Philips "International" TV Companion

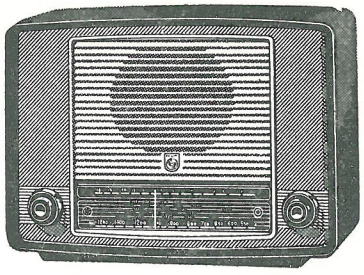
MODEL BZ367A

5 VALVE SUPERHETERODYNE RECEIVER

Mains Supply: 210-250 volts, 50 C/s, 40 Watts

Wave Range: 535-1740 Kc/s Broadcast
5.5-19 Mc/s Shortwave

Intermediate Frequency: 455 Kc/s



REMOVAL FROM THE CABINET

Most service work including alignment, and the replacement of volume and tone controls may be carried out while the chassis is still mounted in the cabinet.

Whenever it is essential to remove the chassis from the cabinet proceed as follows:—

Remove the mains plug from the supply. Remove the base shield earthing screw and the four retaining screws from the back cover. Pull the cover back to remove from the base grooves. Release the power cord and mains plug through the holes in the back cover. Unsolder the speaker and pilot lamp wires from the lugs on top of the output transformer. Remove the two chassis retaining screws located in the front brackets at each end of the chassis and fixed into the moulded bosses in the front of the cabinet above chassis level. Pull the four knobs off the control shafts. Turn the receiver upside down on the bench and remove the pointer from the pointer drive cable. Slide the chassis back out of the cabinet.

To replace the cabinet reverse the above procedure.

When replacing the chassis in the cabinet place the chassis on the rails in the cabinet and fit the mounting screws into the holes in the front brackets. Fit the panel lampholder assembly bracket over the mounting screw on the tuning condenser end of the chassis then slide the chassis forward and tighten the mounting screws.

After the chassis has been replaced it may be necessary to adjust the position of both panel lamps to obtain the best dial scale illumination. The power supply end pilot lamp may be turned on the cabinet boss and the tuning condenser pilot lamp adjusted by loosening off the mounting screw and moving the bracket.

ALIGNMENT OF THE RECEIVER

The chassis should be fitted in the cabinet before alignment adjustments are commenced. Switch on the receiver and allow it to warm up for a few minutes. Turn the tuning condenser to minimum capacity. Check that the wave band switch is in "Broadcast" position. Turn the volume control to maximum high note position. Unscrew the adjusting cores on the I.F. filters nearly right out.

Apply a signal of 455 Kc/s modulated 400 c/s, 30 per cent to the control grid of the ECH81 valve, through a 0.01 mfd condenser, and adjust for maximum output in the following sequence. (See trimmer location diagram.)

1—Diode coil

2—EBF80 plate coil.

3—ECH81 plate coil.

4—EBF80 grid coil.

If the above adjustments are carefully carried out in sequence no further adjustments should be made.

Seal the I.F. adjusting slugs. The input should require less than 25 microvolts for 50 milliwatts output.

Remove the 0.01 mfd condenser from the control grid of the ECH81 valve, and connect the signal generator by means of a standard dummy aerial to the aerial and earth connections of the receiver. Turn the tuning condenser to the maximum capacity position and adjust the pointer at the low frequency end of the dial scale. Turn the broadcast aerial and oscillator trimmers to their mid capacity positions. Apply a signal of 600 Kc/s to the aerial and turn the pointer to the 600 Kc/s position on the dial scale. Adjust the broadcast oscillator padder C 8 until the signal is tuned in. Adjust the coil on the Ferroxcube rod by sliding the coil along the rod with an insulated stick for maximum output. Seal the coil on the rod. Turn the tuning knob until the pointer is in the 1500 Kc/s position on the dial scale and apply a signal of 1500 Kc/s to the aerial. Adjust the broadcast oscillator trimmer C 6 until the signal is tuned in and adjust the broadcast aerial trimmer C 3 for maximum output.

The crossover point is at 950 Kc/s, and if the calibration is out and sensitivity low at this point, the oscillator inductance should be adjusted. If 950 Kc/s tunes in at a lower frequency on the dial scale then the oscillator inductance adjusting core should be screwed in, slightly over-correcting, then the oscillator padder adjusted to correct 600 Kc/s and the oscillator trimmer to correct 1500 Kc/s.

Repeat if necessary.

If 950 Kc/s tunes in at a higher frequency on the dial scale the oscillator inductance adjusting core should be screwed out, again slightly over-correcting, and the oscillator padder and trimmer adjusted to correct the calibration of 600 Kc/s and 1500 Kc/s respectively.

The low impedance aerial coupling gives constant aerial gain over the band and has negligible effect on the Ferroxcube rod adjustment when an

external aerial or signal generator is plugged into the aerial socket so that final adjustment of the rod with an induced signal is not necessary.

Turn the wave band switch to the shortwave band position. Turn the shortwave oscillator trimmer C 5 to the maximum capacity position and the oscillator padder C 7 to the mid capacity position. Set the pointer to the 17 Mc/s position on the scale and apply a signal of 17 Mc/s to the aerial. Turn the oscillator trimmer out until the second signal is tuned in and adjust the shortwave aerial trimmer C 4 for maximum output, rocking the tuning either side of the signal as the aerial trimming adjustment is made. Turn the pointer to the 6 Mc/s position on the scale and apply a signal of 6 Mc/s to the aerial terminal of the receiver. Adjust the shortwave oscillator inductance until the signal is tuned in and adjust the shortwave aerial inductance for maximum output. Turn the pointer to the 17 Mc/s position on the scale, apply a signal of 17 Mc/s to the aerial and readjust as before for calibration and sensitivity.

Apply a signal of 10 Mc/s to the aerial and check the calibration at 10 Mc/s. If the calibration is not correct the oscillator inductance should be adjusted, slightly over-correcting as in broadcast, then adjust to 17 Mc/s by means of the shortwave oscillator trimmer and the 6 Mc/s position with the shortwave padder. The shortwave oscillator padder must be adjusted with an insulated trimmer tool as the outside plates are at the oscillator grid potential. (See circuit diagram C 7.)

After the shortwave band has been correctly aligned and satisfactory calibration and sensitivity obtained seal the trimmers and adjusting slugs. The sensitivity should be less than 15 microvolts input for 50 milliwatts into a 5 ohm load.

VOLTAGE TABLE

All readings taken with a primary input of 230 volts 50c/s. Full load primary current should not exceed 240M/A. Input 40 Watts.

Valve	Function	Filament	Cathode	Screen	Plate
ECH81	Frequency converter and oscillator	6.2	—	60	230 Hexode 100 Triode
EBF80	I.F. Amplifier, demodulator and delayed A.V.C.	6.2	—	60	230
EBC81	Audio voltage amplifier	6.2	—	—	85
EL84	Power output pentode	6.2	6.6	230	260
EZ80	Full wave indirectly heated rectifier	6.2	300	—	285 A.C. per plate
8045D	Pilot lamps	6.2			

Voltage across C30 ..... 300 volts

Voltage across C31 ..... 275 volts

Voltage across C32 ..... 230 volts

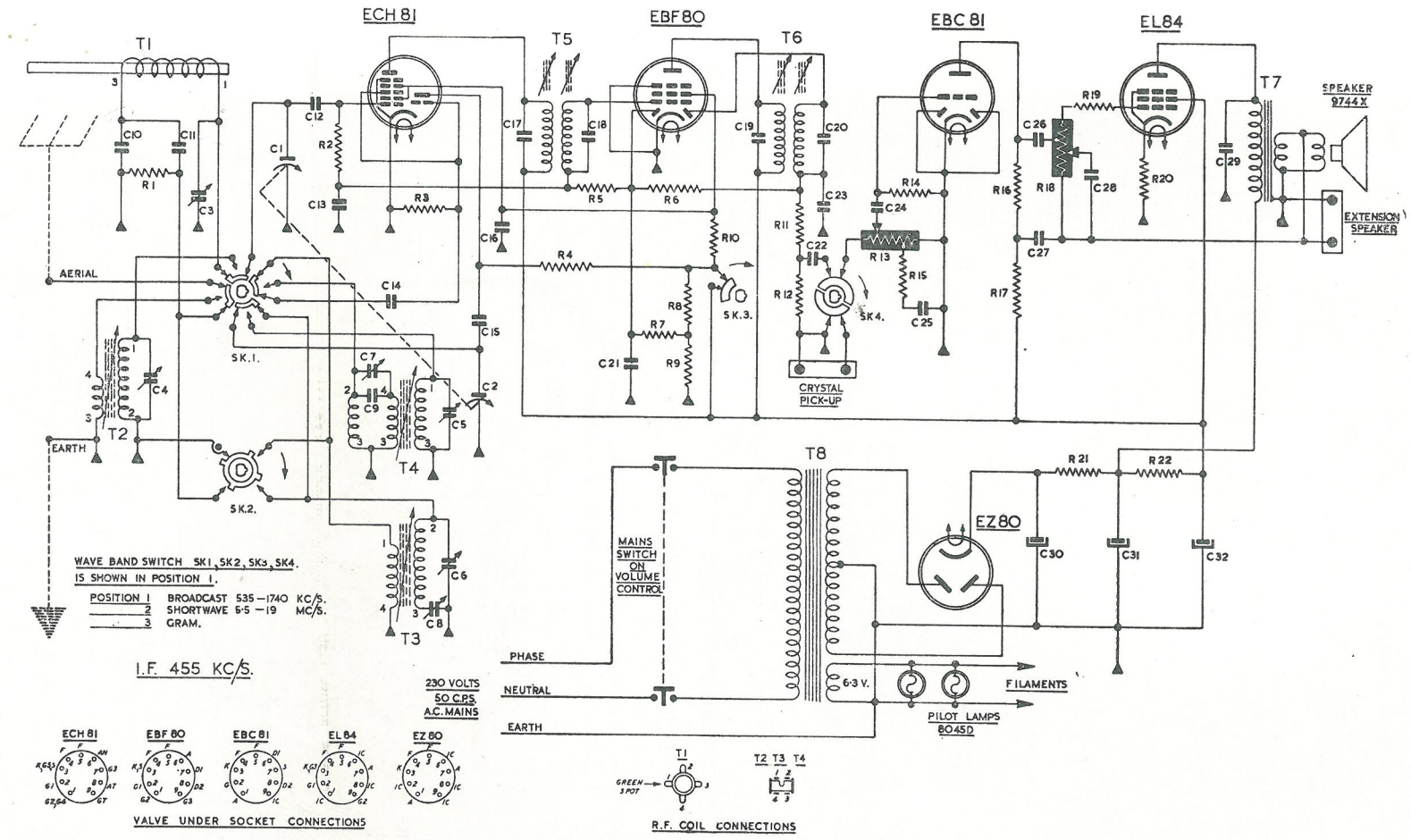
The above voltages are measured between the points indicated and chassis with a meter having a resistance of 20,000 ohms per volt on D.C. ranges and 1000 ohms per volt on A.C. ranges. Variations up to plus or minus 5 per cent are permissible. Wave band switch in the Broadcast position. Tuning condenser at maximum capacity.

EL84

EBC81

EBF80

ECH81



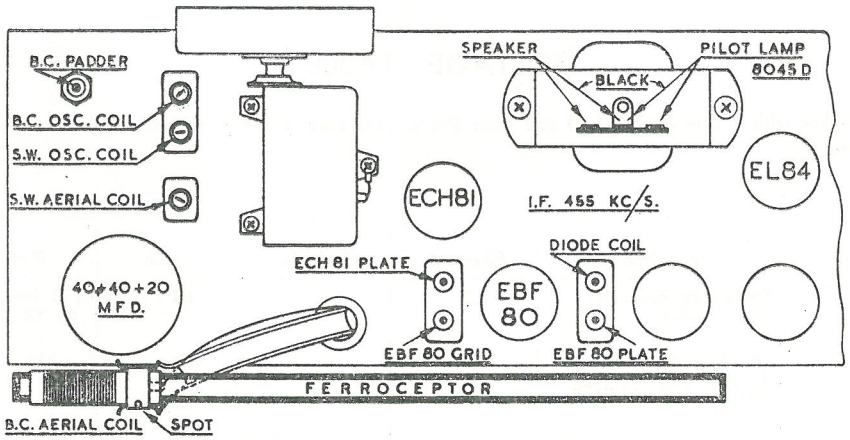
C1 12-500 mmfd } Ganged
C2 12-500 mmfd } condenser
C3 3-30 mmfd air trimmer
C4 3-30 mmfd air trimmer
C5 3-30 mmfd air trimmer
C6 3-30 mmfd air trimmer
C7 6-60 mmfd air trimmer
C8 150-750 mmfd padder
C9 100 mmfd ceramic
C10 3300 mmfd Styroflex
C11 560 mmfd ceramic
C12 150 mmfd ceramic
C13 .05 mfd 350v paper
C14 47 mmfd ceramic
C15 233 mmfd ceramic
C16 .02 mfd 500v paper
C17 110 mmfd ceramic
C18 110 mmfd ceramic
C19 110 mmfd ceramic
C20 110 mmfd ceramic
C21 500 mmfd mica
C22 .01 mfd 500v paper
C23 100 mmfd ceramic
C24 .01 mfd 500v paper
C25 .02 mfd 500v paper
C26 .02 mfd 500v paper
C27 .01 mfd 500v paper
C28 1500 mmfd ceramic
C29 .002 mfd 750v paper
C30 40 mfd } 350v triple electron
C31 40 mfd }
C32 20 mfd }

R1 15k ½w carbon
R2 1M ½w carbon
R3 47k ½w carbon
R4 27k 1w carbon
R5 4.7 meg ½w carbon
R6 2.2 meg ½w carbon
R7 10 meg ½w carbon
R8 470k ½w carbon
R9 100k ½w carbon
R10 22k 1w carbon
R11 100k ½w carbon
R12 270k ½w carbon
R13 2 meg tapped at 400k pot
R14 10 meg ½w carbon
R15 39k ½w carbon
R16 100k ½w carbon
R17 100k ½w carbon
R18 500k tapped at 50k potentiometer
R19 1000 ohms ½w carbon
R20 150 ohms 1w carbon
R21 370 ohms 4w wire wound
R22 1800 ohms 4w wire wound

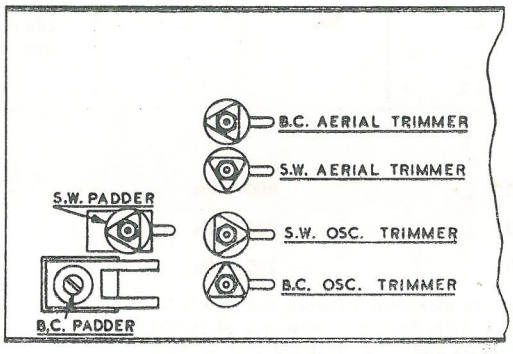
T1 Ferroxcube rod aerial coil VK469-73
T2 Shortwave aerial coil VK469-55
T3 Broadcast oscillator coil VK471-50
T4 Shortwave oscillator coil VK471-37
T5 Micro "12" I.F. transformer A3 127-42
T6 Micro "12" I.F. transformer A3 127-42
T7 Output transformer VK671-01/03
T8 Power transformer VK631-05

LIST OF SPARE PARTS

Cabinet	A3	770	64	Spring clip for back	A3 449 00
Flocked Dial backing	A3	554	28	Wave band switch assembly	VK 421 43
Back and bottom cover assembly	VK	369	83	Tone Control	48 904 30/GL 50K + 45OK
Knob small (Tuning)	A3	752	34		
Knob small (Volume)	A3	752	38	Volume Control	48 900 00/DL M4 + 1M6
Knob large (Tone)	A3	752	36		
Knob large (Wave Change)	A3	752	76	Ferroxcube Rod	56 681 23/4B
Knob spring	A3	522	08	Tuning Condenser (C1, C2)	49 001 42
Dial Scale	VK	852	20		



TOP VIEW



BOTTOM VIEW

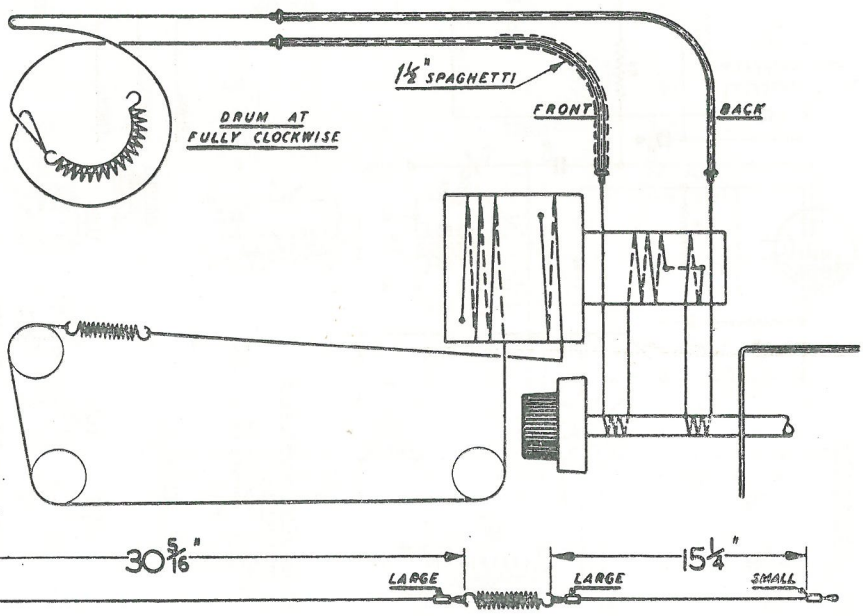
TRIMMER LOCATION DIAGRAMS

COIL AND TRANSFORMER RESISTANCES

T1	Ferroxcube Rod Aerial Coil	VK 469 73		1.1	ohms
T2	Shortwave Aerial Coil	VK 469 55	Primary	1.5	ohms
			Tuned	0.1	ohms
T3	Broadcast Oscillator Coil	VK 471 50	Tuned	6.75	ohms
			Feedback	3.15	ohms
T4	Shortwave Oscillator Coil	VK 471 37	Tuned	0.17	ohms
			Feedback	0.345	ohms
			Padder	1.5	ohms
T5	Micro "12" I.F. Filter	A3 127 42	Primary	14.5	ohms
			Secondary	14.5	ohms
T6	Micro "12" I.F. Filter	A3 127 42	Primary	14.5	ohms
			Secondary	14.5	ohms
T7	Output Transformer	VK 671 01/03	Primary	325	ohms
			Secondary	0.45	ohms
T8	Power Transformer	VK 631 05	Primary	40	ohms
			Filament	0.1	ohms
			High Tension	330	ohms
				360	ohms

DRIVE CORD ASSEMBLY VK 447-81

CORD	06 606 28
FLEX CABLE	08 010 54
FERRULES	A3 674 27
BRASS TUBE	28 118 57
CORD TAG	VK 297 30
SPRING	A3 646 57



WIRE CABLE	33 635 64
BRASS TUBE LARGE	28 118 57
BRASS TUBE SMALL	28 118 58
SPRING	A3 644 71

POINTER CABLE ASSEMBLY VK 447-83