

# UHF CHANNEL TRAP

J. Bareford

Powerful repeaters for cellular radio and paging systems, or a strong local UHF TV transmitter, can wreak havoc with the reception of your favourite TV channel. This is usually caused by excessive field strength and resultant intermodulation in the aerial booster or the UHF input stages of the TV set. Cancel the interference once and for all with this simple two-component notch that covers the entire UHF TV band.

Ghost pictures, moiré effects, poor synchronization, colour corruption, picture inversion and even complete receiver detuning are but a few of the awkward problems suffered by TV owners having their own roof-mounted aerial installation, but unfortunate enough to live close to a transmitter site with UHF stations on it.

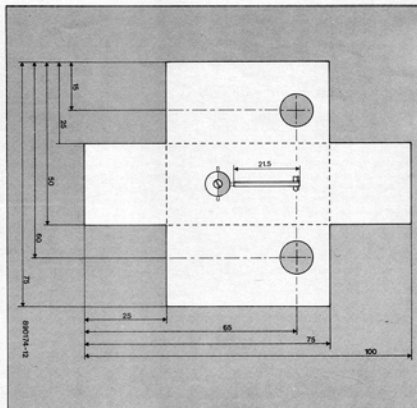
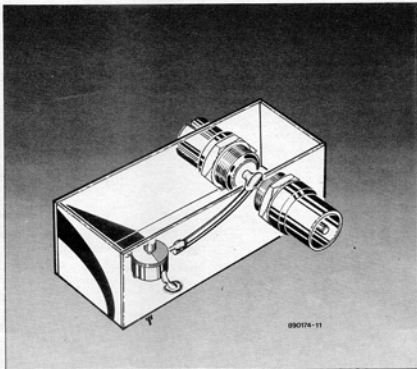
Problems may arise almost overnight when you find that a particular TV channel suddenly has a lot of interference on it, or is simply replaced by a moving pattern with accompanying buzz on the sound channel. On investigating the matter, it may be found that a UHF cellular radio repeater has been installed recently on a nearby elevated building. The strong signal in the 600 or 900 MHz band blocks the preamplifier in your aerial booster or TV set, or, more precisely: the d.c. setting of the preamplifier is shifted to the extent that the stage acts as a mixer or even a demodulator or frequency multiplier (varactor effect).

Similar problems may occur if a strong TV signal blocks reception of a relatively weak programme on a nearby channel.

## 30 decibel down

Receiver overloading may be prevented by suppressing the strong, unwanted component in the input frequency spectrum. The present circuit does this with the aid of a series L-C filter that can be tuned to the interfering frequency. The filter acts as a high-Q notch, offering a suppression of more than 30 dB at the resonance frequency.

As shown in the drawing of Fig. 1, the inductor is a length of 1 mm dia. silver-



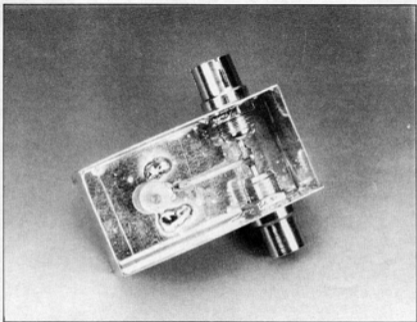
plated wire connected to a 5.5 pF PTFE foil trimmer (colour code grey, Philips Components). The stator terminal of the trimmer is bent forward and soldered to the inductor, while two rotor terminals are soldered direct to ground. This L-C combination covers most of the UHF TV frequency range (approx. 470-870 MHz), and gives far better results than, for instance, a quarter-wavelength coax stub.

The trap is housed in a screened enclosure made from sheet metal (tin-plate or brass). Coax sockets enable the trap to be installed in the cable leading to the input of the aerial booster. Do not fit the trap between the output of the booster and the input of the TV set — it has no effect there because the interference is caused in the booster!

One socket on the trap may be replaced by a coax plug to enable the unit to be plugged direct on to the output of the coupling/filter unit, if used.

Alignment is simple: tune to the TV channel you want to watch, and adjust the trimmer until the picture is free from interference. The adjustment is fairly critical due to the high Q factor of the L-C filter. If there is more than one source of interference, each of these must be suppressed with its own trap, tuned to the relevant frequency.

Alternatively, if you want to block out a particular TV channel permanently



whose reception is otherwise all right (cable networks), adjust the trap for maximum suppression. The TV channel will vanish into noise as you reach the channel frequency. Remember that each channel to be suppressed needs its own trap, un-

less one acts on a number of channels simultaneously, which is not likely to occur on a cable TV system.