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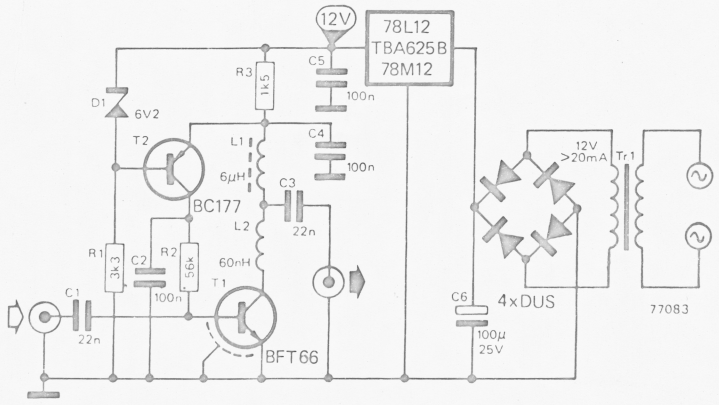
low-noise V.H.F. aerial amplifier



This simple aerial amplifier can be used to boost the level of weak FM signals. It has a gain of 22 dB, and the extremely low noise figure of 1.6 dB, so that it will not unduly degrade the signal-to-noise ratio.

The amplifier consists of a single, low-noise BFT66 transistor T1 operating in common emitter configuration. Base bias is provided by a constant current source T2, which stabilises the operating point.

The value of L1 is nominally 6 μH, but any r.f. choke of a similar standard value (5.6 μH or 6.8 μH) may be used. L2 is a home-made coil consisting of five or six turns of 0.25 mm (33 SWG) enamelled copper wire. This is wound onto a 5 mm diameter former which is then removed and the self-supporting air-cored coil is stretched to about 10 mm length.

When constructing the preamp care should be taken to keep all component leads as short as possible to avoid stray inductance and capacitance. The circuit should be mounted in a screened metal box located as close as possible to the aerial.

Use of an IC voltage regulator has the advantage of reliability and compactness. However, if such an IC is not readily obtainable, it may be replaced by a simpler circuit: a 680 Ω resistor between C5 and C6, and a 12 V/400 mW zener diode plus a 10 μ/16 V electrolytic capacitor in parallel with C5.

Specification

Frequency range:	1 MHz - 300 MHz.
Gain:	22 dB
Noise figure:	1.6 dB
Input and output impedance:	60 Ω
Supply voltage:	+12 V
Supply Current:	4 mA

Reference: Siemens Data on BFT66.