

2.16. TYPE 623

DATE OF DESIGN. 1952

HANDBOOK. B.R. 2181

ESTABLISHMENT LIST. E. 1100

FREQUENCY RANGE. 1.5 to 24 Mc/s (V.F.O.)
2 to 24 Mc/s (C.O.)

FREQUENCY DETERMINATION. V.F.O. or Crystal Osc.

EMISSION AND POWER OUTPUT. C.W. 400 W.

1. Description. Type 623 is a medium power HF transmitter with an output of 400 W, specifically designed for use in submarines. The transmitter is designed for operation from 115 V 60 c/s or 230 V 50 c/s single phase a.c. supplies. In addition 220 V d.c. supply is required for relay, master oscillator oven and anti-condensation heater operation.

The transmitter uses either v.f.o. or crystal for frequency determination. The frequency range of 1.5 to 24 Mc/s is covered in four bands by a variable frequency oscillator tuning over the basic range of 1.5 to 3 Mc/s followed by amplifying or multiplying stages, according to the output frequency. The transmitter is also capable of operation on any one of nine spot frequencies, determined by crystals within the range 2 to 24 Mc/s with no restrictions of the

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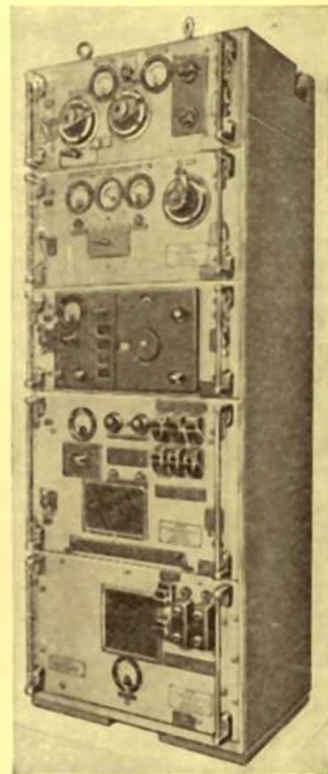
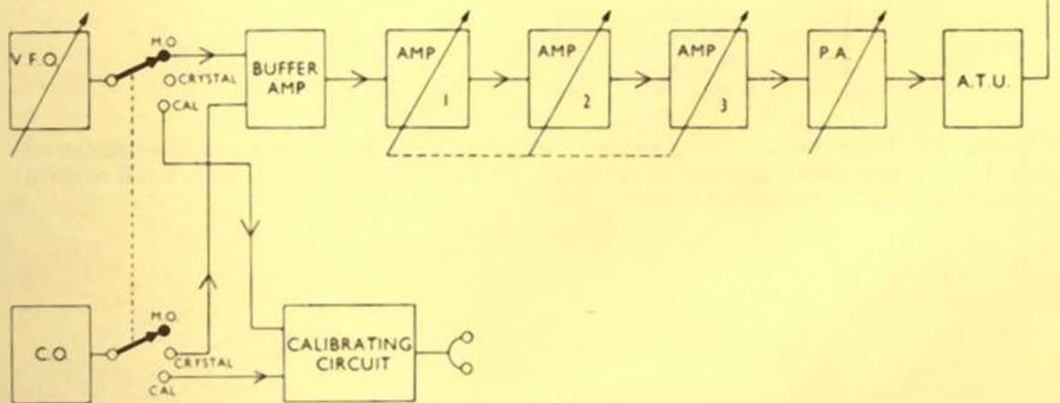


FIG. 1

2. Block Diagram



NOTE: THERE ARE 9 CRYSTAL POSITIONS

FIG. 2. TRANSMITTER - TYPE 623

distribution of the frequencies within this band. The operating frequencies of the crystals employed all lie between 2 and 4 Mc/s and the frequency multiplying stages are again utilized as required.

A built-in calibration system for the v.f.o. is provided by the inclusion of a 100 kc/s crystal capable of being switched into the grid circuit of the crystal oscillator. Calibration is achieved by tuning the v.f.o. to zero beat with harmonics from the 100 kc/s crystal oscillator. The v.f.o. stage and the 100 kc/s crystal are both enclosed in a thermostatically controlled oven to provide stable operating conditions.

3. Power Amplifier Stage. The power amplifier stage covers the frequency range in six bands and employs two tetrodes connected in parallel, to feed a pi network designed for operation into an impedance of 90 ohms.

4. Aerial Tuning. The aerial tuner housed in the top drawer of the transmitter is essentially a matching transformer to convert the impedance of the aerial system to the requisite 90 ohms. A dummy load having a resistance of 90 ohms is built into the cabinet assembly of the transmitter to provide a load for the output stage during tuning.

5. Frequency Build-up. The following tables indicate the functions of the various stages when using v.f.o. or crystal:

a. V.F.O.

<i>Range</i>	<i>V.F.O. Frequency</i>	<i>Multiplication Factor</i>			<i>Output Frequency</i>
	<i>Mc/s</i>	<i>Amp 1</i>	<i>Amp 2</i>	<i>Amp 3</i>	<i>Mc/s</i>
1	1.5 to 3	×1	×1	×1	1.5 to 3
2	1.5 to 3	×2	×1	×1	3 to 6
3	1.5 to 3	×2	×2	×1	6 to 12
4	1.5 to 3	×2	×2	×2	12 to 24

b. CRYSTAL OSCILLATOR

<i>Range</i>	<i>Crystal Frequency</i>	<i>Multiplication Factor</i>			<i>Output Frequency</i>
	<i>Mc/s</i>	<i>Amp 1</i>	<i>Amp 2</i>	<i>Amp 3</i>	<i>Mc/s</i>
1	2 to 3	×1	×1	×1	2 to 3
2	3 to 4	×1	×1	×1	3 to 4
2	2 to 3	×2	×1	×1	4 to 6
3	3 to 4	×1	×2	×1	6 to 8
3	2 to 3	×2	×2	×1	8 to 12
4	3 to 4	×1	×2	×2	12 to 16
4	2 to 3	×2	×2	×2	16 to 24

6. Keying. The Buffer Amplifier and Amplifier 1 stages are keyed. In the SPACE condition the control grids of the valves of these stages have a heavy negative bias. In the MARK condition this bias is removed and the control grids are connected to earth.