

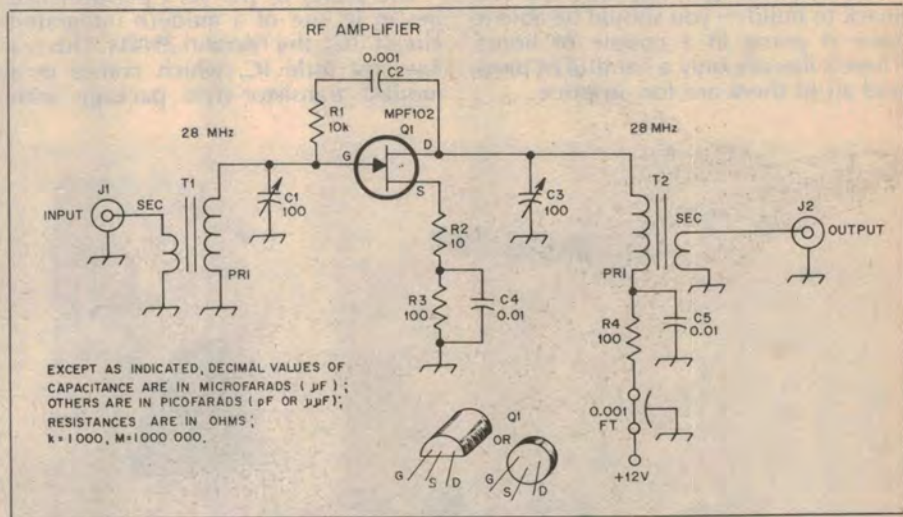
JFET preamplifier for tired receivers

Oscar enthusiasts and those who chase DX on 10 and 15 metres may not have the hottest receivers, especially if low-cost or early design receivers are being used. When receivers run out of front end gain and noise figure, it usually happens on 15 and 10 metres. This problem can often be resolved by adding a preamplifier between the receiver input and the antenna.

A design objective with any amplifier should be unconditional stability — no self-oscillations at any frequency regardless of the load connected to the amplifier. Properly applied feedback ensures unconditional stability. Circuits of this kind are ideal for amateur builders who have limited practical experience in the workshop.

The circuit shows the toroidal input transformer is tuned to the operating frequency by means of trimmer C1. R1 and C2 form a shunt feedback network, coupling RF energy from the drain of Q1 back to the gate out of phase with the input. This improves stability by lowering the gain. R2 provides additional stability by introducing degenerative feedback.

The drain circuit contains a second tuned transformer, T2. R4 and C5 form a decoupling network in the 12V supply line. This helps prevent unwanted



signal energy from entering the preamplifier via the power supply leads.

A 3dB bandwidth of 1MHz is characteristic of this amplifier. The measured gain is 15dB. Stability is excellent under all conditions, including an open-loop situation (no termination at either end of the circuit). The noise figure is under 3dB at 30MHz.

For 10 metres, T1 and T2 consist of 12

turns of 24B&S enamelled wire on Amidon, Palomar, or G.R. Whitehouse T50-6 powdered-iron toroid core. Spread turns evenly around core and cement in place. Then add 1½ turn secondary link at centre of primary winding. Operation on 15 metres can be had by adding two turns of wire to the main windings of T1 and T2. No other changes are necessary.

(By Doug DeMaw W1FB, in "QST").