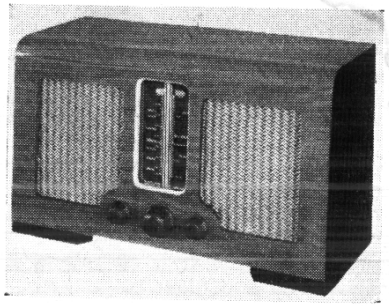
McMICHAEL 508U



Five-valve two-waveband transportable superhet with self-contained frame aerial and twin speakers. Socket is provided for an external aerial. Housed in walnut veneered table cabinet. Suitable for 190-250V AC/DC. Made by McMichael Radio Ltd., 190 Strand, London, WC2.

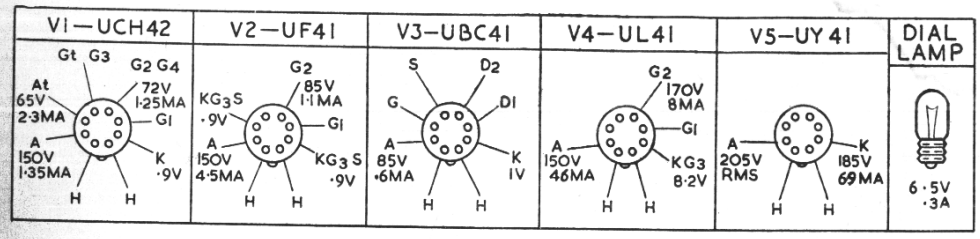
AERIAL. A self-contained frame L1 consisting of three turns of insulated wire around inside of back of cabinet is provided for reception of the more powerful transmissions. In bad areas or for reception of weak stations a socket is provided on rear panel for connection of an external aerial. Socket is isolated from receiver by C1.

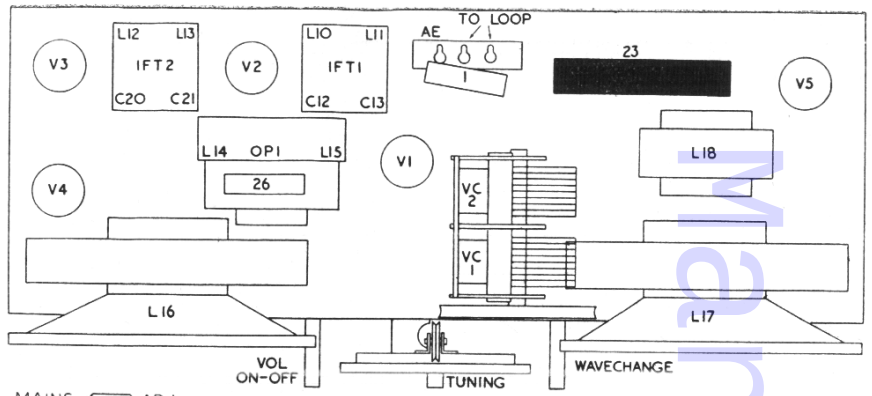
Signal from either L1 or external aerial is fed by S1 to aerial coupling coils L2 (MW), L4 (LW). The grid coils L3 (MW), L5 (LW) trimmed by T1, T2, C3 respectively, are switched by S2 to aerial tuning capacitor VC1 and coupled by C7 to triode hexode frequency-changer V1. AVC decoupled by R17, C5 is fed by R1 to V1. Cathode bias is provided by R6 decoupled by C6. Screen voltage is obtained from potential divider R2, R3 decoupled by C4. Primary L10, C12 of IFT1 is in the hexode anode circuit.

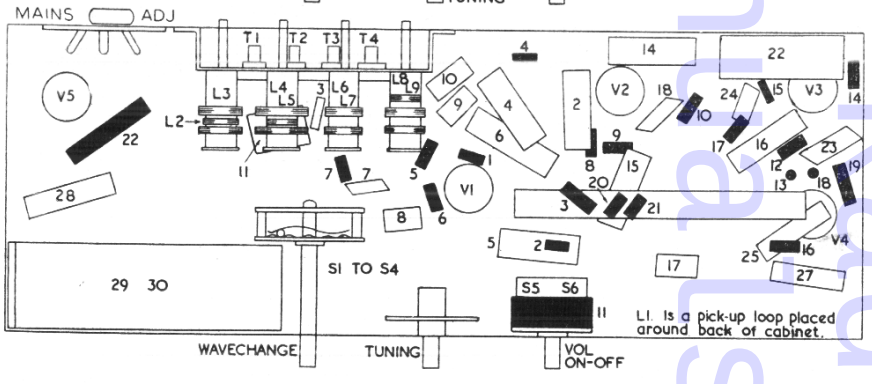
Oscillator is connected in a tuned-grid series-fed circuit. The grid coils L6 (MW), L8 (LW) trimmed by T3, T4 and padded by C11, C10 respectively, are switched by S3 to oscillator tuning capacitor VC2

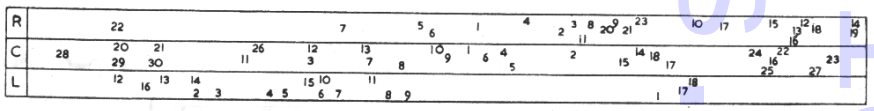
INDUCTORS

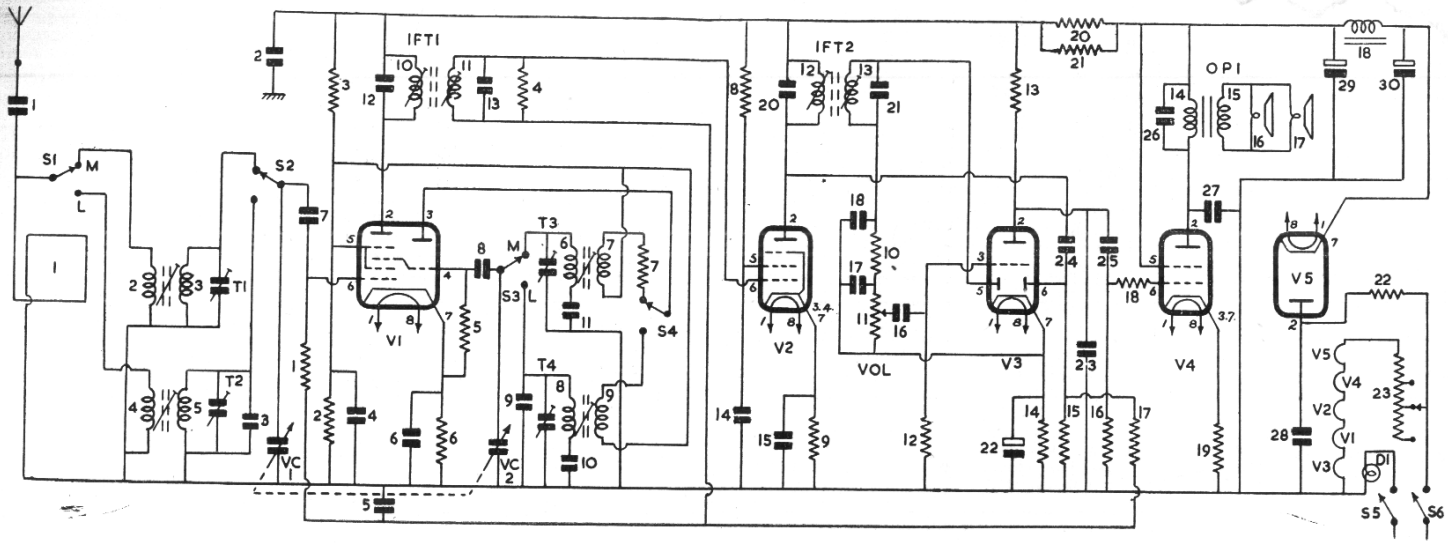
L	Ohms
1	very low
2	.2
3	2.25
4	.3
5	16
6	3
7	1.5
8	7
9	2.5
10	5.5
11	5.5
12	5.5
13	5.5
14	400
15	.25
16	2.5
17	2.5
18	230











RESISTORS

R	Ohms	Watts
1	470K	¼
2	27K	¼
3	12K	¼
4	1M	¼
5	47K	¼
6	220	¼
7	470	¼
8	47K	¼
9	220	¼
10	27K	¼
11	250K Potr. with sw.	
12	2.2M	¼
13	100K	¼
14	2.2K	¼
15	1M	¼
16	470K	¼
17	470K	¼
18	27K	¼
19	150	½
20	2.2K	¼
21	2.2K	¼
22	250 WW	6W
23	1250 (850 + 200 + 200) Mains Dropper	

CAPACITORS

C	Capacity	Type
1	.005	Tubular 1000V
2	.1	Tubular 350V
3	75pF	Silver Mica
4	.1	Tubular 350V
5	.1	Tubular 350V
6	.1	Tubular 350V
7	100pF	Silver Mica
8	100pF	Silver Mica
9	100pF	Silver Mica
10	220pF	Silver Mica
11	590pF	Silver Mica
12	125pF	Silver Mica
13	125pF	Silver Mica
14	.1	Tubular 350V
15	.1	Tubular 350V
16	.01	Tubular 1000V
17	75pF	Silver Mica
18	75pF	Silver Mica
19	Not Fitted	
20	125pF	Silver Mica
21	125pF	Silver Mica
22	50	Electrolytic 12V
23	500pF	Silver Nica
24	25pF	Silver Mica
25	.01	Tubular 1000V
26	.01	Tubular 1000V
27	.005	Tubular 1000V
28	.01	Tubular 1000V
29	32	Electrolytic 350V
30	32	Electrolytic 350V

McMICHAEL 508U—*Continued*

and coupled by C8 to oscillator grid of V1. Automatic bias is developed on C8 with R5 as leak.

Anode reaction voltages are obtained inductively from L7 (MW), L9 (LW). Oscillator anode of V1 is switched by S4 through L7 and L9 to HT which is obtained from potential divider R2, R3. R7 is a series MW limiter.

IF amplifier operates at 470 kc/s. Secondary L11, C13 of IFT1 which is damped by R4 feeds signal and AVC voltages, decoupled by R17, C5 to IF amplifier V2. Cathode bias is by R9 decoupled by C15. Screen voltage is from R8 decoupled by C14. Primary L12, C20 of IFT2 is in the anode circuit.

Signal rectifier. Secondary L13, C21 of IFT2 feeds signal to one diode of V3. R11, the volume control, is the diode load and R10, C17 C18 an IF filter.

AVC. Signal at anode of V2 is fed through C24 to second diode of V3 of which R15 is the load. AVC voltages are decoupled by R17, C5 and fed to V1, V2. Bias across cathode load R14 provides a delay voltage for the AVC line.

AF amplifier. Rectified signal across volume control R11 is fed by C16 to grid of triode portion of V3 of which R12 is load. Cathode bias is by R14 decoupled by C22. R13 is the anode load and C23 RF by-pass capacitor.

Output stage. C25 feeds signal at anode of V3 through grid stopper R18 to pentode output amplifier V4. R16 is its grid resistor and R19 provides cathode bias and negative feedback. Screen voltage is obtained direct from HT line, decoupling being by C29. Primary L14 of output matching transformer OP1 is in the anode circuit. C26 is fixed tone corrector and C27 gives further HF filtering.

Secondary L15 of OP1 feeds output to two parallel connected 5-in. PM speakers L16, L17.

HT is provided by an indirectly-heated half-wave rectifier V5. Its anode voltage is obtained from the mains input through current limiter R22. Choke-capacity smoothing is by L18, C29, C30. Reservoir smoothing capacitor C30 should be rated to handle 150mA ripple.

Heaters of V1 to V5 are connected in series and obtain their current of 100mA from the mains through tapped dropper resistor R23.

Dial lamp is wired in series with mains lead to chassis. S5, S6 which are ganged to the volume control spindle form the receiver ON/OFF switch.

Chassis removal. Remove the three control knobs and rear panel. Disconnect lead from external aerial socket on rear panel. Unsolder the two receiver leads from frame aerial tag panel mounted on underside of cabinet top.

Turn cabinet upside down and remove screws fastening centre base panel to bottom of cabinet. Remove the panel and remove the two chassis fixing bolts exposed.

TRIMMING INSTRUCTIONS

Apply signals as stated below	Tune Receiver to	Trim in Order stated for Max. Output
(1) 470 kc/s to g1 of V1, via .01 mF	—	Cores L13, L12, L11, L10
(2) With gang at max. capacity set dial cursor to datum marks at bottom of scale		
(3) 1.579 mc/s to AE socket via dummy aerial	190 metres	T3, T1
(4) 600 kc/s as above	500 metres	Core L6, L3. Repeat (3) and (4)
(5) 333 kc/s as above	900 metres	T4, T2
(6) 150 kc/s as above	2000 metres	Core L8, L5. Repeat (5) and (6).

Weak Results with Car Radio

THE majority of service engineers will agree that it is usually much more difficult to locate a fault in a receiver that is giving weak results than in one that is completely dead. Such a case was encountered recently in a car radio.

Reception was very poor, and a quick check showed that the HT voltage was 150 instead of the normal 200. The test battery was freshly charged and in good condition, so a thorough check was made on the power pack of the set. Transformer, vibrator, rectifier and condenser pack were tested and found to be all right.

Every decoupling condenser on the HT line was tested without a leak being revealed. The audio coupling condenser from the plate of the double diode triode to the grid of the output valve was tested lest perhaps positive voltage on the grid on the output was causing it to draw excessive current, so dropping the HT voltage. It proved to be OK.

Normally routine testing with the voltmeter and ohm-meter should reveal the cause of a loss in HT voltage when due to a faulty component. However, in this case it was decided that the trouble was due to abnormal conditions in some part of the receiver circuit, and so signal injection was resorted to in an effort to locate the faulty stage which might betray itself by a loss in gain even while allowing for the fact that HT was below normal.

In the course of the signal injection procedure it was found that the IF stage was somewhat out of alignment, so it was duly peaked up. On testing the set, results were found to be first class ; a further check then showed that the HT was now 200 volts.

At first it was suspected that some obscure fault had mysteriously cleared itself, but a soak test of several hours and rough handling failed to shake the receiver from its excellent performance. Further investigation revealed the cause of the trouble. With a voltmeter connected to the HT line the IF stage was gradually screwed out of alignment, and at every turn of the screw the volts dropped !

The trouble was finally proved to be due to poor regulation in the diminutive power supply and the fact that the IF valve drew more than its normal milliamps when off resonance.—P.J.S.

EKCO TSC30

AN example of the effect that can be caused by lack of smoothing came my way. At first glance it would appear that the deflector coils had developed a partial short ; the picture had a crushed effect at the right-hand side, leaving a black section about an inch wide. A closer examination showed the edge of the blacked-out area to have a definite wavy line. Replacing C62 (Ekco Service Sheet), a 16mF condenser which was OC, restored the set to normal.—T.F.W.

LAMMIX MIXER-MINCER

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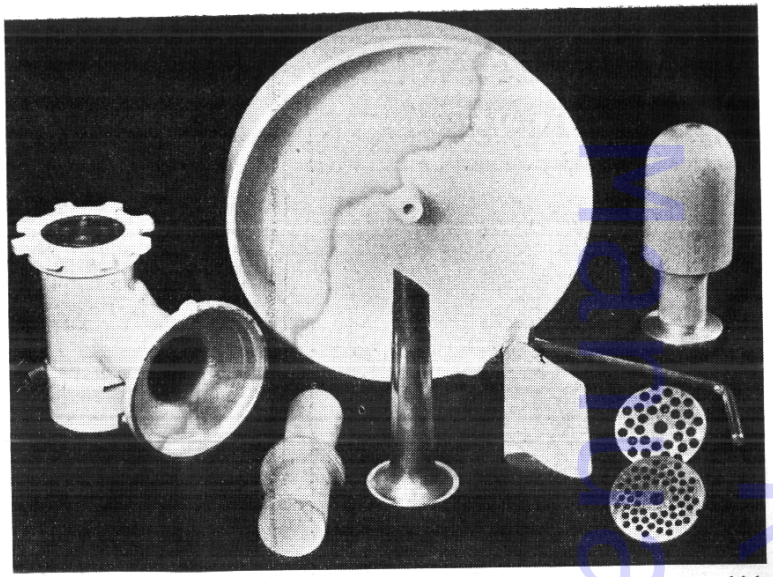

Fig. 6.—These are the accessories provided in what is known as the basic outfit

¼hp and has a rotor speed of 10,000rpm. It is housed in a diecast aluminium cradle which is pivoted on a spindle mounted in anti-vibration rubber bearings on the baseplate. Motor shaft is fitted with a twin pulley coupled to gearbox pulley by duplex rubber belts.

Gearbox (Fig. 4) consists of a diecast aluminium housing containing pulley shaft fitted with worm which drives a 5-in. worm-wheel to which is attached the coupling socket mounted on top outside of gear case. Gear case is screwed to a raised seating on baseplate casting.

Motor driving belt tension is maintained by reaction of motor and restrained by rubber connector positioned between top of motor cradle and baseplate. Output socket of gearbox projects up through hole in body cover. Locating and retaining stud for mincer attachments, etc., which plug into socket, is provided on chromium face plate positioned over hole in cover.

The stainless steel mixing bowl is 9⅜ins. in diameter and 6¾ins. deep, and is fitted with a slotted spindle in the centre of underside of base (Fig. 3) which engages with pin in gearbox socket. Bottom of bowl and spindle are protected by a circular flange welded to base.

Inside rim of bowl is toothed to form a gear to drive the dolly.

Dolly (Fig. 6) consists of a hardwood beater mounted eccentrically on a rubber toothed gear-wheel. The dolly fits onto spindle of overarm and is caused to rotate when its teeth are engaged with those of bowl. Spring tension of overarm keeps teeth of gears in mesh even with the stiffest mixing.

Scraper (Fig. 6) consists of a hardwood knife-edged blade attached to a stout chromium-plated arm designed to fit into socket at side of overarm.

Mincer unit (Fig. 6) is a tinned-iron casting fitted with slotted feeding screw spindle and using standard No. 8 cutter and plates. Mincer is clamped on output socket by means of a split-collar tightened by wingnut.

Sausage making attachment (Fig. 6) for use with mincer is a shaped metal funnel which is clamped under cutter holding ring. Mincer plunger, which is used to press ingredients down on to feeding screw, is made of hardwood.

MAINTENANCE

Motor. Bearings are grease packed and should not need any attention throughout their normal life. Brushes are standard type, and should be renewed when worn down to less than ¼in. Access to motor is obtained by removing the top cover (Fig. 3) which is held in position by screws at each end. Brushes can then be removed by unscrewing the two slotted cover caps at cooling fan end.

With brushes removed, DC resistance checks of field coils and armature can be made. Field coils (measured between each brush holder and appropriate mains lead) should be approximately 6.5 ohms (200-250V) or 1.7 ohms (100-125V) each. Armature windings (measured between opposite segments on commutator) should be approximately 9 ohms (200-250V) or 2.5 ohms (100-125V).

Removal of motor. Loosen the two screws of clamp on top of motor cradle and allow rubber restrainer to spring clear. Remove the two driving belts from pulleys. Disconnect earth wire tag from cradle and remove suppressor capacitor and mains cable cleat fixing screws.

Also undo ON/OFF switch locking nut and withdraw switch from baseplate. With an Allen key undo the two Allen screws on top of cradle (Fig. 5).

Gearbox. This is packed with high-grade grease, and should not require any attention.

Overarm. The spring located on column should occasionally be rubbed over with grease.

Removal of overarm. Tighten handwheel with arm in mid position. Unscrew and remove stop peg. With machine in a firm position on bench grasp overarm by its knob and then slacken off handwheel on top of column and allow arm to move backwards until spring tension is relieved. Fully unscrew and remove handwheel (clockwise direction) and carefully lift overarm from column (Fig. 2).