

# McCARTHY S6AW A.C. SUPERHET

**CIRCUIT.**—The aerial can be fed either through a small coupling condenser or an inductively-coupled band-pass filter. This operates on medium and long waves. On the short waves the band-pass filter is cut out.

V1, an octode frequency changer valve, converts the signal to a frequency of 465 kc. The signal then passes through the first I.F. transformer to V2, a variable- $\mu$  H.F. pentode, acting as an I.F. amplifier.

The output of V2 is coupled through the second I.F. transformer to the demodulating diode of V3, a double diode. The other diode provides A.V.C. through the usual resistance network.

In the grid circuit of V4, a triode L.F. amplifier, is connected an L.F. volume control. V4 is resistance-capacity coupled to the final stage, V5, an output pentode.

The gramophone switch cuts off the H.T. supply to V1 and V2 when the set is being used for gramophone reproduction. This ensures there is no interference from radio on the gramophone.

Mains equipment consists of the mains transformer, electrolytic smoothing condensers, the speaker field as a smoothing choke and an indirectly-heated full-wave rectifier.

**Removing Chassis.**—First remove the four control knobs from the face of the receiver cabinet. These are all of the grub screw fixing type.

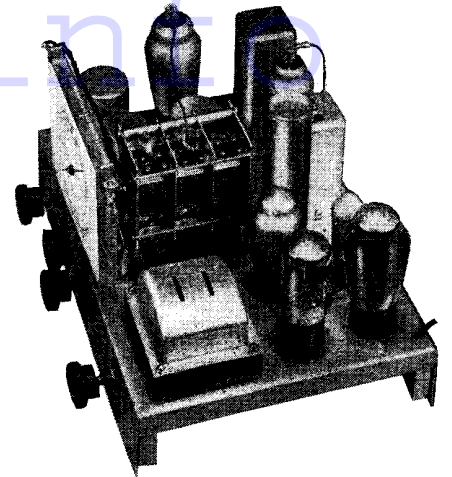
The back is removed by pushing upwards the two sliding clips observed on the upper portion of the back of the cabinet. Then turn the set up on its side (on a smooth surface of the bench to prevent scratching the polish) and remove the two fixing bolts and washers securing the chassis to the cabinet.

The chassis can then be removed to the extent of the speaker leads. The cable is long enough to allow the chassis to be completely removed from the cabinet for all service requirements.

The speaker can be removed by unscrewing the four fixing nuts observed on the frame. The connections to the speaker transformer may be noted if unsoldering of the leads is contemplated. Starting from the left-hand side, the red lead goes to the first tag, white lead to the adjacent tag, the next tag is blank, and the black lead is connected to the next tag, leaving the last contact blank.

**Special Notes.**—There are two dial lights in the receiver. These are mounted one on each side of the wavelength dial in screw-in holders. The bulbs are rated at 3.5 volts .3 amp.

The following condensers and resistances were found to have values different from



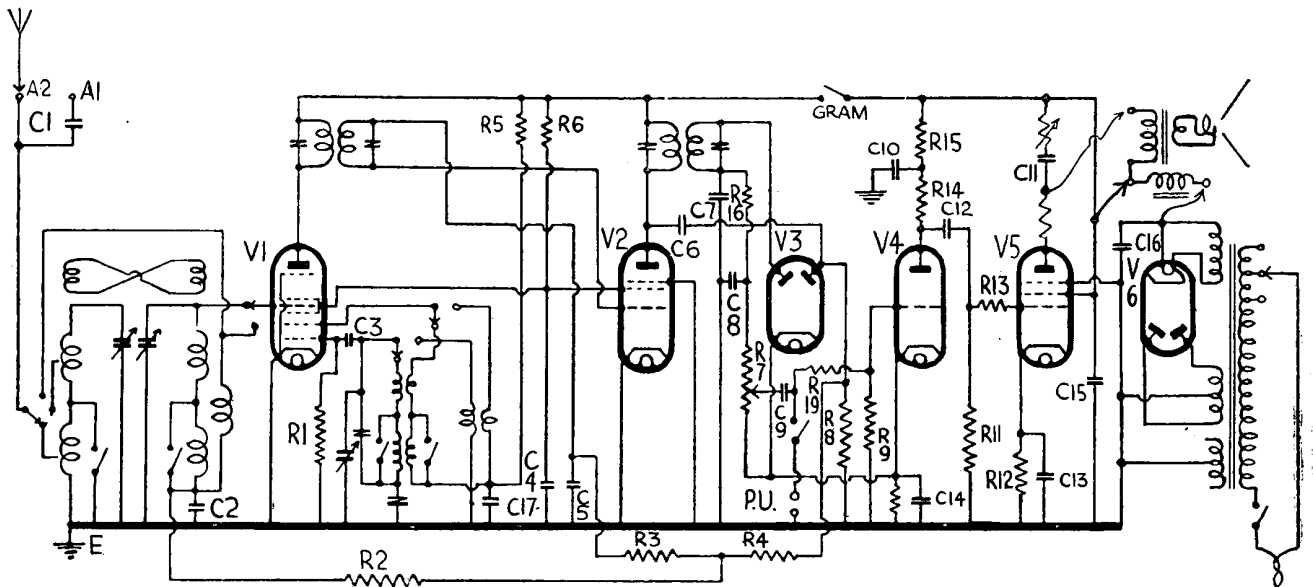
Model S6AW in the McCarthy range is a 6-valve, 3-wave and A.C. superhet retailing in chassis form at 7 gns., less speaker. The cabinet version is supplied to special order only.

## RESISTANCES

R.	Purpose.	Ohms.
1	Oscillator grid leak ..	50,000
2	V1 A.V.C. decoupling ..	1 meg.
3	V2 A.V.C. decoupling ..	1 meg.
4	A.V.C. feed ..	1 meg.
5	Oscillator anode decoupling ..	25,000
6	V1 and V2 screen decoupling ..	25,000
7	V.C. and diode load (part) ..	500,000
8	A.V.C. diode load ..	500,000
9	V4 grid leak ..	1 meg.
10	V4 cathode bias ..	1,000
11	V5 grid leak ..	250,000
12	V5 cathode bias ..	150
13	V5 grid stopper ..	50,000
14	V4 anode load ..	50,000
15	V4 anode decoupling ..	10,000
16	Demodulator diode load (part) ..	100,000
17	Tone control ..	10,000
18	V5 anode feed ..	250
19	V4 grid stopper ..	50,000

## CONDENSERS

C.	Purpose.	Mfds.
1	Series aerial ..	.0001
2	V1 A.V.C. decoupling ..	.1
3	Oscillator grid ..	.0001
4	V1, V2, screen decoupling ..	.1
5	V2 A.V.C. decoupling ..	.1
6	A.V.C. diode coupling ..	.0001
7	H.F. by-pass ..	.0003
8	H.F. by-pass ..	.0001
9	L.F. coupling ..	.01
10	V4 anode decoupling ..	.1
11	Tone control ..	.01
12	L.F. coupling ..	.02
13	V5 cathode shunt ..	.25
14	V4 cathode shunt ..	25
15	H.T. smoothing ..	8
16	H.T. smoothing ..	8
17	Osc. anode decoupling ..	.1



Valve arrangement in the McCarthy S6AW A.C. superhet comprises an octode frequency changer, a V.M. H.F. pentode, a double diode, a triode L.F. amplifier, an output pentode and a rectifier. When the set is switched to reproduce gramophone records, the H.T. supply to the frequency changer and I.F. stage is switched off.

For more information remember

www.savoy-hill.co.uk

200  
250v

those listed by the makers: C2 was .01 mfd.; C11, .02; C12, .01; C13, 50; C14, 50; R's 2, 3, 4 and 9 were found to be 500,000 ohms; R13, 25,000; and R16 was 50,000 ohms.

The mains voltage adjustment of the receiver is to be found at the rear of the chassis and takes the place of sockets with voltage variations marked near by, and a bridging contact to make adjustments.

A pair of sockets at the rear of the chassis enables a pick-up to be connected to the L.F. section of the receiver.

Another pair of sockets enables an external speaker to be operated. They are connected across the speaker transformer primary. A permanent magnet moving-coil speaker should be used, with its own matching transformer. This should have a primary impedance of 6,000 ohms.

### Circuit Alignment Notes

**I.F. Circuits.**—Set the gang condenser to maximum. Connect a modulated oscillator between the top grid cap of V2 and the chassis through a small fixed condenser in the usual manner. Connect an output meter across the extension speaker terminals.

Tune the oscillator to 465 kc. and adjust IFT1, IFT2, IFT3 and IFT4 for maximum response, reducing the input as the cir-

cuits come into line to render the A.V.C. inoperative.

**Signal Circuits.**—Connect the leads from the oscillator to the aerial and earth sockets. Only feed sufficient input from the oscillator to obtain a half-scale deflection on the output meter.

**Short Waves.**—Tune the set to 25 metres (12 mc.) and inject a signal of corresponding wavelength. Adjust the trimmer T on the short-wave oscillator coil underneath the chassis for maximum response.

**Medium Waves.**—Switch the set to the correct band, inject and tune in 261.1 metres (1149 kc.). Adjust T to the M.W. osc. tracking condenser (near frequency changer valve), until maximum output is registered on the output meter. Adjust aerial trimmer and the band-pass trimmer (both on gang) for maximum.

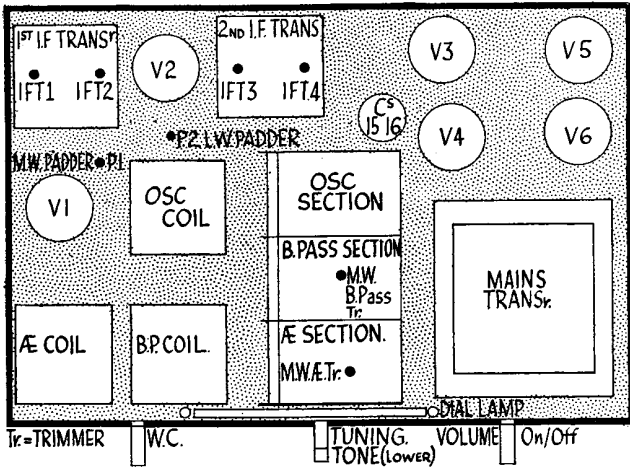
Tune the set to 449.1 metres (668 kc.) and oscillator to corresponding wavelength.

Adjust medium wave padding condenser P1 (between frequency changer and I.F. valve) for maximum response.

**Long Waves.**—Tune the set and generator to 1,000 metres (300 kc.) and adjust L.W. osc. tracking condenser under chassis for maximum response.

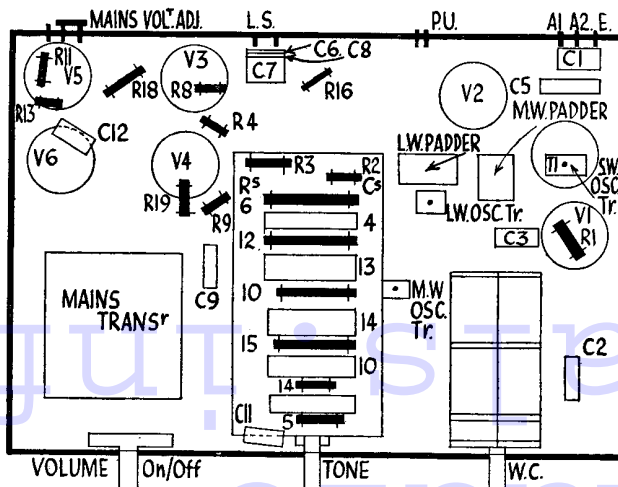
Tune set to 1,875 metres (160 kc.) and inject a signal of that wavelength.

Adjust the long wave padding condenser P2 (near I.F. valve) for maximum response in the output meter.



The layout of the chassis of the McCarthy S6AW. The diagram on the left, shown "fitted," is the top of the chassis. Note that details given on the opposite page on "Removing Chassis" apply only to the special cabinet version—

—the standard model is without speaker or cabinet. This lower diagram shows the arrangement of components on the underside of the chassis. Note the pick-up and extra speaker sockets.



## McCarthy on Test

**MODEL S6AW.**—Standard model for A.C. mains operation, 200-250 volts, 40-100 cycles. Available in chassis form only, price 7 gns., with valves, but less speaker. Speaker prices according to type.

**DESCRIPTION.**—Three-waveband superhet using five valves and rectifier.

**FEATURES.**—Controls for tuning, volume, tone and waveband selection. Circular scale calibrated in wavelength and station names. Two aerial sockets and provision for extension speaker and pick-up.

**LOADING.**—71 watts.

### Sensitivity and Selectivity

**SHORT WAVES** (16.5-50 metres).—Average gain and selectivity. Handling is easy and there is no appreciable drift.

**MEDIUM WAVES** (200-550 metres).—Good gain. Selectivity up to standard; local stations spread on adjacent channels only. Gain well maintained over entire waveband.

**LONG WAVES** (800-2,000 metres).—Very good gain. Selectivity sufficient for all usual stations. Some overlap on Deutschlandsender.

### Acoustic Output

Ample for ordinary room. Average balance and tone; crisp, clean attack, with quite good lower-note radiation. Tone control not too vigorous. Colouration slight.

## Replacement Condensers

**EXACT** replacements for certain condensers in the McCarthy S6AW are made by A. H. Hunt, Ltd., Garratt Lane, Wandsworth, London, S.W.18. They are: for C's 13 and 14, type 2918, 1s. 9d.; for C10, type 3631, 1s. 6d.; for C's 15 and 16, type 2009, price 7s. 6d.

## QUICK TESTS

Quick tests are available on this receiver on the speaker transformer leads. Volts measured between these and the chassis should be:—

- Red, 338 volts, unsmoothed H.T.
- White, 180 volts, smoothed H.T.
- Black, 195 volts, smoothed H.T.

## VALVE READINGS

No signal. Volume maximum. 200 volt A.C. mains.

V.	Type.	Electrode.	Volts.	Ma.
1	All Mullard. TH4 met. (7)	Anode ..	200	10
		Osc. anode ..	75	5
		Screen ..	60	4.5
2	VP4Bmet.(7)	Anode ..	200	3
		Screen ..	60	1.2
3	2D4Amet.(5)	—	—	—
4	354Vmet.(5)	Anode ..	72	2
5	Pen A4 (7) ..	Anode ..	180	29
		Screen ..	195	4.
6	IW4 (4) ..	Filament ..	335	—