



# LAFAYETTE "PRECON"

**AMATEUR**

**PRESELECTOR**

**CONVERTER**

**4950**

**Imported**

**MODEL HE-73**

- **Crystal Controlled**
- **For 80-40-20-15-10 Meter Bands**
- **As a Converter—Converts Receiver to Dual Conversion Operation**
- **Improves Selectivity**
- **Widens Band Spread**

A great 2-in-1 combination. Tuned interstage circuits and 2 stages of RF amplification assures higher signal-to-noise ratio, improved I.F., image rejection. Easy to install.

## TECHNICAL SPECIFICATIONS

OPERATION .....	80M: 3.5 - 4.0 Mc Preselector only
	40M: 7.0 - 7.3 Mc Preselector only
	20M: 14.0 - 14.35 Mc Preselector & Converter
	15M: 21.0 - 21.45 Mc Preselector & Converter
	10M: 28.0 - 29.7 Mc Preselector & Converter
CONVERTER OUTPUT FREQUENCY.....	3.50 - 3.85 Mc on 20M band
	3.50 - 3.95 Mc on 15M band
	3.50 - 5.20 Mc on 10M band
OSCILLATOR CRYSTAL .....	5,250 Kc for 20M band
	8,750 Kc for 15M band
	12,250 Kc for 10M band
ANTENNA INPUT .....	52 ohms, coaxial connector provided
OUTPUT IMPEDANCE.....	Low Impedance, coaxial connector provided
TUBE COMPLEMENT .....	V1 - 6BA6 RF amp
	V2 - 6BL8 Mixer and oscillator (converter) or RF amp (preselector)
POWER SOURCE.....	117 volts 50-60 cps AC
POWER CONSUMPTION .....	18 VA
DIMENSIONS.....	Height 6", width 10", depth 8".
WEIGHT.....	9-1/2 lbs.



The HE-73 is a combined pre-selector and crystal-controlled converter designed for use with any communications receiver for improved reception on the most-often used amateur bands. When used as a pre-selector, it provides two stages of RF amplification for the 80, 40, 20, 15 and 10 meter bands. Individual tuned circuits for each band are provided in both RF stages, thus ensuring a high signal-to-noise ratio. An antenna trimmer provides a means of peaking the signal on all bands. A gain control in the cathode of the first RF amplifier provides an adjustment of the RF gain to prevent overloading on stronger signals. When used as a converter, the HE-73 provides one stage of RF amplification, with conversion provided by a mixer and a crystal-controlled oscillator operating as a doubler. The HE-73 operates as a converter on the 20, 15 and 10 meter bands, the output frequency being in the 3-6 Mc range. Also included in all modes is a cathode-follower which provides a low impedance output for connection to the receiver.

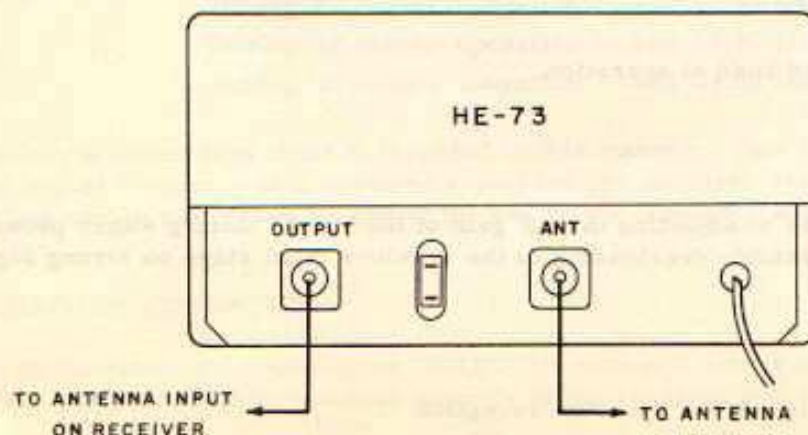
As a converter or preselector, the Lafayette HE-73 "Precon" offers numerous advantages when used in any receiving system. As a preselector, the HE-73 provides two additional tuned stages of RF, increasing the sensitivity of any receiver throughout its tuning range (up to 10 meters) by a significant amount. As a converter, the HE-73 converts any single conversion receiver into a double-conversion unit with crystal-controlled front end -- a desirable feature normally found only in high-priced receivers. Even with receivers already tuning up to 30 Mc, the HE-73 provides superior reception of signals in the higher frequencies by converting them down to the 3-6 Mc range on the receiver where the receiver normally offers greater stability, extended bandwidth facilities and higher sensitivity. These advantages, coupled with the additional RF gain of the HE-73, assure an overall receiving system of exceptionally high quality. It can also be used to extend the tuning range of receivers with limited frequency coverage. Provided the receiver tunes up to 6 Mc, the HE-73 will permit reception on all bands up to and including 10 meters. The table below shows the operating frequencies of the HE-73 for each band setting during either Pre-selector or Converter operation.

FUNCTION SWITCH TO	BAND SWITCH TO	HE-73 TUNED TO	HE-73 OUTPUT FREQUENCY
PRESELECTION	80M	3.5 - 4.0 Mc	3.5 - 4.0 Mc
"	40M	7.0 - 7.3 Mc	7.0 - 7.3 Mc
"	20M	14.0 - 14.35 Mc	14.0 - 14.35 Mc
"	15M	21.0 - 21.45 Mc	21.0 - 21.45 Mc
"	10M	28.0 - 29.70 Mc	28.0 - 29.70 Mc
CONVERTER	80M*		
"	40M*		
"	20M	14.0 - 14.35 Mc	3.50 - 3.85 Mc
"	15M	21.0 - 21.45 Mc	3.50 - 3.95 Mc
"	10M	28.0 - 29.70 Mc	3.50 - 5.20 Mc

\* Only RF amplification provided on these bands.

## INSTALLATION

**WARNING:** If the HE-73 is to be connected to an AC/DC receiver, be sure to use an isolation transformer between the AC power source and the receiver. Failure to do so will create a shock hazard and possibly cause serious damage to both units.





## ANTENNA

Connect your antenna cable (which should be terminated with a PL-259 coaxial male connector) to the input connector marked "ANT". Input impedance of the HE-73 is approximately 52 ohms.

## OUTPUT

The connector marked "OUTPUT" should be connected to the antenna input of your receiver, using a short length 52-75 ohms coaxial cable terminated at each end with a PL-259 connector.

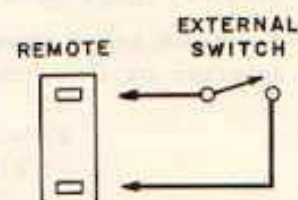
## AC POWER

The HE-73 operates from a 105-120 volt, 50-60 cycle AC line. Do not attempt to operate from any other power source.

## REMOTE SOCKET

A socket in the back of the HE-73 allows simultaneous control of this unit with a transmitter switching device so that the HE-73 will be inoperative (B+ removed) during periods of transmission.

The HE-73 is shipped with a jumper connected internally across the REMOTE socket. For normal operation, there is no need to remove this jumper wire. For remote switching, it will first be necessary to remove this jumper. The remote switching device is then connected to this socket (using a standard AC line cord plug) so that the two contacts are shorted when signal reception is desired.



NOTE: These contacts are in series with the B+ line. Opening them will remove B+ voltages, shorting them will re-apply the voltages.

## CONTROLS

### FUNCTION SWITCH

This switch is used to set the HE-73 to the desired mode of operation, as follows:

- OFF..... In this position, AC power is removed from the unit and the antenna is connected directly to the output connector (and thus to the input of the receiver), completely by-passing the HE-73.
- PRE-SEL..... When set to this position the HE-73 functions as a preselector, providing two stages of RF amplification for signals in the band selected.
- CONV ..... This setting is used to provide converter operation on the 20, 15, and 10 meter bands. On 80 and 40 meter bands, this setting provides preselector operation only.

### BAND SWITCH

This switch selects the desired band of operation.

### GAIN CONTROL

This control provides a means of adjusting the RF gain of the HE-73 during either preselector or converter operation to prevent possible overloading of the receiver input stage on strong signals

### ANTENNA TRIMMER

This control serves to peak signals for optimum reception.



# OPERATING INSTRUCTIONS

## PRESELECTOR OPERATION (RF amplifier only)

1. Switch receiver on, and set FUNCTION switch on the HE-73 to "PRE-SEL". Allow both units to warm up properly.
2. Set the HE-73 BAND switch to band on which reception is desired (80, 40, 20, 15 or 10 meters).
3. Set the HE-73 GAIN control to maximum (10).
4. Set receiver to same band as that selected on the HE-73. Peak any signals in the band with the HE-73 ANT TRIM control.
5. The receiver may now be operated in the normal way over the band to which the HE-73 is set. Tune receiver over the selected band, peaking antenna trimmer on receiver and HE-73 where necessary. If signals overload the receiver, decrease the setting of the HE-73 GAIN control.
6. To operate on another band, simply repeat the procedure outlined in steps 2 through 5.

## CONVERTER OPERATION (20, 15, 10 meters only)

1. Switch receiver on and set FUNCTION switch on the HE-73 to CONV. Allow both units to warm up properly.
2. Set the HE-73 BAND switch to band on which reception is desired (20, 15, or 10 meters).
3. Set HE-73 GAIN control to maximum (10).
4. The receiver should be tuned over the band of frequencies which are produced at the output of the HE-73 for the particular BAND switch setting. For example, if the HE-73 is set for converter operation on 20 meters (14.0 - 14.35 Mc), tune the receiver over the range of 3.50 - 3.85 Mc (this is indicated on the front panel of the HE-73). For quick conversion of receiver dial readings to actual received frequency, see the Conversion Chart in this manual. Remember, however, that accurate determination of the frequency of the received signal from this chart is possible only when receiver dial calibration is correct (or amount of error known).

Always use antenna trimmers on both units to peak signals. If receiver overloads on stronger signals, reduce RF gain control on HE-73.

5. For reception on another band, simply repeat the procedure outlined in steps 2 through 4. The output frequency range for each band (during converter operation) is indicated on the front panel of the HE-73. Always tune the receiver to this range.

## Converting Receiver Dial Readings

To determine the frequency of a received signal during converter operation, simply add the oscillator frequency to the receiver's dial setting as indicated below:

During 20 meter operation -- add 10.50 Mc

During 15 meter operation -- add 17.50 Mc

During 10 meter operation -- add 24.50 Mc

As a convenience, a conversion chart is included in this manual. This chart provides a quick means of identifying the actual frequency of a received signal for any receiver dial setting (every 50 Kc). Intermediate readings can be converted by adding the oscillator frequency as indicated above.

## STRAIGHT-THROUGH OPERATION

Straight-through operation (by-passing the "PRECON" entirely) can be obtained by setting the FUNCTION switch to OFF. This connects the antenna directly to the receiver and removes power from the HE-73.

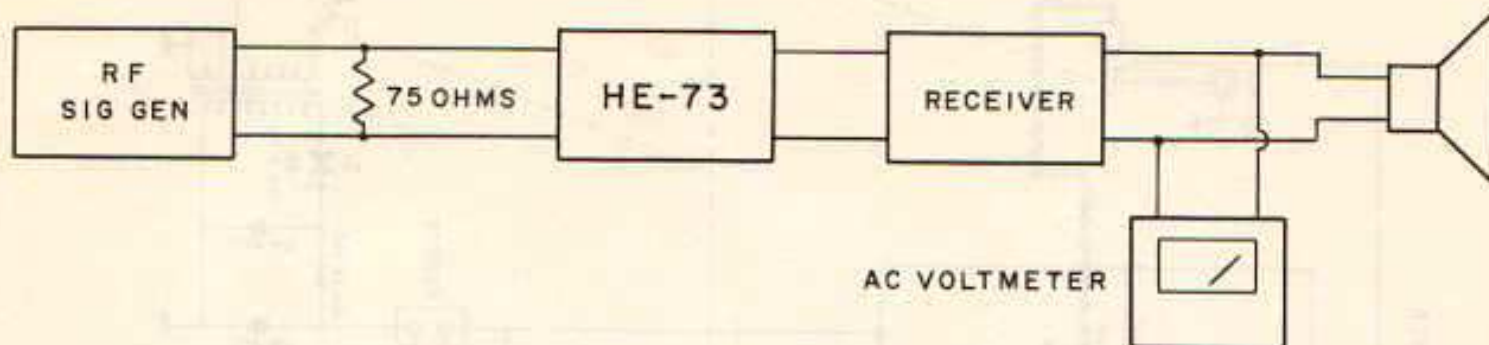


# CONVERSION CHART

RECEIVER DIAL READING (MC)	ACTUAL RECEIVED FREQUENCY (MC)*		
	CONVERTER ON 20M OPERATION	CONVERTER ON 15M OPERATION	CONVERTER ON 10M OPERATION
3.50	14.00	21.00	28.00
3.55	14.05	21.05	28.05
3.60	14.10	21.10	28.10
3.65	14.15	21.15	28.15
3.70	14.20	21.20	28.20
3.75	14.25	21.25	28.25
3.80	14.30	21.30	28.30
3.85	14.35	21.35	28.35
3.90		21.40	28.40
3.95		21.45	28.45
4.00			28.50
4.05			28.55
4.10			28.60
4.15			28.65
4.20			28.70
4.25			28.75
4.30			28.80
4.35			28.85
4.40			28.90
4.45			28.95
4.50			29.00
4.55			29.05
4.60			29.10
4.65			29.15
4.70			29.20
4.75			29.25
4.80			29.30
4.85			29.35
4.90			29.40
4.95			29.45
5.00			29.50
5.05			29.55
5.10			29.60
5.15			29.65
5.20			29.70

\* The figures in these three columns hold true only if the receiver dial calibration is correct.

## ALIGNMENT INSTRUCTIONS



1. Connect RF Signal Generator HE-73 and receiver as shown in the diagram above. Use 75 ohm coaxial cable between units, if possible.
2. Set RF gain on HE-73 to 5, ANT TRIM at 5.
3. When performing alignment observe the following precautions:
  - a) Keep generator output as low as possible at all times. If necessary, reduce settings of RF gain control on HE-73 or receiver (or both).
  - b) When tuning your receiver to an output signal from the HE-73, always adjust the receiver's antenna trimmer (if so equipped) for maximum signal reception.
  - c) Where possible, turn off AVC on receiver to permit sharper output indications on AC voltmeter connected across receiver output.
4. A chart for identification of adjustment points is provided on the underside of the HE-73. Make all adjustments through holes provided, using GC8276 alignment tool (or equivalent).

FUNCTION SWITCH	BAND SWITCH	RF SIGNAL GENERATOR FREQUENCY	RECEIVER TUNED TO*	ADJUST FOR MAX OUTPUT INDICATION ON RECEIVER
PRE-SEL	80 Meter	3.70 Mc	3.70 Mc	80M RF Trim, 80M Ant Trim
"	40 Meter	7.20 Mc	7.20 Mc	40M RF Core, 40M Ant Core
"	20 Meter	14.20 Mc	14.20 Mc	20M RF Core, 20M Ant Core
"	15 Meter	21.20 Mc	21.20 Mc	15M RF Core, 15M Ant Core
"	10 Meter	28.20 Mc	28.20 Mc	10M RF Core, 10M Ant Core
CONV	20 Meter	14.20 Mc	3.70 Mc	20M Osc Core
"	15 Meter	21.20 Mc	3.70 Mc	15M Osc Core
"	10 Meter	28.20 Mc	3.70 Mc	10M Osc Core

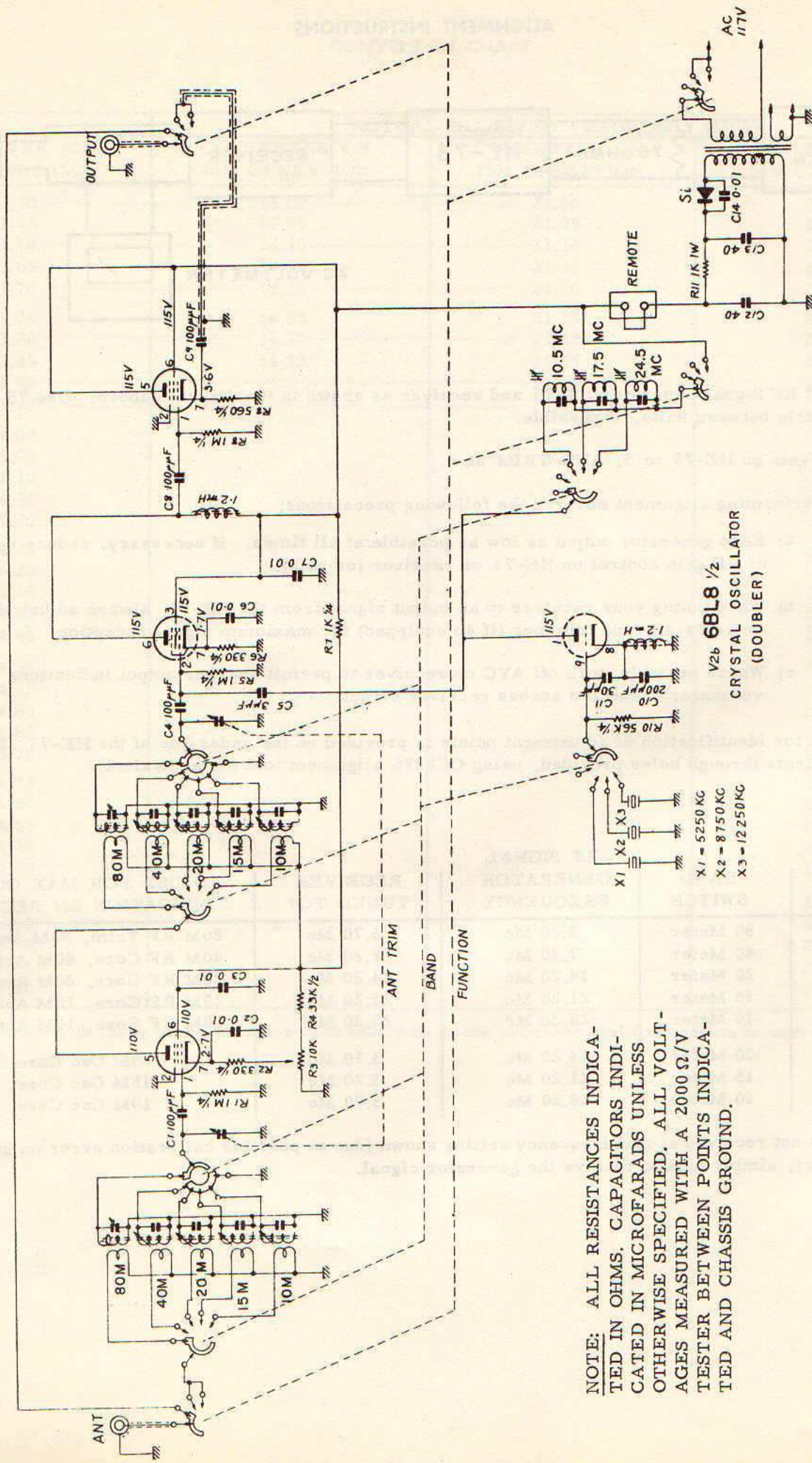
\*If signal is not received at dial frequency setting shown (due to possible calibration error on generator or receiver), simply tune to receive the generator signal.



V<sub>1</sub> 6BA6  
RF AMP

V<sub>2</sub> 6BL8 1/2  
RF AMP OR MIXER

V<sub>3</sub> 6BA6  
CATHODE FOLLOWER



NOTE: ALL RESISTANCES INDICATED IN OHMS. CAPACITORS INDICATED IN MICROFARADS UNLESS OTHERWISE SPECIFIED. ALL VOLTAGES MEASURED WITH A 2000  $\Omega/V$  TESTER BETWEEN POINTS INDICATED AND CHASSIS GROUND.

SCHEMATIC DIAGRAM