



Seco model 500 Crystalalignmeter has bakelite case and easy-to-read front panel.

NEW CITIZENS RADIO TEST SET

Make 7 checks on Citizens-band equipment using a single test instrument

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THE rapid growth of class-D Citizens-band radiotelephony has led to the development of specialized test instruments such as monitors, rf signal generators, field-strength meters, crystal checkers and tuning meters. All these and other useful functions are combined in Seco's new model 500 two-way radio test set—called the Crystalalignmeter.

The model 500 performs the following functions:

- ▶ Tests activity of fundamental type crystals.
- ▶ Tests the activity of third-overtone type crystals with output in the 26–28-mc range.
- ▶ Serves as a low-power rf signal generator supplying modulated or unmodulated rf signals from third-overtone crystals and modulated signals from fundamental crystals.
- ▶ Operates as an rf indicator for tuning antennas and transmitters for maximum output.
- ▶ Operates as a 0–50-ma plate-current meter.
- ▶ Serves as a visual and audible modulation monitor.
- ▶ Operates as a beat-frequency demodulator and indicator.

The test set's circuit

The circuit of the model 500 is shown in Fig. 1. It consists of two transistor oscillators and a germanium diode used as a mixer-modulator and a meter rectifier. The 2N1225 is a high-frequency transistor operating as a fundamental or overtone-type crystal oscillator, depending on the type of crystal being checked. The 2N44 af oscillator modulates the rf output of the 2N1225 when it is used as a crystal-controlled signal source.

The switch must be in the OFF position when the test set is not being used

or is being used as a plate milliammeter, rf power indicator, monitor or beat-frequency demodulator. The meter is a basic 0–1-ma movement that is used to read plate current, relative rf power output and modulation peaks.

(The manufacturer's diagram of the model 500 shows only the physical arrangement of the terminals on the slide switch and its external connections. We have drawn this switch as a three-circuit four-position type so you can get a better idea of the circuitry.)

The three sets of markings on each switch position seem to be a part of a plot to confuse the operator rather than to help him get the most out of the instrument. For example, there are two MOD RF positions. One—also marked A—delivers modulated rf from fundamental type crystals. The other (C) operates with overtone type crystals. There would be less chance of being used incorrectly if position A was marked MOD FUNDAMENTAL.

Third-overtone CB transmitting and

amateur crystals with output in the 26- to 28-mc range are tested for activity with the switch in the UNMOD RF position. Meter readings increase with Q or crystal activity. A good crystal drives the meter to at least half-scale. A reading in the "?" area indicates a marginal crystal which should be replaced.

In making this test, the 2N1225 oscillator is converted to a third-overtone type circuit similar to those in most Citizens-band transceivers. The oscillator tank is broad-banded for operation in the 26–28-mc range. The circuit is loaded so the rf output indicated on the meter is a measure of crystal Q.

Fundamental type crystals for CB receiver and transmitter circuits and amateur and other services below 20 mc are tested with the switch in the MOD RF (A) position which converts the oscillator into an untuned type similar to a Pierce circuit. Crystal quality is indicated on the meter as described above. Lower meter readings are

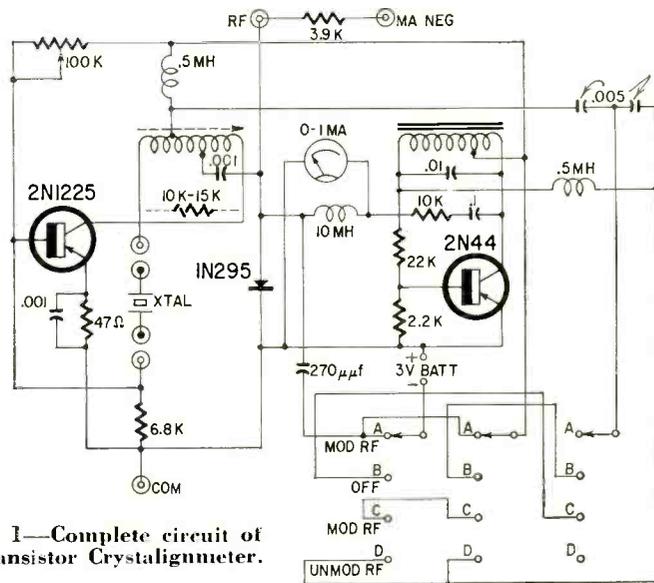


Fig. 1—Complete circuit of 2-transistor Crystalalignmeter.