

CHANNEL 5 GHOST STORY
By G8MNY

After seeing some of the recent test of CH5's CROYDON Tx at Beulah Hill on channel 37, I investigated the weak signal and it's ghost at my South Croydon QTH. The Tx is scheduled as 250KW ERP some 6dB down on the 4 services from the CrystalPalace Mast.

MEASUREMENTS

My comparative signal strength measurements were done with a simple fairly flat response loop aerial as the normal group A aerial for this area will have cut off by channel 37, a UHF signal meter, and stack of attenuators. This showed the CH5 signal to be at least 26dB weaker than the others, and not the 6dB as published. This was later confirmed with my homebrew spectrum analyser. From CH5 contacts via Packet Radio all CH5 Tx were supposed to be on full power!

GHOST

The signal also had a severe but well defined ghost that defied my attempts to remove it. It was just over one of the five 10uS wide colour bars later, I guessed this delay to be about 12uS. (52uS across picture)
This gives a reflected path of 12x300m = 3.6KM longer. I did a map plot traced on a large piece of paper with my QTH and the Croydon Tx site. Hammered in 2 nails placed at these focus points, then I was able to draw a ghost ellipse using a piece of string around these 2 nails but some 3.6KM to scale longer, by placing a pencil inside the string and keeping it tight and drew the ellipse. This went right through the Crystal Palace mast, so I now knew that this was the cause. But why was it so strong? Beulah Hill mast does not produce any detectable ghost on the other 4 Crystal Palace signals.

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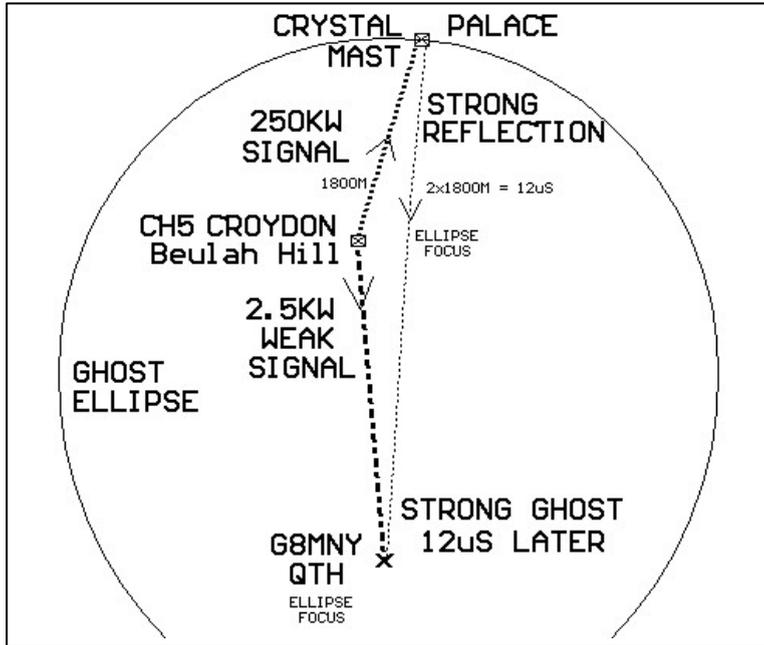
Ghost Ellipse of all          ..... CRYSTAL PALACE
3.6km longer paths          ....   *.. MAST
longer paths.                ...   ;: ...
Drawn with a                 ..      1.8km; :   ..
loop of string               ..           ; :   ..
3.6km longer                 .. 250KW Signal;/;\ :   ..
around the                   .      CH 5 MAST ; :   .
focuses.                    .      Beular Hill * : Strong .
                             .      ellipse focus| \:/ Reflection .
                             .                   | : 3.6km later .
                             .      Weak 2.5KW   | : = 12uS .
                             .      Main South  \|/ : .
                             .      Signal       | : .
                             .                   | : .
                             .      G8MNY       | : similar .
                             .      QTH * beam headings .
                             ..      ellipse     ..
                             ..      focus      ..
                             ..                ..
                             ...              ...
                             .....          .....

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RALLY ANSWER

After speaking to a broadcast engineer at Sandown Rally I had the answer. The French had objected to a main station on ch 37 as this would case interference to there existing TV service. So the Croydon TX aerials had been designed to be 20dB down to the south e.g. 1/100 of 250KW = 2.5KW ERP. This was the cause of the weak signal, and as the full power signal can hit the Crystal Palace mast and reflect

this is added to the weaker south signal, making the ghost some 20dB stronger. This ghost move around in and out of phase (positive & negative) as the 2 masts move relative to each other in windy weather. For most viewers the ghost can't be removed with different aerials as the masts are too close (20 apart my QTH).



DIGITAL

The Teletext P100 had a list of the CH5 Transmitter channels, (also on page 1FF?) & P198 had a status of the teletext encoder, showing errors etc on some of the channels. No other pages on the test broadcasts. This channel is supposed to be the first fully digital TV links. However under the recent bad Wx there was picture break-up of the Colour Bars with wrong little squares (corruption on MPEG3 ?).

Also while checking UHF band

with a spectrum analyser, I noticed 2 Broadband square shaped signals on ch 28 & 34. These were both 50dB down on the main CP signals, and may be DIGITAL TV test transmissions!

We now know all about digital!