

CHAPTER 1

Description

The Labgear 160 Twin is a dual function Top Band Transmitter primarily for mobile use which can be instantly withdrawn from the vehicle for fixed station operation. Employing only 4 valves for the R.F. section and modulation, the Transmitter is compacted yet highly efficient. Careful consideration has been given to the front panel layout to ensure complete ease of operation while under mobile conditions.

The Labgear 160 Twin is housed in a ventilated metal cabinet of attractive design.

Specifications:

1. Nominal Input 10 Watts telephony and telegraphy.
2. Valve Line-Up VFO $\frac{1}{2}$ ECF82 (V3A), Doubler $\frac{1}{2}$ ECF82 (V3B), final R.F. Amplifier EL84 (V4), Speech Amplifier ECC83 (V1), Modulator EL84 (V2)
*OB2 stabilizer
for VFO fitted.*
3. Frequency Coverage 1.8 to 2 Mc/s.
4. Output Circuit Adjustable link coupled output, 30-100 ohms unbalanced.
5. Metering Moving coil meter switched to monitor grid drive or PA anode current as required.
6. Modulation High level plate and screen modulator (gives full modulation using crystal microphone)
7. Shielding Screened leads and compartment shielding incorporated as necessary
8. Power Requirements 300V. at 120 mA, 12.6V. at 1.2 A. or 6.3 V. at 2.4 A. (see chapter III)
9. Power Consumption See page on Power Supplies.
10. Finish Instrument grey hammertone cabinet with matt black front panel
11. Size 7 $\frac{3}{4}$ " x 7" x 4"
12. Weight 5 lbs.

CHAPTER 11

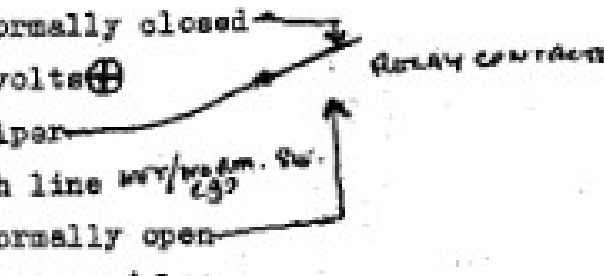
Circuit Description

The VFO operates in the frequency range 900 to 1,000 Kc/s, adequate electrical band spread is provided so that the amateur band occupies a major proportion of the calibrated dial. V3A ($\frac{1}{2}$ 6CF82) is a Hartley VFO feeding pentode section (V3B), a frequency doubler, the anode circuit of which is choke/capacity coupled to the power amplifier. A high L/C ratio ensures constant drive throughout the tuning range. V4 the final RF amplifier is operated in class C, the anode employing a conventional parallel tuned, parallel fed tank circuit. A system of tapped linked coupling permits satisfactory matching to a low impedance asymmetrical load. The modulator consists of a two stage speech amplifier, (V1) feeding an 6L84 modulator stage providing adequate plate and screen modulation, for the final R.F. amplifier.

Keying is effected in the cathode of V4.

Power Connections

Connections to the plug at the rear of the Transmitter are as follows:-

1. Chassis \ominus
 2. RX muting, normally closed
 3. HT plus 300 volts \oplus
 4. RX muting, wiper
 5. Remote switch line *100V/250V AC Sw. (3)*
 6. RX muting, normally open
 7. 12.6 volts heaters AC \sim
- 8+9. NO CONTACTS.*
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CHAPTER 111

Power Supplies

The AC Mains P.S.U. although primarily designed for use with the Labgear One Sixty Twin, is also suitable for use with equipments having similar power requirements. An alternative 6.3V heater tap has been provided to permit use with equipment employing a standard heater supply.

Max. Power Capability

NOT TO BE EXCEEDED

300V.

120 ma.

12.6V. 1.5 A.

max. rating 20 Watts

6.3 V. 3 A.

Terminal Block Connections

Switch Line

White

HT. + 300V.

Red

Heaters 12.6V.

Green

Not connected

Chassis

Blue

Heater 6.3V.

Brown

DC-DC Converter, this unit is designed to supply the necessary power for the Labgear One Sixty Twin in its mobile role and is exceptionally quiet in operation permitting it to be installed adjacent to the transmitter. ON/OFF switching is effected by a power control relay thus enabling the unit to be switched remotely. Polarity reversal protection has been incorporated to safeguard the power transistors. An adequate heat-sink has been provided to ensure safe operation under extreme conditions.

N.B. Should the unit be installed in the engine compartment it must be mounted away from the exhaust system or any other excessively hot area.

Terminal Block Connections

Switch Line

White

HT. + 300V.

Red

Chassis (pos.)

Black

H.T. - 300V

Yellow

Battery 12/14

Blue

Heater 12.6V

Green

CHAPTER IV .

Installation and Operating Instructions.

Immediately upon receipt examine the transmitter for any damage incurred in transit. If damage is detected, the following details must, at once, be notified in writing to the carrier concerned and also to Labgear Limited, Crowell Road, Cambridge, England.

- (a) Particulars of damage.
- (b) Date of receipt.
- (c) Invoice or packing note number.
- (d) Condition of carton in which the Transmitter was transported.

NOTE This instrument has been designed to operate in conjunction with either our B5141 DC-DC Converter or B5142 AC Mains P.S.U. Details of these two units are described in chapter three. Once the Power Supplies are connected to the unit attach the serial load 75 ohms impedance to the socket at the rear of the instrument, also the lead from the key to the appropriate jack socket.

NOTE Ensure voltage selector situated on top of transformer is set for correct mains voltage.

Plug in the microphone, high impedance, to the co-axial socket on front panel, also connect key.

Setting Up CW.

Mod gain control fully anti-clockwise.

Metre switch to Ig.

Set VFO dial to required frequency.

'Switch ON' and allow to warm up.

Switch to CW, Net/Normal switch to 'Normal'.

TX/RX switch to TX.

Then press key, meter should indicate 3-4 mA. drive current. Switch meter to BA and commencing with variable capacitor at max. (fully clockwise) rotate to obtain minimum dip in anode current using the PA tuning control.

If necessary adjust link coupling for an anode current of not more than 40 mA.

Setting up - Telephony

Set up as for CW; with CW/PH switch in PH position advance mod gain control for slight increase in anode current on speech peaks.

Notting Procedure

Switch Net/Normal switch to Net (P.A. is inoperative).

Adjust VFO tuning control for zero beat with RX BFO or incoming signal.

Return Switch to normal.

CHAPTER V

To connect Labgear Mobile Microphone E.5150

The Labgear Mobile Microphone can simply be connected into a One Sixty Twin Transmitter as follows:-

1. Remove 'Mic' coax socket and replace fixing screws.
2. Insert a gromet and pass the free end of the non-kink cable through the hole.
3. A 4 B.A. hank-bush is provided on the chassis adjacent to the 'Mic' socket enabling simple fixing for an additional 3 way tag strip for terminating the microphone cable.
4. Connect:-
 1. Red to the screened lead previously connected to 'Mic' socket.
 2. Green to chassis
 3. Blue to chassis
 4. White to pin 5 of the power socket at the rear of the unit.
 5. The microphone requires a 4.7 K resistor connected between the red lead and chassis.

Transit/Receiver switching is now facilitated by the 'press to talk' switch on the top of the microphone, or alternatively the TX/RX switch on the front panel can be used in the normal way.

Errat VI.

ALTERNATIVE POWER SUPPLY ARRANGEMENTS FOR ONE SIXTY TWIN

The Laogear One Sixty Twin may be operated from any power supply capable of providing the necessary H.T. and L.T. requirements as shown in Chapter 1 paragraph 8.

1. P.S.U. (no Power Control Relay)

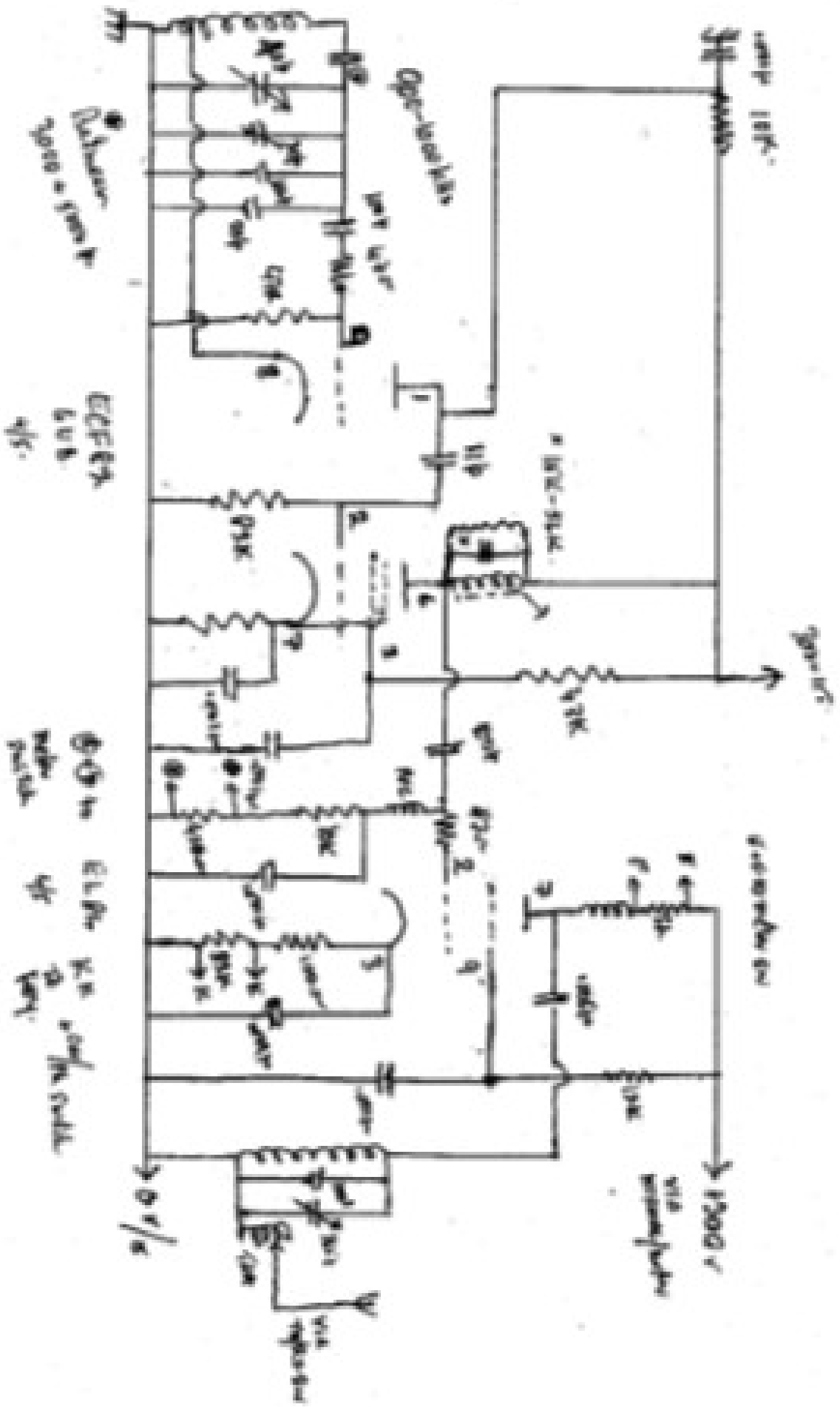
It is suggested that an H.T. ON/OFF switch on the P.S.U. be actually wired as a TX/RX switch. This can be used to interrupt the H.T. feed line to the One Sixty Twin by breaking the centre tap of the transformer H.T. winding. The TX/RX switch on the One Sixty Twin should then be left permanently in the TX position and the H.T. ON/OFF control on the P.S.U. then becomes the TX/RX switch.

Netting procedure is now effected by placing the TX/RX switch on the One Sixty Twin to RX, Net/Normal switch to Net and H.T. ON/OFF switch on P.S.U. to ON.

2. P.S.U. (With Power Control Relay)

All controls on the front panel of the One Sixty Twin may be used as in Chapter IV. The TX/RX remote switch line (pin 5) may be used as a return line to chassis for a power control relay, it is recommended that the relay contacts be connected in series with the centre tap of the HT winding of the transformer.

VFO, BUFFER, PA.



MODULATOR.

