

MODEL 206-A CRYSTAL CALIBRATOR

TEN-TEC Model 206-A Calibrator is an accessory which provides accurate determination of the received operating frequency. It inserts highly accurate signals every 25 kHz into the receiving antenna circuit. These signals are derived from a 100 kHz crystal oscillator that is factory set to zero beat with WWV. A divide-by-four flip-flop produces the 25 kHz signal which contains harmonics that extend above 30 MHz. It is these harmonics that are received and when tuned to zero beat, determine the accuracy of the VFO dial scale.

To correctly identify a given 25 kHz signal from an adjacent one, the four-to-one divider can be switched off so that signals every 100 kHz will be received. After determining the nearest 100 kHz point, the switch can then be returned to the 25 kHz position so that an accurate signal close to the desired frequency will be generated.

To easily identify the calibrator signal on a crowded band, the output is pulsed approximately three or four times a second. Also, a slide switch is provided to turn the calibrator off during transceiver operation.

INSTALLATION

To install the calibrator, connect the antenna to the ANTENNA jack provided on the rear apron. Prepare a short length of cable with a phono connector on one end and a connector matching the receiver antenna input connector on the other. Connect this cable between the RECEIVER jack on the calibrator and the receiver antenna input. With another cable, apply 9 to 14 VDC to the remaining jack on the calibrator.

If the installation is in an Argonaut system, the +12 VDC may be obtained from one of the AUX 12 VDC jacks on the Argonaut. When installing calibrator in an Argonaut-405 Linear system, insert Model 206-A between the Argonaut output and the Model 405 input, not in the linear output lead.

OPERATION

- 1.) Turn unit on and place 25/100 switch in 25 kHz position.
- 2.) With transceiver or receiver tuned to approximate frequency desired, tune dial to closest 25 kHz marker, i.e. 0, 25, 50 or 75 on the scale. The pulsed calibrator signal should be heard near this position. (Use broadest selectivity position, if selectable, for calibration purposes so that zero beat will be most easily discernible.)
- 3.) In cases where drastic frequency changes may occur, such as after a repair to the receiver VFO, it may be difficult to determine which 25 kHz marker is being received. By placing the 25/100 switch in the 100 kHz position, signals will be heard every 100 kHz. Once the proper 100 kHz point is noted, the switch can then be re-set to the 25 kHz position. (Strength of the signals in the 100 kHz position will be somewhat less than in the 25 kHz position. This is normal.)
- 4.) Tune receiver or transceiver so that pulsed signal is nulled to zero audio beat. Readjust dial scale, if provisions for setting scale are incorporated, so that indicated reading corresponds to proper frequency mark, i.e. 0, 25, 50 or 75 kHz.
- 5.) Switch calibrator off when operating normally.

SERVICING

Model 206-A Calibrator consists of a plug-in assembly, 80308, that is also used in other TEN-TEC products. A separate service sheet for this assembly is provided as part of these instructions. When used in this calibrator, the DEFEAT feature is not used. Hence there should be no pin voltages present at this point. Theory of operation is also given in these instructions.

80308 CRYSTAL CALIBRATOR

Transistor Q1 is a crystal controlled oscillator operating at 100 kHz. It is set to the correct frequency by adjusting the capacitive load across the crystal with C1 trimmer. This setting is made while zero beating calibrator output with WWV signal as outlined in SECTION 2.

The output of the oscillator is applied to one input of a dual input NAND gate whose second gate is fed from a slow running multivibrator made up of two similar gates in IC-1. Speed of the multivibrator is controlled with R6, but oscillation will not result if the control is set to either extreme. To further divide the pulsed 100 kHz signal down to 25 kHz, dual flip-flop, IC-2, is used. Output from this stage as well as from the 100 kHz signal, is fed to the OUT terminal. The fourth gate in IC-1 is energized to the "on" state with application of +12 volts to the circuit. Output of this gate connects to the DEFEAT terminal on rf amplifier, thereby reducing its gain while the calibrator is functioning.

Power to the integrated circuits is regulated to 5.6 volts with zener diode D1. The terminal marked 25/100 is not used, but converts calibrator to 100 kHz mode if grounded.

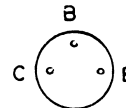
Pin Voltage Readings - (Receive mode.)

Pin	On	Off
25/100	-	-
OUT	0	0
GND	0	0
+12	13.8	0
DEFEAT	0.1	3.9*
+12	13.8	0
GND	0	0

* Rf gain full on.

Semiconductor Voltage Readings - (Calibrator "on.")

Transistor	Collector	Base	Emitter
Q1	5.3	-2.0	0



Pin	IC-1	IC-2
1	2.0	1.7
2	2.0	-
3	1.1	3.2
4	1.9	0
5	1.9	5.6
6	2.7	1.7
7	0	3.2
8	1.7	-
9	1.2	-
10	2.7	1.7
11	0.1	-
12	5.6	-
13	5.6	0
14	5.6	1.7
15	-	-
16	-	-

