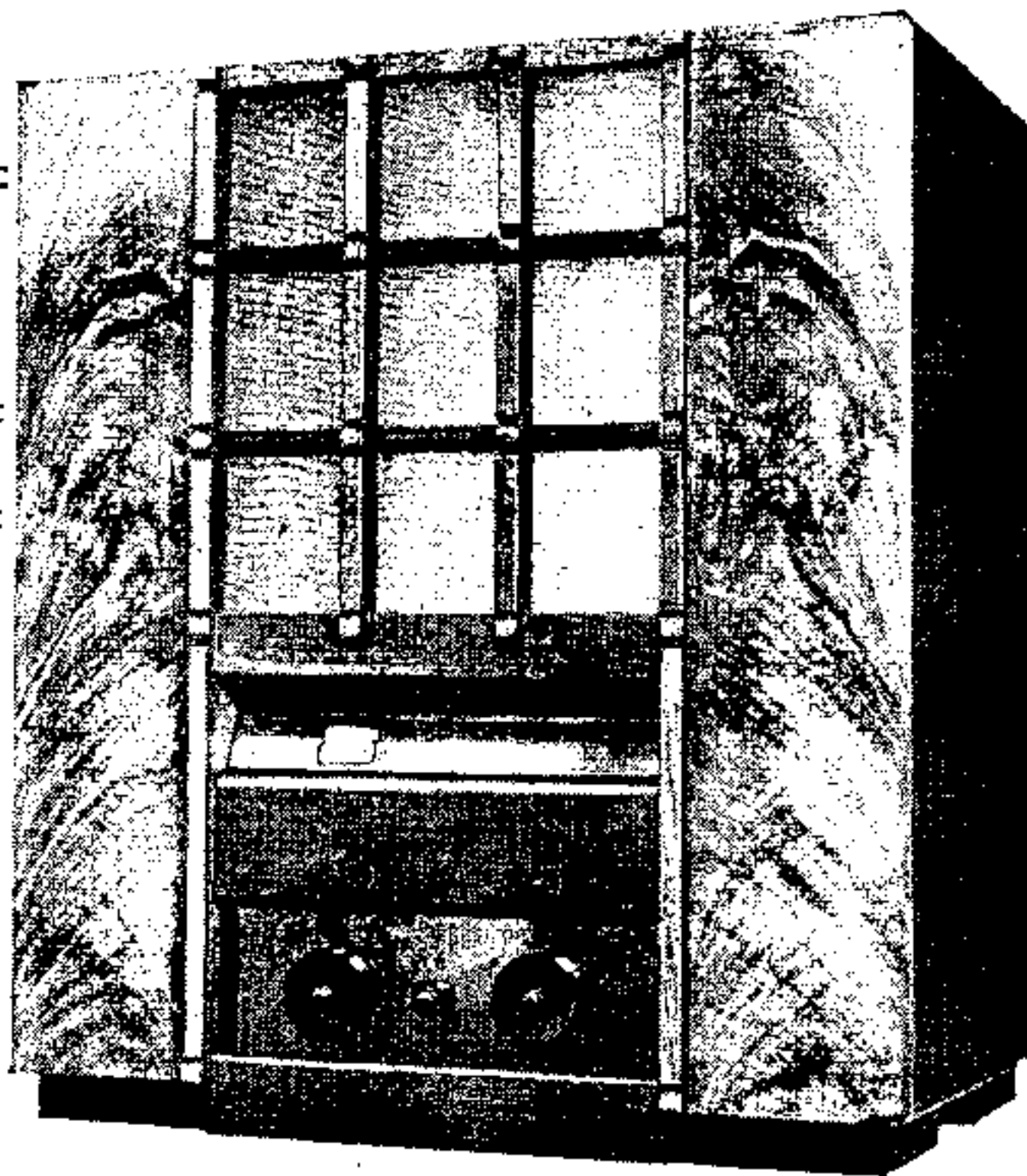


# MURPHY

# TYPE A3

# RECEIVER



ANY discussion relating to this receiver must inevitably commence with the cabinet. Its challenge is sufficiently provocative for it to claim attention even before the technical merits and performance of the chassis. The maker's view is that the broadcast receiver is essentially a modern development, and that if it is to be housed in a "period" cabinet it is only logical that the period should be contemporary. Most people will agree that this object has been achieved without leaning too far towards the extravagantly futuristic. The set should be capable of maintaining its individuality, without actually jarring, in any existing furnishing scheme.

Having accorded the cabinet the attention which it demands, we may pass on to more familiar ground. The makers have adopted a three-valve circuit and have set to work to obtain the highest possible efficiency from each stage. The overall gain has been measured in accordance with the recommendations of I.R.E. Committee on Standardisation, and it is found that an input to the first grid of 230 micro-volts (1,000 kc. modulated 30 per cent. at 400 cycles) is required to give the required standard output power of 50 milliwatts.

The general feel of the controls suggests that a high value of H.F. amplification has been attained, for the receiver relies only to a secondary degree on the use of reaction for its sensitivity and range. The makers state that the H.F. stage-gain under normal conditions is of the order of 300. It is somewhat surprising to find, therefore, that the H.F. valve takes its place in a row with other valves without any special screening either for the valve or its anode lead. In all other parts of the H.F. circuit, however, meticulous care has been exercised to remove all traces of feed-back. All components associated with the grid and anode circuits, including the appropriate

sections of the wave-range switch, have been separated and screened off.

In order to provide selectivity commensurate with the H.F. stage-gain it has been found essential to employ an input band-pass filter. Inductive coupling has been chosen, and the wave-range switch, in addition to short-circuiting the long-wave coils, also short-circuits the long-wave section of the coupling inductance.

The coils for both the input filter and the tuned-anode circuit are of the basket type and are individually screened in a series of shallow aluminium boxes. Tuning is by means of a Polar "Tub" triple-gang condenser provided with a cord-driven slow-motion drum dial calibrated in wavelengths.

#### Volume Control.

Before leaving the H.F. stage mention should be made of the method of reaction and volume control. The reaction coils, which are identical with the coupling inductances in the filter circuit, are closely coupled to a pair of similar coils in series with the tuned-anode circuit. A variable resistance in parallel with the reaction coils controls the degree of feed-back without seriously affecting the ganging of the tuned circuits. With the reaction control at zero the signal strength of the B.B.C. stations, and, indeed, of many Continental stations, is not sufficiently reduced, and an input volume-control resistance, mounted on the

same spindle as the reaction control, has been included in parallel with the aerial circuit. It is brought into action by a "Local-Distance" switch, and is capable of reducing the input practically to zero. The values have been chosen to give an unbroken range of volume control from zero to the full power of the set. Thus the "Local" maximum volume is equivalent to the "Distance" minimum volume.

### A Sensitive Three-valve A.C. Receiver Incorporating a Moving-Coil Loud Speaker.

#### SPECIFICATION.

**CIRCUIT:** Three indirectly heated valves. Screen-grid H.F., power grid detector, power pentode. Band-pass input filter. Full-wave valve H.T. rectifier.

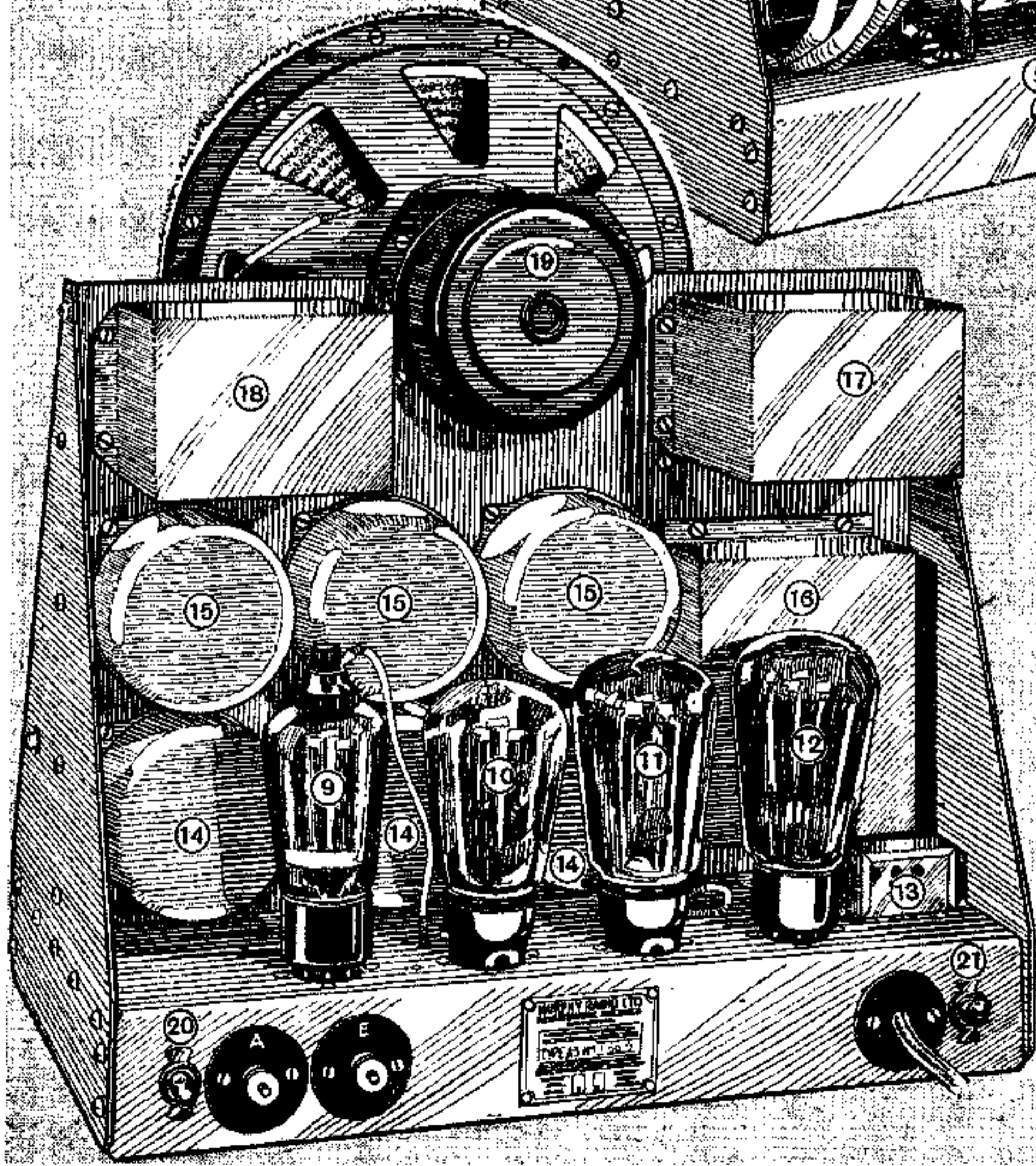
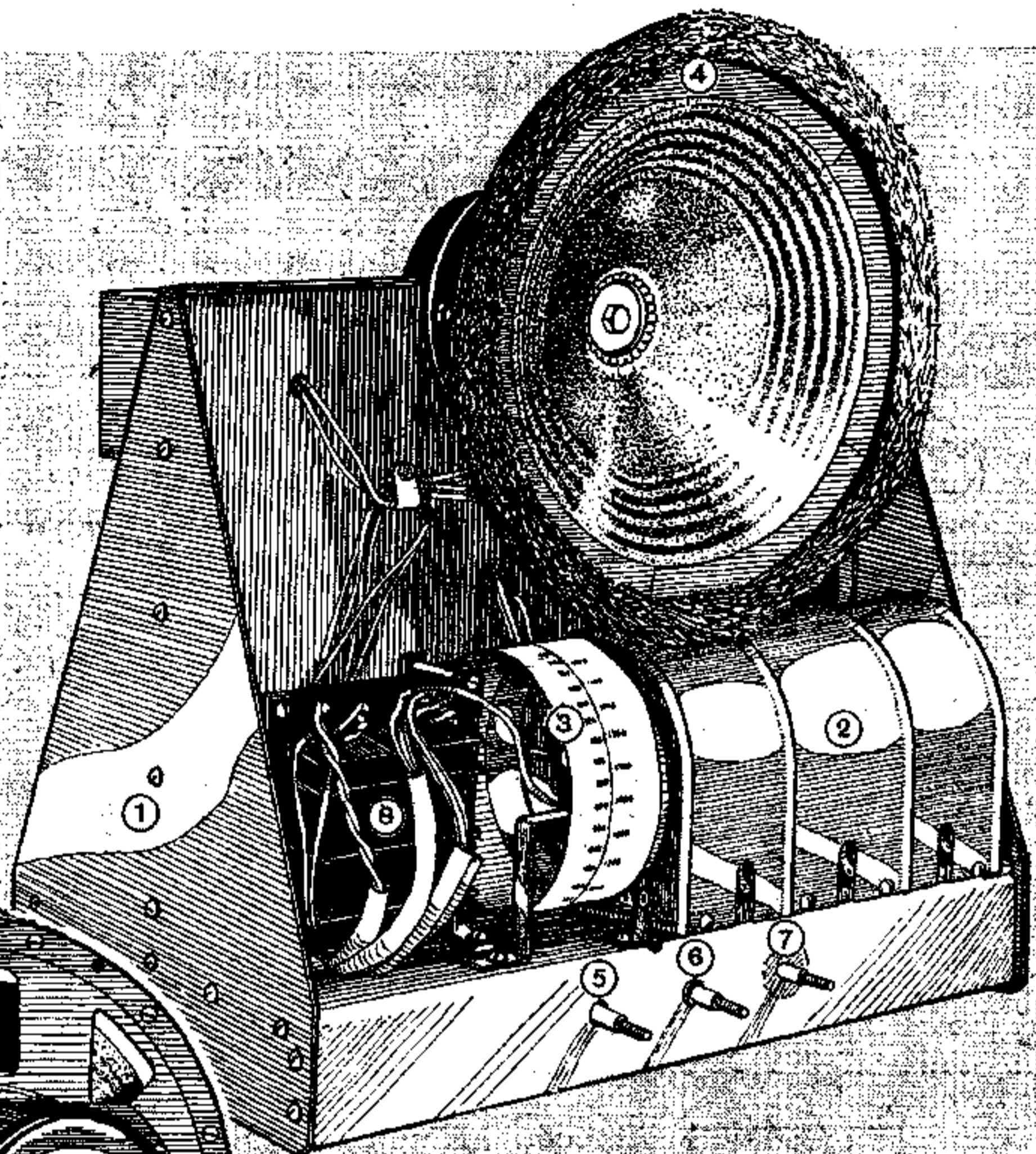
**CONTROLS:** (1) Tuning. (2) Combined reaction and input volume control. (3) Wave-range. (4) "Local-Distance" switch. (5) Mains "on-off" switch.

**GENERAL:** Illuminated drum dial calibrated in wavelengths. Self-contained moving-coil loud speaker.

**MAKERS:** Murphy Radio Ltd., Welwyn Garden City, Herts.

**PRICE:** 19 guineas including valves and loud speaker.

1. CADMIUM-PLATED STEEL CHASSIS
2. TRIPLE-GANG CONDENSER
3. ILLUMINATED WAVELENGTH SCALE
4. MOVING COIL LOUD SPEAKER
5. TUNING CONTROL
6. WAVE-RANGE SWITCH
7. COMBINED REACTION AND VOLUME CONTROL
8. MAINS TRANSFORMER



9. H.F. VALVE (54VA)
10. DETECTOR (AC/HL)
11. POWER PENTODE (AC/PEN)
12. FULL-WAVE RECTIFIER (PHILIPS 1807)
13. SCREENED MAINS VOLTAGE ADJUSTMENT
14. S.W. TUNING COILS
15. L.W. TUNING COILS
16. SMOOTHING CONDENSERS
17. SMOOTHING CHOKE
18. OUTPUT TRANSFORMER
19. FIELD MAGNET ENERGISED BY H.T. CURRENT.
20. "LOCAL-DISTANCE" SWITCH
21. MAINS 'ON'-'OFF' SWITCH

Constructional details of the Murphy type A.3 chassis.

**Murphy Type A.3 Receiver.**—

The coupling between the aerial and the filter circuit is through a small series condenser, and aerials of any length from a few inches to 100ft. can be connected without affecting ganging or selectivity.

The detector functions as a power-grid rectifier and is followed by a parallel-fed transformer feeding into the power-pentode output valve. To stabilise the effect of the input capacity of the pentode under working conditions a resistance has been connected across the secondary of the transformer. The working conditions in the detector stage and the overall L.F. amplification have been adjusted to give a range of undistorted power in the loud speaker of from 500 to 1,400 milliwatts. For input equivalent to more than 1,400 milliwatts the detector has been arranged to overload before the pentode. Under these conditions the signal strength fades away instead of producing excessive voltages and their equivalent noises in the output circuit.

Attention has been devoted to the elimination of "pentode whistle" and a special output transformer has been developed to suit the characteristics of the AC/PEN valve and the Rola loud speaker.

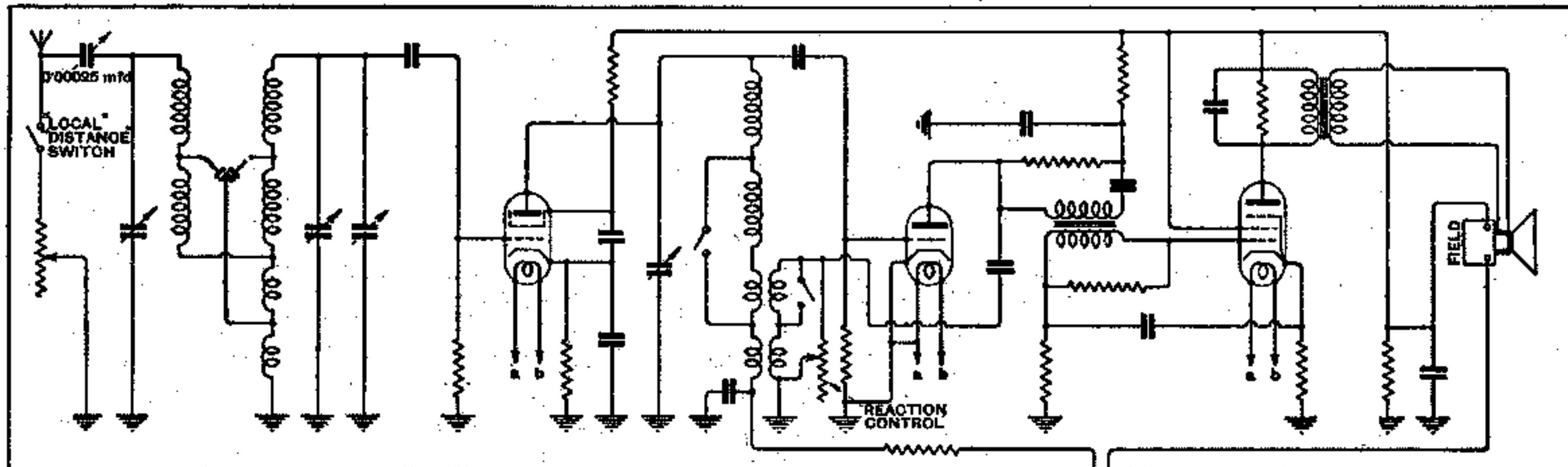
The loud speaker field winding is included in the H.T. circuit and is energised by the H.T. current, which it assists in smoothing. It is preceded by an orthodox filter stage in which the choke is tuned to 100 cycles to deal with the output from the full-wave valve rectifier.

In accordance with the policy of the company the

In spite of the fact that only one H.F. stage is employed, the range is comparable with that of many American chassis employing two or even three H.F. stages. In support of this it may be stated that seven foreign stations were received at programme strength on the medium-wave range in broad daylight. Of these, Brussels (509 metres) and Hilversum (298 metres) were reliable at all times and came in at good volume without critical reaction. After dark fourteen Continental stations were received with reaction at minimum and the control switch in the "Distance" position. By making judicious use of reaction this number could be increased without difficulty to twenty or twenty-five stations. The tests were made within five miles of Brookmans Park with an aerial 50ft. in length. In these circumstances the interference band due to the Regional transmitter extended from 315 to 410 metres, and that due to the National transmitter from 245 to 285 metres. In Central London these figures were reduced to 355-375 metres and 255-268 metres respectively.

The long waves provided seven reliable programmes in addition to 5XX, the selectivity being sufficient to separate Radio Paris, Daventry and Eiffel Tower, but hardly equal to the task of receiving Königswusterhausen with the former stations in operation.

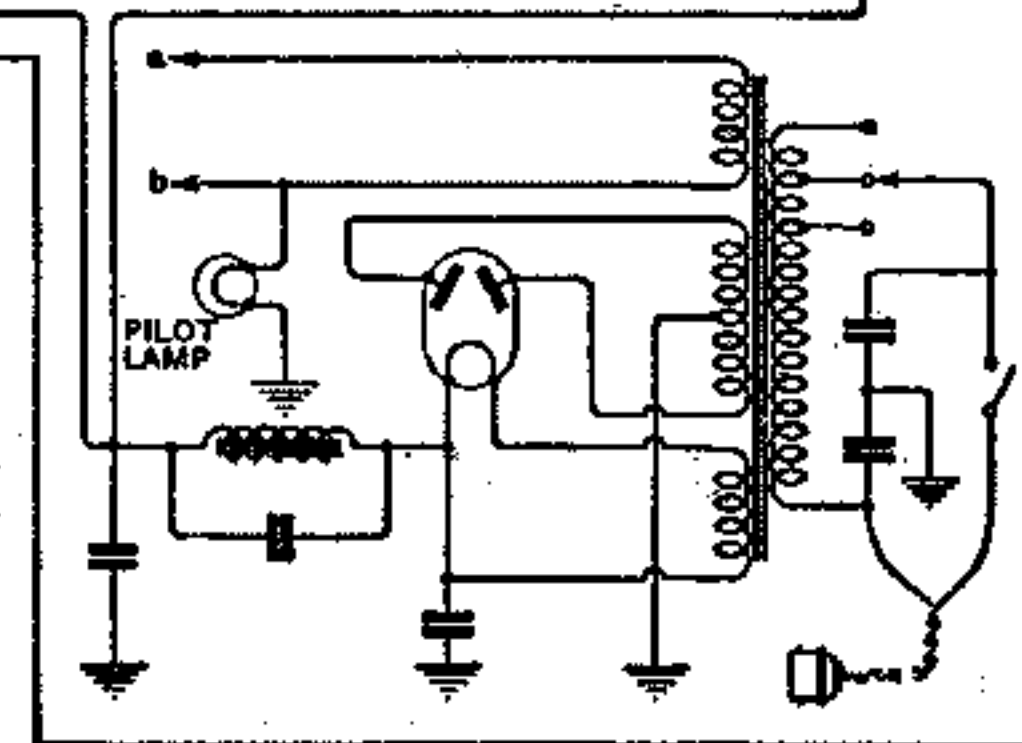
To summarise, the Murphy Type A.3 receiver is a boldly conceived design giving exceptionally good range for three valves, adequate selectivity and a very high standard of quality and volume of reproduction. The



number of controls has been reduced to a minimum. The three principal controls, (1) Tuning, (2) Combined reaction and input volume control, (3) Wave-range switch, are concentrated in a narrow black nickel-plated metal panel on the front of the cabinet. Immediately above is another panel in which a window is cut for viewing the illuminated wavelength scale.

In commenting on the performance, first place must be given to the quality of reproduction. This is really very good indeed and is equally free from box resonance in the bass and shrillness in the upper register. Nevertheless, there is little doubt that frequencies up to 4,500 cycles are well reproduced, and in the bass the pedal notes of the organ are adequately represented. In two searching tests of good quality—the reproduction of the piano and of a woman's voice—the results were extraordinarily realistic.

Circuit diagram of the Murphy A.3 receiver. The volume control and reaction control resistances are mounted on the same spindle.



controls are simple to operate, and in view of the fact that a moving-coil loud speaker is included the price is very reasonable.