

McMichael

Model 135

An AC Superheterodyne with a Novel Tuning Scale

FEATURES.—Type.—Table model superheterodyne for AC mains only. Circuit.—Triode-pentode frequency-changer—var.-mu pentode IF amplifier—double-diode second detector—pentode output valve. Full-wave valve rectifier. (1) Tuning. (2) Volume and on-off switch. (3) Tone. (4) Waverange. Price.—15 guineas. Makers.—McMichael Radio Ltd., Slough, Bucks.

THE circuit of the latest McMichael superheterodyne follows conventional practice in general outline but there are several points of interest in relation to detail. There are four valves comprising a frequency-changer, IF amplifier, second detector with AVC, and a pentode power output valve. Instead of the usual double-diode-triode in the second detector stage a special Cossor double-diode valve has been employed, and the whole of the LF amplification is carried out in the final stage.

At the input end of the circuit there are also several points of interest. The band-pass input filter is self-coupled, the tuned circuits being wound on a common former with suitable spacing between the windings. In order to ensure uniformity of response throughout the medium-wave

range the aerial resonant circuit is fed through a small series condenser as well as through a coupling coil. The effect of the series condenser is to give a better input at the high-frequency end of the scale. The LF coupling coil on the front in conjunction with the aerial capacity is arranged to resonate in the neighbourhood of 450 kc/s, thus giving an increase to the low-frequency end of the scale. It is claimed that the resultant of these two effects keeps the aerial input constant within 25 per cent. over the medium-wave band. On long waves the series condenser feed is disconnected, the coupling being made through the aerial primary winding in the usual manner. Second-channel interference is minimised by feeding a small out-of-phase voltage component from the aerial input to the low potential end of the secondary tuned circuit.

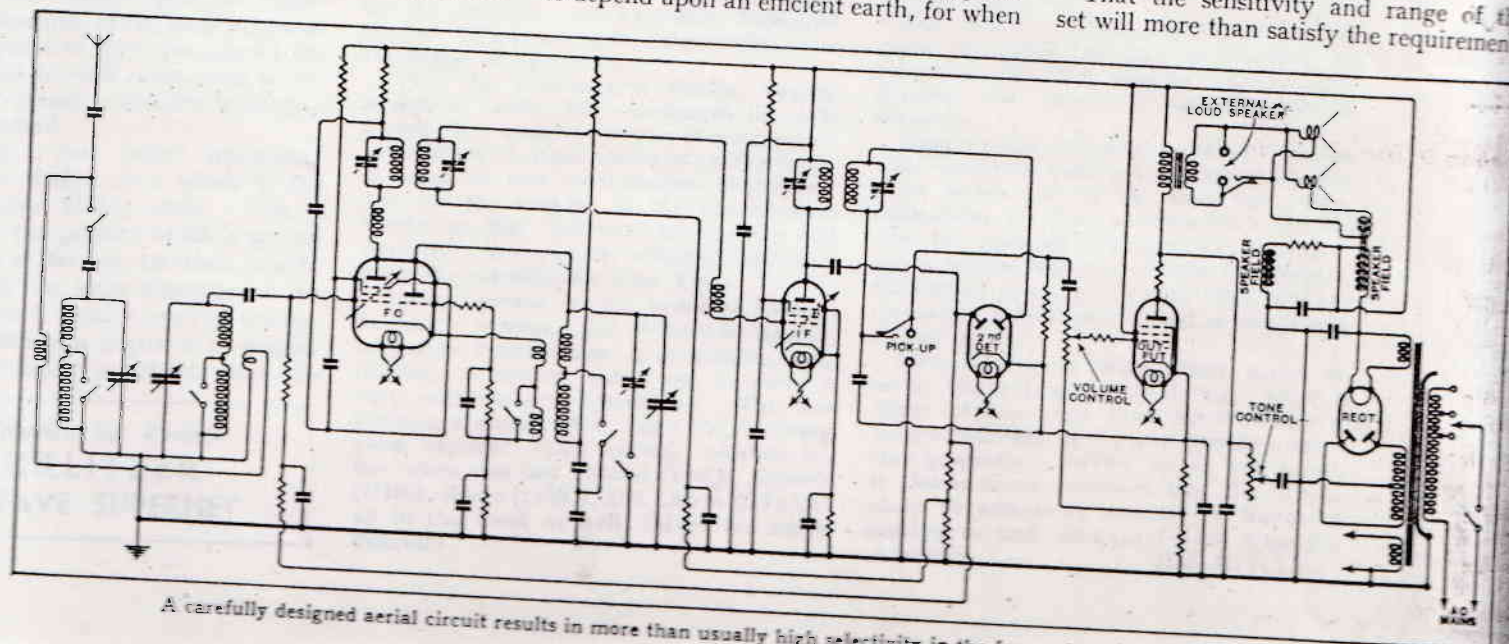
The satisfactory functioning of the second-channel suppressor circuit appears to depend upon an efficient earth, for when

the earth lead became accidentally detached from the receiver during the tests quite a prominent whistle appeared near the North Regional transmitter. Normally with a proper earth connection this would pass quite unnoticed. Another fault which developed without the earth lead was a region of instability on the long-wave range. With the earth lead properly connected the behaviour of the set was exemplary in every way, and we draw attention to this point only to show that it is not always wise to rely on the capacity earth returned through the mains leads which is sufficient in the case of many sets.

Quiet Background

In view of the fact that the McMichael Model 135 is fitted with a shielded primary on the mains transformer it was only to be expected that the background noise is also considerably reduced when a proper earth connection was used.

That the sensitivity and range of the set will more than satisfy the requirements



A carefully designed aerial circuit results in more than usually high selectivity in the four-valve superheterodyne.

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of listeners who look to the Continent as much as to this country for their wireless programmes is beyond a shadow of doubt. The selectivity is certainly above the average, and appears to be much more uniform over the medium-wave range than is general. On neither of the Brookmans Park transmitters was any interference detectable in Central London outside a band of 9 kc/s on either side of their normal settings. In other words, not more than one channel would be lost under these conditions. On long waves the Deutschland-sender was quite easily received clear of Droitwich and Radio-Paris without having to call upon the tone control to reduce noise due to side-band interference. From the last statement it follows that the long-wave selectivity was even higher than that on the medium-wave band and some over-emphasis of the bass was evident on long-wave stations when absolutely accurately tuned.

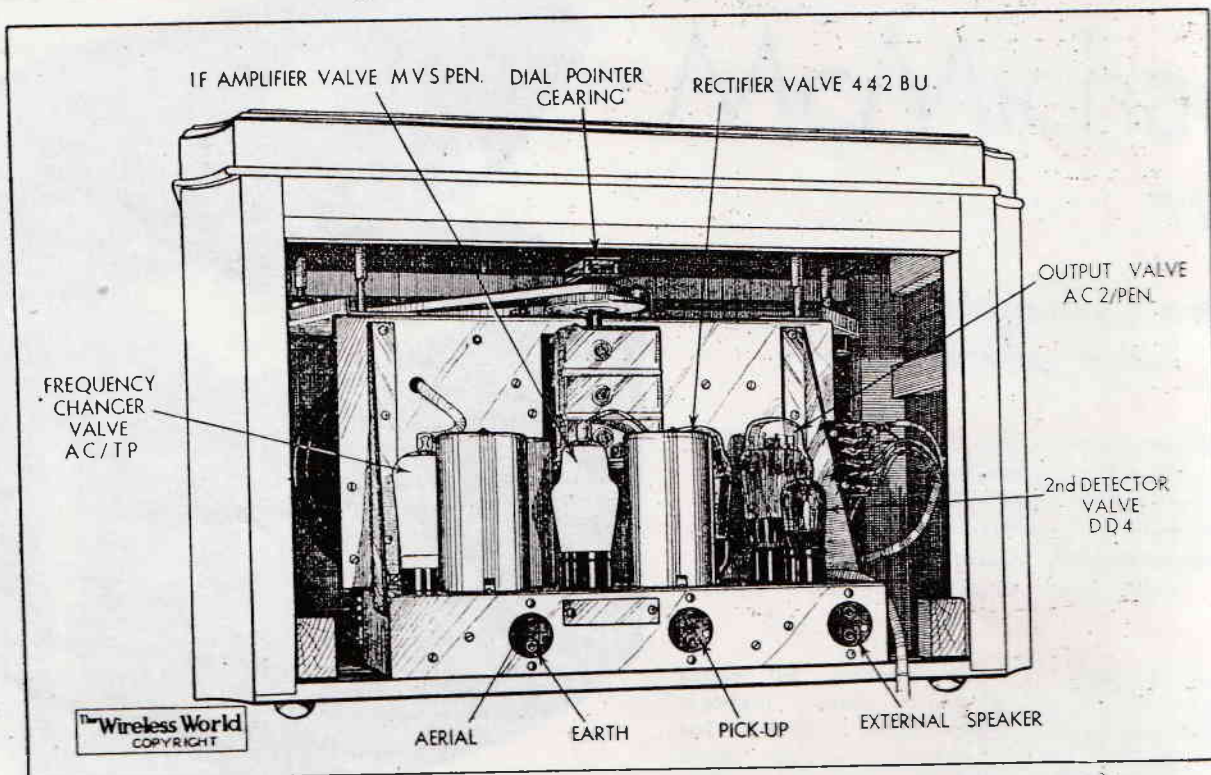
The quality of reproduction as regards frequency range is very much the same as that of other superheterodynes in this class, but there can be no doubt that the use of dual loud speakers not only improves the naturalness of the bass response, but disperses the sound generally and obviates the "corridor" effect which sometimes results from the focusing from a single loud speaker unit.

The front of the cabinet in which the loud speaker apertures are situated is convex, and the rounded corners give strength to the comparatively thin walls, which prevents the formation of wood resonances which might spoil the otherwise smooth qualities of the bass response. From every point of view the cabinet design is pleasant to look upon, and is unusual without breaking entirely from conventional standard.

Undoubtedly the most interesting feature of the design as a whole is the large rectangular tuning scale. This is explored by a 4in. pointer which is geared to give nearly a 360 deg. rotation, which, combined with the large diameter of the scale, gives much greater ease of tuning. The last fraction of a degree is so magnified when tuning-in a station that the

absence of a tuning indicator does not make itself apparent. The scale is "flood-lit" by a strip light inside the lid, and a part of this light also shines through a small monogram let into the front edge of

the lid, thus indicating whether the set has been accidentally left on. The necessity for this tell-tale is in itself a sufficient indication of the low level of background noise.



The chassis controls pass vertically through the top panel of the cabinet, the central control being geared to give an open wavelength scale.

Short-wave Broadcasting

AT the moment of writing, conditions on the short waves seem to be as unreliable as the weather. The past two or three days have been of the kind when "locals," normally weak, assume fantastic strengths. All this, needless to say, happens at the expense of the distant stations, which fade right away for a period.

Some of the very powerful European commercial stations—notably HAS2 in Budapest—are apt to be extremely troublesome when conditions of this sort prevail.

Owners of unselective receivers are apt to hear HAS2 from one end of the short-wave spectrum to the other; and there are even cases on record of his having been heard on the medium- and long-wave broadcast bands! His wavelength, incidentally, is in the region of 23 metres.

HVJ, the Vatican City station, usually associated with the wavelength of 50.26 metres, has been coming in at tremendous strength on his other setting of 19.84 metres. Some of the test transmissions in preparation for the relaying of the Canonisation Service on May 19th were particularly well received in this country, although they were primarily intended for New York.

The congestion on the 31-metre band is becoming serious, and Sydney's Sunday afternoon transmission is sometimes very difficult to receive, unless one is using a very selective superheterodyne. The two German stations, DJA and DJN, working close together, cause enough interference, but when one has Madrid (EAQ), Geneva (HBL), Rome (12RO), and Lisbon (CT1AA) all in the band as well, things are really difficult!

W1XK, on about 31.36 metres, is a new call-sign for the old station W1XAZ at Springfield. W1XK is located at Millis, Mass., and relays the medium-wave programmes of WBZ and WBZA.

One or two readers have reported good reception of the programmes from CR7AA (Mozambique) on 85 metres. Considering that we do not usually associate the 80-metre amateur band with long-distance work (except for Americans in the early mornings), this reception is remarkable.

Ponta Delgada, Azores (CT2AJ), has also been heard, working on 75 metres. These two stations both use powers of the order of 100 watts only.

The B.B.C.'s announcement of its decision to install two new transmitters at Daventry for the Empire service will gladden the hearts of many overseas listeners.

Similar plans, however, are afoot in many other countries, and one wonders what the short waves will be like in a few years. Indications are that medium-wave history will be repeated—transmitters of higher power will be built to overcome interference difficulties, and they, in their turn, will increase the interference. And so the world moves on!

Ultra-short-wave broadcasting seems to be on the increase in the U.S.A. Over a dozen stations are now listed below 7 metres; whether they really provide a valuable programme service we do not know. It almost seems, however, that the U.S.A. could be effectively covered by means of short-wave and ultra-short-wave transmissions only.

MEGACYCLE.

Next Week's Set Review—
WURLITZER
ALL-WAVE SUPERHET