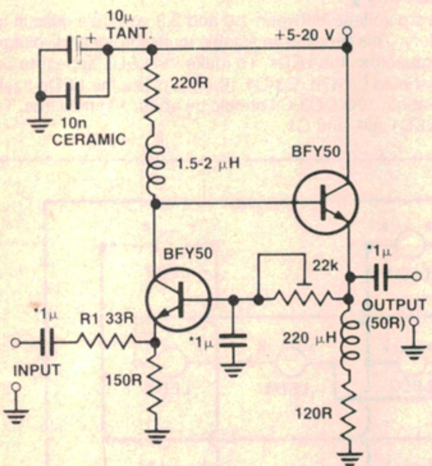
RF

Wideband Power Amplifier

Well, not all that much power — in the milliwatt range, really. This uses the same configuration as the common-base/common-collector amp opposite, but power gain is provided and the circuit will deliver between about 10 and 180 mW output, depending on power supply voltage. The common collector stage provides current gain, transferring power to the load. This stage has to operate at a fairly high quiescent current. In fact, to get the bandwidth, both stages have to be operated at high quiescent current levels.

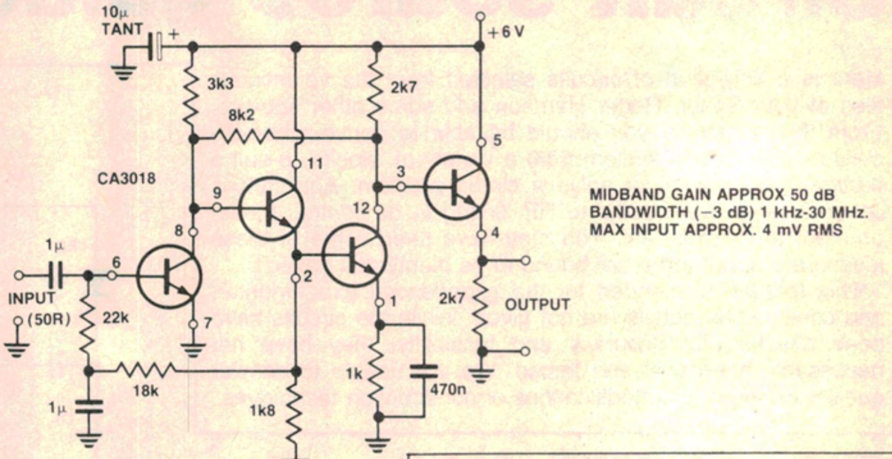
mon base stage compensates for the input capacitance of the common collector stage. The RFC in the emitter of the output device gives 'lift' at high requencies, helping broaden the bandwidth. R1 can be used to match the input to the source driving impedance. Two of these amplifiers can be cascaded to deliver around half a watt output with little decrease in overall bandwidth. Increase the 1μ capacitors to decrease lower cutoff.

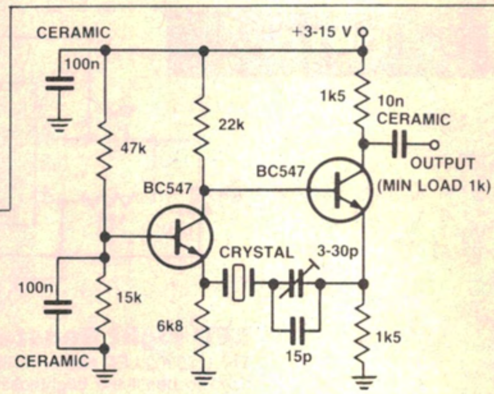


MIDBAND POWER GAIN 13-15 dB.
POWER OUTPUT (5 V SUPPLY) APPROX. 10 mW (20 V SUPPLY) 180 mW; BANDWIDTH APPROX. 50 kHz-15 MHz.
* 50 V METALLISED POLY OR MONOBLOCK (LOW INDUCTANCE) TYPES.

Wideband Amp with dc Feedback

For high, stable gain, a wideband amp requires several stages with multiple dc feedback paths. The two left hand and two right hand transistors here form common emitter/common collector pairs, the common collector devices providing a high impedance load for the previous transistor and a low source impedance for the following stage. This reduces internal capacitive feedback. A CA3018 transistor array IC is used. The lower cutoff is determined by the capacitor values. Use low self-inductance metallised poly low voltage types.



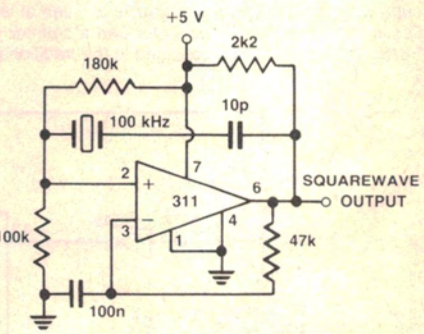


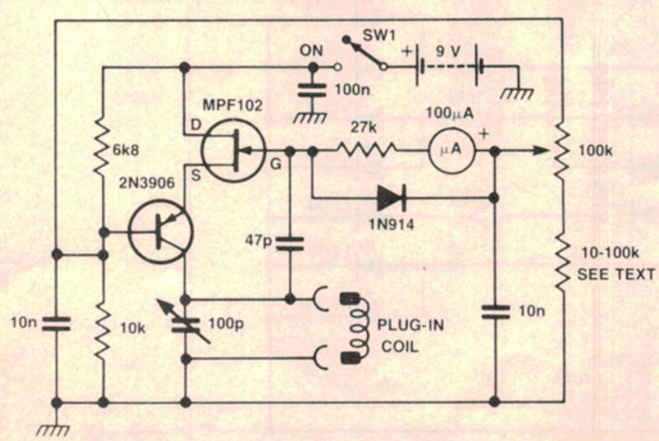
100 kHz — 10 MHz Crystal Oscillator

This untuned crystal oscillator will operate reliably over the range from 100 kHz to 10 MHz. Output level depends on supply rail, generally around one-third (peak-to-peak). Output is basically sinewave, but you can 'square up' the output by decreasing the value of the emitter resistor of the output transistor. Dropping it to, say, 220 Ohms gives good harmonics beyond 30 MHz from a 100 kHz crystal. While BC547 transistors are recommended, many types can be used, providing their gain-bandwidth product is 250 MHz or above. e.g: 2N5777, 2N3563/4, 2N3642, 2N2222, BF115, BFY90 etc. For crystals below 100 kHz, transistors with good LF gain are recommended — such as the 2N3565. Supply voltage can range from 3 V to 15 V. The trimmer capacitor is to set the crystal on frequency if necessary. If not, use a 100p ceramic.

IC Crystal Oscillator

This low frequency crystal oscillator provides an essentially squarewave output. Upper frequency limit is below 10 MHz. The output voltage swings virtually from rail to rail (5 Vp-p here).





Solid-State Dipper

This circuit employs a grounded-base oscillator to provide tuning via a single-gang variable capacitor where the rotor plates can be grounded. Simple two-terminal plug-in coils can be used too. The circuit will oscillate over quite a wide frequency range. the 100k pot adjusts the oscillation amplitude to suit the meter and battery voltage. The series resistor to common should be adjusted to cut-and-try so that the pot operates over its range. At upper VHF, the 47p capacitor should be reduced. All capacitors should be ceramic types and short leads are recommended in construction.