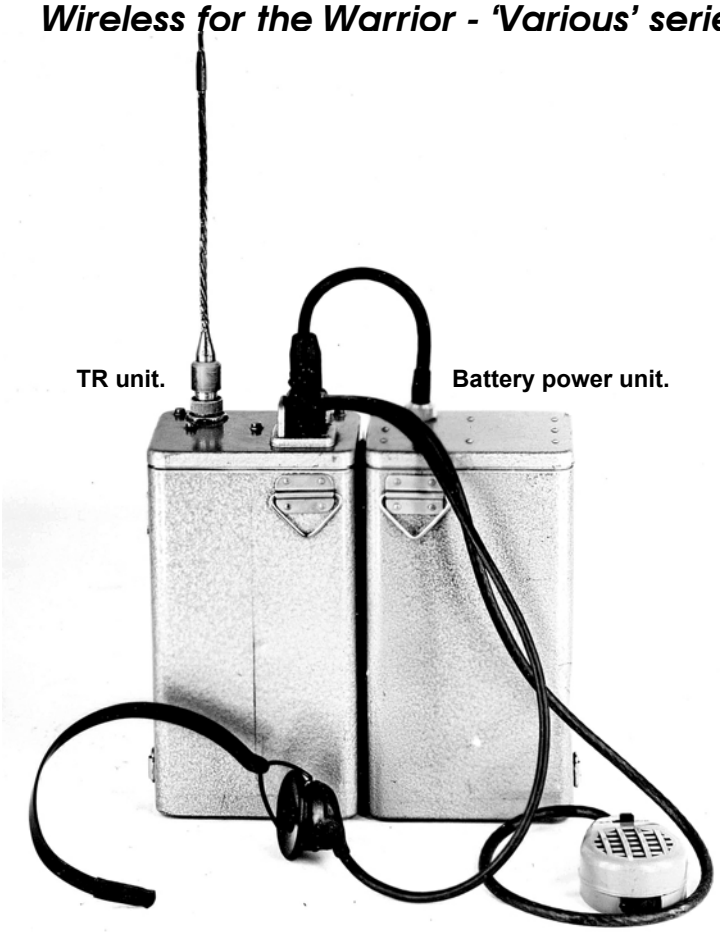
BCC type LL46U V1.01

Country of origin: England

Larkspur era #1



Original commercial version of the BCC type 46U.

DATA SUMMARY

Organisation: British Army.

Developer/maker: British Communications Corporation Ltd.

Year of first production: 1955.

Purpose: VHF AM voice ground to air communication.

Frequency coverage: Single channel in 100-120MHz band.

Receiver: Crystal controlled dual conversion superhet, 1st IF (fs-4fXR), 2nd IF fixed 5MHz. AM voice.

Sensitivity: 3uV for 14dB s/n.

Transmitter: Crystal oscillator/multiplier, driver/multiplier, RF power amplifier/doubler, push/pull modulator (anode-screen grid modulation). Differential carbon microphone.

RF output: >120mW.

Valves: DL73 2x, DL70 2x, DL92 2x, DF91 4x, DAF91, DL94.

Semiconductors: CV442 2x (used as crash limiters).

Aerial: Vertical quarter wave flexible rod.

Power Supply: Dry batteries; LT 1½V 2x, HT 45V 2x.

Continuous working time at 1:10 transmit: 10 hours.

Current consumption: Receive LT 0.75A HT 24mA
Transmit LT 0.62A HT 26mA

(The commercial variant could be equipped with an optional vibrator-type power-supply unit designed to operate from a 2 V non-spillable accumulator. When this configuration was employed, the equipment was fitted with an auxiliary on/off control and a neon indicator lamp to provide a visual confirmation of the power-supply status.).

Size (cm): Height 27.3, length 10.6, width 27.6 (both units).

Weight: Transmitter-receiver unit 2.1kg. Battery unit 3kg. Total weight of equipment 5.8kg.

Accessories: Microphone/headphone assembly, aerial, shoulder straps, protective canvas bag; Spare batteries.

Remarks

The Type LL46U was a crystal-controlled, single-channel VHF AM man-pack transmitter-receiver employed by the British Army as an interim solution for ground-to-air communications. Its service life concluded with the introduction of Station Radio A43R Mk.2, following the re-equipment of close-support aircraft with UHF radio systems. Procurement quantities were limited, and operational deployment was confined to theatres in which terrain conditions could impede the effective use of the vehicle-borne Burndept BE 201.

The commercial type 46U series, developed by BCC in 1955, was manufactured in three initial variants: L46U (75–100 MHz), LH46U (118–132 MHz), and HH46U (156–184 MHz). The LL46U variant, produced specifically for the British Army, operated within the 100–120 MHz band. Its design was broadly consistent with the commercial models, with the exception of modified power-supply and microphone/headphone connector interfaces. All type 46U T/R units could be powered either by a dry-battery power unit or by a vibratory power unit with a built in 2 V accumulator. The LL46U supplied to the Army was equipped solely with the battery power unit and utilised Plessey-type plugs and sockets.

(Commercial-version connectors are illustrated on the left of this page; for the Army configuration, refer to page 3.)

The transmitter-receiver unit and its associated power-supply module, each contained within a watertight enclosure of identical dimensions, were normally coupled to form a single man-portable assembly. When configured for field use, the combined set was fitted with a pair of shoulder straps to permit carriage during dismounted operations. The microphone incorporated the primary on/off control on its forward face, while a spring-loaded push-to-talk switch was positioned along the upper edge to facilitate controlled transmission. According to observations by Andy Jackson, G8JAC, the BCC Series 46 constituted a single-channel VHF man-pack radio set introduced in late 1953 for employment by civil aviation authorities, emergency-service organisations, and engineering units. Subsequent development of the design resulted in the type 88, configured for installation on motorcycles to support mobile communications. Production of the series type 46 is believed to have continued until at least 1957.

Acknowledgements:

- Photographs and drawings courtesy Royal Signals Museum, Blandford Forum, Dorset, UK.
- Photocopy of type 46U handbook, 100-120MHz version, courtesy REME Museum (taken in 1989 at Arborfield).
- Scans of EMERs Tele. F79x, courtesy Keith Watt: website: https://www.royalsignals.org.uk/. These were downloaded free from the Manuals Section. Certain rules apply for downloading.
- WftW Compendium 2, L. Meulstee, ISBN 978-90-819271-0-9.

References:

- Correspondence with Andy Jackson, G8JAC.
- BCC Portable VHF transmitter type HH46U, maker's handbook, Dec. 1955.
- Idem, but type LL46U VHF 100-120MHz version. n.d.
- User handbook for Radio Installation A.S.S.U. Tentacle in Truck ¼-Ton GD 4x4 Rover Mk. 3 and Trailer ½-Ton GS Cargo 2-Wheeled Mk. 2., WO Code No. 12776, August 1963.
- EMERs Telecommunications F 790, Transmitter-receiver LL46U, Technical handbook Data summary, 30 May 1962.
- EMERs Telecommunications F 792, Transmitter-receiver LL46U, Technical handbook, Tech. Description, 4 Jan 1963.
- EMERs Telecommunications F 792, Transmitter-receiver LL46U, Technical handbook, Unit repairs, 1 June 1962.

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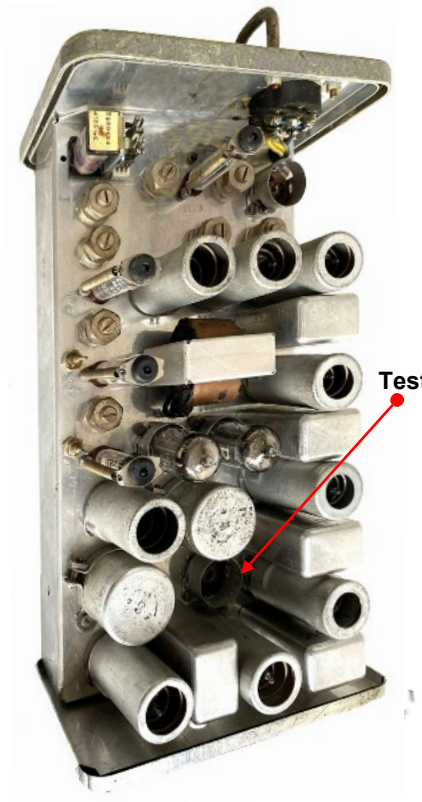
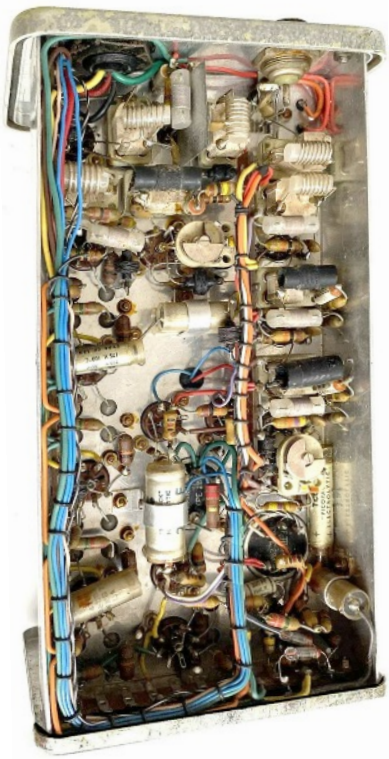
Battery power-supply unit comprising two 1.5V LT cells connected in parallel and two 45V HT batteries connected in series.

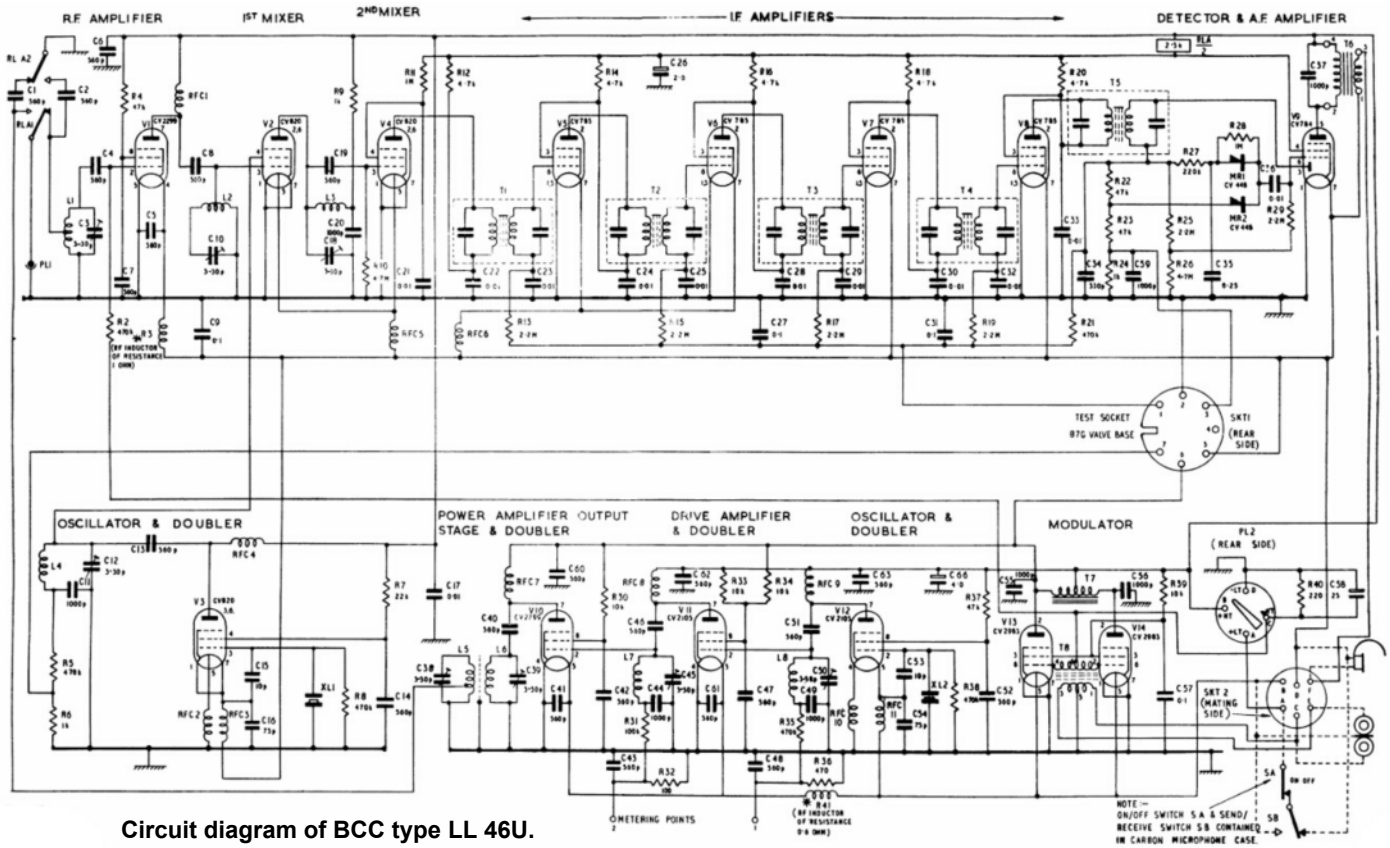


Top view of the transmitter-receiver chassis.



Bottom view of the transmitter-receiver chassis.

The transmitter crystal operated at one-eighth of the carrier frequency, while the receiver crystal frequency was derived by subtracting 5 MHz from the incoming signal frequency and dividing the result by ten. An alignment test point was provided in the form of a BG7G valve base mounted on the chassis.



Circuit diagram of BCC type LL 46U.

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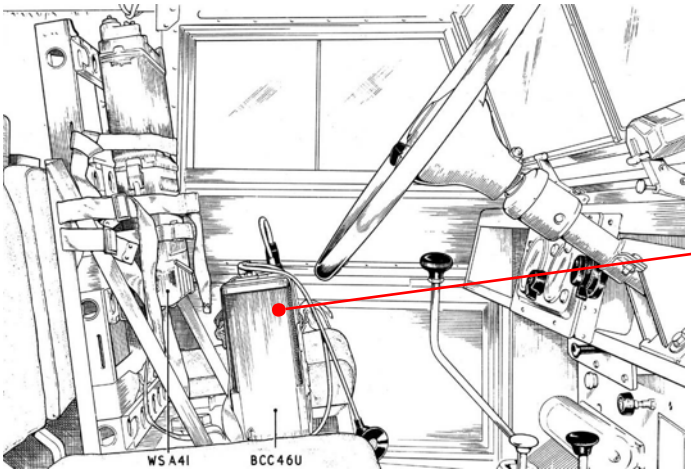
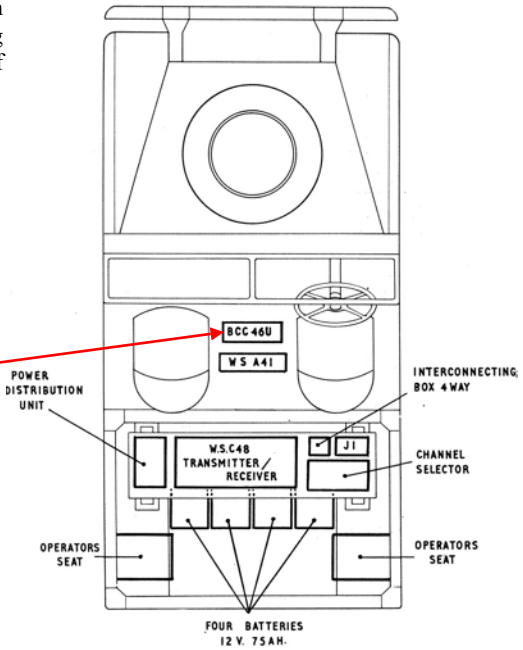
BCC LL46U in Air Support Signal Units (A.S.S.U) Tentacle.

In 1943, the Air Ministry adopted a policy of using standard fighter aircraft for tactical support and artillery reconnaissance. This made it necessary to change the communication arrangements with the Army, since RAF fighters were equipped only with VHF sets. Communication was to be provided by a ground station capable of operating on both VHF and HF, with retransmission facilities enabling direct communication between aircraft and ground forces. Initially named Contact Car and later better known as Tentacle, it was used by forward formations in the Air Support Signal Units (ASSU). Over the years, various ASSU stations with different equipment were in service, fitted in a range of vehicles, all providing communication between aircraft and signal units. Illustrated descriptions of ASSU stations can be found on pages 57 to 64 of WftW Compendium 2.

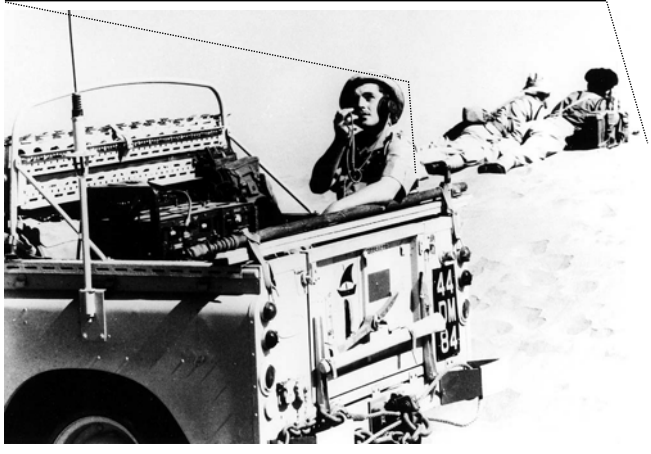
General view of ASSU Rover Mk.3 and trailer.



Position of Station Radio A41 and BCC LL46U in an ASSU Mk.3 Rover, both secured by webbing straps. The centre passenger seat was removed and a two - set stowage frame installed in its place.

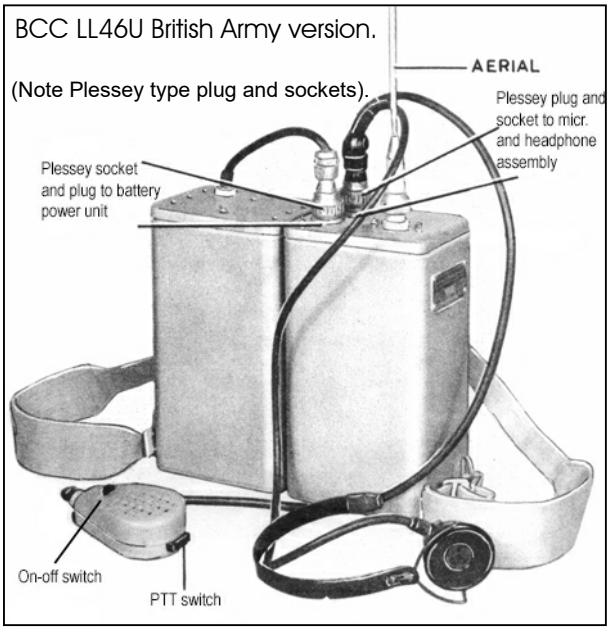


Plan view of ASSU Rover layout.



BCC LL46U

The photograph on the left shows the use of a man-pack BCC LL46U (enlarged in the caption above) and a Burndept BE201 fitted in a Rover. The photo was probably taken during an exercise or range trial in Aden.



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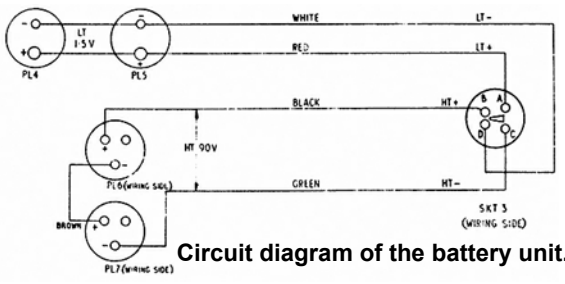
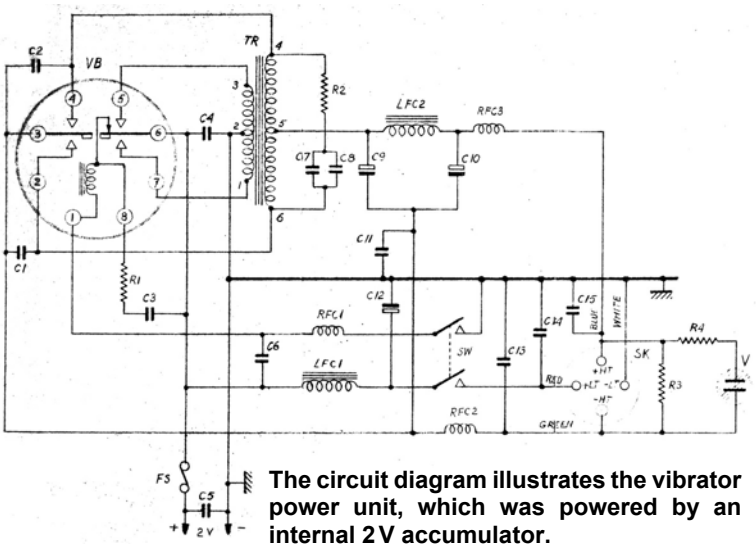
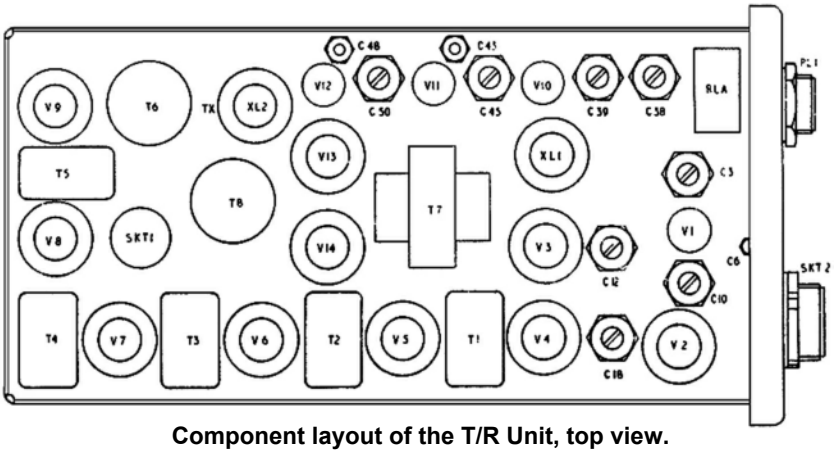


Circuit diagram of the battery unit.

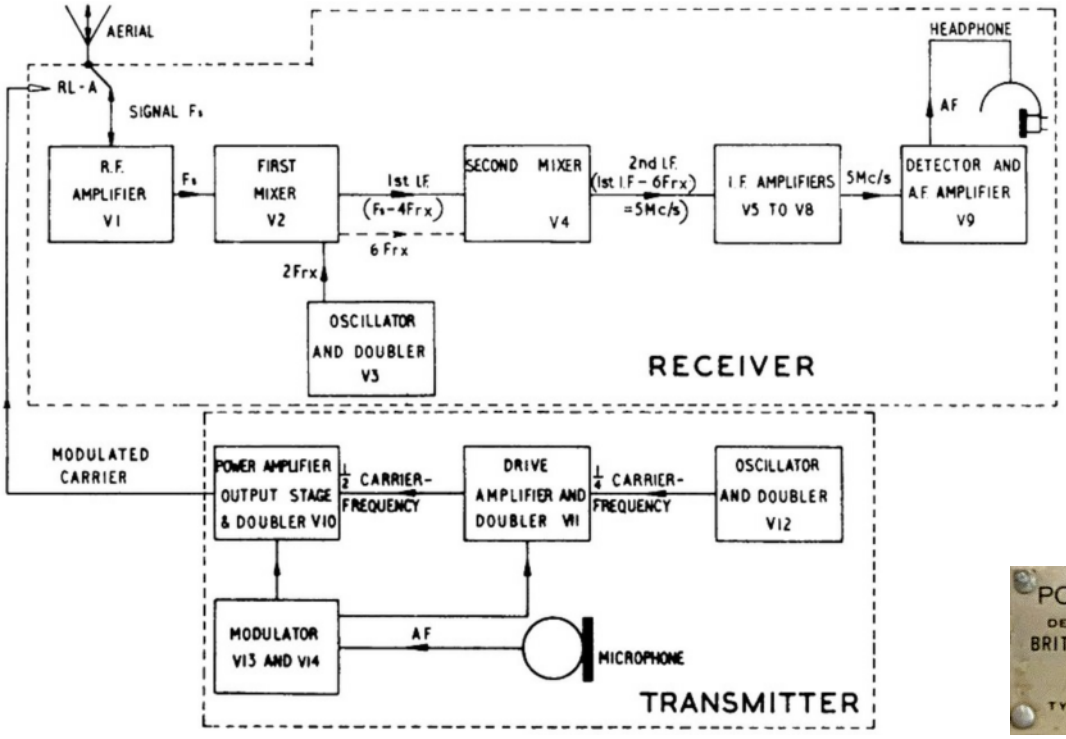


The circuit diagram illustrates the vibrator power unit, which was powered by an internal 2 V accumulator.

Side view of the T/R unit illustrating the mechanical arrangement designed to secure and align the two units as an integrated module.



Component layout of the T/R Unit, top view.



Block circuit diagram of the BCC type LL46U.

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