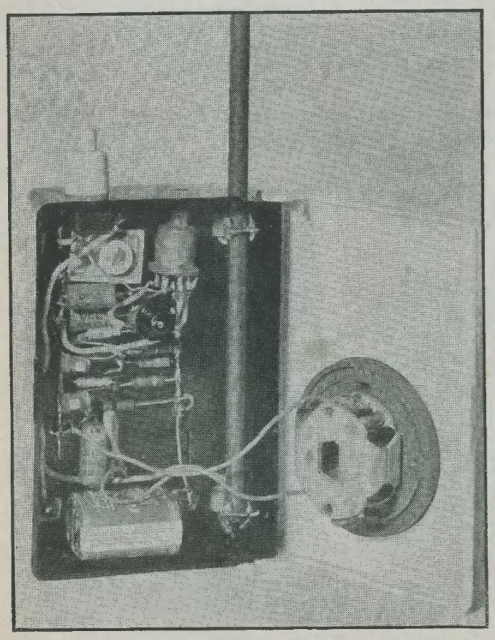
TRANSISTOR TOP-BAND TRANSMITTER

Designed by D. J. French, Grad. I.E.E.

THIS TRANSISTOR TRANSMITTER HAS BEEN designed purely for short range local working and would prove ideal for use during field days, between, for instance, the various groups working at differing QTH's and even between teams working in various tented erections, etc. In addition to these uses, it would prove ideal where communication has to be established between officials at a Hamfest or rally, or where the erection of a beam array requires the conveyance of two-way intelligence.

The circuit is shown in Fig. 1. In this, the XA104 transistor is operating in a grounded emitter oscillator circuit, the feedback required to produce the necessary oscillation being obtained via a coupling winding in series with the emitter circuit. The tertiary winding of the coil, with C_6 in parallel, effectively tunes the oscillator over the frequency range of 1 to 2 Mc/s.

The audio input via the balanced armature microphone is fed into the two-stage amplifier, the output of which is then fed to the base of the oscillator, modulation then taking place. The current consumption of the unit is somewhat less than 3mA, the power requirements being taken from a 15 volt supply.



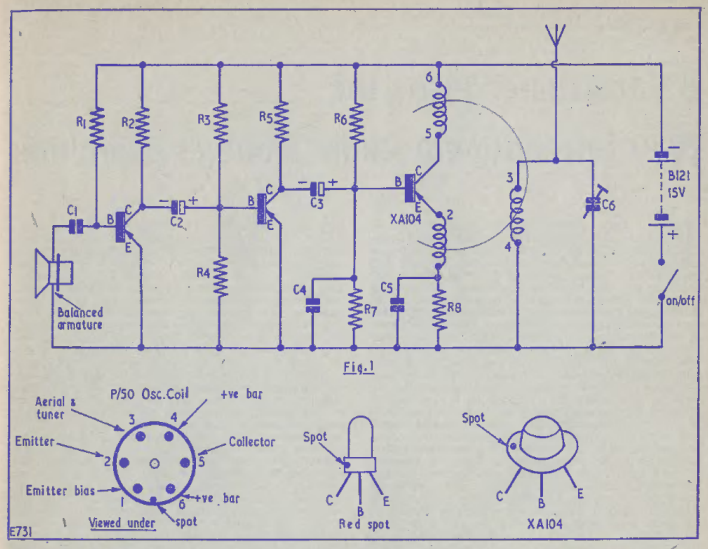
Layout of prototype top-band transmitter

As will be seen from the photograph (shown here) the radiating aerial used is of the copper rod variety and the range of the transmitter will, therefore, be dependent upon the total length of rods so used. With, for instance, one foot of aerial the effective range will be 15 feet, with 2ft of aerial the range will be 25 feet, a 3ft aerial will radiate some 40 feet, whilst 4ft of aerial will operate over some 60 feet.

The transmitter will be found to be slightly directional in operation, but the frequency stability of the unit is excellent and no drift will be found apparent even after initially switching on. The transmitter should be operated so that the aerial rods are in the vertical plane and it will be found, in practice, that the trimmer condenser C_6 will require some adjustment when the aerial length is either increased or reduced.

It should be noted here by the constructor that the radiation of this little transmitter is capable of being picked up on an ordinary medium wave receiver set at the 200 metre end of the band, and in this connection care should be exercised that the unit is, in fact, tuned to the "Top Band" frequency before transmitting commences.

The actual construction of the transmitter is very simple and the illustration herewith shows the physical layout of the various components. The actual layout is not, in itself, critical, although constructors would do well to follow generally that shown adopted here. Care should be taken to ensure that the microphone does not foul the components when the lid of the case is closed. It should also be mentioned here that with the prototype shown, a normal press type switch is included—whereas in the production model kits, a slide switch will be incorporated.



Components List

Resistors

R_1	1MΩ ⅛ watt
R_2	5.6kΩ ⅛ watt
R_3	330kΩ ⅛ watt
R_4	10kΩ ⅛ watt
R_5	4.7kΩ ⅛ watt
R_6	47kΩ ⅛ watt
R_7	10kΩ ⅛ watt
R_8	1kΩ ⅛ watt

Condensers

C_1	0.1μF
C_2	2μF, 9V wkg.
C_3	2μF, 9V wkg.
C_4	0.04μF
C_5	0.04μF
C_6	100pF trimmer

Transistors

2 Red Spot
1 XA104

Miscellaneous

Type P/50 osc. coil (Henry's Radio Ltd.)
Ever-Ready 15V battery, Type B121
On/Off switch
Aerial sections (1ft lengths)
3 transistor holders
Balanced armature unit
Chassis with clips (Henry's Radio Ltd.)
Drilled cabinet (Henry's Radio Ltd.)

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