

# Silicon Diode Sweep Generator

This simple RF sweep generator has proved invaluable for aligning IF and RF circuits over a wide range of frequencies. The circuit consists of a Colpitts oscillator which is swept by means of two varactor diodes. The diodes are direct coupled from a unijunction sawtooth oscillator, via a common emitter stage. The sawtooth is also used for the CRO horizontal sweep.

The RF oscillator uses plug-in coils enabling any desired centre frequency to be

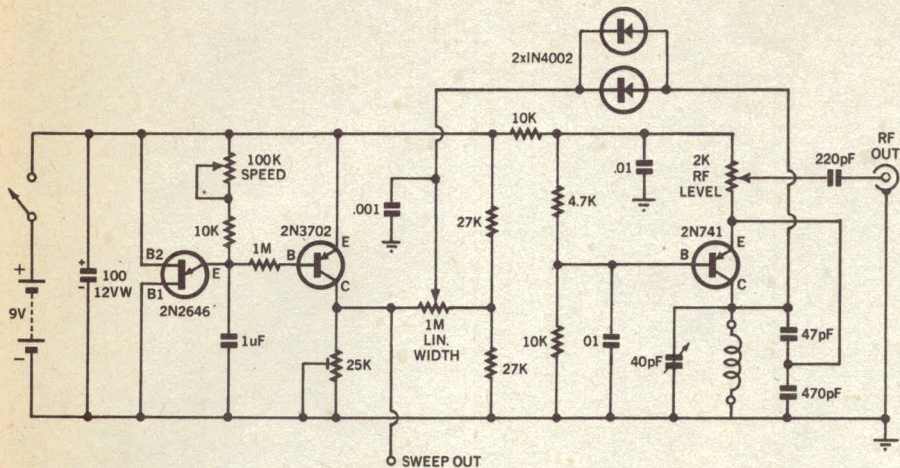
selected. The greatest frequency sweep will occur when the capacitance of the tuned circuit is kept to a minimum, which means that a typical 455KHz IF coil needs extra turns added for best results. A 50KHz sweep has been obtained at 455KHz and the circuit has been tested up to 10.8MHz.

To prevent the diodes from conducting at any point of the RF cycle when maximum sweep width is used, the oscillator level is kept low by means of the 10K dropping

resistor. Correct operation may be checked by displaying the RF output on a CRO. If the level drops at the low frequency end of the sweep, the 10K resistor should be increased. However, the stage may fail to oscillate if the voltage is reduced too much. Any germanium PNP RF transistor should be satisfactory for the RF oscillator.

The unijunction oscillator and the following stage are so arranged to produce a sawtooth waveform with some curvature.

## CIRCUIT & DESIGN IDEAS



This tends to counteract the non-linear capacitance voltage characteristic of the diodes.

The 25K trimpot should be set so that the stage just bottoms (saturates) at the beginning of the sweep. If saturation cannot be obtained with the trimpot set to maximum, reduce the value of the 1M base feed resistor.

The sweep width control is very useful when checking amplifiers using narrow band ceramic, crystal, mechanical or LC filters. Under these conditions, only a few sweeps per second are used to prevent ringing effects. Also, the display may be expanded to show a very small part of the spectrum in detail.

The original unit was assembled on a 3in strip of tag board and mounted with the battery, controls and sockets in a 4in x 4in x 2in box. Several suitable coils with tuning slugs were salvaged from an old all-band receiver.

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