

The K.W. "One-Sixty" Transmitter is a CW/phone transmitter for the 1.8 mc to 2 mc amateur band, with a DC input of 10 watts. It incorporates full CW "break-in" working facilities, also provision for muting a receiver with normal simplex working.

The variable frequency oscillator uses a EF80 valve in a "Clapp" oscillator on 900-1000 Kc/s. This is followed by a second EF80 as a frequency doubler, this being transformer coupled to a PL81 valve as a power amplifier. The RF output of the transmitter is a pi-network filter suitable for direct feed to an end fed aerial or into a low Z co-axial line.

Modulation of the plate and screen of the P.A. is by two 6BW6 valves in push-pull driven by a 12AX7 and 6BR7. Input is from a crystal microphone.

Front panel controls are a combined mains on/off and CW/phone switch, receive/send switch, "net" switch, VFO tune control, PA tune control and an aerial coupling control. Also on the front panel is the P.A. anode current meter and VFO dial.

On the rear drop of the chassis is the mains voltage selector, receiver muting sockets, aerial socket, key jack and mic. input socket.

A pre-set audio gain control is fitted for control of the modulation depth and is mounted on the top of the transmitter chassis.

Other points of interest are as follows:-

Two 6X4 rectifiers used for H.T. supply from mains transformer.

An OA2 voltage stabiliser used to stabilise the screen (osc' anode) of the EF 80 clapp osc'.

A silicon rectifier for negative bias on the PL81 P.A.

"Bridge" neutralization of the PL81 power amplifier.

Fused mains and H.T. line.

## Setting Up

First select the correct mains voltage tapping and connect the transmitter mains load to the supply mains (Green Earth).

Turn function switch to "phone", connect an aerial and microphone to the indicated positions at rear of tx.

Set VFO dial to a suitable frequency and switch to transmit from receive. Set aerial coupling control fully clock-wise and tune P.A. for minimum indication on meter. Once this point is found turn aerial coupling anti-clockwise whilst maintaining a minimum meter reading with the P.A. tune control. This should continue until a reading of 40 m/a is obtained on the meter this indicating that the transmitter is "loaded" by the aerial (or other load) corresponding to an input of 10 watts (250 v. at 40 m/a)

Speaking into the microphone will result in slight fluctuations of the P.A. current. The modulation may be checked for correct depth by any of the usual methods. Modulation depth is pre-set and this control is available by removing the transmitter from its cabinet and will be found on the chassis behind the meter. Due to HT being on the meter terminals it is advisable to use an insulated screw-driver for adjustment of this control. Once the setting has been made for a particular microphone, there should be no necessity to readjust. The control is set at the works for an average crystal microphone.

For C.W. working plug a key into the appropriate socket and switch to CW.

## Control

The receive-transmit switch is used on phone to control the transmitter and also to mute a receiver on transmit. A non-reversible plug and socket is provided at rear for this and the connections are "open" on transmit and closed on receive, thus being suitable for breaking the HT line of the receiver.

With C working, the transmit/receive switch may be used as on "phone" if desired. Due to the fact that the oscillator of the transmitter is keyed the transmitter

netting on to a required frequency is merely by switching from "ON" to "NET". This provides sufficient output from the transmitter for the VFO to be audible on the station receiver. Netting is identical on CW and phone.

### Aerial Connection

Aerial switching from transmitter to receiver can be done by means of a relay operated by the Transmit/Receive switch at the transmitter front panel or by a T/R Switch. Should a relay be used it is necessary to wire the Relay coil in series with an appropriate voltage source, across the two 'Mute' sockets at the rear of the chassis. The relay will operate when the switch is put to 'Receive'. A separate set of contacts should be provided on the relay for muting the receiver.

Should a single wire aerial be used, this will be connected only to the centre of the Antenna co-ax socket. It is advisable to connect an earth to the chassis of the KW "One-Sixty" or to the green wire of the mains lead.

### Removing Chassis from Cabinet

To remove chassis from cabinet, unscrew four panel fixing screws at side edges of panel. Remove top screw from chassis retaining foot at rear centre of chassis. Push chassis forward from rear, lifting slightly to clear rear of chassis from heads of screws which are retaining cabinet feet.

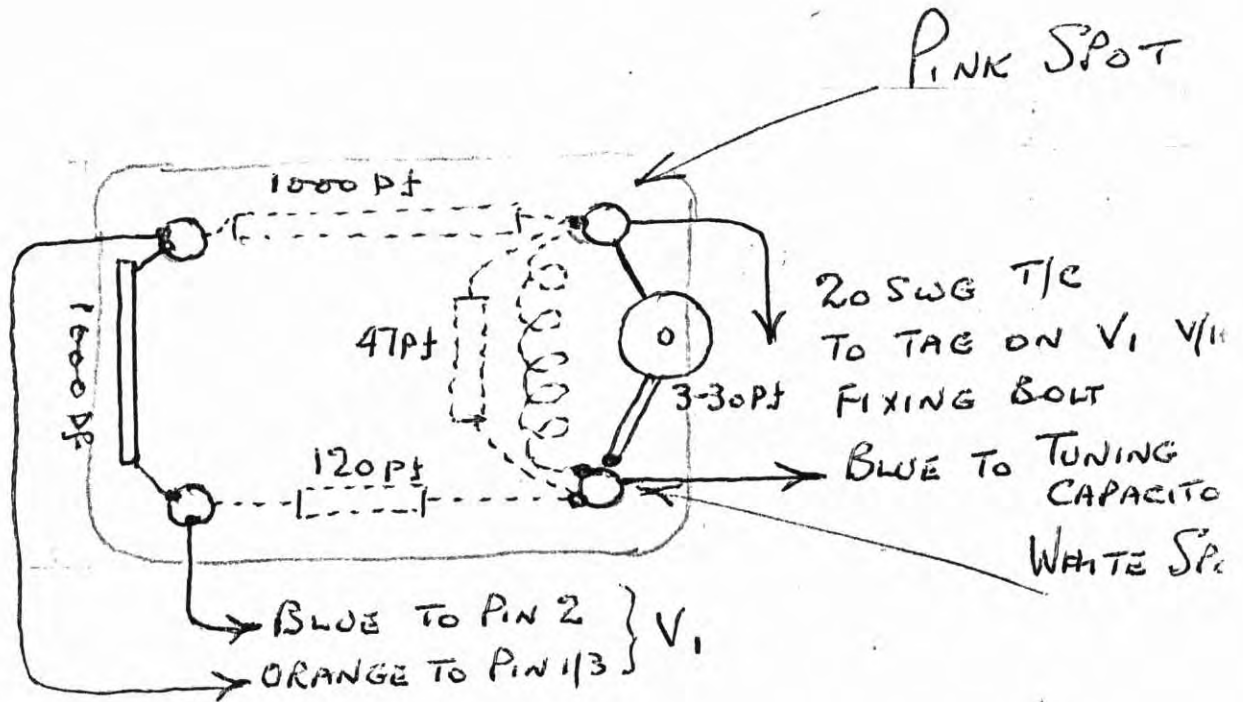
K.W. ELECTRONICS LTD.  
VANGUARD WORKS, 1 HEATH ST., DARTFORD  
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# Oscillator Coil.

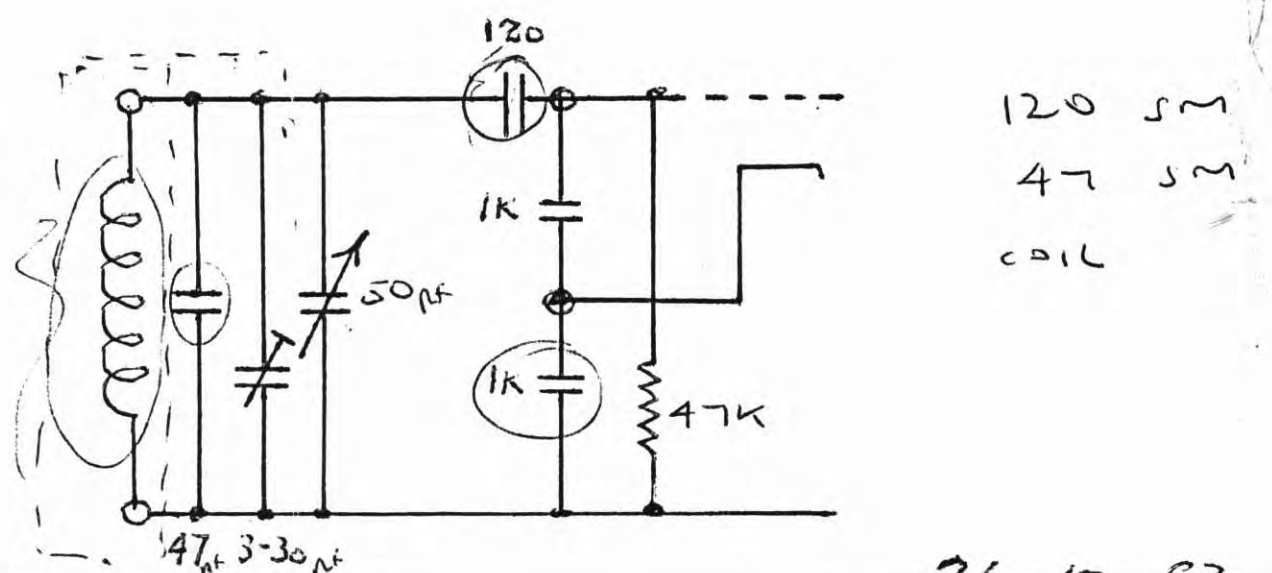
KW 160

## ARRANGEMENT OF COMPONENTS INSIDE CAN.



VIEWS FROM UNDERSIDE OF CHASSIS WITH COIL IN POSITION.

COMPONENTS SHOWN IN BROKEN LINES ARE INSIDE CAN.



INSIDE CAN

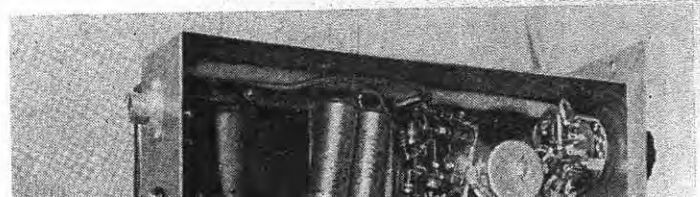
Fig. 1. Circuit complete of the new "K.W. One-Sixty," a self-contained CW/Phone transmitter for Top Band. It includes all the refinements to give smooth, clean speech with full modulation; quick and accurate netting; and a sharp T9x CW note, with BK and receiver muting facilities.

## Table of Values

### The "K.W. One-Sixty" Top Band Transmitter

- |  |                                     |  |                            |
|--|-------------------------------------|--|----------------------------|
| C1 = 50 $\mu\mu\text{F}$                             | R2 = 10,000 ohms, 2w.               | R15, R17, R18 = 470,000 ohms           | APC = Anti-parasitic choke |
| C2 = 30 $\mu\mu\text{F}$ , trimmer                   | R3, R5, R24, R27, R28 = 47,000 ohms | R16 = 4,700 ohms                       | WBC = Wide-band coupler    |
| C3 = 300 $\mu\mu\text{F}$ , var.                     | R6, R19, R21 = 100,000 ohms         | R20 = 2,200 ohms                       | F1 = 1 amp.                |
| C4, C5 = .001 $\mu\text{F}$ , silver mica            | R4 = 10,000 ohms                    | R22, R23 = 220,000 ohms                | F2 = 500 mA                |
| C6 = 220 $\mu\mu\text{F}$                            | R7, R11 = 470 ohms                  | R26 = 250 ohms                         | V1, V2 = 6BX6              |
| C7, C9, C10, C12, C15, C26, C27 = .005 $\mu\text{F}$ | R8 = 6,800 ohms                     | R29 = 4,700 ohms, w/wound              | V3 = 21A6 (PL81)           |
| C8, C23, C24 = .01 $\mu\text{F}$                     | R9, R10, R14 = 1,000 ohms           | R31 = 2.2 megohms                      | V4 = 6BR7                  |
| C11 = 750 $\mu\mu\text{F}$ , trimmer                 | R12, R30 = 22,000 ohms              | VR1 = 0.5 megohm, pre-set gain control | V5 = 12AX7                 |
| C13, C32, C33 = 25 $\mu\text{F}$ elect.              | R13 = 1 megohm                      | S1 = 4-pole, 3-way                     | V6, V7 = 6BW6              |
| C14, C16, C17 = .0018 $\mu\text{F}$                  |                                     | S2, S3 = 2-pole, 2-way                 | V8, V9 = 6X4               |
| C18, C19 = 500 $\mu\mu\text{F}$ , var.               |                                     |  | V10 = OA2                  |
| C20, C22 = 390 $\mu\mu\text{F}$                      |                                     |  |                            |
| C21 = 0.1 $\mu\text{F}$                              |                                     |  |                            |
| C25, C28, C29 = 8 $\mu\text{F}$ elect.               |                                     |  |                            |
| C30, C31 = 32 $\mu\text{F}$ , elect.                 |                                     |  |                            |
| C34, C36 = 40 $\mu\mu\text{F}$                       |                                     |  |                            |
| C35 = 30 $\mu\mu\text{F}$                            |                                     |  |                            |
| R1 = 6,800 ohms, 5w., w/wound                        |                                     |  |                            |

(NOTE: Items Rec. 1, Ch.1, T1 and T2, WBC and L1, L2 are as fitted.)



Underneath the "K.W. One-Sixty" transmitter (C19 in the circuit) is mounted at upper left, mounted in the chassis drop are the

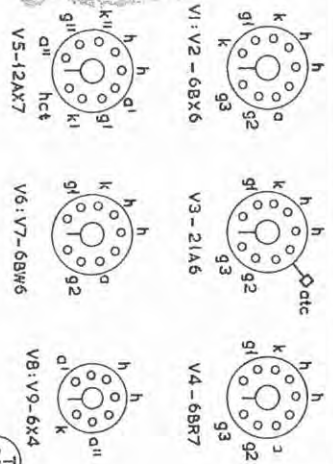
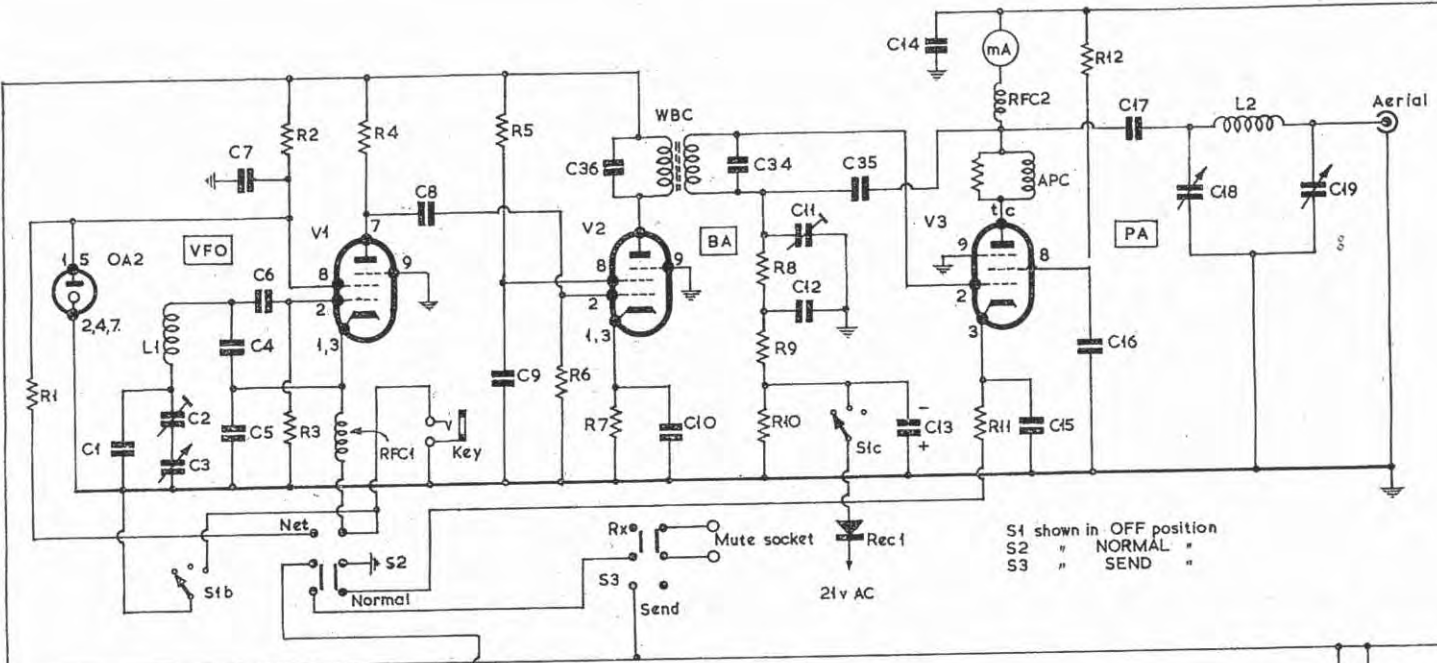
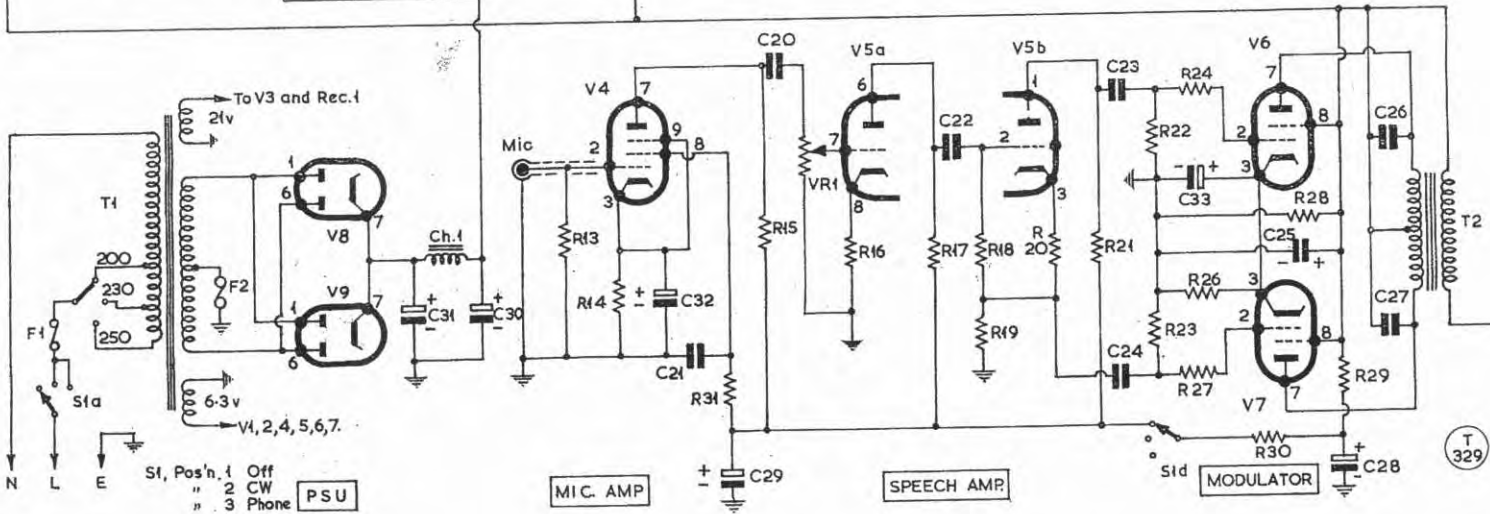


Fig. 2. Base connections of the valves used in the "K.W. One-Sixty" transmitter. Note that for V3, the PL81 in the PA is the equivalent of the 21A6 shown here.



S1 shown in OFF position  
 S2 " NORMAL "  
 S3 " SEND "



S1, Pos'h. 1 Off  
 " 2 CW  
 " 3 Phone

# **K4XL's** **BAMA**

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