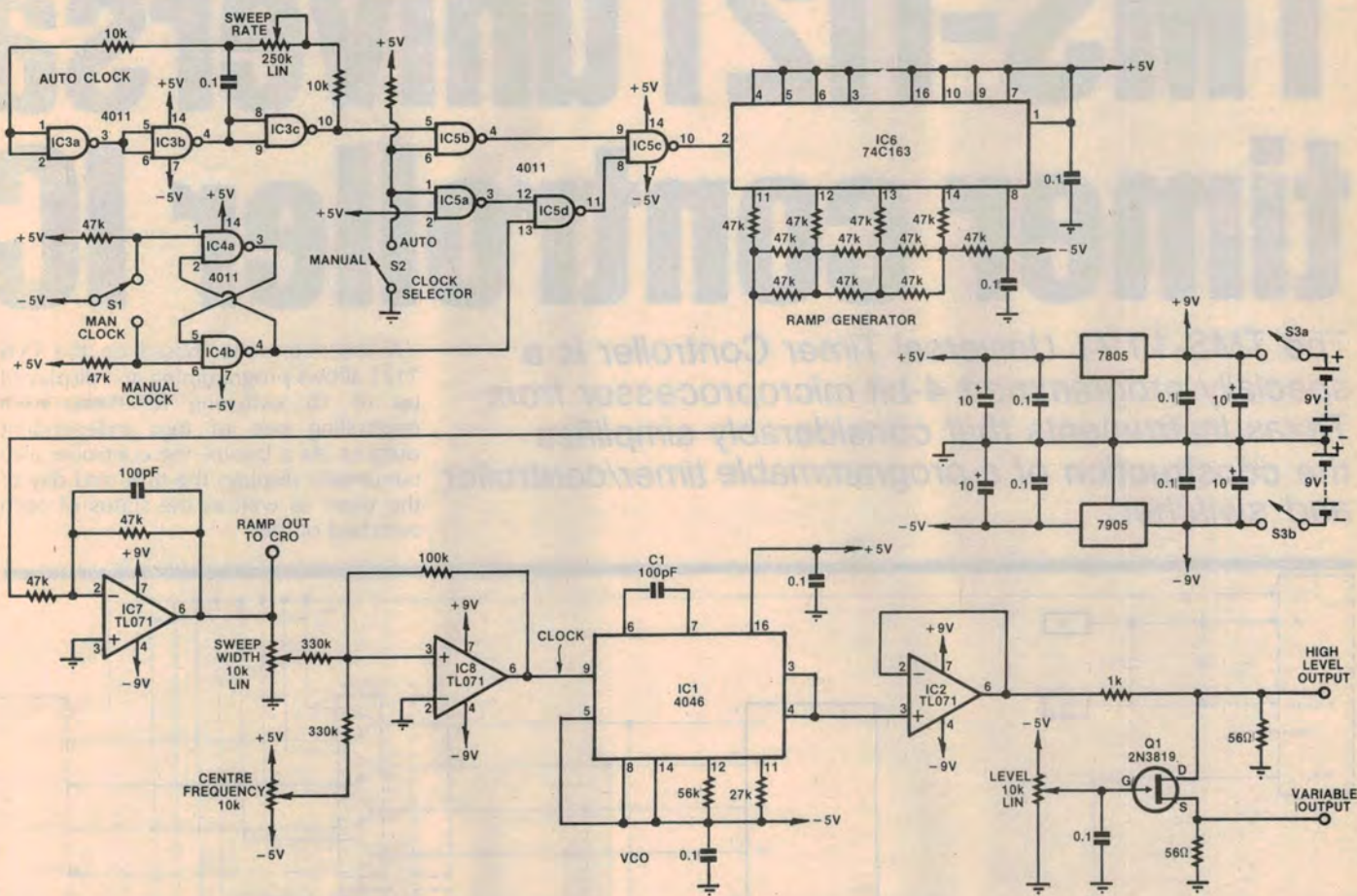


Circuit & Design Ideas



Digital sweep/marker generator

Alignment of IF stages on shortwave receivers and amateur equipment often requires the use of a sweep generator. This design is tuneable from about 400kHz to 565kHz and is self-marking by virtue of the digital circuitry employed.

Actually, the unit is not a true sweep generator in the conventional sense. Instead, it steps equally through 16 spot frequencies with the sweep width adjustable by means of a potentiometer. Stability is excellent and is generally within 10Hz for several minutes, while linearity is extremely good at around 1%.

Basically, the unit consists of a linear VCO (IC1) controlled by a stepped sawtooth waveform which also doubles as the timebase for the CRO. This sawtooth waveform can be either automatically clocked or manually stepped. IC2 buffers the output from the VCO. A high level output, intended for connection to a DFM, is derived from its pin 6 output while a variable level signal is derived via FET Q1.

The auto clock consists of a CMOS

square wave generator (IC3), variable in frequency from 32Hz to about 400Hz. The output passes to the auto/manual select switch. When in the auto position, the switch passes this clock train on to a 4-bit binary up counter (IC6) which counts up from zero to 16, resets, and starts again. IC6 and its associated ladder resistor network forms a digital to analog converter (DAC). Output from the DAC is a 16-step ramp voltage, with each step representing one clock pulse. Note that since the circuit uses $\pm 5V$ supplies, the ramp extends from $-5V$ to $+5V$.

The output from the DAC is fed to inverting amplifier IC7, the output of which is fed to the X amplifier of the

CRO and to summing amplifier IC8 via a 10k Ω sweep width pot. A 10k Ω centre frequency shift pot sets the bias on pin 3 of IC8 and thus sets the centre frequency shift voltage around which the ramp swings. This voltage is buffered by IC8, which has a gain of 1/3, and is used to control the VCO.

IC4 provides the manual clocking facility. When S2 is in the manual position, clock pulses from IC4 are stepped manually by spring-loaded toggle switch S1. Thus, the ramp can be stepped to any point on the sweep and the frequency measured.

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\$20

Money for old rope

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