

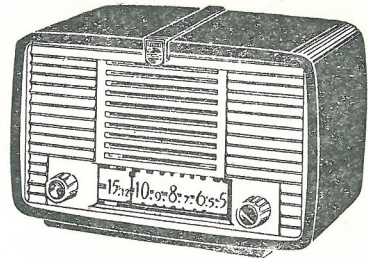
## PHILIPS RADIOPLAYER: MODEL BZ146U

4-Valve Superheterodyne Receiver.

Mains Supply: 210-250 volts A.C., 50-100 C/s., or D.C.

Tuning Range: 535-1600 Kc/s.

Intermediate Frequency: 455 Kc/s.



### REMOVAL FROM THE CABINET

To remove the chassis from the cabinet, the following procedure should be adopted:

Remove the mains plug from the supply. Remove the back cover. Remove the two knobs.

Loosen off the two screws holding the speaker clamps, and turn the clamps to one side.

Remove the two chassis mounting screws from the back of the chassis, and slide the chassis clear of the cabinet.

To replace the chassis in the cabinet, rest the speaker in the felt-covered bracket behind the front of the chassis. Slide the chassis almost into the cabinet, and position the speaker correctly in the moulding. Turn the clamps on to the rim of the speaker, and push the chassis forward until the back of the chassis touches the threaded boss for the mounting screws. Tighten the speaker clamp screws, and replace the chassis screws.

Replace the two knobs. Replace the back cover.

### ALIGNMENT OF THE RECEIVER

Attention is drawn to the fact that the high tension supply is rectified from the mains, so that in the event of the mains cord being improperly connected it is possible that the phase of the supply is connected to the chassis. Therefore, before commencing work on the receiver it is advisable to check the mains plug for correct phasing. A further check may be carried out by connecting a neon lamp between chassis and earth, measuring the potential of the chassis, with respect to neutral with a low consumption A.C. voltmeter, or by using a suitable 1:1 isolating transformer.

Set the centre of the pointer to the edge of the reference lines at the low frequency end of the dial scale. These reference lines are the two white horizontal bars on the right-hand end of the scale, which stop short of 550 Kc/s.

Switch on the receiver and allow it to warm up for a few minutes. Turn the volume control to the maximum position and the tuning condenser to the minimum capacity position.

Apply a signal of 455 Kc/s. modulated 30% through a capacity of 0.01 mfd. to the control grid of the UCH42 valve.

Adjust the micro band pass filters by means of the adjusting slugs on the top of the cans in the order (see trimmer position diagram):

1. Diode Coil; 2. UAF42 Plate Coil; 3. UCH42 Plate Coil; 4. UAF42 Grid Coil; repeating the process until maximum output is obtained.

The input required from the attenuator for a power output of 50 milliwatts at the secondary of the output transformer should not exceed 300 microvolts.

The most satisfactory method of injecting a signal into the Ferroceptor is to apply a signal from a signal generator into a loop of six turns of approximately 6" diameter, mounted in a vertical plane with its centre approximately 4½" above the bench, at right angles to the longitudinal axis of the Ferroceptor, and approximately 12" away.

If the output impedance of the signal generator is fairly high, the signal may be injected into the control grid of the UCH42 through a 5 mfd. condenser, or the "hot" lead of the signal generator may be wound loosely round the Ferroceptor coil. However, neither of these two methods will give the accurate results obtainable with the loop method, as the "Q" value of the input circuit is very high, and the capacity effect of the direct coupling methods will not allow the precise adjustments required for optimum results.

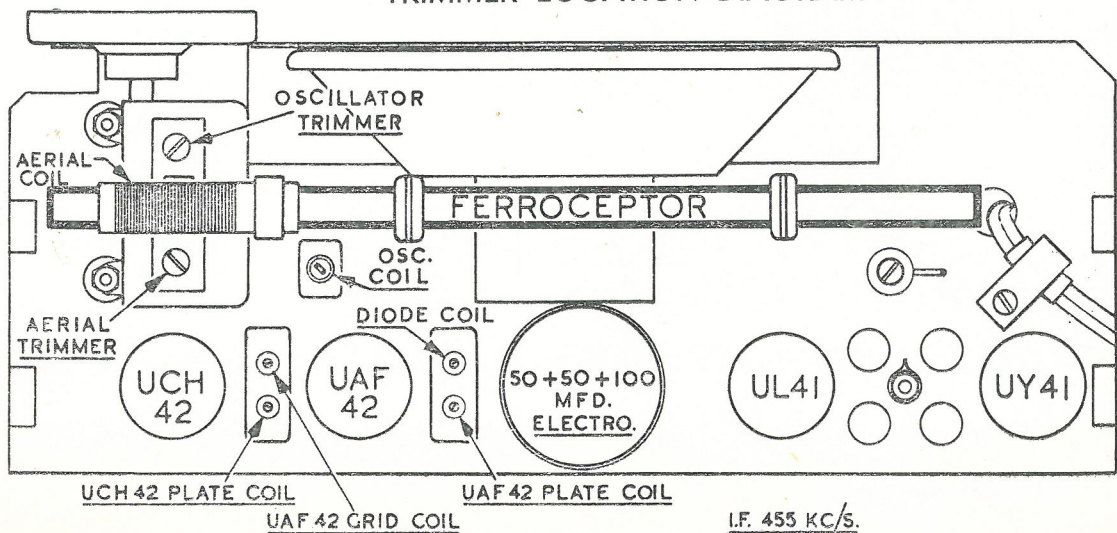
Apply a signal of 600 Kc/s. to the loop coil, and turn the pointer to the 600 Kc/s. position on the dial.

Adjust the oscillator coil inductance until the signal is tuned in, and with an insulated rod, adjust the coil on the Ferroceptor for maximum output. Turn the pointer to the 1400 Kc/s. position on the dial scale, and apply a signal of 1400 Kc/s. to the loop.

Adjust the oscillator trimmer until the signal is correctly tuned and adjust the aerial trimmer for maximum output.

Repeat as for 600 Kc/s. and seal the Ferroceptor coil firmly in position. Check at 1400 Kc/s. and adjust if necessary. Check the calibration at 950 Kc/s. Seal tuning condenser trimmers and the oscillator coil slug.

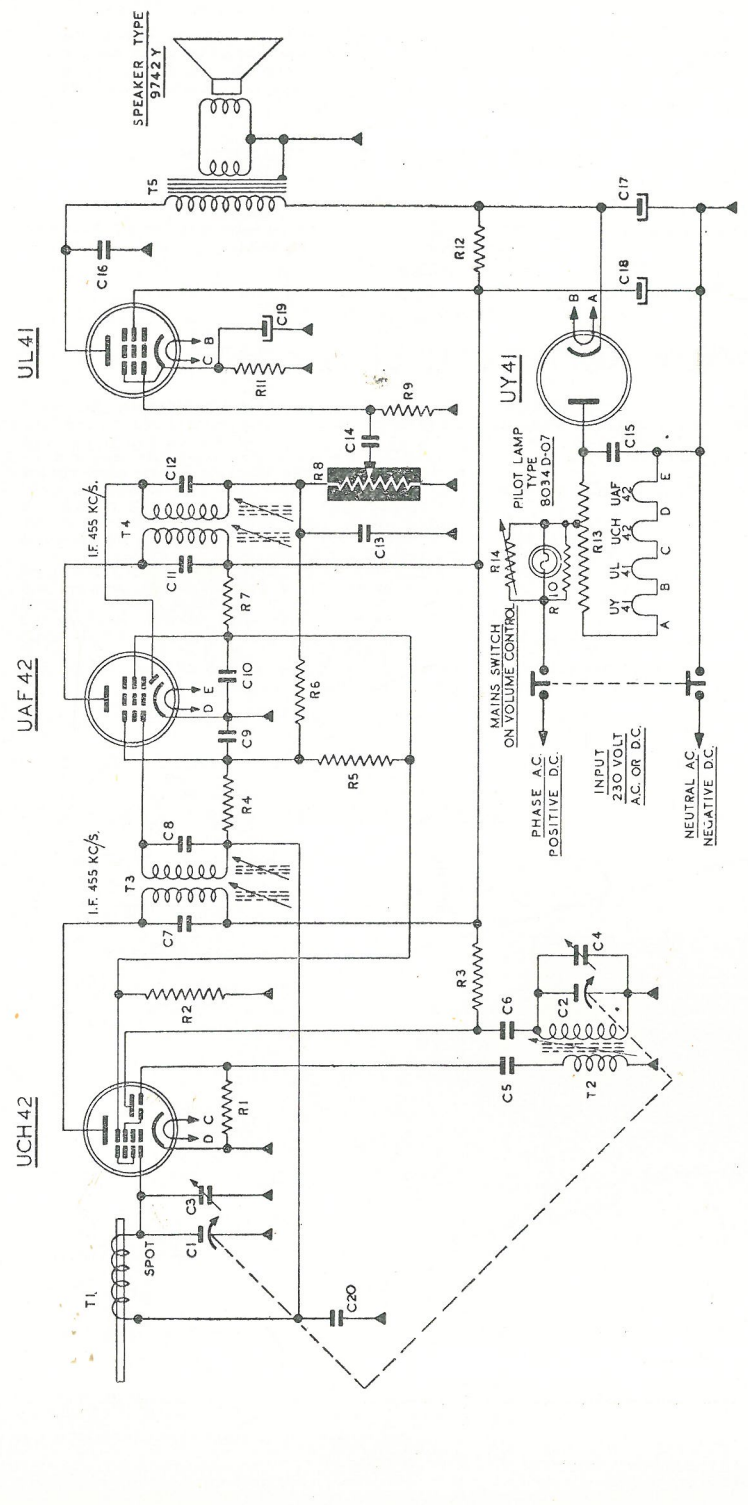
### TRIMMER LOCATION DIAGRAM



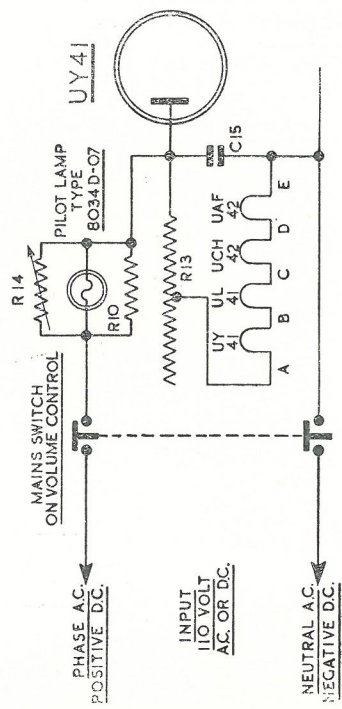


# PHILIPS RADIOPLAYER: MODEL BZ146U

C	R	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
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LEFT: BZ146U: 110 VOLT  
 R14 Tempco 49-379-55  
 R13 1320 ohms w.w.  
 R10 300 ohms 1/2w.



- CONDENSERS**
- C1 12-460 mmfd. gang condenser
  - C2 10-193 mmfd. gang condenser
  - C3 25 mmfd. compression trim.
  - C4 25 mmfd. compression trim.
  - C5 100 mmfd. ceramic
  - C6 150 mmfd. ceramic
  - C7 110 mmfd. I.F. condenser
  - C8 110 mmfd. I.F. condenser
  - C9 500 mmfd. mica
  - C10 0.05 mfd. 350v. paper
  - C11 110 mmfd. I.F. condenser
  - C12 110 mmfd. I.F. condenser
  - C13 100 mmfd. ceramic
  - C14 0.05 mfd. 500v. paper
  - C15 0.022 mfd. 1000v. paper
  - C16 0.005 mfd. 750v. paper
  - C17 50 mfd. 350v. Triple
  - C18 50 mfd. 350v. elec.
  - C19 100 mfd. 12v. electrolytic
  - C20 0.05 mfd. 350v. paper

**RESISTORS**

- R1 47k 1/2w. carbon
- R2 27k 1/2w. carbon
- R3 25k 1/2w. carbon
- R4 4.7 meg. 1/2w. carbon
- R5 10 meg. 1/2w. carbon
- R6 2.2 meg. 1/2w. carbon
- R7 15k 1w. carbon
- R8 0.5 meg. volume control
- R9 680k 1/2w. carbon
- R10 300 ohms 1/2w. carbon
- R11 150 ohms 1w. carbon
- R12 1000 ohms 1w. carbon
- R13 1320 ohms tapped at 130 ohms w.w.
- R14 Tempco resistor 49-379-55

**COILS**

- T1 Ferroxcube rod aerial VK-469-66
- T2 Oscillator coil VK-471-44
- T3 1st I.F. transformer A3-124-25
- T4 2nd I.F. transformer A3-124-25
- T5 Output transformer VK-670-94



## VOLTAGE TABLE

All readings taken with an input of 230 volts 50 C/s.  
Full load input current (moving iron ammeter) 250 mA.

Valve	Function	Filaments	Plate	Screen	Cathode
UCH42	Frequency converter and oscillator	14	Conv. Osc. 175 95	65	—
UAF42	I.F. Amplifier, Demodulator and Delayed A.V.C.	12.6	175	65	—
UL41	Power Output	45	190	175	10.4
UY41	Half Wave Rectifier	31	210 A.C.	—	203
8034D	Panel Lamp	10	—	—	—

The above voltages are measured between the points indicated and chassis, except in the case of the filament voltages, which are measured directly between the valve socket terminals, the meter used having a movement of 20,000 ohms per volt on D.C. ranges and 1000 ohms per volt on A.C. ranges. Variations up to  $\pm 5\%$  are permissible. Voltage across the pilot lamp measured with a moving iron voltmeter.

### COIL AND TRANSFORMER RESISTANCES

VK-469-66	FERRORECEPTOR COIL	Tuned	1.1 ohms
VK-471-44	OSCILLATOR COIL	Tuned	11 ohms in later products 6-7 ohms
		Feedback	4.7 ohms in later products 3 ohms
A3-124-25	MICRO BAND FILTER	Each winding	12.5 ohms
VK-670-94	OUTPUT TRANSFORMER	Primary	245 ohms
		Secondary	0.85 ohm

### REPLACING THE DIAL DRIVE CORD

Check the position of the tuning condenser drum and make sure that when the tuning condenser is in the maximum capacity position the cord opening in the drum is at 3 o'clock.

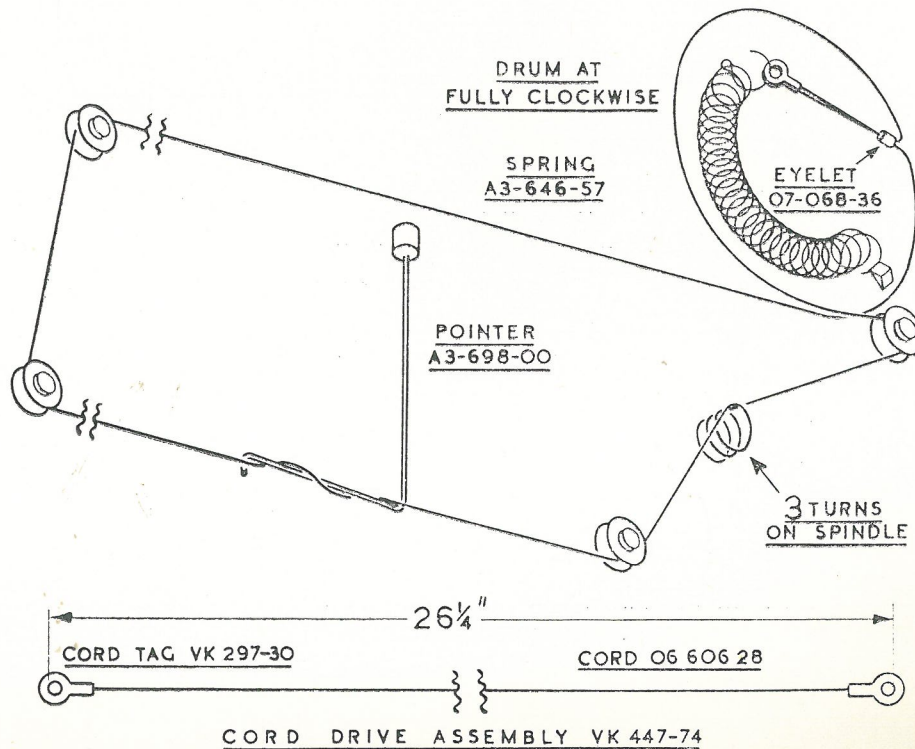
Make sure that the drum is tight on the condenser shaft.

Remove the tuning shaft bearing bracket. Fold the drive cord assembly in half, and place the loop through the eyelet (07-068-36) so that the round shoulder protects the end from the sharp edge of the drum rim hole. Clip the two ends of the cord with the tags (VK-297-30) to one end of the spring (A3-646-57), and the other end of the spring to the drum.

Place the eyelet securely in its correct position in the slot on the rim of the drum and

with the condenser at maximum capacity place one part of the cord loop round the drum in a clockwise direction, along the top edge of the chassis and over the upper left-hand pulley. Take the rest of the cord round the drum in an anti-clockwise direction, over the upper right-hand pulley, then round the tuning shaft three times in an anti-clockwise direction, with the cord progressing toward the end of the shaft.

Place the cord under the lower right-hand pulley, then with a pair of pliers, stretch the tension spring until the cord can be placed under the lower left-hand pulley. Replace the tuning spindle bearing. Turn the drive shaft a few times, and adjust the cord so that it runs evenly in the centre of the rim of the tuning condenser drum.

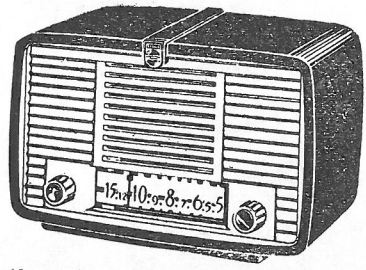


MODEL BZ146U



*Philips 156 by Muller 466 very similar but different cabinet*

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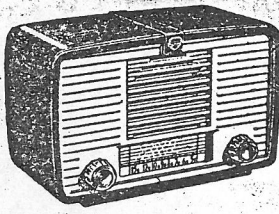


BZ 14-6U

*= BZ146U*

**REMOVAL FROM THE CABINET**

To remove the chassis from the cabinet, the following procedure should be adopted:  
 Remove the mains plug from the back cover. Remove the two knobs from the back cover. Loosen off the two screws holding the back cover clamps, and turn the clamps to one side.  
 Remove the two chassis mounting screws from the back of the chassis, and slide the chassis out of the cabinet.



**MULLARD MODEL 454**

A marvellous 4-valve "Baby Grad" Broadcast model which, because of its built-in Ferroceptor rod aerial, does not need an outside aerial. Two-tone moulded cabinet with illuminated dial. 10 1/4 in. wide, 6 1/2 in. high.

£14/17/6

Or No Deposit and 3/3 Weekly

the micro band pass filters by means of tuning slugs on the top of the cans in the trimmer position diagram):  
 1. UCH42 Plate Coil; 2. UAF42 Plate Coil; 3. UCH42 Grid Coil; 4. UAF42 Grid Coil; repeating the procedure until maximum output is obtained.  
 The output required from the attenuator for a maximum output of 50 milliwatts at the secondary of the transformer should not exceed 300 micro-

To replace the chassis in the cabinet, the following procedure should be adopted:  
 Replace the speaker in the felt-covered bracket on the back of the chassis. Slide the chassis into the cabinet, and position the speaker in the felt-covered bracket. Turn the clamps on to the speaker, and push the chassis forward until the speaker mounting screws of the chassis touches the threaded mounting screws. Tighten the speaker mounting screws, and replace the chassis screws.

Replace the two knobs. Replace the back cover.

**ALIGNMENT OF THE RECEIVER**

Attention is drawn to the fact that the high tension supply is rectified from the mains, so that in the event of the mains cord being improperly connected it is possible that the phase of the supply is connected to the chassis. Therefore, before commencing work on the receiver it is advisable to check the mains plug for correct phasing. A further check may be carried out by connecting a neon lamp between chassis and earth, measuring the potential of the chassis, with respect to neutral with a low consumption A.C. voltmeter, or by using a suitable 1:1 isolating transformer.

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Switch on the receiver and allow it to warm up for a few minutes. Turn the volume control to the maximum position and the tuning condenser to the minimum capacity position.

Apply a signal of 455 Kc/s. modulated 30% through a capacity of 0.01 mfd. to the control grid of the UCH42 valve.

A satisfactory method of injecting a signal into the Ferroceptor is to apply a signal from a signal generator into a loop of six turns of approximately 1 1/2 inch diameter, mounted in a vertical plane and centred approximately 4 1/2 inch above the bench, at right angles to the longitudinal axis of the Ferroceptor, and approximately 12 inch away.

If the output impedance of the signal generator is fairly high, the signal may be injected into the control grid of the UCH42 through a 5 mfd. condenser, or the "hot" lead of the signal generator may be wound loosely round the Ferroceptor coil. However, neither of these two methods will give the accurate results obtainable with the loop method, as the "Q" value of the input circuit is very high, and the capacity effect of the direct coupling methods will not allow the precise adjustments required for optimum results.

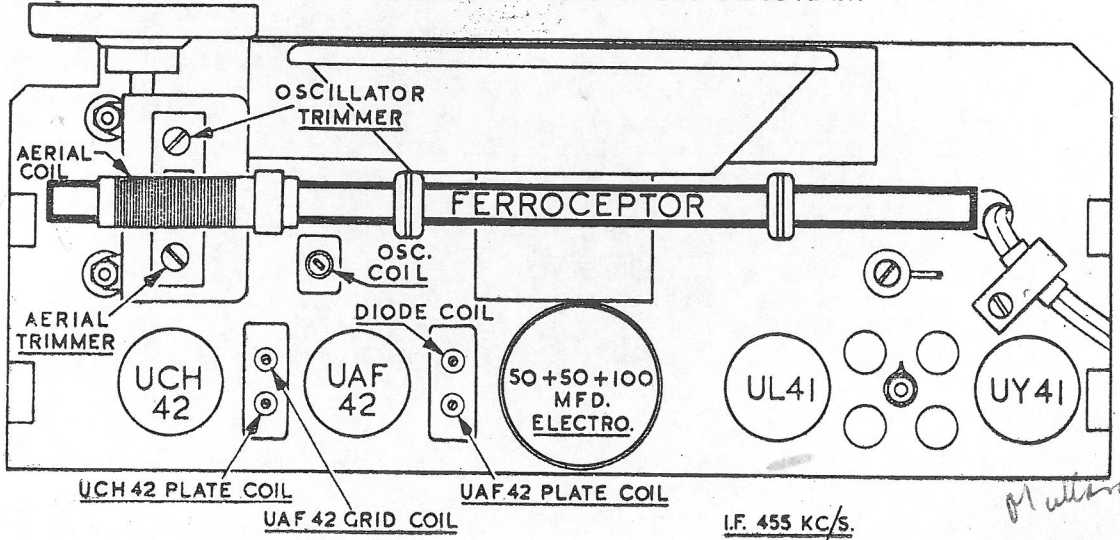
Apply a signal of 600 Kc/s. to the loop coil, and turn the pointer to the 600 Kc/s. position on the dial.

Adjust the oscillator coil inductance until the signal is tuned in, and with an insulated rod, adjust the coil on the Ferroceptor for maximum output. Turn the pointer to the 1400 Kc/s. position on the dial scale, and apply a signal of 1400 Kc/s. to the loop.

Adjust the oscillator trimmer until the signal is correctly tuned and adjust the aerial trimmer for maximum output.

Repeat as for 600 Kc/s. and seal the Ferroceptor coil firmly in position. Check at 1400 Kc/s. and adjust if necessary. Check the calibration at 950 Kc/s. Seal tuning condenser trimmers and the oscillator coil slug.

**TRIMMER LOCATION DIAGRAM**



**PHILIPS RADIOPLAYER: MODEL BZ146U**

*454*

*Mullard*

*Mullard 454*

*BZ146U*