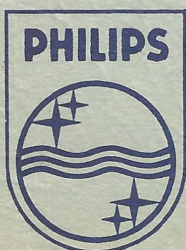


PHILIPS

SERVICE DATA

EV 4456

TUNER



ELECTRO-ACOUSTICS

RADIO TUNER PREAMPLIFIER

MODEL NUMBER EV4456

The EV4456 radio tuner preamplifier as its name implies is a complete sound system control centre. It combines a three valve superheterodyne radio tuner with tuning indicator, microphone preamplifier, pickup/radio voltage amplifier, inputs for electronic bell (for schools) and tape recorder, output feed to the microphone input of a tape recorder and monitor speaker with volume control. The unit is mounted on a standard 10½ inch panel for rack mounting and it is intended to feed a signal of 1 volt RMS to the input of any standard Philips booster amplifier from which it obtains its high tension, bias and heater requirements as well as the necessary audio voltage for operation of the monitor speaker.

The radio tuner section employs a tuned RF stage and the I.F. is stagger tuned to give a "flat topped" selectivity curve to ensure a wide audio frequency response together with good adjacent channel rejection. This type of selectivity characteristic cannot be achieved if there is any tendency towards regeneration in the signal circuits and great care has been taken with the layout of the EV4456 in this respect. Despite the reduction in gain that the stagger tuning causes, the radio sensitivity is exceptionally high and it possesses an excellent image and overall frequency response. The wide audio range is not of much use unless it is accompanied by low distortion. Great care has been taken to minimise differential and other forms of distortion in the second detector. The aerial coil of the unit has been fitted with a low impedance (70 ohm) primary. When sensitivity measurements are carried out the use of a standard R.M.A. dummy aerial between the signal generator and the receiver is not recommended. The low impedance output of the generator should be connected directly to the receiver as the dummy aerial represents a series impedance of several thousand ohms.

The audio section of the EV4456 allows the connection of any high impedance microphone, with separate mixing with the selected radio, tape or pickup programme. By the use of negative feedback the output impedance of the unit is kept to a low value to minimise loss of high frequencies along the shielded lead to the amplifier input.

The attached specification sheet gives complete performance details of the EV4456 radio tuner preamplifier.

SPECIFICATION

RADIO TUNER PREAMPLIFIER TYPE EV4456

Tuning Range	1610 Kc - 540 Kc		
Intermediate Frequency	455 Kc		
Valves	6N8 R.F. Amplifier 6AN7 Converter 6N8 I.F. Amplifier, A.V.C., Demodulator 12AX7 Mic Preamplifier, Audio Amp. 6M84 Tuning Indicator		
Output	1 volt, low impedance to drive standard booster amplifier		
Inputs	Microphone	100,000 ohms	3.5mV
	Pickup	500,000 ohms	160mV
	Tape	500,000 ohms	160mV
Auxiliary Output	20mV at 10,000 ohms impedance to feed high impedance microphone input of tape recorder.		
Frequency Response	Radio	:	within 5dB, 30 to 5,000 c/s -10dB at 7Kc -20dB at 10Kc
	Pickup	:	within 2dB, 30 to 15,000 c/s
	Microphone	:	" " " " "
Controls	Tuning Microphone, Volume Radio, pickup, tape, volume Radio, pickup, tape, selector switch Monitor volume		

TEST SHEET

SPECIFICATION

continued

TUNER PREAMPLIFIER

W4456

- Radio Sensitivity Better than 2uV for 10dB signal to noise
 " " 10uV " 20dB " " "
- Image Ratio Better than 40dB
- Power Supply 6.3 volt AC, 250 - 300 volt DC and -1.5 volt DC
 obtained via multicore cable and Painton Plug
 from booster amplifier.

Valve

Anode

Screen

Cathode

This receiver has a low impedance aerial coil primary. It is recommended that measurements for sensitivity are made with the low impedance output of the signal generator connected directly to the receiver and not via the standard R.M.A. dummy aerial.

The primaries of the I.F. transformers are set on 451 Kc/s and the secondaries on 459 Kc/s.

Connect the output meter across the 1200 ohm load resistor on the output of the amplifier and set the Philips Signal Generator GM2883 range switch to .4 - .5Mc band.

Turn modulation switch to 400 c/s tuning control to 451 Kc/s and adjust output to less than 10uV. The audio gain control on the tuner should be turned to maximum and the tuning control to the I.F. end of the band.

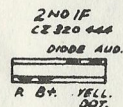
Connect the signal generator without dummy antenna to pin 2 of the 6AN7 socket via a .01uF condenser. Connect earth lead of generator to chassis.

Turn up attenuator of signal generator until a faint 400 c/s note is heard in a monitor loudspeaker.

11. Adjust primary of 1st. I.F. for peak, backing off attenuator to preserve a low output signal in the speaker.
12. Adjust signal generator to 459 Kc/s.
13. Adjust signal generator attenuator until a weak 400 c/s note is again heard then adjust 2nd. I.F. secondary and 1st. I.F. secondary in steps as above.
14. Repeat above procedure twice over maintaining only sufficient level from the signal generator to give an output reading not greater than 10 volts on the meter.
15. The I.F.'s should now be correctly aligned and a signal not greater than 15uV should produce a signal to noise ratio of 10dB. When the generator frequency is moved over the range 450 - 460 Kc the amplitude of the two peaks should be within 3dB of each other.
16. Disconnect the generator from the 6AN7 and connect a short piece of wire to the aerial terminal. Turn the tuning control across the dial to ensure that the oscillator is working.
17. With the gang condenser fully closed set the cursor so that the right hand edge is against the small red line at the bottom of the dial below 2ML. Check to see that the left hand edge of the cursor reaches the small red line at the opposite end of the dial when the gang is fully open.
18. Tune to 3AR. Using special brass tool adjust oscillator coil slug until station is correctly tuned in. Tune to 3AK and adjust oscillator trimmer.
19. Repeat step 18.
20. Connect Advance B4A signal generator via 10 ohm output en termination pad to the aerial terminal. Tune receiver and generator to 650Kc and adjust tuning control for maximum output.
21. Keeping signal level low adjust aerial and RF coil slugs for maximum output.
22. Set generator to 1450Kc and tune in. Adjust aerial and RF trimmers for maximum output.
23. Repeat steps 21 and 22. Tune cover dial and check positions of stations.
24. Set generator to 1Mc and tune in. Set generator output to 4uV and check signal to noise ratio. This should be better than 10dB.
25. Connect an audio generator set at 1000 c/s with an output of 160mV to the pickup input and change function switch to pickup. Output should be approximately 100 volt.

26. By means of radio/pickup volume control reduce output to 50 volt. Change frequency to 100 c/s. Output should be 45 to 50 volt. Change frequency to 10,000 c/s. Output should be 40 - 45 volt.
27. Connect generator to microphone input with output set at 1000 c/s and 3.3 mV. Turn microphone volume control to maximum and ensure that an output of 100 volt is obtained.
28. Disconnect generator and short circuit microphone input. Output should be less than 150 mV.
29. Disconnect all instruments and booster amplifier. Turn tuning gang to L.F. end of dial and despatch to store.

	<u>Valve</u>	<u>Anode</u>	<u>Screen</u>	<u>Cathode</u>
V1	6N8	230v D.C.	140v D.C.	0
V2	6AN7	230v D.C.	85v D.C.	0
V3	6M84	70v D.C.	-	-
V4	6N8	230v D.C.	85v D.C.	0
V6	12AX7	140/140v D.C.	-	1.3v D.C.

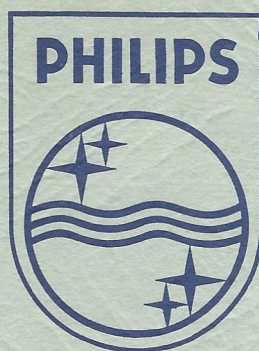


				DIMENSION TOLERANCES (UNLESS OTHERWISE SPECIFIED) TO BE: FRACTIONAL ±		DECIMAL ±	
				USED ON <i>EV4456</i>	DRAWN <i>JH</i>	DATE <i>12-6-62</i>	E PHILIPS ELECTRICAL INDUSTRIES PTY. LTD. E.L.A. DIVISION, MELBOURNE, AUSTRALIA CIRCUIT DIAGRAM OF RF. MODEL TUNER PRE-AMP MODEL No. EV4456 DRG. No. 21
				FINISH <i>-</i>	CHECKED <i>N.M.C.</i>	<i>14-3-63</i>	
				No. REQ'D PER UNIT <i>-</i>	APP.		
<i>ISS. O.</i>		<i>12-6-62</i>					
C.N. No.	CHANGES	BY	DATE	MATERIAL <i>-</i>	SCALE: <i>1:1</i>		

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CIRCUIT DIAGRAM OF
RF. MODEL TUNER PRE-AMP

MODEL No. EV4456 DRG. No. 21



PHILIPS ELECTRO - ACOUSTICS

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NEWCASTLE	194 Parry Street.	Phone 61 5001
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Further information on this equipment can be obtained from any of the above
Philips Branches.