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12163

# SSB

( Single - Sideband )

## EQUIPMENT

OPERATING MANUAL  
PRICE \$2.50  
BANDHOPPER VFO



MANITOWOC, WISCONSIN

MANUFACTURERS OF PRECISION ELECTRONIC EQUIPMENT

## THEORY OF OPERATION

The Band-Hopper VFO is designed for use with all Phasemaster transmitters, exciters, or any other exciter using the 9 MC frequency of SSB generation. It incorporates into one compact unit all the requirements for an all band VFO with extreme stability and ease of tuning with precision gearing throughout.

The Band-Hopper master oscillator operates on a 5.0 to 5.6 MC range on all bands. The 5.0 to 5.6 MC range is used for mixing against the 9 MC SSB exciter signal to provide operation on both 80M and 20M bands. The 160M band uses the 2nd harmonic of the 5.0 to 5.6 MC range and the 40M band uses the 3rd harmonic of the 5.0 to 5.6 MC range. The 15M band is heterodyned with the 5.0 to 5.6 MC and a 25MC crystal controlled signal to provide a 30.0 to 30.45 output frequency. The 10M band is split into two (2) bands to provide maximum bandspread. The 10<sub>1</sub> band is heterodyned with the 5.0 to 5.6 MC and a 32.5 MC crystal controlled signal to provide a 37.5 to 38.1 output frequency. The 10<sub>2</sub> band is heterodyned with the 5.0 to 5.6 MC and a 33.0 MC crystal controlled signal to provide a 38.1 to 38.7 MC output frequency. Output is fed from the mixer stage into a bandpass isolation stage to provide from 3 to 8V RF. RF output is kept at the lowest usable level on the higher bands to eliminate undesirable mixing products from overdriving the exciter mixer.

## CAUTION

DO NOT CUT OR CHANGE the length of the output coax cable on the Band-Hopper. The supplied length is necessary for proper

operation. If this cable is too long, lay it behind your equipment. DO NOT coil into a loop!

#### OPERATING INSTRUCTIONS

Operation of the Band-Hopper is simple and straight forward. Two (2) slide switches are located on the front panel. The switch marked power turned on the AC power to the Band-Hopper. The switch marked STBY is provided for those who desire immediate stability from day to day. Both switches must be up for proper operation. If you desire immediate stability for operating at a latter time, switch the standby switch down when your present operation is concluded. Leave power switch on. This allows the master oscillator to operate and removes plate power off all other stages, still allowing normal temperature and stability to be maintained even when the VFO is not in normal use. The Band-Hopper Power supply is rated sufficiently that it may be left in Standby for long periods of time.

Select desired band with the bandswitch knob. Set desired frequency on the main dial. A logging scale is provided on the bottom scale of the main dial and a vernier scale at the tuning knob. This is provided for accurate reset to any frequency at a later date. The Band-Hopper is not intended as an accurate frequency standard, therefore when operation close to the bandedges is desired it is recommended that a seperate calibrated frequency standard be utilized to eliminate illegal operation outside of the amateur band. Band calibration of the dial is 5KC on 80, 20, 15, 10 meters and 10KC on 160, 40 meters.

## CONNECTING TO YOUR EXCITER

The Band-Hopper is complete with an 8 prong octal plug placed on the end of a length of coax cable. Connections are proper for plugging directly into the accessory power socket located on the rear of the Phasemaster II and Central Electronics, 10A, 10B, and 20A exciters.

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## ALIGNMENT

The Band-Hopper is factory aligned and should need no adjustment of any slug tuned circuits.

A band set adjustment is located thru a hollow shaft on the oscillator compartment shield cover directly behind the dial panel. In some cases the 9MC frequency of your exciter may not be exactly on frequency so it may be desirable to correct the frequency reading of the Band-Hopper by adjusting the band set condenser. Remove the Band-Hopper slightly from its cabinet so access can be had to the band set adjustment on the top of the master oscillator compartment. NOTE: This adjustment is marked BS. CAUTION. DO NOT adjust oscillator slug adjustment located opposite the bandset adjustment or tracking of the dial may be disturbed. Set the VFO dial to 4MC for 80M operation with your exciter on calibrate. Using a calibrated source such as your receiver and a 100 KC standard set the BS adjustment to zero beat. Replace Band-Hopper in its cabinet. This will adjust all bands for proper dial accuracy and should not further require adjustment over long periods of time.

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## CHART OF VFO RANGE FREQUENCY AND OUTPUT FREQUENCIES

BANDS	CHART OF BAND RANGE	BANDHOPPER OUTPUT FREQUENCY
160M	1.8 - 2.0 MC	10.8 to 11.0 MC
80M	3.5 - 4.0 MC	5.5 to 5.0 MC
40M	7.0 - 7.4 MC	16.0 to 16.4 MC
20M	14.0 - 14.4 MC	5.0 to 5.4 MC
15M	21.0 - 21.45 MC	30.0 to 30.45 MC
10 <sub>1</sub> M	28.5 - 29.1 MC	37.5 to 38.1 MC
10 <sub>2</sub> M	29.1 - 29.7 MC	38.1 to 38.7 MC

### BANDHOPPER VFO VOLTAGE CHART

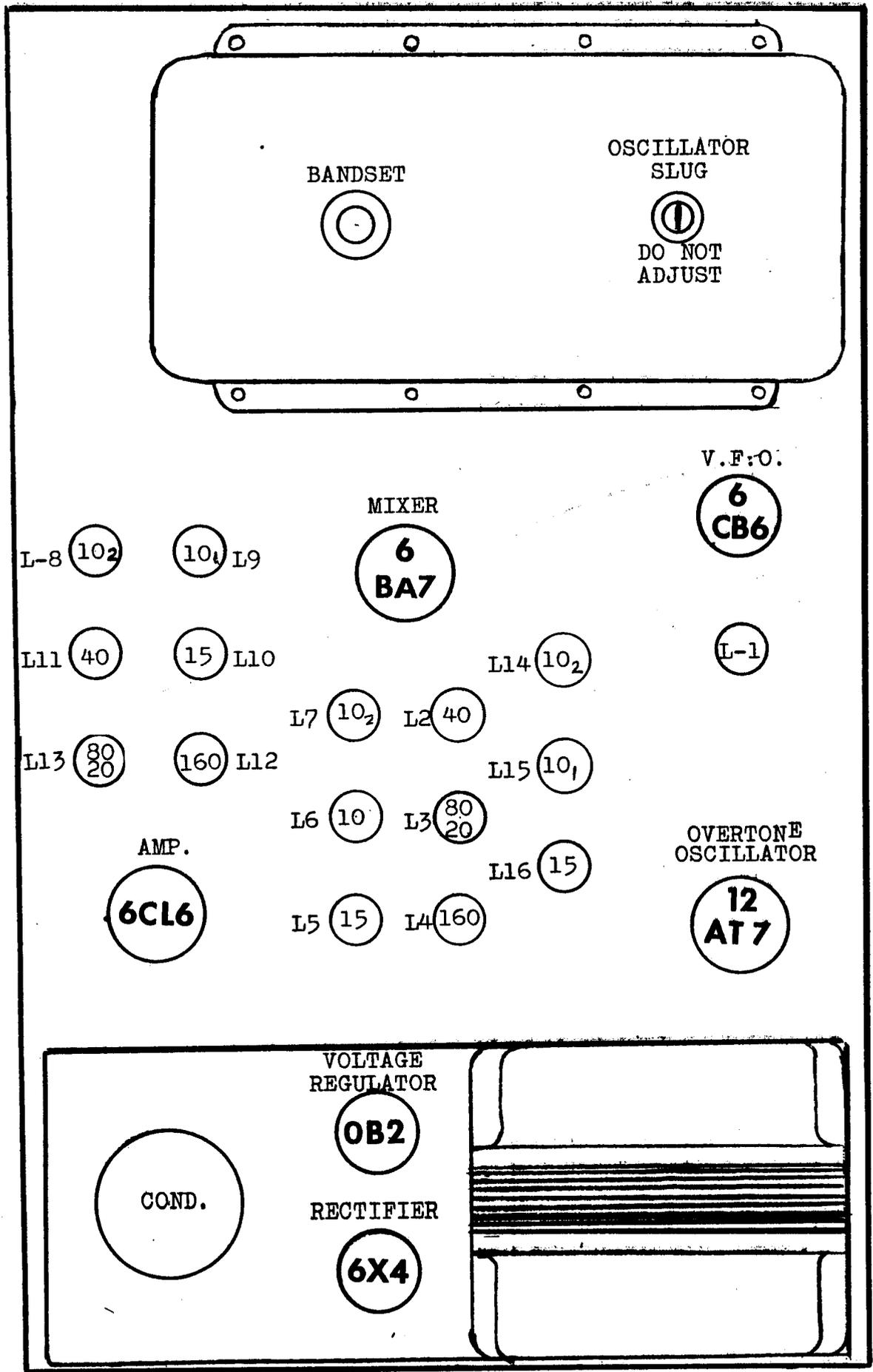
	1	2	3	4	5	6	7	8	9
6CB6	-2.5V	.7V	3.1V AC	3.1V AC	105V	105V	0		
6BA7	85V	-.3V	0	3.1V AC	3.1V AC	0	-.8V	0	225V
6CL6	0	-.85V	100V	3.1V AC	3.1V AC	225V	0	100V	-.85V
12AT7	235V	0	2V	3.1V AC	3.1V AC	225V	0	2V	3.1V AC
6 x 4	230V AC	0	3.1V AC	3.1V AC	0	230V AC	255V		
OB2	105V	0		0	105V		0		

**Conditions:**

Band 15 Meters  
 Frequency 21.3 MC  
 Power and Standby Switches on  
 All voltages measure from chassis with VTVM  
 All voltages DC unless marked

Band-Hopper VFO  
 Printed in U.S.A.

LAKESHORE INDUSTRIES  
 Manitowoc, Wisconsin



**BANDHOPPER VFO**

WARRANTY

Lakeshore Industries warrants all equipment of its manufacture and bearing its name plate when not misused or neglected, to be free from defects in workmanship or material for a period of three (3) months from date of purchase, providing the warranty card has been properly filled out and returned to Lakeshore Industries within 10 days of purchase.

Replacement will be made only when said part or unit is returned post-paid, with prior permission and in the judgment of us was defective at the time of sale. This warranty does not extend to any Lakeshore Kits which have been subject to misuse, neglect, accident and improper construction or application. This warranty is in lieu of all other warranties and the above company neither authorizes any other person to assume for them any other liability in connection with the sale of Lakeshore Industries equipment.

LAKESHORE INDUSTRIES  
Division of Aitken-Reed, Inc.  
Manitowoc, Wisconsin

