

# Clear Sky in every room

**Bill Wright describes a worthwhile improvement to the usual domestic TV distribution system**

In most homes with satellite TV the aerial signal is looped through the satellite receiver and the resulting output is sent to all the TV sets. The most common method is UHF distribution using a small amplifier.

These small domestic systems often have a series of items connected one to the other in a 'daisy chain'.

This normally works well, but every component has the potential to add interference. In a satellite receiver the built-in UHF amplifier adds a little noise and the modulator contributes spurious outputs on channels other than its own. These are usually subtle effects, but less subtle are the effects of signals and noise received by the aerial on the channel used for satellite distribution (the 'in-house' channel). You should always try to find a clear channel, but this can be difficult and sometimes a channel that's clear today may be full of rubbish tomorrow, owing to abnormal propagation conditions. If your satellite reception in the bedroom varies between indifferent and terrible this is why.

These problems are much more likely if a masthead amplifier or other 'aerial booster' is in use. The amplifier will not only increase the strength of the signals you want to receive, it will also lift every bit of signal and noise on every channel in the UHF band, including the one you want to use for your in-house channel. It will also add a little bit of noise itself and this noise, occurring as it does at the front end of the system, can be surprisingly pernicious.

If there's a two-stage masthead amplifier feeding a distribution network via the Sky box's UHF loopthrough there will almost certainly be problems, even if the Sky box's output is carefully set to a clear channel. The satellite picture in the bedroom might have lines on it when a motorbike goes past. It will almost certainly be slightly snowy because of the noise from the masthead amplifier. Patterning – oblique lines and so forth – might appear periodically, caused by analogue signals appearing on the channel as propagation conditions change. If a digital signal appears on the channel the in-house picture will become very snowy, as if the cable is broken.

## A simple wheeze

These faults can even arise when no masthead amplifier is in use. Remember that this is old-fashioned analogue TV – the signal from the satellite box has to be 46dB above the noise for good reception (digital only needs about 26dB), so an interfering signal too weak for you to see when you are searching for a clear channel can degrade reception of an in-house signal using that channel.

What's the solution? For a small system with only one in-house channel the essence of it is to put a notch filter on the incoming aerial feeder and a one-channel pass filter on the output of the satellite receiver, with both filters tuned to the in-house channel. All installers should make themselves familiar with this simple but invaluable technique.

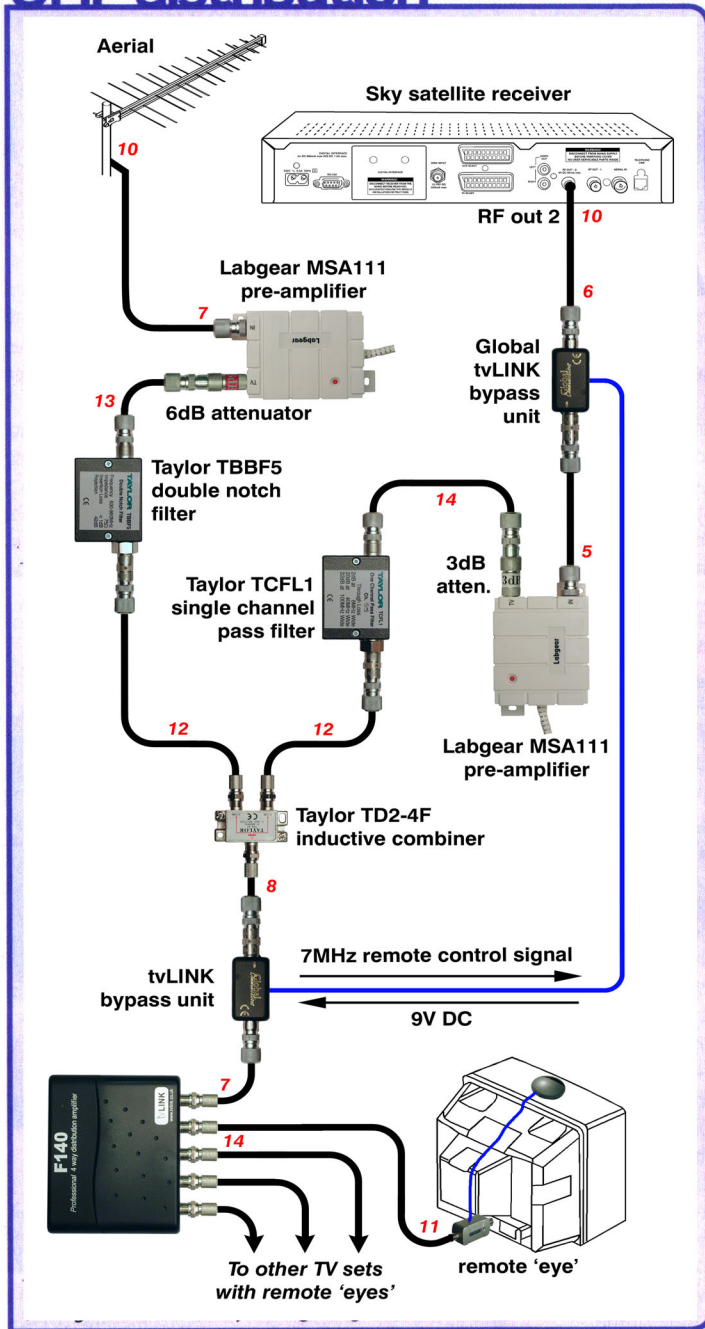
The notch filter (or 'stop filter') prevents anything on the nominated channel passing into the system and so creates a clear channel for the 'in-house' signals. The one-channel pass filter stops the satellite receiver's modulator polluting nearby channels with spurious noise. If all you want to do is clean up one in-house channel on a small domestic system this simple wheeze works well.

The diagram tells you all you need to know. In this example a small set-back amplifier and a 6dB attenuator are used to lift the aerial signals just the right amount. These signals then pass through a double notch filter, which is adjusted to stop the channel which is to be used for the in-house signals. The filter greatly weakens signals and noise on that channel while leaving the rest of the UHF band more or less unscathed. Just don't use an in-house channel within three of any that you need to receive from the aerial.

To tune the filter (if you bought it un-tuned) connect it temporarily to the satellite receiver output and adjust for minimum reception. The red numbers on the diagram are likely analogue signal levels in dBmV. The brand names shown are my personal favourites – other makes are, of course, available.

The Sky box's UHF output passes through a remote eye bypass unit, which

## UHF distribution



lets the remote eye signals get past the other components. The signal is then gently amplified to make up for the losses in the following components. It then passes through a two-stage one-channel pass filter, before being combined with the aerial signals in a simple inductive splitter. The levels of the aerial signals and the in-house channel can be adjusted independently by varying the value of the attenuators. The rest of the system is bog-standard – a small amplifier with the usual return path for the remote eye signals and cables running to all the TV sets ■