

A Decade of the Bell Hill Beacon Complex – G0API

May 2012 marked the start of the second decade of continuous 24/7 operation of the beacons on Bell Hill, IO80UU59.

Formal opening was performed by Phil G3OBD, an early pioneer of microwave operation and a member of FRARS and the “infamous” Bell Hill Bombers - circa 1960 era contest team.

The beacon site equipment, contained in the purpose built blockhouse at the foot of the 15m Versatower mast, was designed and built in large part by members of FRARS – G3YGF, G4JNT and G0API, with several other members and non-members contributing over the years.

Except for a near miss lightning strike that blew the protection filtering of the first SMPSU , beacon operation on 70.031MHz –G4JNT/b , 2320.905MHz - GB3SCS , 3400.905MHz – GB3SCF , 5760.905MHz – GB3SCC , 10368.905MHz – GB3SCX , 24048905MHz – GB3SCK and G8BKE/b – 47GHz , has continued non-stop.

Over the years several alternative signalling modes have been tested in the bands 2.3-10GHz, in addition to the traditional keyed carrier CW. These include several of the WSJT digital schemes and an in-house designed tri-state FSK. The digital modes demand high accuracy in terms of radiated frequency maintenance and to this end each beacon is locked back to a central GPS controlled 10MHz reference and final frequency is held to within a few Hz, even at 10GHz.

The beacons were established to form a single point on air reference, allowing users to setup new kit and evaluate variations in conditions –all data being available via several references including from 2007 www.Beaconspot.EU , built by the UK Microwave Group.

Regular “housekeeping “ reports are sent from stations around the UK and used to monitor performance but during 2012 the range at which reception limits were seems to have taken a step change. The following listing shows the individual beacon Best DX and the e.r.p./antenna used :

G4JNT/b – 2036km IZ8DWF, JM87AW, 599 on 1/6/2010. 0.5W – 1/2wave dipole at 2.5m agl.

GB3SCS – 1221km OE5VRL, JN78DK, 599 on 14/11/2012. 8W – Alford slot antenna @ 13.5m agl.

GB3SCF – 1214km OK1YA, JN79IO, 599(booming in! quoted) on 14/11/2012. 5W – Alford slot antenna @ 13.5m agl.

GB3SCC – 1221km OE5VRL, JN78DK, 559 on 14&15/11/2012. 8W – slotted waveguide antenna @ 13.5m agl.

GB3SCX – 1221km OE5VRL, JN78DK, 519 on 14/11/2012. 14W – slotted waveguide antenna @ 13.5m agl.

GB3SCK – 224km G4EAT, JO01HR, 539 on 2/3/2011. 3W - slotted waveguide antenna @ 13.5m agl.

G8BKE/b – 78km G8KQW/P, IO90JB, 599 on 14/10/2012. 1W– 20dB waveguide horn antenna @ 14m agl.

Note: with the exceptions of 70MHz and 47GHz, all antennas are omidirectional, i.e. they radiate equally in all directions.

The antennas of the other beacons are at 274m asl – the only object higher than them is the lightning conductor spike, which is 2m higher!

The mast also hosts the 5GHz WLAN link used by FRARS for high speed internet broadBand.

The best DX figures quoted for each microwave beacon is the BEST recorded for ANY UK based beacon and BEST in Europe for the 4 bands 2.3-10GHz, which is an interesting statistic and one that seems to confirm the effectiveness of the elevated site, with its cross channel lockdown capability.

Full technical details of the beacons can be found on our website www.scrbg.org

FRARS has helped to create this system from the input of individual members and by providing table space for the annual SCRBG junk sale @Hamfest, with additional donations over the last 10 years. All monies raised go towards the annual site rental, electricity and insurance bills, with any balance used for development and maintenance.

On behalf of the South Coast Repeater & Beacon Group (we also built the original GB3SC and GB3SZ Repeaters and assisted the potential GB3SQ ATV machine)

A Big **THANK YOU!**

