

# PHILIPS RADIOPLAYER

## Table Radiogram : Model HZ726A

5 Valve Superheterodyne Receiver.

Gram Unit Type 2978—33 1/3 r.p.m. and 78 r.p.m. for standard and micro-groove recordings.

Mains Supply 210–250 Volts, 50 c/s

Broadcast Coverage 535–1635 Kc/s

Intermediate Frequency 455 Kc/s



### REMOVAL FROM THE CABINET :

An inspection plate on the bottom of the cabinet, is provided, so that for most of the service work to be carried out it is not necessary to remove the chassis from the cabinet.

To remove the chassis from the cabinet proceed as follows:

Remove the mains plug from the supply.

Disconnect the motor plug, pickup plug and speaker plug from the back of the chassis.

Remove the aerial lead from the fahnstock clip of the plate aerial on the side of the cabinet.

Lift the player lid and tie the pickup to its rest with a piece of string, through the hole provided in the rest.

Remove the turntable from the spindle.

Remove the two screws holding the lid stay to the motor board. Unscrew the four screws holding the motor board, and lift out the motor board and pickup unit complete.

Remove the four control knobs, by unscrewing and removing the four grub screws. Note that the knobs have small semicircular packing pieces in them which must be correctly replaced in the knob, before refitting.

Remove the four chassis mounting bolts from under the cabinet.

The chassis complete with dial mechanism will now slide out of the cabinet, leaving the loudspeaker mounted on the baffle board.

To replace the chassis, reverse the above procedure.

For service information on the 2 speed record player see separate service documentation for type 2978 two speed record player.

### ALIGNMENT OF THE RECEIVER :

All the necessary adjustments are readily accessible by the removal of the bottom inspection cover, so that it is not necessary to remove the chassis from the cabinet, before proceeding with the alignment.

Switch on the receiver and allow it to warm up for a few minutes.

Set the pointer to the centre of the reference point at the low frequency end of the scale and check that the pointer is rotating true with the centre of the dial glass. The reference point is the short fine line located about 5/16" below the 550 Kc/s calibration point.

Turn the volume control to the maximum position and the tuning condenser to maximum capacity.

Turn the tone control to the "high" position and the radio/gram switch to the radio position.

Apply a signal of 455 Kc/s modulated 30% through a capacity of 0.01 mfd to the control grid (No. 6 pin) of the ECH42 valve.

Adjust the intermediate frequency filters for maximum output by means of the adjusting slugs at the side of the cans (see trimmer position diagram), in order:

- |                     |                     |
|---------------------|---------------------|
| 1. Diode coil       | 2. EAF42 plate coil |
| 3. ECH42 plate coil | 4. EAF42 grid coil  |

Repeat the above until maximum output is obtained.

Disconnect the 0.01 mfd coupling condenser from the control grid of the ECH42 and connect the signal generator through a standard dummy aerial to the aerial and earth wires of the receiver.

Turn the pointer to the 1500 Kc/s position on the scale and apply a signal of 1500 Kc/s to the aerial.

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

Turn the pointer to the 600 Kc/s position on the scale and apply a signal of 600 Kc/s to the aerial.

Adjust the padder until the signal is tuned in and adjust the aerial inductance slug for maximum output.

Turn the pointer to the 1500 Kc/s point and adjust as before. If it is necessary to move the

trimmer more than a fraction of a turn, repeat the procedure for 600 Kc/s and 1500 Kc/s again.

Check the sensitivity and calibration at 950 Kc/s. If the calibration is not correct, the sensitivity will be low, and if 950 Kc/s tunes in at a lower frequency on the dial scale, then the oscillator inductance adjusting slug should be screwed in, slightly overcorrecting, and the oscillator padder adjusted to correct 600 Kc/s and the oscillator trimmer adjusted to correct 1500 Kc/s. If the 950 Kc/s signal tunes in at a higher frequency on the dial scale then the oscillator inductance adjusting slug should be screwed out, again slightly overcorrecting and the oscillator padder adjusted to correct 600 Kc/s and the oscillator trimmer adjusted to correct 1500 Kc/s.

*Note.*—Once the aerial coil inductance and the trimmer have been adjusted at their respective frequencies, they should not be moved during calibration adjustments.

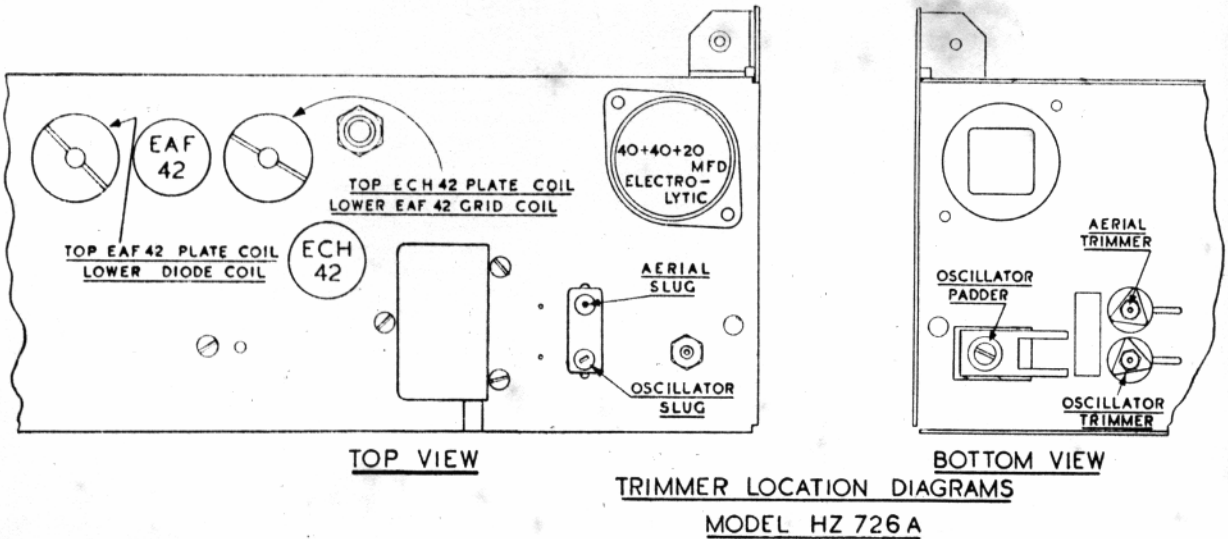
When all adjustments are completed seal all trimmers and adjusting slugs.

Maximum sensitivity figures are given below. These are given mainly as a guide and should if anything, be better than the figures quoted.

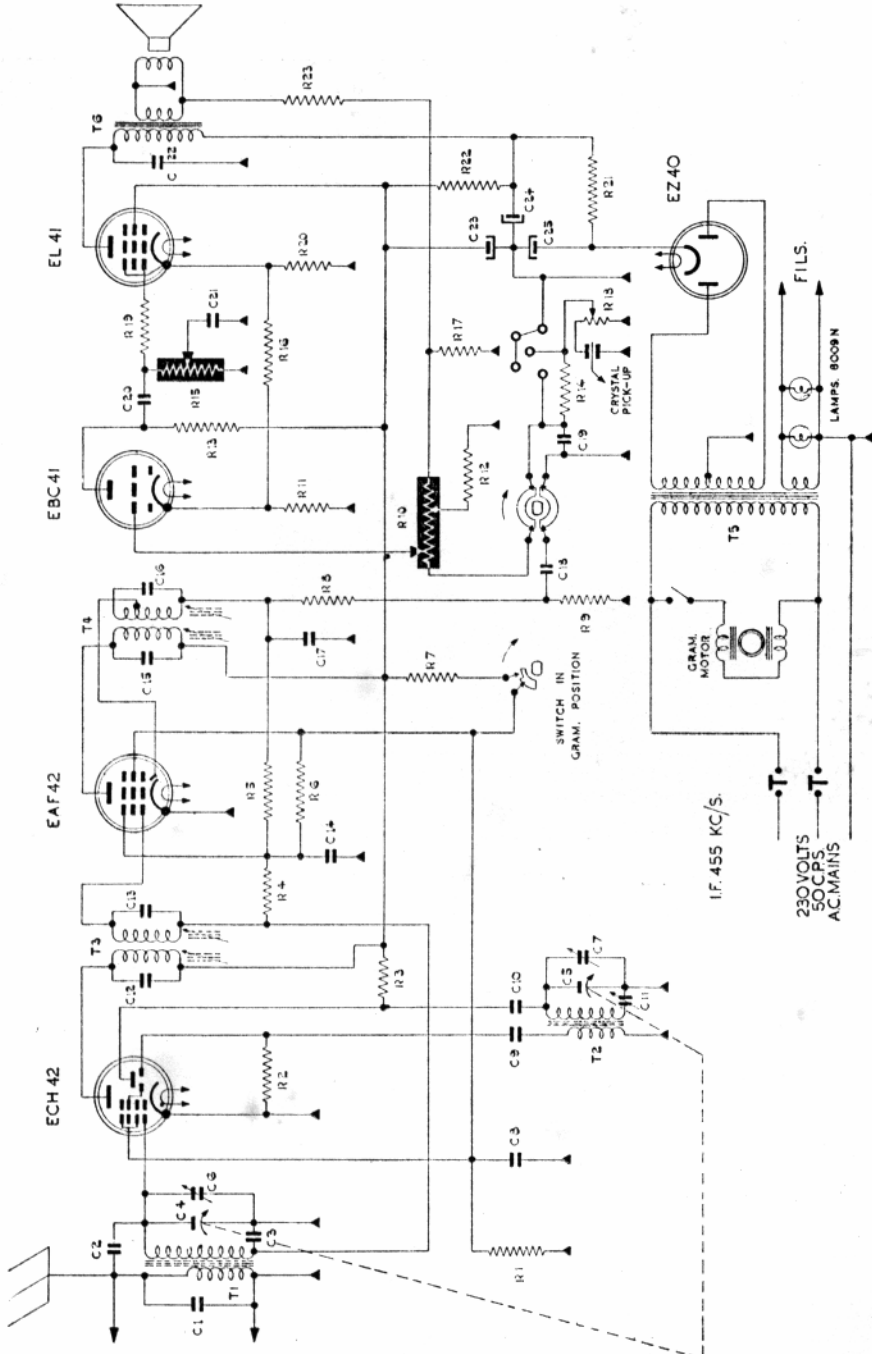
The standard output is 50 milliwatts into a 5 ohm load.

## Maximum Sensitivity Figures

FREQUENCY	SIGNAL APPLIED TO	SENSITIVITY
455 Kc/s	ECH42 control grid via 0.01 mfd condenser	15 Microvolts
600 Kc/s	Aerial connection via standard dummy	5 "
950 Kc/s	" " " " "	5 "
1500 Kc/s	" " " " "	5 "



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25



**CONDENSERS**

- C1 10 mmfd ceramic
- C2 3.9 mmfd ceramic
- C3 0.05 mfd 400v. paper
- C4 12-500 mmfd tuning condenser
- C5 3-30 mmfd air trimmer
- C6 0.05 mfd 500v. paper
- C7 36 mmfd ceramic
- C8 150 mmfd ceramic
- C9 150-750 mmfd paddler
- C10 110 mmfd I.F. condenser
- C11 110 mmfd I.F. condenser
- C12 110 mmfd I.F. condenser
- C13 110 mmfd I.F. condenser
- C14 400 " mica
- C15 110 " I.F. condenser
- C16 11 " ceramic
- C17 100 " ceramic
- C18 0.01 mfd 400v. paper
- C19 330 mmfd ceramic
- C20 0.01 mfd 500v. paper
- C21 0.002 mfd 500v. paper
- C22 0.005 " "
- C23 20 mfd 350v. Triple
- C24 40 " " electro-
- C25 40 " " lytic

**RESISTORS**

- R1 50k 1/2w.
- R2 47k 1/2w.
- R3 25k 1/2w.
- R4 4.7k 1/2w.
- R5 2.2 meg. 1/2w.
- R6 10 meg. 1/2w.
- R7 30k 1w.
- R8 270k 1/2w.
- R9 300k 1/2w.
- R10 0.65 meg. + 2m. vol. control
- R11 1500 ohms 1/2w.
- R12 100k 1/2w.
- R13 150k " "
- R14 500k tone control
- R15 47k 1/2w.
- R16 10 ohms 1/2w.
- R17 500k variable
- R18 10k 1/2w.
- R19 150 ohms 1w.
- R20 500 ohms 4w. wire wound
- R21 2200 ohms 2w.
- R22 390 ohms 1/2w.
- R23 390 ohms 1/2w.

**COILS**

- T1 Aerial coil
- T2 Oscillator coil
- T3 I.F. transformer
- T4 " " "
- T5 Power transformer
- T6 Output " "

IF. 455 KC/S.  
230 VOLTS  
50 CPS.  
AC MAINS

LAMPS. 800/9N  
FILLS.

# VOLTAGE TABLE

All readings taken with a primary input of 230 volts, 50 c/s.

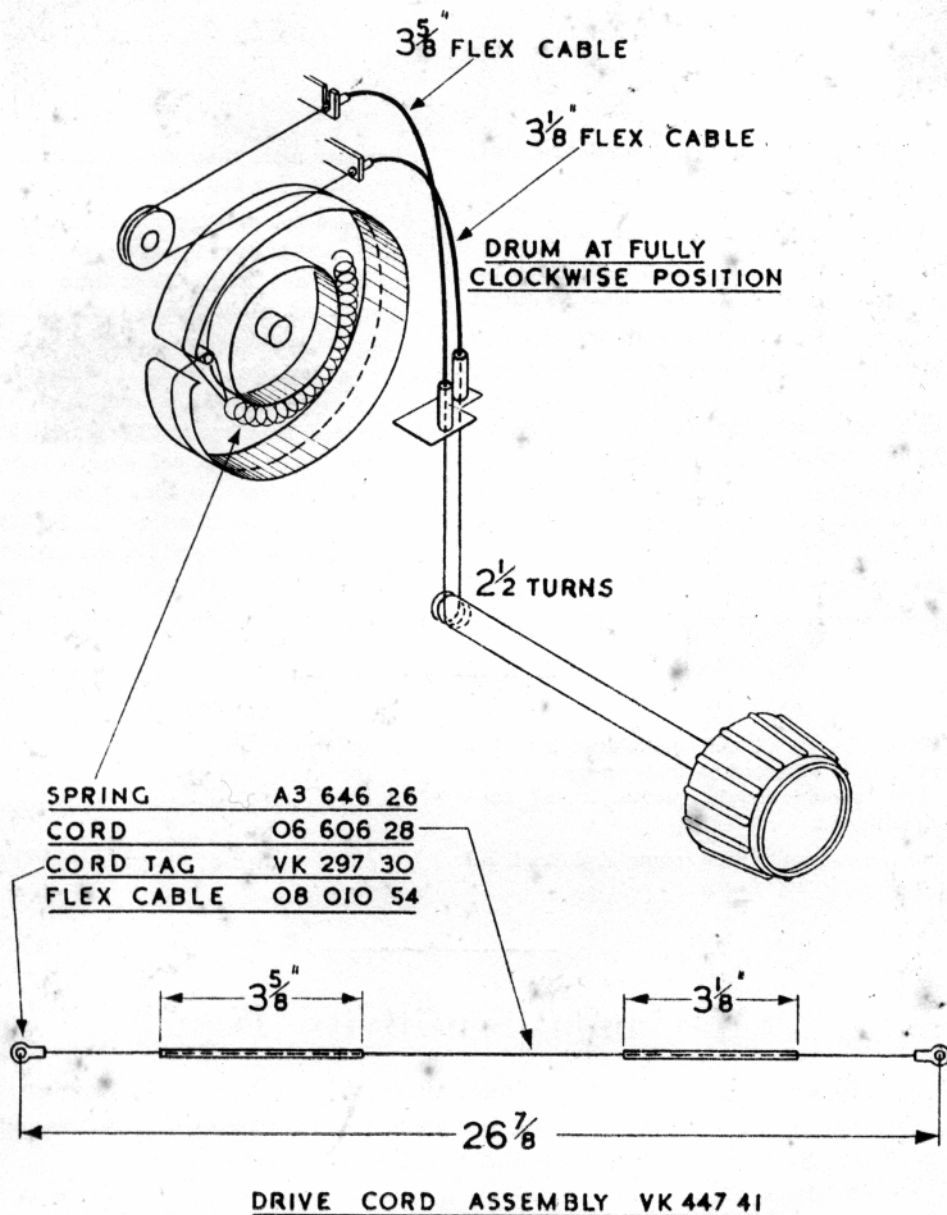
Full load primary current, without the record player, should not exceed 225 mA.

Valve	Function	Filament	Plate	Screen	Cathode
ECH42	Frequency converter and oscillator Triode Hexode	6.3v	210v	60v	0
EAF42	I.F. amplifier demodulator and delayed A.V.C. Diode Pentode	6.3v	210v	60v	0
EBC41	Audio voltage amplifier Triode	6.3v	95v	—	1.1v
EL41	Power output—Pentode	6.3v	260v	210v	6.1v
EZ40	Full wave rectifier	6.3v	280 A.C. per plate	—	300v
8045N	Panel lamps (2 per set)	6.3v	—	—	—

The above voltages are measured between the points indicated and chassis with a meter having a resistance 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. Radio/gram switch in position RADIO and tuning condenser at maximum capacity.

## Coil and Transformer Resistances

CODE NUMBER	DESCRIPTION	RESISTANCE	
VK 469-54	Aerial Coil Broadcast	Primary	71 ohms
		Secondary	2.45 ohms
VK 471-36	Oscillator Coil Broadcast	Tuned	11 ohms
		Feedback	4.7 ohms
A3 121-95	Intermediate Filters	Each winding	7.25 ohms
		Low end to tap	4.4 ohms
VK 670-75	Output Transformer	Primary	175 ohms
		Secondary	0.475 ohms
VK 630-67	Power Transformer	Primary	37.5 ohms
		Filaments	0.075 ohms
		Secondary	{ 265 ohms 290 ohms



**REPLACING THE GANG DRIVE CORD:**

It is necessary when replacing the gang drive cord, to remove the dial, pointer and backplate.

Slide the pilot lamp holders off their mountings and remove the two screws and clamps holding the dial glass. Remove the dial glass and slide the pointer off the gang shaft.

Remove the dial backplate by undoing the four self tapping mounting screws.

Turn the gang to the maximum capacity position and attach the spring A3 646-26 (see diagram) securely to the drum by bending the lug on the drum over one end of the spring.

Take the drive cord assembly VK 447-41 and place the cord tag nearest the 3 1/8" length of flex cable over the end of the spring. Take the cord over the small brass capstan and round the drum in a clockwise direction to the cable socket in the pulley bracket assembly mounted on the tuning condenser. The cord is then pushed through the slot in the lower cable socket and the 3 1/8" flex cable pushed back into the socket. Push the cord through the slot in the outer cable socket mounted on the chassis and fit the free end of flex cable. The cord is next fed round the shaft in a clockwise direction

making 2 1/2 turns round the tuning shaft, progressing towards the front end of the shaft.

Place the cord through the remaining cable socket on the chassis bracket and fit the 3 1/8" flex cable and cord in to this, and the upper cable socket on the tuning condenser bracket. This end of the cord is next placed round the small brass pulley and round the gang drum in a clockwise direction. With a pair of pliers expand the drum spring at the same time taking up the slack in the free end of the cord until it can be continued round the drum and passed through the slot in the drum, round the capstan and over the end of the spring. Release the spring and see that the cord is positioned on the drive shaft in such a way that it does not bind in the chassis bearing and close up any gaps between adjacent turns. Turn the drive shaft a few times so that the tension is equalised over the cord.

Replace the dial backplate, making sure that the felt centering bush lines up with the shaft of the tuning condenser.

Slide the pointer onto the tuning condenser shaft and adjust the pointer by holding the dial glass in position, by hand, and making the necessary alterations outlined under realignment instruction, before replacing the holding clamps and screws.



2 BOND STREET,  
WELLINGTON.

No.2

29th September, 1952.

## HZ726A PICKUP FILTER CORRECTION AND GRAM. ADJUSTMENTS

Variations in output voltage and response in the crystal unit of the Record Player Type 2978 have made it necessary in production to modify the input circuit of Model HZ726A, by fitting a voltage divider across the pickup, which may be adjusted with a screw-driver.

The two-speed player is mounted on four soft conical springs, which should allow the unit to move freely up and down.

When the springs are properly adjusted, a twelve inch record placed on the turntable should be reasonably level, and should clear the front lid rest by  $3/16"$  to  $5/16"$ . If the adjustment has moved during transit and clearance is outside this tolerance, lift out the motor board, and adjust the four nuts under the springs until the unit floats on the springs and the clearance is within the above tolerance.

Make sure that the pickup and motor cord wires are not tight between the mounting plate and the motor board, or between the unit and the motor board, - otherwise acoustic feedback will be present.

Switch the set on to the Gram position, and place a record on the turntable. With the record stationary, place the pickup in the run out position of the record and turn the set to maximum output. It is possible that a loud microphone howl will be heard. With a screw-driver adjust the pickup voltage divider control across the pickup until it is no longer possible to make the set howl.

Check the audio output of the set on gram, and if it is too low, check the playing mounting, and lead position, as these may be causing the microphonic threshold to be evident at quite a low level.

If the high frequency response of the pickup is too low, remove the 330 pfd ceramic condenser (c.19) in the correction filter.

NOTE: In a few of the earlier production chassis, the adjustable voltage divider was in the form of two fixed resistors.

341 (9/52)