for tuning as in para. 12, tune the signal circuits as follows:—

(a) Rock the TUNE SIGNAL control gently either side of the dial calibration point to obtain maximum background noises in the telephone headset. The TUNE SIGNAL dial setting must be similar to that of the TUNE OSC dial.

(b) Lock the TUNE SIGNAL control at this setting, checking that the background noise does not vary.

**14.** Setting up the muting control.
Tools and test equipment.

The following are required for setting up ot the muting control RV3:—

| | |
|---|---|
| Tools tuning trimmer | ~~10S/9447666~~ 10A/13505 |
| Signal Generator CT520 | ~~10A/13505~~ 10S/9447666 |
| Wattmeter Absorption AF | 10S/9149811 |
| **Multi- meter Set CT498A** | 10S/1057049 |
| Plug Type 1 | 10H/488 |
| Telephone headset Type 8 | 10AH/13 |
| Crystal Unit (as required) R1392B, D and E | 10XAJ/———— |
| Crystal Unit (as required) R1392J | 10XZDMA/———— |

**Note . . .**

1. *Adjustment of the muting control may be performed with the receiver tuned to any convenient frequency.*

2. *When Mod. No. RMC* 0192 *has not been fitted ignore paras. (c) to (f) inclusive.*

**15.** (a) Set the receiver system switch to MAN GC.

(b) Disconnect the aerial from the receiver.

(c) Short circuit the aerial input socket and resistor RV3.

(d) Connect the multimeter, set to read 100V DC, between V12 cathode (positive) and chassis.

(e) Check that the multimeter reads 35V ± 3V. If not adjust the variable resistor RV5.

(f) Remove the short circuits from the aerial input socket and resistor RV3.

(g) Connect the signal generator output to the receiver aerial socket using connector detailed in Appendix G1.

(h) Set the signal generator to give a 7μV modulated output at the receiver frequency.

(j) Set the wattmeter to 600 ohms and

connect it to the receiver line socket using the plug Type 1.

(k) Adjust the signal generator frequency slightly for maximum receiver output as indicated by the wattmeter or telephone headset.

**16.** (a) Insert the trimming tool into the slot in the spindle of RV3 and turn it fully counter-clockwise (maximum sensitivity).

(b) Turning RV3 slowly clockwise, note the gradual decrease in receiver output indicated on the wattmeter or the telephone headset. Continue to rotate RV3 until a sudden decrease in receiver output is observed. Note the position of the slot.

(c) Rotate RV3 slightly in a counter-clockwise direction until the receiver output rises rapidly. Note the position of the slot.

(d) Set the control RV3 midway between the positions noted in para. 16(b) and 16(c).

**17.** Verify the setting of RV3 by checking the sensitivity of the receiver as follows:—

(a) Increase the output level of the signal generator to 10μV.

(b) Ensure that the receiver output as indicated by the wattmeter is not less than 1mW +15db.

# APPENDIX B1

## TESTING AND ALIGNMENT OF I.F. CIRCUITS (R1392B, D and E)

**Note . . .**

1. *When the receiver is shown by tests in paras. 6 and 7 to be misaligned then realignment must be carried out by 3rd line personnel only.*
2. *Allow the signal generator CT520 4 hours to warm up before using for IF alignment.*

### Tools and test equipment

**1.** The following are required for aligning the IF circuits:—

| | |
|---|---|
| Tools tuning trimmer | 10A/13505 |
| Signal Generator CT520 | 10S/9447666 |
| Wattmeter Absorption AF | 10S/9149811 |
| Telephone headset Type 8 | 10AH/13 |
| Plug Type 1 | 10H/488 |
| Crystal Unit | 10XAJ/4860 |
| Silicon compound (IF cores retaining) | 33H/9423548 |
| Adaptor Crystal Type 91 | 10XAE/4 |

### Preparation

**2.** Prepare the receiver as follows:—

(a) Ensure that the mains supply to the power unit is switched off. Set the power unit mains switch to off.

(b) Disconnect all external connections, and remove the receiver from the rack. Remove the dust cover.

(c) Stand the receiver on end, in a convenient position on the test bench, so that easy access is gained to top and bottom IF trimmers.

(d) Connect the receiver to a power unit as a bench installation. Ensure that the power unit mains switch is set to OFF.

(e) Plug the telephone headset into the receiver MONITOR jack.

(f) Set the controls as follows:—

(i) Meter switch to SIGNAL.

(ii) System switch to AGC.

(iii) RF GAIN control to maximum (fully clockwise).

(iv) LF GAIN control to maximum (fully clockwise).

(v) MUTING control (RV3) to maximum (fully counter-clockwise).

(g) Insert a 4860 Kc/s crystal into socket ST1.

**3.** Prepare the signal generator as follows:—

(a) Connect the signal generator output between the control grid (Pin 6) of the mixer valve (V3) and receiver chassis using adaptor No. 2 (App. G1).

(b) Connect the signal generator to the mains supply.

(c) Set the signal generator controls as follows:—

(i) Range switch to cover 4·860 Mc/s.

(ii) FREQUENCY CONTROL to 4·860 Mc/s.

(iii) INCREMENTAL FREQUENCY CONTROL to 0.

(iv) Output controls to give 10μV output.

(v) MAINS switch to ON.

(vi) CARRIER switch to ON.

(vii) SET CARRIER for correct level.

**4.** Prepare the wattmeter as follows:—

(a) Set the impedance selector switch to 600 ohms.

(b) Set the power range selector switch to 1mW +15db.

(c) Insert the wattmeter input plug into the receiver LINE jack.

**5.** Set the signal generator frequency to the receiver crystal as follows:—

(a) Switch on receiver power unit, allow at least 15 minutes for the equipment to reach a stable operating temperature.

(b) Carefully adjust the signal generator FREQUENCY control until a beat note is heard in the receiver telephones.

(c) Set the FREQUENCY control to the zero beat position.

(d) Note the dial setting.

**Sensitivity and frequency check**

**6.** (a) Remove the crystal from the receiver.

(b) Set the signal generator MOD switch to ON.

(c) Adjust the signal generator FREQUENCY control for maximum receiver output as indicated by the wattmeter. Reset wattmeter power range switch as necessary to give a convenient reading.

(d) Note the output obtained and the setting of the FREQUENCY control.

(e) If the receiver output is 1mW +15db or more, and maximum response occurs within 3 Kc/s either side of 4860 Kc/s perform the bandwidth checks detailed in para. 7.

(f) If maximum response occurs outside the 3 Kc/s limit, or the receiver output is less than 1mW +15db and cannot be improved by substitution of IF and/or AF valves, perform the realignment operations detailed in para. 10 to 14.

**Caution . . .**

*Avoid damage to the wattmeter by setting the power range switch temporarily to a suitable higher range whenever the signal generator output is increased.*

**6db bandwidth check**

**7.** (a) Adjust the receiver LF GAIN control until the output indicated by the wattmeter is exactly 1mW.

(b) Increase the signal generator output to 20mV.

(c) Adjust the signal generator INC FREQUENCY control either side of resonance, and note the frequencies at which the receiver output is exactly 1mW (these are the 6db down points).

(d) Ensure that these frequencies are not less than 50 Kc/s apart, and are equally disposed on each side of resonance.

(e) Reset the INC FREQUENCY control to zero.

(f) If the bandwidth on either side of resonance is less than 25 Kc/s at the 6db points, perform the realignment operations detailed in para. 10 to 14.

**60db bandwidth check**

**8.** (a) Increase the signal generator output to 10mV.
(b) Carefully adjust the signal generator INC FREQUENCY control either side of 4860 Kc/s.

(c) Note the frequencies at which the receiver output is exactly 1mW (these are the 60db down points). Ensure that they are not more than 180 Kc/s apart and are equally disposed on each side of 4860 Kc/s.

**Muting adjustment**

**9.** When all checks are satisfactorily concluded, reset the muting control RV3 as follows:—

(a) Switch off the signal generator and disconnect it from the receiver.

(b) Switch off the receiver power unit and disconnect all external connections.

(c) Refit the dust cover to the receiver.

(d) Perform the operations detailed in App. A., para. 5 to 17.

**IF Alignment**

**Note . . .**

*If on completion of the tests detailed in paras. 6, 7 and 8, the IF circuits appear to be badly misaligned, carry out the instructions in para. 10 and then proceed as in para. 16. If the IF circuits appear to require only slight alignment, carry out the instructions in para. 10 and then proceed as in para 11.*

**10.** To align the IF circuits if the receiver does not pass the tests detailed in paras. 6, 7 and 8, prepare the equipment as follows:—

(a) Insert a 4860 Kc/s crystal in receiver socket ST1.

(b) Set receiver RF GAIN and LF GAIN to maximum.

(c) Set the signal generator controls as follows:—

(i) MOD switch to OFF.

(ii) Adjust FREQUENCY control to obtain zero beat in receiver telephone headset.

(iii) MOD switch to ON.

(d) Remove the receiver crystal.

(e) Adjust the signal generator output voltage to obtain a reading not exceeding 1mW + 15dB in the wattmeter.

**Note . . .**

*Reduce the signal generator output voltage as necessary during the alignment operations, so that the receiver output does not exceed 1mW + 15dB.*

**11.** Adjustment of the fourth IF transformer.

(a) Adjust the core of L15 (through the hole below IFT4) for maximum reading on the wattmeter.

(b) Adjust the core of L14 (through the hole on the top of IFT4) for maximum reading on the wattmeter.

**12.** Adjustment of the third IF transformer.

(a) Repeat the operations detailed in para. 10.

(b) Adjust first the top and then the bottom core of IFT3 for maximum reading on the wattmeter.

**13.** Adjustment of the second IF transformer.

(a) Repeat the operations detailed in para. 10.

(b) Adjust first the top, and then the bottom core of IFT2 for maximum reading on the wattmeter.

**14.** Adjustment of the first IF transformer.

(a) Repeat the operations detailed in para. 10.

(b) Adjust first the top and then the bottom core of IFT1 for maximum reading on the wattmeter.

**15.** IF Sensitivity, frequency and bandwidth checks.

Repeat the checks detailed in paras. 6, 7 and 8, starting at para. 6(c). When IF alignment is satisfactorily completed, continue with the B.F.O. alignment at para. 17.

**16.** When checks carried out in paras. 6, 7 and 8 show the IF circuits to be badly misaligned, proceed as follows:—

(a) Remove the muting valve V15 from its holder.

(b) Using adaptor No. 2 (see Appendix C), apply a signal of [redacted]mV, modulated 30%, at 1000 c/s to the control grid of V9.

(c) Insert a crystal of 4860 Kc/s into receiver socket ST1 and adjust the signal generator FREQUENCY control for zero beat in the headset. Remove the crystal from the socket.

(d) Adjust the cores of IFT4 for peak output as indicated by the wattmeter.

Adjust LF GAIN for a convenient receiver output on the wattmeter, not exceeding 1mW + 15dB.

(e) Tune the INC. FREQUENCY control both sides of resonance, and observe the frequency deviation required to cause a reduction in output power of 1·5dB on each side. The frequency deviation should be 25 Kc/s each side of resonance. Re-adjust the cores of IFT4 if this reading is not obtained until readings of 25 Kc/s each side of resonance are achieved. Leave INC. FREQUENCY control at zero.

(f) Disconnect signal generator output from control grid V9, and apply a signal of 1·4mV to control grid of V8.

(g) Repeat operation detailed in para. 16(c).

(h) Adjust the cores of IFT3 for maximum receiver output. Keep receiver LF GAIN adjusted to the reading selected in para. 16(d).

(j) Tune the INC. FREQUENCY control both sides of resonance and observe the frequency deviation required to cause a reduction in output power of 3dB on each side. These frequencies should be ± 25 Kc/s either side of resonance. If necessary, L12 and L13 should be re-adjusted until the specification is achieved. Leave INC. FREQUENCY control at zero.

(k) Disconnect signal generator from control grid of V8, and apply a signal of [illegible] micro volts to the control grid of V7.

(l) Repeat operation detailed in para. 16(c).

(m) Adjust the cores of IFT2 for maximum receiver output. Keep receiver LF GAIN adjusted to the reading selected in para. 16(d).

(n) Tune the INC FREQUENCY control both sides of resonance and observe the frequency deviation required to cause a reduction in output power of 4·5dB either side of resonance. These frequencies should be ± 25 Kc/s either side of resonance. If necessary, L10 and L11 should be re-adjusted until the specification is achieved. Leave INC. FREQUENCY at zero.

(p) Disconnect signal generator from control grid of V7, and apply a signal of [illegible] micro volts to the control grid (Pin 6) of the mixer valve (V3).

(q) Repeat operation detailed in para. 16(c).

(r) Adjust the cores of IFT1 for maximum receiver output. Keep receiver LF GAIN adjusted to the reading selected in para. 16(d).

(s) Tune the INC. FREQUENCY control both sides of resonance and observe the frequency deviation required to cause a reduction in output power of 6dB either side of resonance. These frequencies should be not less than ± 25 Kc/s either side of resonance. If necessary, L8 and L9 should be re-adjusted until the specification is achieved.

(t) Increase the signal generator output by 60dB, and tune the INC. FREQUENCY control both sides of resonance until the output power reads the same as that selected in para. 16(d). These frequencies should be not greater than ± 90 Kc/s either side of resonance.

(u) Replace the muting valve V15 into its holder.

**17.** Beat oscillator alignment.

Align the heterodyne oscillator as follows:—

(a) Set the system switch to TONE MAN GC.

(b) Set the TONE FREQUENCY control to its central position. Check the capacitor C16 to ensure that its plates are set to give half maximum value.

# APPENDIX B2

## ALIGNMENT OF CRYSTAL OSCILLATOR, HARMONIC AMPLIFIER AND RF AMPLIFIER CIRCUITS (R1392B, D, E AND J)

### Tools, test equipment and materials

**1.** The following are required for aligning the crystal oscillator, harmonic amplifier and RF amplifier circuits:—

| | | |
|---|---|---|
| Tools tuning trimmer | | 10A/13505 |
| Tools tuning coils | | ~~10/13506~~ 10A/13506 |
| Signal Generator CT520 | | 10S/9447666 |
| Wattmeter Absorption AF | | 10S/9149811 |
| Telephone Headset Type 8 | | 10AH/13 |
| Plug Type 1 | | 10H/488 |
| Millammeter (0-1 FSD) | | 5Q/87 |
| Capacitor tubular ceramic 100pf | | 10C/0132380 |
| Sealing wax | | Code No. 55-11 |
| Crystal Unit | R1392B, D and E | 10XAJ/5280 |
| Crystal Unit | | 10XAJ/6120 |
| Crystal Unit | | 10XAJ/6680 |
| Crystal Unit | | 10XAJ/7515 |
| Crystal Unit | | 10XAJ/8392 |
| Crystal Unit | R1392J | 10XZDMA/5285·55 |
| Crystal Unit | | 10XZDMA/6118·88 |
| Crystal Unit | | 10XZDMA/6674·44 |
| Crystal Unit | | 10XZDMA/7785·55 |
| Crystal Unit | | 10XZDMA/8396·66 |
| Adaptor Crystal Type 91 | | 10XAE/4 |

**Note . . .**

*Crystal frequencies quoted in brackets in the remainder of the text are applicable to R1392J.*

### Preparation

**2.** Prepare the receiver as follows:—

(a) Ensure that the mains supply to the power unit is switched OFF. Set the power unit mains switch S2 to OFF.

(b) Disconnect all external connections and remove the receiver from the rack. Remove the Receiver dust cover and the covers on the RF amplifier and oscillator units.

(c) Stand the receiver in a convenient position on the bench and connect to the power unit as a bench installation. Ensure that the power unit mains switch is set to OFF.

(d) Plug the telephone headset into the receiver MONITOR jack.

(e) Set the receiver controls as follows:—

(i) Meter switch to OSC.

(ii) System switch to MAN GC.

(iii) RF GAIN and LF GAIN controls fully clockwise.

(iv) Muting control RV3 fully counter-clockwise.

(f) Identify R7 on the underside of the harmonic amplifier, disconnect it

at the chassis end and insert the milliammeter in series, with positive to chassis.

(g) Insert the 5280 Kc/s (5285·55 Kc/s) crystal into socket ST1 and set the TUNE OSC and TUNE SIGNAL dials to 100 Mc/s.

**Note . . .**

*During subsequent operations the TUNE SIGNAL dial must be kept at the same setting as the TUNE OSC dial.*

**3.** Switch on the receiver power unit and allow at least 15 minutes for the equipment to reach a stable operating temperature.

**Oscillator unit alignment**

**4.** Using the hexagon end of the trimming tool, adjust the core of L4 for peak reading on the external milliammeters.

**5.** Replace the crystal with one of 8392 Kc/s (8396·66 Kc/s) and set the TUNE OSC control to 156 Mc/s. Adjust C4 for peak reading on the external milliammeter.

**6.** Repeat paras. 2(g), 4 and 5 until further adjustments produce no improvement in meter readings.

**7.** Prepare the signal generator as follows:—

(a) Connect the signal generator output lead via adaptor No. 2 (App. G1) and a 100pF capacitor to the tag of the variable capacitor C11 to which the 3·3pF capacitor C57 is connected.

(b) Connect the earth braiding of adaptor No. 2 to the receiver chassis.

(c) Connect the signal generator to the mains supply.

(d) Set the signal generator controls as follows:—

(i) Range switch to cover 100 Mc/s.

(ii) FREQUENCY control to 100 Mc/s.

(iii) INC FREQUENCY control to 0.

(iv) Output controls to 5μV.

(v) MAINS switch to ON.

(vi) CARRIER switch to OFF.

**8.** Prepare the wattmeter as follows:—

(a) Set the IMPEDANCE selector switch to 600 ohms.

(b) Set the POWER RANGE selector switch to read 1mW +6db.

(c) Connect the terminals to the plug Type 1 and insert the plug into the receiver LINE jack.

**Note . . .**

*Once set by the manufacturers, coils L5, L6 and L7 will normally remain at the correct setting. Therefore, when performing the following operation, the amount of movement required to check the alignment is very small.*

**9.** With the 5280 Kc/s (5285-55 Kc/s) crystal inserted and the OSC TUNE control set to 100 Mc/s adjust L5, L6 and L7 by slightly extending or compressing the coil turns, using the wedge tuning tool, for minimum reading on the receiver tuning meter, maximum deflection on the wattmeter.

**10.** Replace crystal with 8392 Kc/s (8396·66 Kc/s), set OSC TUNE to 156 Mc/s and signal generator FREQUENCY CONTROL to 156 Mc/s. Adjust C7, C10 and C15 for minimum reading on the receiver tuning meter, maximum deflection on the wattmeter.

**11.** Repeat paras. 9 and 10 until further adjustment produces no improvement in the meter readings.

**12.** Using crystals of 5280 Kc/s, 6120 Kc/s, 6680 Kc/s, 7515 Kc/s and 8392 Kc/s (5285·55 Kc/s, 6118·88 Kc/s, 6674·44 Kc/s, 7785·55 Kc/s and 8396·66 Kc/s), set the TUNE OSC to 100 Mc/s, 115 Mc/s, 125 Mc/s, 140 Mc/s and 156 Mc/s (100 Mc/s,

115 Mc/s, 125 Mc/s, 145 Mc/s and 156 Mc/s) respectively and adjust for a minimum reading on the receiver tuning meter, maximum deflection on the wattmeter, at each frequency. Check that the difference between the meter readings with the oscillator tuned and untuned is greater than 0·2mA on all test frequencies.

**13.** (a) Replace oscillator unit dust cover and secure by the centre screw only.

(b) Repeat the operations detailed in paras. 2(g), 4, 5 and 10 and note the final meter readings.

(c) Remove the cover and carefully seal the trimmers C4, C7, C10 and C15 with a small quantity of sealing wax.

(d) Replace the cover and ensure that the meter readings are the same as those obtained in para. 13(b).

(e) Secure the dust cover by tightening the five screws.

**14.** Carry out the oscillator stability check as follows:—

(a) Remove the crystal from the receiver socket ST1.

(b) Rotate the TUNE OSC dial slowly throughout its full range, ensure that there is no dip in the tuning meter reading at any setting of the dial.

**15.** Set the receiver power unit mains switch to off, disconnect the external ammeter and resolder the free end of R7 to the chassis.

**Amplifier Unit RF alignment**

16. (a) Set the receiver power unit mains switch to ON.

(b) Ensure that the receiver controls are as follows:—

(i) Meter switch to OSC.

(ii) System switch to MAN GC.

(iii) RF GAIN and LF GAIN fully clockwise.

(iv) Muting control fully counter-clockwise.

**17.** Insert a 5280 Kc/s (5285·55 Kc/s) crystal into the receiver socket ST1 and connect the wattmeter to the LINE jack.

**18.** Set the signal generator to produce an output of 50μV modulated to a depth of 30 per cent, connect the signal generator output to the receiver aerial socket, using Adaptor No. 1 (App. G1).

**19.** Set the signal generator FREQUENCY control to 100 Mc/s and the receiver TUNE SIGNAL control to 100 Mc/s. Adjust the TUNE OSC control for minimum reading on the receiver meters.

**20.** Adjust the signal generator FREQUENCY control for a peak reading on the wattmeter.

**Note . . .**

*Once set by the makers, coils L1, L2 and L3 will normally remain at the correct settings. Therefore, when performing the following operation, the mount of movement required to check alignment is very small.*

**21.** Adjust L1, L2 and L3 by extending or compressing the coil turns for peak reading on the output meter.

**22.** Reset the signal generator FREQUENCY control to 156 Mc/s and the receiver TUNE SIGNAL control to 156 Mc/s.

**23.** Replace the crystal with one of 8392 Kc/s (8396·66 Kc/s) and adjust the TUNE OSC control for minimum reading on the receiver meter.

**24.** Adjust the signal generator FREQUENCY control for peak reading on the wattmeter.

**25.** Adjust C1, C6 and C12 for a peak reading on the wattmeter.

**26.** Repeat paras. 17 and 19 to 25 above

until no further improvement can be obtained on the wattmeter readings.

**27.** Replace the crystal by one of frequency 6680 Kc/s (6674·44 Kc/s) and adjust the TUNE OSC control for minimum reading on the receiver meter.

**28.** Set the signal generator FREQUENCY to 125 Mc/s and the TUNE SIGNAL control to 125 Mc/s.

**29.** Adjust signal generator FREQUENCY control and TUNE SIGNAL control for peak reading on the wattmeter.

**30.** Adjust L18 for peak reading on the wattmeter.

**31.** If the setting of L18 required alteration, repeat paras. 17 and 19 to 25 above, adjusting only L1 and C1.

**32.** Reduce the signal generator output to 10μV and set the frequency to 100 Mc/s.

**33.** Replace the crystal by one of 5280 Kc/s (5285·55 Kc/s) and adjust the TUNE OSC control for minimum reading on the Receiver tuning meter.

**34.** Set the system switch to AGC and the meter switch to SIGNAL and note the reading on the receiver meter.

**35.** Adjust the TUNE SIGNAL control and the signal generator FREQUENCY control for minimum reading on the receiver meter. This reading should show a dip greater than 0·1mA compared with the reading noted in para. 34.

**36.** Repeat paras. 32 to 35 using crystals of 6120 Kc/s, 6680 Kc/s, 7515 Kc/s and 8392 Kc/s (6118·88 Kc/s, 6674·44 Kc/s, 7785·55 Kc/s and 8396·66 Kc/s), and signal generator frequencies set to 115 Mc/s, 125 Mc/s, 140 Mc/s and 156 Mc/s respectively (115 Mc/s, 125 Mc/s, 145 Mc/s and 156 Mc/s respectively), ensuring that the TUNE/UNTUNED condition of the TUNE SIGNAL control produces a dip in the receiver tuning meter in excess of 0·1mA at all test frequencies.

**37.** (a) Replace the RF amplifier unit dust cover and secure by one screw.

(b) Adjust the signal generator output to give 10μV at 156 Mc/s.

(c) Tune the receiver for maximum reading on the wattmeter.

(d) Adjust C1, C6 and C12 for maximum output: note this reading.

(e) Remove the dust cover and carefully seal the trimmer with a small quantity of sealing wax.

(f) Replace the dust cover, check that the wattmeter readings are the same as those obtained in para. 37(d) and tighten the securing screws.

**Muting adjustment**

**38.** Reset the muting control RV3 as follows:—

(a) Carry out the operations detailed in Appendix A, paras. 14 to 17 inclusive.

**39.** (a) Using appropriate crystals carry out overall sensitivity checks at 156, 140, 125, 115 and 100 Mc/s (156, 145, 125, 115 and 100 Mc/s). At least 1mW +15db must be obtained at all test frequencies.

(b) Providing the overall sensitivity is satisfactory, refit receiver into the rack.

# APPENDIX B3

## TESTING AND ALIGNMENT OF 25 Kc/s IF CIRCUITS FOR 50 Kc/s CHANNEL SPACING

**Note . . .**

*This alignment is for R1392J only.*

**Caution . . .**

1. *The IF alignment should only be performed by suitably experienced personnel and should not be attempted unless appropriate test equipment is available.*

2. *Allow the Signal Generator CT520 4 hours to warm up before starting alignment.*

### Tools and test equipment

**1.** The following are required for aligning the IF circuits:—

| | |
|---|---|
| Tools tuning trimmer | 10A/13505 |
| Signal Generator CT520 | 10S/9447666 |
| Wattmeter absorption AF | 10S/9149811 |
| Telephone headset Type 8 | 10AH/13 |
| Crystal unit | 10XZDMA/4860 |
| Plug Type 1 | 10H/488 |
| Silicon Compound (IF core retaining) | 33H/9423548 |

### Preparation

**2.** Prepare the receiver as follows:—

(a) Switch off mains supply and remove all external connections from the rear of the receiver.

(b) Remove the dust cover and stand the receiver on its end, so that easy access may be gained to the top and bottom IF trimmers.

(c) Connect the receiver to a power unit.

(d) Set the controls as follows:—

(i) Meter switch to SIGNAL.

(ii) System switch to MAN GC.

(iii) RF and LF GAIN controls to Maximum (fully clockwise).

(iv) MUTING control (RV3) to Maximum (fully counter-clockwise).

(e) Plug the telephone headset into the receiver MONITOR jack and insert the 4860 Kc/s crystal.

**3.** Prepare the signal generator as follows:—

(a) Connect the signal generator output between the control grid (Pin 6) of the Mixer valve (V3) and the receiver chassis using connector No. 2. (Appendix G1).

(b) Set the signal generator frequency to 4·860 Mc/s and output controls to give 10 microvolt output.

(c) Switch power ON and allow a 4 hours warm up period.

(i) Adjust SET CARRIER to correct level.

(ii) Adjust SET MOD to correct level.

(iii) Set modulation to 30%.

(iv) Set to CW.

(v) Set INC FREQ. control to 0.

**4.** Prepare the wattmeter as follows:—

(a) Set the impedance selector to 600 ohms.

(b) Set the power range selector switch to cover 32mW.

(c) Connect the wattmeter to the receiver LINE jack.

**5.** Set the signal generator frequency to the receiver crystal as follows:—

(a) Switch on receiver power unit, allow at least 15 minutes for the equipment to reach a stable operating temperature.

(b) Adjust the signal generator FREQUENCY control until a beat note is heard in the telephone headset. Further adjust until this beat note falls to zero.

(c) Remove the crystal from the receiver.

**Sensitivity test**

**6.** Set the signal generator to AM and check that the reading on the wattmeter is not less than 32mW.

**Caution . . .**

*To prevent possible damage to the wattmeter whilst carrying out 6db and 60db checks, set the power range switch to a suitable higher range when the signal generator output is increased.*

**6db bandwidth check**

**7.** (a) Adjust the signal generator INC FREQ control either side of 0 Kc/s to find the two peak response points. Select the setting which gives the highest output on the wattmeter.

(b) Adjust the receiver LF GAIN control until the output indicated by the wattmeter is exactly 1mW. This is now a reference level so the LF GAIN control must not be readjusted during this test.

(c) Increase the signal generator output to 20μV. (+6db).

(d) Adjust the INC FREQUENCY control either side of zero, and note the frequencies at which the output is exactly 1mW (these are the 6db down points).

(e) Ensure that these frequencies are not less than ±12 Kc/s from 4860 Kc/s.

(f) If the receiver bandwidth is outside this limit, carry out alignment procedure detailed in paras. 9 and 10.

**60db bandwidth check**

**8.** (a) Increase the signal generator output to 10 mV (+60db). See "CAUTION".

(b) Carefully adjust the signal generator INC FREQ control either side of 0 Kc/s.

(c) Note the frequencies at which the wattmeter reads exactly 1mW (these are the 60db down points).

(d) Ensure that these frequencies are not greater than ± 40 Kc/s from 4860 Kc/s.

(e) If the receiver bandwidth is outside this limit, carry out alignment procedure detailed in paras. 9 and 10.

**IF alignment**

**9.** To align the IF circuits if the receiver does not pass the tests detailed in paras. 7 and 8, prepare the equipment as follows:—

(a) Insert a 4860 Kc/s crystal in receiver socket ST1.

(b) Set RF GAIN and LF GAIN to maximum.

(c) Set the signal generator for 4·860 Mc/s CW at 16 Millivolts.

(d) Set the wattmeter to a suitable range.

(e) Connect the signal generator to the control grid (TC) of V9, using adaptor No. 2 (see Appendix G).

(f) Adjust signal generator FREQUENCY tuning control for zero beat in the headset.

(g) Remove the crystal from the receiver.

(h) Set the signal generator to 30% MOD at 1 Kc/s.

**10.** Adjustment of IF transformers.

(a) Adjust the cores of L14 and L15 for peak reading on the wattmeter.

(b) Reduce the signal generator output to 1·6 Millivolts and transfer the

lead to the grid of V8. Adjust the cores of L12 and L13 for peak reading on the wattmeter.

(c) Reduce the signal generator output to 160 microvolt and transfer the lead to the grid of V7. Adjust the cores of L10 and L11 for peak reading on the wattmeter.

(d) Reduce the signal generator output to 16 microvolt and transfer the lead to the grid of V3. Adjust the cores of L8, L8A and L9 for peak reading on the wattmeter.

(e) Offset the incremental tuning control by not less than 40 divisions from 0 and increase the output to 16 millivolts.

(f) Readjust the incremental tuning for full scale deflection on the wattmeter.

(g) Using great care, adjust the neutralising capacitor C58 in IFT1 for minimum reading on the wattmeter, resetting the incremental tuning as necessary towards 0 until further adjustment of the neutralising capacitors fails to reduce the wattmeter reading.

**Note . . .**

*Capacitor C58 is factory set and should not normally need adjustment; should this become necessary, it must only be carried out by experienced fitters or failing this, at Third Line.*

(h) Repeat operation detailed in para. 10(d).

(j) Check the 6db bandwidth as detailed in para. 7, slightly adjusting the cores of L8, L8A and/or L9 as necessary.

**11.** Carry out operations detailed in Appendix B1, paras. 17 and 18.

## APPENDIX C1

## TOOLS, TEST EQUIPMENT AND MATERIALS

| Item No. | Nomenclature | Section Ref. No. | | Daily | Weekly | 3 Monthly | 3rd Line Non Calendar |
|---|---|---|---|---|---|---|---|
| 1 | Telephone headset Type 8 | 10AH/13 | | x | x | x | x |
| 2 | Multimeter Set CT498A | 5QP/1057049 | | x | x | x | x |
| 3 | Signal Generator Type CT520 | 10S/9447666 | | | | x | x |
| 4 | Wattmeter absorption AF | 10S/9149811 | | | | x | x |
| 5 | Tester Insulation resistance Type D | 5G/203 | | | | x | |
| 6 | Plug Type 1 | 10H/488 | | | | x | x |
| 7 | Plug Type 150 | 10H/133 | | | | x | x |
| 8 | Crystal Unit | 10XAJ/5280 | R1392B, D and E | | | | x |
| 9 | Crystal Unit | 10XAJ/6120 | | | | | x |
| 10 | Crystal Unit | 10XAJ/6680 | | | | | x |
| 11 | Crystal Unit | 10XAJ/7515 | | | | | x |
| 12 | Crystal Unit | 10XAJ/8392 | | | | | x |
| 13 | Crystal Unit | 10XZDMA/5285-55 | R1392J | | | | x |
| 14 | Crystal Unit | 10XZDMA/6118-88 | | | | | x |
| 15 | Crystal Unit | 10XZDMA/6674-44 | | | | | x |
| 16 | Crystal Unit | 10XZDMA/7785-55 | | | | | x |
| 17 | Crystal Unit | 10XZDMA/8396-66 | | | | | x |
| 18 | Adaptor Crystal Type 91 | 10XAE/4 | | | | | x |
| 19 | Cloth mutton | 32B/~~1062~~ 125407 | | x | x | x | x |
| 20 | Tools tuning trimmer | 10A/13505 | | | | x | x |
| | | Additional items required for unscheduled 3rd Line Servicing | | | | | |
| 21 | Crystal Unit | 10XAJ/4860 (R1392B, D & E) | | | | | |
| 22 | Crystal Unit | 10XZDMA/4860 (R1392J) | | | | | |
| 23 | Tools tuning coils | 10A/13506 | | | | | |
| 24 | Milliammeter moving coil (0-1mA F.S.D.) | 5Q/87 | | | | | |
| 25 | Capacitor tubular ceramic 100 pf | 10C/0132380 | | | | | |
| 26 | Sealing Wax | Code No. 50-11 | | | | | |
| 27 | Silicon Compound core restaining | 33H/9423548 | | | | | |

## APPENDIX C2

## LIST OF VALVES AND FUSES

Abbreviations used in pin connection tables:

A = Anode G = Grid (numbered from the cathode)
C = Cathode H = Heater
D = Diode Anode M = Metallizing or Metal Shield

### TABLE 1

### RECEIVER VALVES

| Valve | Ref. No. | Function | Type | Base | T.C. | Pin Connections 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V1 | CV 1136 | 1st RF Amplifier | HF Pentode | B9G | | H | A | G2 | MC G3 | MC G3 | G1 | MC G3 | MC G3 | H |
| V2 | CV 1136 | 2nd RF Amplifier | HF Pentode | B9G | | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, |
| V3 | CV 1136 | Mixer | HF Pentode | B9G | | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, |
| V4 | CV 1065 | Oscillator/Trebler | HF Pentode | Mazda Octal | G1 | H | C | A | G2 | G3 | M | | H | |
| V5 | CV 1136 | Freq. Multiplier | HF Pentode | B9G | | H | A | G2 | MC G3 | MC G3 | G1 | MC G3 | MC G3 | H |
| V6 | CV 1136 | Buffer Amplifier | HF Pentode | B9G | | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, |
| V7 | CV 1053 | 1st [illegible]F Amplifier | Vari-Mu HF Pen. | Octal | G1 | M | H | A | G2 | G3 | | H | C | |
| V8 | CV 1053 | 2nd [illegible]F Amplifier | ,, ,, ,, | Octal | G1 | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, | |
| V9 | CV 1053 | 3rd [illegible]F Amplifier | ,, ,, ,, | Octal | G1 | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, | |
| V10 | CV 1935 | BFO | HF Pentode | Octal | G1 | M | H | A | G2 | G3 | | H | C | |
| V11 | CV 587 | AF Amplifier | D.D. Triode | Octal | G1 | | H | A | D1 | D2 | | H | C | |
| V12 | CV 587 | AGC Rectifier and DC amp. | ,, ,, | Octal | G1 | ,, | ,, | ,, | ,, | ,, | ,, | ,, | ,, | |
| V13 | CV 1932 | Output | Triode | Octal | | | H | A | | G1 | | H | C | |
| V14 | CV 1092 | Pulse Interference Limiter | Diode | | | | | | | | | | | |
| V15 MOD. 2654 | CV 1092 | Muting | Diode | | | | | | | | | | | |
| | CV 1092 | Detector | Diode | | | | | | | | | | | |

## TABLE 2
## POWER UNIT VALVE AND FUSES

| Valve | Ref. No. | Function | Type | Base | Pin Connections 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V1 | CV 1863 | Full Wave Rectifier | F.W. Rect. | Octal | - | H | - | A2 | - | A1 | - | H/C |

| Fuse | Sect. Ref. No. | Function | Rating | Nomenclature | Colour Code |
|---|---|---|---|---|---|
| F1 and F2 | 10H/9613 | Mains Fuses | 1 Amp | Fuses Type 5 | Blue |
| F3 and F4 | 10H/95 | HT Fuses | 150 mA | Fuses Type 19 | Red |

# APPENDIX C3

## USE OF ~~TEST SET MULTIRANGE NO. 1~~ MULTIMETER SET CT.498A AS AN OUTPUT POWER METER

**Note . . .**

| Receiver power output in db relative to 1mW | Actual power in mW | ~~Test set multirange No. 1~~ CT.498A reading (10V AC range) |
|---|---|---|
| −6 | 0·25 | 0·40 |
| −5 | 0·32 | 0·45 |
| −4 | 0·40 | 0·50 |
| −3 | 0·50 | 0·60 |
| −2 | 0·63 | 0·70 |
| −1 | 0·79 | 0·80 |
| 0 | 1·00 | 0·90 |
| +1 | 1·26 | 1·00 |
| +2 | 1·59 | 1·10 |
| +3 | 2·00 | 1·20 |
| +4 | 2·51 | 1·40 |
| +5 | 3·16 | 1·60 |
| +6 | 3·98 | 1·80 |
| +7 | 5·01 | 2·00 |
| +8 | 6·31 | 2·30 |
| +9 | 7·94 | 2·50 |
| +10 | 10·00 | 2·90 |
| +11 | 12·59 | 3·20 |
| +12 | 15·85 | 3·60 |
| +13 | 19·95 | 4·10 |
| +14 | 25·12 | 4·50 |
| +15 | 31·62 | 5·10 |
| +16 | 39·81 | 5·70 |
| +17 | 50·12 | 6·30 |
| +18 | 63·10 | 7·10 |
| +19 | 79·43 | 8·00 |
| +20 | 100·00 | 8·80 |

## APPENDIX D1

## FAULT LOCATION CHART

| Symptom | Probable Fault | Remedy |
|---|---|---|
| **Power Supply and Fuses** | | |
| **1.** Meter readings normal.<br>Receiver functions normally.<br>Power unit indicator lamp not lit. | (a) Faulty indicator lamp. | (a) Renew lamp. |
| | (b) Open circuit supply to indicator lamp. | (b) Trace open circuit and reconnect. |
| **2.** No meter readings.<br>Indicator lamp not lit.<br>Receiver does not function. | (a) Main supply failure. | (a) Check external supply. |
| | (b) F1 and/or F2 open circuited. | (b) Renew fuses as necessary with fuses 1 amp. (blue) 10H/9613. |
| **3.** Receiver does not function.<br>Indicator lamp lit.<br>P.U. reads normal AC input but no reading on HT. | (a) Fuses F3 and/or F4 open circuited. | (a) Renew fuses as necessary with fuses 150mA (red) 10H/95. |
| | (b) Rectifier valve V1 524G faulty. | (b) Renew valve V1. 10CV/1863. |
| **Crystal** | | |
| **4.** Meter switch at OSC.<br>System switch to AGC<br>Valve noise only in 'phones.<br>No dip in tuning meter reading when TUNE OSC dial is rocked about the calibration point. | (a) Crystal faulty. | (a) Renew crystal. |
| | (b) High resistance contact to ST1. | (b) Clean contacts and replace crystal. |
| | (c) Oscillator trebler V4 faulty. | (c) Renew valve V4 10CV/1065. |
| | (d) Multiplier valve V5 faulty. | (d) Renew valve V5 10CV/1136. |
| **Valves** | | |
| **5.** Symptom as at 4 above but with a slight dip in tuning meter reading. | V6 faulty. | Renew valve V6 10CV/1136. |
| **6.** Meter switch at OSC.<br>System switch at AGC.<br>Valve noise only in 'phones.<br>Tuning meter reading zero. | Mixer valve V3 faulty. | Renew valve V3 10CV/1136 |

| Symptom | Probable Fault | Remedy |
|---|---|---|
| **7.** Meter switch at SIGNAL. System switch at AGC. With strong signal input, no dip in tuning meter when TUNE SIGNAL dial is rocked about the calibration point. | | |
| (a) Valve noise only in 'phones. | (a) R.F. amplifier V1 and/or V2 faulty. | (a) Ensure that valve pins make good contact in valve holder, or renew as necessary valve 10CV/1136. |
| (b) Faint valve noise only. | (b) IF amplifier V8 and/or V9 faulty. | (b) Check grid lead and valve holder connections, or renew as necessary valve 10CV/1053. |
| (c) Low output. | (c) AGC valve V12 faulty. | (c) Check grid lead and valve holder connections. If in order, renew valve, 10CV/587. |
| **8.** Meter switch at SIGNAL. System switch at AGC. With strong signal input, no dip in tuning meter when TUNE SIGNAL is rocked about the calibration point. Faint valve noise only. Tuning meter reading:— | | |
| (a) High. | (a) First IF valve V7 signal grid open circuited. | (a) Check grid lead, valve pins and valve holder connections. If in order renew valve 10CV/1053. |
| (b) Zero. | (b) V7 faulty open circuit heater or no emission. | (b) Renew valve V7 10CV/1053. |
| **9.** Tuning meter readings normal on OSC and SIGNAL. Little or no audio output. | (a) AF amplifier valve V11 signal grid open circuited. | (a) Check grid lead, valve pins and valve holder connections. If in order renew valve 10CV/587. |
| | (b) V11 or V13 faulty. | (b) Renew valve V11 10CV/587, or V13, 10CV/1932. |
| | (c) Detector valve faulty. | Renew detector valve 10CV/1092. |

| Symptom | Probable Fault | Remedy |
|---|---|---|
| **10.** Tuning meter readings normal. No heterodyne note on TONE MAN GC. | B.F.O. valve V10 faulty. | Replace valve V10, 10CV/1935. |
| **11.** OSC meter reading normal. SIGNAL meter reading slightly higher on MAN GC than on AGC. Little or no audio output. | Pulse limiter valve V14 faulty. | Replace valve V14, 10CV/1092 |
| **12.** Tuning meter readings normal. Noise level high with no signal input. | Noise limiter valve V15 faulty. | Replace valve V15, 10CV/1092 |

## APPENDIX D2

## TYPICAL VALVE AND LINE VOLTAGES

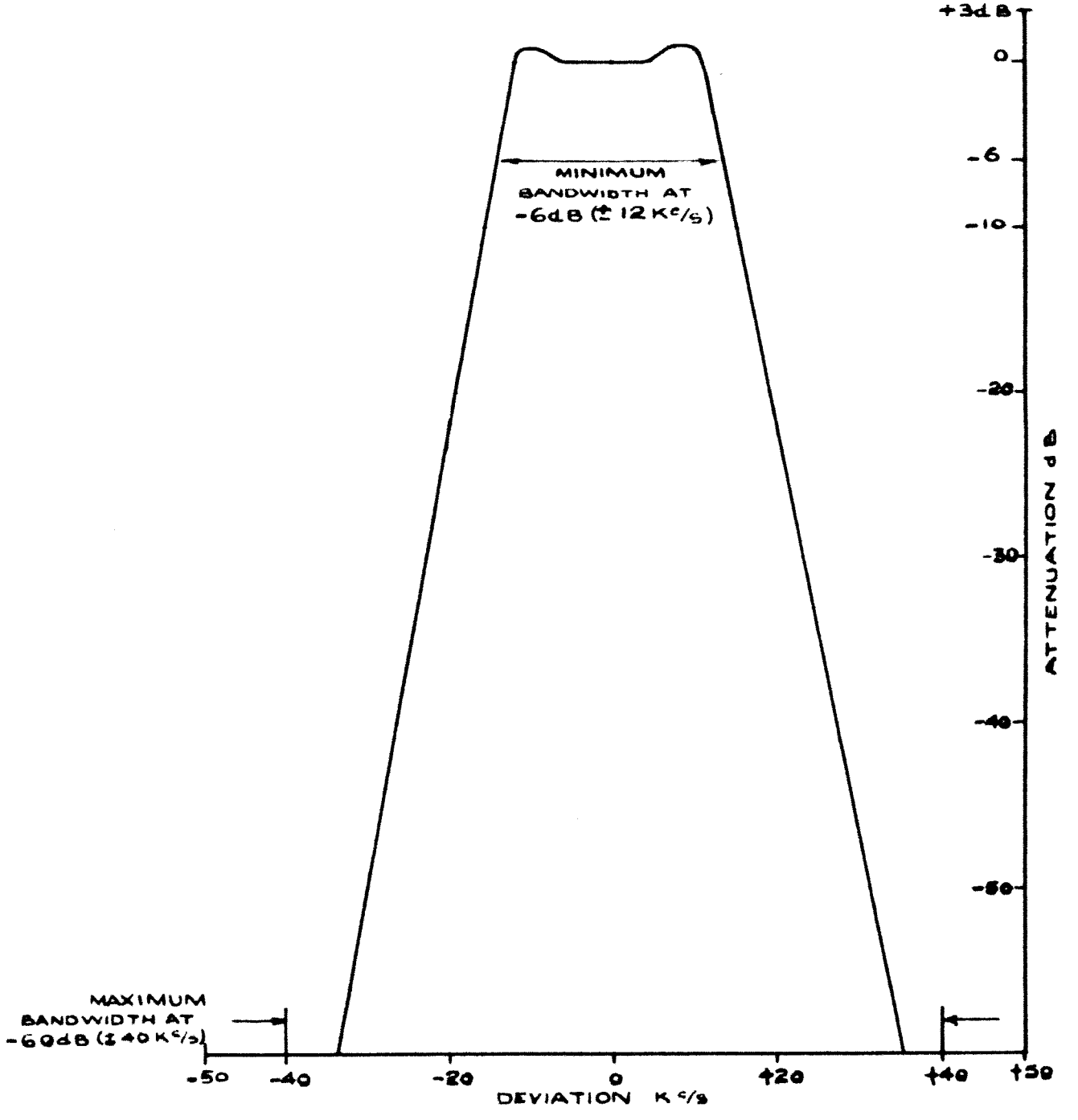
1. The following table gives the approximate voltage readings which should be obtained between the points listed and chassis. voltages are to be measured with the receiver in the following condition: –

(a) Aerial—disconnected.
(b) Output—connected as normal.
(c) Gain controls set to maximum (fully clockwise).
(d) System switch to TONE MAN GC.
(e) Meter switch to SIGNAL.
(f) Receiver tuned to normal operational frequency.

| Valve | Ref. No. | Function | Anode | | Screen | | Cathode | |
|---|---|---|---|---|---|---|---|---|
| | | | Pin | Volts | Pin | Volts | Pin | Volts |
| V1 | CV 1136 | 1st RF Amplifier | 2 | 135 | 3 | 195 | 4, 5, 7 or 8 | 1.6 |
| V2 | CV 1136 | 2nd RF Amplifier | 2 | 135 | 3 | 195 | 4, 5, 7 or 8 | 1.6 |
| V3 | CV 1136 | Mixer (No crystal) | 2 | 160 | 3 | 150 | 4, 5, 7 or 8 | 0 |
| V3 | CV 1136 | Mixer (With crystal) | 2 | 185 | 3 | 195 | 4, 5, 7 or 8 | 0 |
| V4 | CV 1065 | Osc and Trebler (No crystal) | 3 | 200 | 4 | 150 | Across R4 | 1.8 |
| V4 | CV 1065 | Osc and Trebler (With crystal) | 3 | 190/210 | 4 | 140/160 | Across R4 | 1.6/2.0 |
| V5 | CV 1136 | Freq. Multiplier (No crystal) | 2 | 130 | 3 | 190 | 4, 5, 7 or 8 | 1.7 |
| V5 | CV 1136 | Freq. Multiplier (With crystal) | 2 | 150 | 3 | 195 | 4, 5, 7 or 8 | 1.3 |
| V6 | CV 1136 | Buffer Amp. | 2 | 130 | 3 | 200 | 4, 5, 7 or 8 | 1.6 |
| V7 | CV 1053 | 1st IF Amp. | 3 | 195 | 4 | 74 | 8 | 2.2 |
| V8 | CV 1053 | 2nd IF Amp. | 3 | 195 | 4 | 74 | 8 | 2.2 |
| V9 | CV 1053 | 3rd IF Amp. | 3 | 188 | 4 | 115 | 8 | 3.8 |
| V10 | CV 1935 | BFO | 3 | 38 | 4 | 88 | | |
| V11 | CV 587 | A.F. Amp. | 3 | 80 | — | — | 8 | 1.5 |
| V12 | CV 587 | A.G.C. | 3 | 130 | — | — | — | — |
| V13 | CV 1932 | Output | 3 | 200 | — | — | 8 | 6 |

# Appendix D3

## TYPICAL I.F. AMPLIFIER RESPONSE OF R.1392J



# APPENDIX E

## GENERAL PHYSICAL SERVICEABILITY

The continuous serviceability of a radio installation depends not only on the servicing operations specified in the schedules, but also on the observance by operators, mechanics and fitters, of small defects of a physical nature which should be reported and rectified as they occur. Some of these defects which should become obvious to personnel in the normal course of their work on the installation are listed below, but the experienced radio tradesman will obviously extend this list to meet the requirements of the particular installation.

(a) Mechanical structures should be secure and rigid, nuts and bolts should be tight.

(b) Major components should be securely fixed.

(c) Porcelain insulators should show no signs of damage or arcing at high voltage points.

(d) There should be no signs of overheating, or other deterioration, of resistors, chokes, transformers or other components.

(e) Cables and cable forms should be securely clamped, and should not be subject to undue strain, and should show no signs of damage.

(f) Braiding should be adequately earthed.

(g) All cables (where applicable) should carry identification sleeves.

# Appendix F

# PERFORMANCE CRITERIA

**Note . . .**

*Two types of figure are used in this appendix, "Performance Figures" and "Servicing Figures". The former are starred, are mandatory, and must be met. The latter are for guidance only, but should be recorded to show deterioration, if any, of the equipment.*

| *Test* | *Reference* | *Performance Criteria* |
|---|---|---|
| | **PERFORMANCE FIGURES** | |
| SENSITIVITY (For 10 micro V input) | Div 2, Sect 4, Para. 17b | At least − 15 dBm* |
| SIGNAL TO NOISE RATIO | Div 2, Sect 4, Para 17g. | R1392 D, B and E* At least 20 dB down on 15 dBm (− 5 dBm) R1392 J At least 10 dB down on 15 dBm |
| AGC | Div 2, Sect 4, Para 18b | A fall in meter reading of at least* 0·1 mA when system switch is set to AGC. |
| | **SERVICING FIGURES** | |
| METER READINGS: — | Div 1, Sect 2, Para 4 | |
| Osc (Mixer Ia) | | 0·6 to 0·7 mA. |
| TUNE (1st IF Ia) | | 0·8 to 0·9 mA. (0·7 to 0·8 mA if mod No. 2654 not incorporated) |
| HT. (PU234A) | Div 1, Sect 2, Para 3. (Div. 1, Sect 1, Para 4) | 250 to 260 volts |

Printed for H.M.S.O. by Christchurch Times Ltd.,
7499 840261 500 5·70 483/1

# APPENDIX G1

## Local Manufacture of adaptor leads for use with Signal Generator CT520

### 1. Adaptor lead No. 1

This adaptor lead is to be used when connecting the output of the Signal Generator CT520 to the Receiver aerial socket. It consists of a 12 inch length of 75 ohms coaxial cable (Uniradio 57, 5E/9100285) fitted with a plug Type 150 (10H/133) at one end and a male N-type plug (10H/5803675) at the other end.

An adaptor such as Transradio BNC male to N female (Code BSA 3/7) must be used to connect the lead No. 1 to the CT 520 output lead.

### 2. Adaptor lead No. 2

This adaptor lead is to be used when connecting the output of the CT520 via the terminating unit TM 5551 to the receiver for IF Amplifier and Oscillator Unit alignment. It consists of a 12 inch length of 75 ohms coaxial cable (Uniradio 70, 5E/9100298) with a BNC plug (10H/20770, 5935-99-5809636) at one end and crocodile clips (5K/9400856) at the other end.

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# Appendix G2

## NEUTRALISING TUNING TOOL (R1392J)

This item to be locally manufactured from unit resources.