## UN-GLUING HOT-MELT GLUE

GILES READ G1MFG, recently made a small electronic assembly, securing some components with hot melt glue. Unfortunately, one of the components failed and needed to be removed and replaced.

By Murphy's Law the faulty component was "at the bottom of the pile", well stuck down and largely obscured by other components He writes:

"Having previously had little success in using a hot-air gun for removing hot-melt glue, I decided to immerse the entire assembly in very hot (just off the boil) water I was surprised and delighted to see the glue becoming transparent . after a minute or so, when the warmth penetrated, the glued parts were easily separated

"Needless to say precautions are necessary to avoid scalding oneself, and tools present problems Metal tools tend to act as heatsinks and immediately become attached to the assembly one is trying to dismantle. I found a reasonable compromise between insulation and practicality was to use kitchen paper to hold the various items This has the added advantage that the paper can be used to wipe off excess glue.

"Consideration needs to be given also to the effect of hot water on the components Most electronic components are sealed to a greater or lesser extent and can be safely immersed temporarily in hot water, but some components (microphones, loudspeakers etc) can be immediately ruined by contact with water. Others, such as variable capacitors, may have their electrical characteristics altered subtly or severely. Mechanical components can suffer oxidisation-related problems."

## SIMPLE 3.5/7MHz CW TRANSMITTER

THOSE OF US involved with wartime clandestine radio came to recognise the value of relatively simple CO-PA transmitters, providing some 5 to 15 Watts RF output from 6V6, 6L6, 7C5, etc valves, on frequencies between 3 and 10MHz. Today this type of CW transmitter could easily be implemented using a single ECL86 triode-pentode, but many newcomers (and some old-timers) feel that it is infra dig to continue to use valve technology in low power transmitters.

The answer for those disbelieving (in my view wrongly) in the continued value of thermionics can take heart from a design for "A simple CW transmitter for 80 and 40 metres" by Charles Kitchen, N1TEV (*QST*, February 1998, pp40-42), sub-headed "If you've never used a MOSFET-powered transmitter before, give this one a try!"

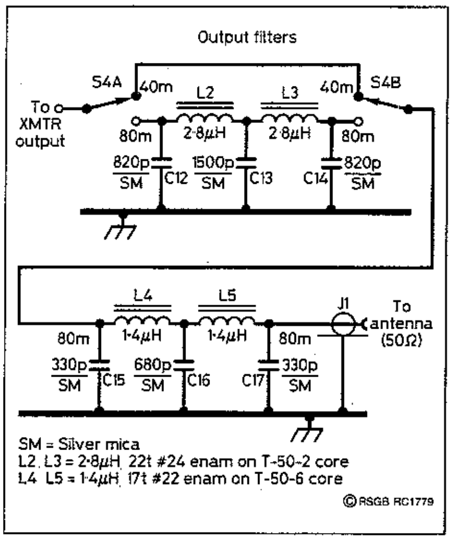


**Fig 12: Output filters used to ensure the transmitter meets FCC spectral purity requirements. Both filters are in circuit for 3.5MHz operation. On 7MHz the final filter is bypassed. All capacitors are silver mica.**

N1TEV points out that this transmitter (**Fig 11**) is "a modern-day equivalent of the classic two-valve CO-PA transmitter used by so many hams for decades - usually their first transmitter. and usually home-brewed Building this equivalent is much simpler and probably less expensive. The two-stage transmitter uses a low-cost, high speed op-amp in the crystal oscillator circuit and a modern HEXFET device (an N-channel, enhancement-mode power MOSFET) for the output amplifier. Unlike some other solid-state designs, this little gem requires few components and can be built in an evening or two - ARRL Lab measurements indicate power outputs of 6W on 3 5MHz with a 30V power supply for a DC input of about double this. On 7MHz, 1W output with a 25V supply" With about a 24V supply it could make a very useful 4W Novice transmitter on 3 5MHz

The use of a HEXFET PA provides a much higher load impedance for the oscillator than a bipolar device, eliminating the need for a step-down transformer generally required between bipolar transistor stages, and permitting the use of simple RC coupling. With a typical breakdown voltage of 500V and built-in Zener diode over-voltage protection, the HEXFET PA can operate without a load and under conditions of high SWR without damage. Suitable low-cost microprocessor crystals can be used.

An Analog Devices AD811AN op-amp is used as the oscillator stage. The AD811 was carefully chosen because it has a beefy 100mA output stage and very low output impedance Other op-amps with these characteristics may work, but are likely to be very much more expensive. Similarly, the IRF820 was chosen because of its fairly low input capacitance (350pF). Other HEXFETs such as the IRF830 and 840 have very high input capacitances (about 800 or 1500pF), and would require the use of a step-down transformer.

N1TEV suggests that series-connected 6V lantern batteries are ideal for powering this transmitter. Apply no more than 30V, otherwise the AD811 may be destroyed Use of a 'hefty' mains PSU, with low internal resistance, may cause the AD811 to overheat, resulting in a 'chirpy' note. Higher voltages could be applied to the IRF-820 only. 'Dead bug' or similar constructional techniques are suitable, provided normal HF RF practice is employed. It is advisable to wire and test the oscillator circuit before adding the output stage To avoid static damage, keep the IRF820 inside its protective foam as long as possible, and install it as the final component.

To meet current FCC requirements on spectral purity, N1TEV provides circuits for a suitable low-pass filter: **Fig12**. ♦

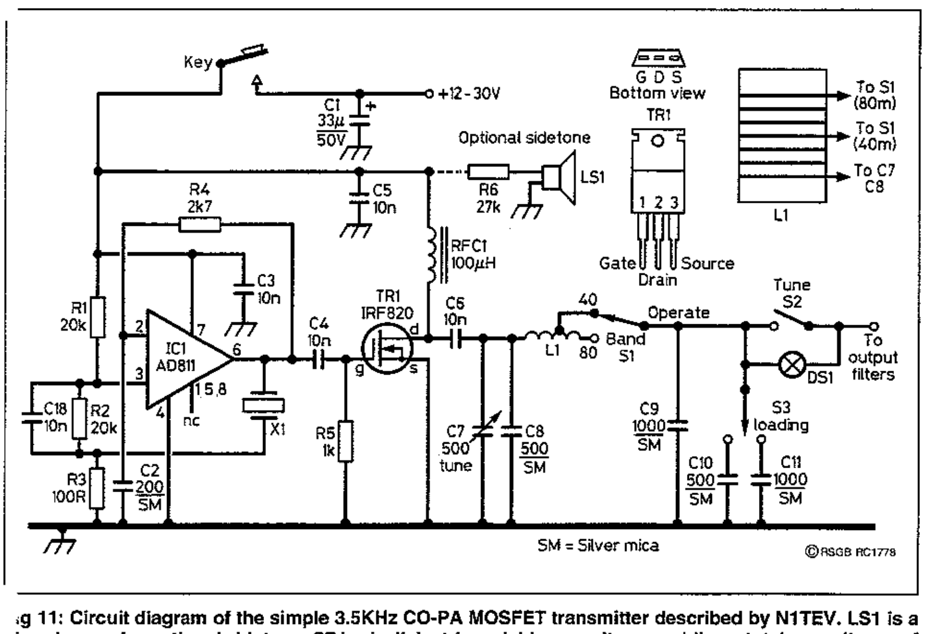


**Fig 11: Circuit diagram of the simple 3.5KHz CO-PA MOSFET transmitter described by N1TEV. LS1 is a piezo buzzer for optional sidetone. C7 is air-dielectric variable capacitor, providing a total capacitance of about 500pF (discarded broadcast 350pF 'gang' with sections paralleled is suitable). N1TEV used (Y1) a 3.6864MHz microprocessor crystal, but this would not be a suitable frequency in the UK.**