

INSTRUCTIONS

PHILCO RADIO MODEL 490

The Philco Model 490 combines the Philco Short Wave Converter with the Philco Nine Tube Super-heterodyne Radio, making a universal receiver for short wave and standard broadcast reception. A change from one type of reception to another can be made at will. Such a combination affords a reception range from 19 megacycles to 550 kilocycles (16 meters to 545 meters).

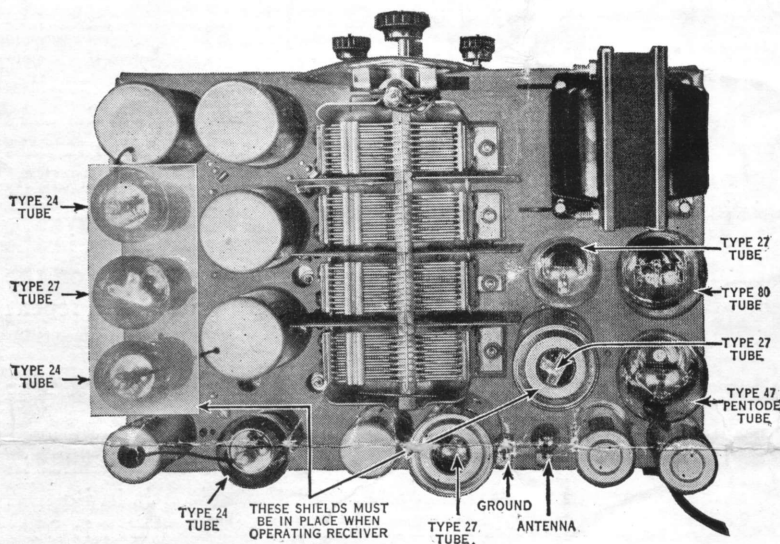


Fig. 1—Tube Positions Broadcast Receiver

short wave unit, usually gives the best results. The lead-in wire is an active part of the aerial, and the aerial length should always be measured from the Converter to the insulator at the far end. The outer end of the aerial should be as high as possible and the entire aerial should be spaced well away from trees and buildings and supported by glass or porcelain insulators. It is more important for short wave reception than for standard broadcast reception that the aerial and lead-in wires be well insulated and spaced well away from nearby objects, particularly large metal surfaces.

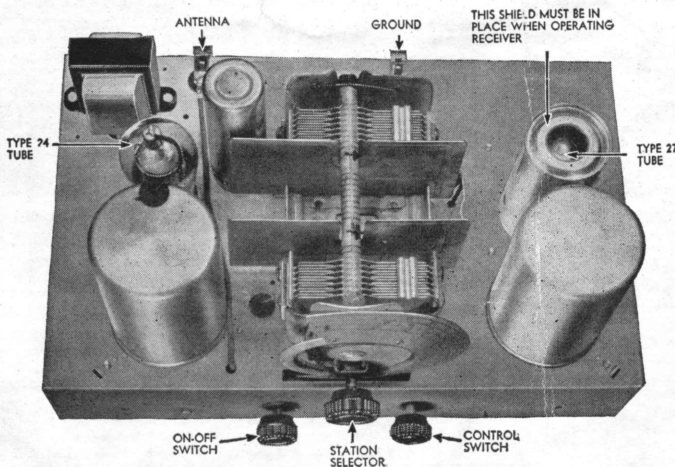


Fig. 2—Tube Positions Short Wave Unit

Eleven tubes are supplied, as follows:

- 4 Philco Type 24
- 5 Philco Type 27
- 1 Philco Type 47
- 1 Philco Type 80

Use only Philco tubes for 100 per cent. balanced unit performance. Make sure that all the tubes are seated in their respective sockets and that the clip terminals at the end of the short black wires in both the short wave and broadcast units are connected to the terminals on top of the screen grid tubes. Figs. 1 and 2 show the correct tube positions.

AERIAL. A standard broadcast outdoor aerial, consisting of a single copper wire 50 to 100 feet long, connected to the "ANT." terminal of the

GROUND. The same ground wire which is used for the broadcast receiver is used for the short wave unit. A suitable ground clamp and wire should be securely attached to a radiator pipe or water pipe and the bare wire end connected to the "GND." terminal of the short wave unit.

CONNECTIONS. See that the plug connections at the back of the instrument are made, and that the blue and white wires, coming out of the large cable of the short wave unit are connected to the "ANT." and "GND." terminals, respectively, of the broadcast unit. Connect the electric power cord to a source of

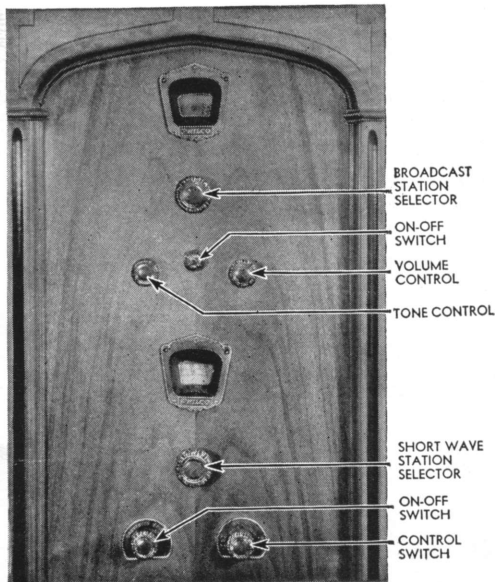


Fig. 3—Operating Controls

alternating current within the limits of voltage and frequency (cycles) as listed in the license notice on the broadcast chassis.

OPERATION—SHORT WAVE. After all connections have been made, turn the “On-Off” switch of both the Converter and the broadcast receiver to the “On” position. Turn the station selector of the broadcast receiver to 1000 kilocycles or to any other point between 950 and 1050 (95 to 105 on the Philco broadcast receiver scale) at which no interference from nearby powerful stations is heard. Turn the broadcast receiver volume control well up. After the tubes heat, turn the control knob at the lower right of the Converter until the dot is opposite the desired short wave range. This is a three position switch that controls the tuning ranges of the short wave unit. For example, when the switch is in the left hand position, the frequency range is from 1.5 to 3.6 megacycles (200 to 83.3 meters). Now slowly turn the station selector of the Converter until a station is heard. The tuning is extremely critical, particularly on the top and middle dial scales, and it is easily possible to pass by a station without knowing of its presence. Usually a slight hissing sound will be heard as the station is tuned in, and after

careful adjustment of the station selector the voice or music will be heard. Vernier tuning to bring in the stations more clearly can be accomplished by means of a slight adjustment of the station selector on the broadcast receiver. If nothing is heard on one range, turn the control knob to another position and repeat the tuning process.

Tune the desired station accurately to the point where it is clearest, and reduce or increase the volume with the broadcast receiver volume control.

The figures on the Short Wave Converter scale correspond with the station broadcast frequencies in megacycles (1000 kilocycles) as listed in newspapers and other station logs. When the switch is in its first position, all the way to the left, the corresponding scale on the dial should be read. This range is from 1.5 to 3.6 megacycles (200 to 83.3 meters). The next position is from 3.6 to 8.5 megacycles (83.3 to 35.3 meters). The third position which uses the upper dial scale is from 8.5 to 19 megacycles (35.3 to 15.8 meters). A conversion chart from dial readings in megacycles to meters is shown in Fig. 5.

DISCONTINUING OPERATION. When discontinuing operation, simply turn the “On-Off” switches of both the Short Wave Converter and the broadcast receiver to the “Off” position.

GENERAL INFORMATION. Short wave reception and transmission is considerably different in many respects from standard broadcasting. Tuning is far more critical and fading is often more noticeable and more rapid. This model is equipped with automatic volume control which greatly reduces the amount of fading. Reception can often be obtained at extremely great distances and programs which would not otherwise be heard are received with good volume. The following general points should be borne in mind, when operating the short wave unit:

- 1—Short wave tuning requires more accuracy and patience than broadcast tuning.
- 2—In general, distant stations operating on frequencies between 19 and 8.5 megacycles will be heard best during the afternoon and early evening, and between midnight and daybreak.
- 3—Distant stations between 8.5 and 3.6 megacycles can be heard best after dark.
- 4—Relatively short distances will be received below 3.6 megacycles. Commercial stations and police stations are within this range.
- 5—Difference in time must be taken into consideration. The time in England is five hours later than that in New York, and in most of continental Europe it is six hours later than in New York.

OPERATION—BROADCAST RECEIVER.

Radio broadcast reception can be obtained in the usual way on the broadcast receiver without changing any of the connections. When the short wave unit is turned off, the aerial and ground connections are automatically transferred to the broadcast receiver. With the short wave unit turned off, and the broadcast unit "On-Off" switch turned to the "On" position, turn the broadcast station selector and different stations will be tuned in at various points on the scale.

Tune the desired station accurately to the point where it is clearest, and reduce or increase the volume with the volume control—never by detuning, as detuning will spoil the tone quality.

The figures on the Philco scale represent channel numbers which, by the addition of a cipher, correspond with the station broadcast frequencies in kilocycles as listed in newspapers and other station logs. For example: 85 on the scale represents channel 85 and a frequency of 850 kilocycles.

AUTOMATIC VOLUME CONTROL.

The automatic volume control incorporated in this Receiver tends to equalize the volume of all stations at the sound level for which the manual control has been set. This prevents the blaring of strong stations during tuning and reduces the fading of distant stations. With the volume control in a given position, the reproduction will not vary greatly in volume, even if the tuning is changed from a weak station to a strong one, or vice versa.

CONTROL OF STATION TONE.

The left-hand control knob operates the new Philco Tone Control which enables the user to adjust the tone quality of the reception from any broadcasting station to suit his taste.

There are four settings of the tone control which are felt as notches when the knob is turned. These have been named: (1) brilliant, (2) bright, (3) mellow and (4) deep. The approximate position of the dot on the tone control knob for each setting is shown in Figure 4.

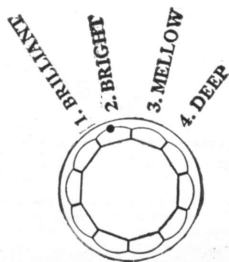


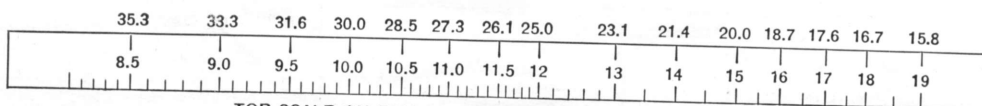
Fig. 4

With this control it is possible to compensate for differences in the quality of broadcasting from different stations and for differences in the human ear.

Setting 1 emphasizes the high notes and thus makes speech particularly sharp and clear. Setting 4 emphasizes the low notes and gives a deep character to the reproduction. Setting 2 will usually be found the most pleasing for music, although, under conditions where static or interference noises are bothersome, setting 3 (or in some cases 4) will be best as it will subdue these background noises.

METERS (APPROXIMATE)

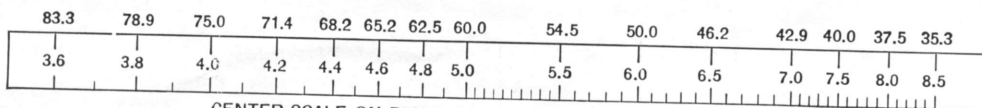
PHILCO DIAL SCALE
MEGACYCLES



TOP SCALE ON DIAL—SWITCH KNOB POSITION "8.5 TO 19"

METERS (APPROXIMATE)

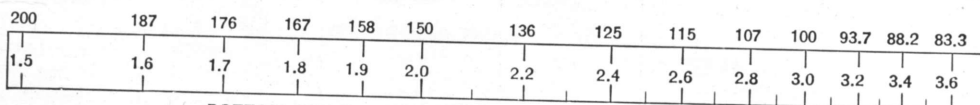
PHILCO DIAL SCALE
MEGACYCLES



CENTER SCALE ON DIAL—SWITCH KNOB POSITION "3.6 TO 8.5"

METERS (APPROXIMATE)

PHILCO DIAL SCALE
MEGACYCLES



BOTTOM SCALE ON DIAL—SWITCH KNOB POSITION "1.5 TO 3.6"

Fig. 5—Conversion Chart—Megacycles to Meters.

PHILCO SHORT WAVE STATION LOG

Approximate Megacycles on Philco Dial	Meters	STATION	LOCATION
1.59	198		Police Departments, U. S. A.
1.71	175		Television, U. S. A.
2.00	150		Police Departments, U. S. A.
2.10	142		
2.40	125		
2.47	121		
2.68	112	W2XAP	Jersey City, N. J.—Television
2.85	105	W9XR	Chicago, Ill.—Television
2.85	105		Airport and Aeroplane Stations
3.5	85.5		
3.0	100	VK6WF	Perth, West Australia
3.16	94.5	WCK	Detroit, Mich.—Police Department
3.26	92	W2XCU	Ampere, N. J.
3.5	85.5		Amateur Stations
3.55	84.5		
4.27	70.0	RV15	Khabarovsk, U.S.S.R.
4.80	62.5	W2XCU	Ampere, N. J.
5.5	54.5		Airport and Aeroplane Stations
5.7	52.6		
5.51	54.5		Moscow, U.S.S.R.
5.87	51.0	W6XAF	Sacramento, Cal.
5.97	50.5	HVJ	Vatican City, Rome
6.02	50.0	W9XF	Chicago, Ill. (Rebroadcasts WENR)
6.04	49.5	W2XAL	Coytesville, N. J. (Rebroadcasts WRNY)
6.04	49.5	W9XAQ	Chicago, Ill. (Rebroadcasts WMAQ)
6.06	49.4	W3XAU	Philadelphia (Rebroadcasts WCAU)
6.06	49.4	W8XAL	Cincinnati, Ohio (Rebroadcasts WLW)
6.07	49.4	UOR2	Vienna, Austria
6.08	49.4	HSP	Bangkok, Siam
6.08	49.4	W9XAA	Chicago, Ill. (Rebroadcasts WCFL)
6.09	49.4	OXO	Copenhagen, Denmark
6.10	49.1	VE9GW	Bowmanville, Ontario, Canada
6.10	49.1	W3XAL	Bound Brook, N. J. (Rebroadcasts WJZ)
6.10	49.1	7LO	Nairobi, Kenya, Africa
6.12	49.0		Paris, France
6.13	49.0	KZRM	Manila, Philippine Islands
6.14	49.0	W8XK	East Pittsburgh, Pa. (Rebroadcasts KDKA)
6.15	48.6	HRB	Tegucigalpa, Honduras
6.43	46.7	W2XCU	Ampere, N. J.
7.40	40.5	ZTD	Durban, South Africa
7.69	39.0	HKF	Bogota, Colombia
8.11	37.0	HS4PJ	Bangkok, Siam
8.11	37.0	RV19	Tomsk, Siberia, U.S.S.R.
8.65	34.7	W2XCU	Ampere, N. J.
9.36	32.0	CM2MK	Havana, Cuba
9.38	32.0	ZTJ	Johannesburg, South Africa
9.49	31.5		Lynghby, Denmark
9.51	31.5	VK3ME	Melbourne, Australia
9.52	31.5	OXO	Copenhagen, Denmark
9.53	31.4	W2XAF	Schenectady, N. Y. (Rebroadcasts WGY)
9.53	31.4	W9XA	Denver, Colo. (Rebroadcasts KOA)
9.55	31.4	ZL2XX	Wellington, N. Z.
9.57	31.4	W1XAZ	E. Springfield, Mass. (Rebroadcasts WBZ)
9.57	31.4	W8XK	E. Pittsburgh, Pa. (Rebroadcasts KDKA)
9.58	31.3	PCJ	Eindhoven, Holland
9.59	31.3	VK2ME	Sydney, Australia
9.84	30.5	TIH	Heredia, Costa Rica
9.87	30.4		Buenos Aires, Argentina
10.0	30.0	CM2LA	Havana, Cuba
10.2	29.4	HS2PJ	Bangkok, Siam
10.4	28.8	LSX	Monte Grande, Argentina
10.8	27.7	GBX	Rugby, England
11.5	26.0	KZRM	Manila, Philippine Islands
11.7	25.6	CJRX	Winnipeg, Manitoba, Canada
11.75	25.4	G5SW	Chelmsford, England
11.80	25.4	UOR2	Vienna, Austria
11.80	25.4	W9XF	Chicago, Ill. (Rebroadcasts WENR)
11.81	25.4	W2XAL	Coytesville, N. J. (Rebroadcasts WRNY)
11.84	25.4		Rome, Italy
11.88	25.3	W8XK	East Pittsburgh, Pa. (Rebroadcasts KDKA)
12.85	23.3	W2XCU	Ampere, N. J.
14.43	20.8	VPD	Viti Levu, Fiji Islands
15.00	20.0	CM6XJ	Tuinucu, Cuba
15.12	19.9	HVJ	Vatican City, Rome, Italy
15.21	19.7	W8XK	East Pittsburgh, Pa. (Rebroadcasts KDKA)
15.25	19.7	W2XAL	Coytesville, N. J. (Rebroadcasts WRNY)
15.28	19.6	W2XE	Jamaica, N. Y. (Rebroadcasts WABC)
15.34	19.5	W2XAD	Schenectady, N. Y. (Rebroadcasts WGY)
17.30	17.3	W2XCU	Ampere, N. J.
17.44	17.2	XDO	Chaputepec, Mexico
17.77	16.8	PHI	Huizen, Holland
17.78	16.8	W8XK	East Pittsburgh, Pa.
17.78	16.8	W9XAA	Chicago, Ill.

PHILADELPHIA STORAGE BATTERY COMPANY

Ontario and C Streets, Philadelphia, Pa., U. S. A.