Q5

North Bristol Amateur Radio Club
S.H.E.7, Braemar Crescent, Northville, Bristol.

MAY 2010

Not much to report this Q5.

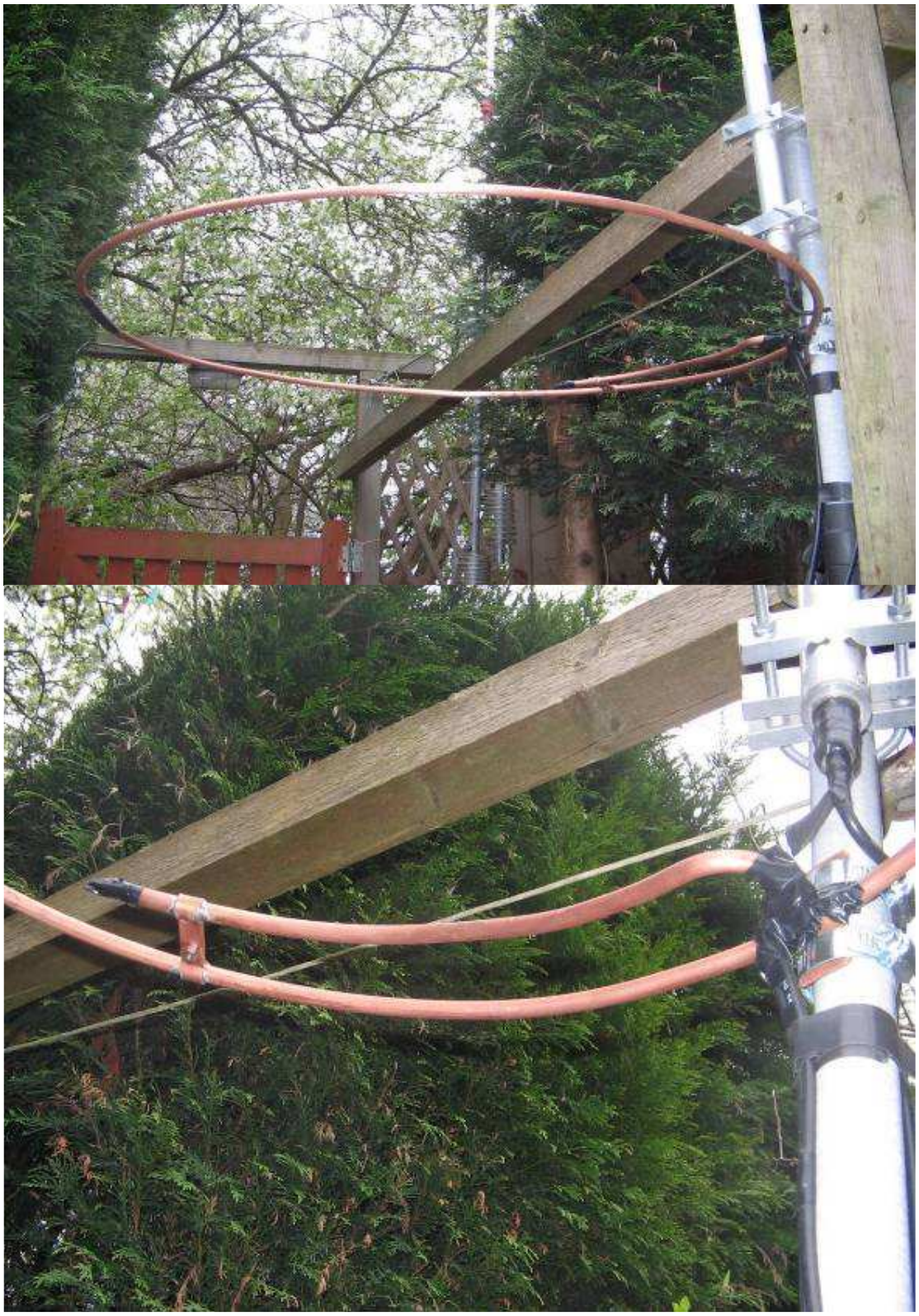
Silent Key:- Ken G3ECS.

RAE Course's are still running but slowly, we have had 2 pass at foundation and 1.at intermediate.

Rallies.
27th June. West of England Rally.
8th August Flight Refuelling ARS Hamfest..

FIG 1

FIG 2



TOP FIG 3
BOTTOM FIG 4

FIG 5

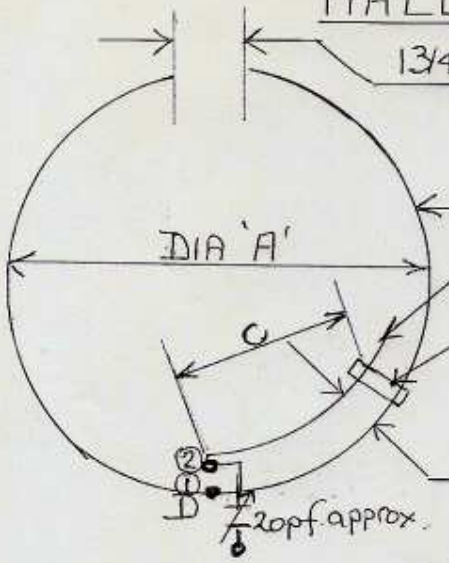
FIG 1 Top Antenna is a Collinear for 70cms 2Mtr and 6Mtr.
Middle Antenna is a 2Mtr Halo.
Bottom Antenna is a 6Mtr Halo.

FIG 2 Top 4Mtr Vertical
Bottom 4Mtr Halo.
The mast is lowered, total height Vertical 20' Halo 19'

FIG 3&4 4MTR Halo showing the gamma match.
The construction is the same on 2 & 6Mtr's

FIG 5 The Balun is the same on 2, 4&6Mtr's

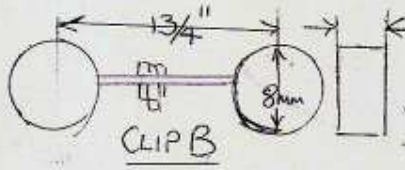
HALO'S.



FEED CABLE 50 Ω
RG58 CU Vf = 0.66
CAPACITY RG58 CU. 30pf per FT.

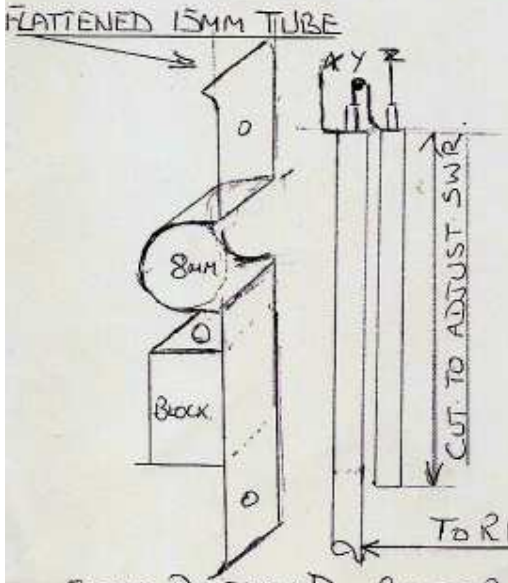
LENGTH C FOR. 2MTRES APROX 5½"
LENGTH C FOR 4MTRES APROX 11"
LENGTH C FOR 6MTRES APROX 16"

LENGTH TUBE FOR. 2 MTRES	= 39".	MAKES DIA A APROX	12"
— " — 4 — " —	= 80"	— " —	24.4"
— " — 6 — " —	= 111.84"	— " —	35.6"



FLATTEND 8 MM TUBE

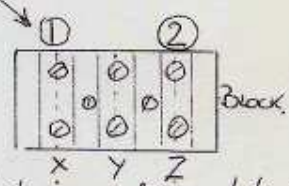
BALUN 8 TURNS ON 3/4" FORMER.



FITTED POSITION D

HALO'S GAIN Ø

Fix Block to Bracket connect Pattons ① & ②



The Bracket is soldered to the halo It can the fixed to a mast using Bolts Screws etc. Jubilee Clip.

SOLDER TO KEEP HALO IN POSITION

Halo Antenna

2Mtr Halo Gain Zero to cover 144 to 145 MHz
25 feet cable fitted (22x1/4 wave). Cable loss 2dB
7.5 inches Co-ax for capacitor 18pf approx.
Frequency required 144.300 MHz (SSB calling)
Rig used Kenwood TR9000. + Tokyo Hy-Power.

TEST using MFJ-259 Analyzer.

Frequency	SWR	R	X
144.030	1.2 – 1	40	5
144.300	1.2 – 1	43	6
145.020	1.3 – 1	58	13
145.500	1.5 – 1	74	9
145.920	1.7 – 1	90	0

TEST with Rig and SWR /PWR Meter.

Frequency	SWR	TX Pwr in Watts.
144.100	1.1 – 1	8.5
144.290	1.1 – 1	110
144.300	1.1 – 1	8
145.300	1.05 – 1	7
145.900	1.1 – 1	7

4Mtr Halo Gain Zero to cover 70 to 70.5 MHz
23 feet cable fitted (10x1/4 wave) Cable loss 1.1dB
12 inches Co-ax for capacitor 30pf approx.
Rig used Ascom

TEST using MFJ-259 Analyzer.

Frequency	SWR	R	X
70.050	1.2 – 1	45	7
70.150	1.2 – 1	45	9
70.250	1.2 – 1	45	11
70.450	1.4 – 1	45	15

TEST with Rig and SWR/PWR Meter.

Frequency	SWR	TX Pwr in Watts
70.050	1.2 – 1	14
70.150	1.2 – 1	15
70.250	1.3 – 1	15
70.350	1.4 – 1	16
70.450	1.4 – 1	16

70.487 1.45 – 1 16

6Mtr Halo Gain Zero to cover 50.00 to 52.00 MHz
26 feet cable fitted (8x1/4 wave) Cable loss 0.75dB.
12 inches Co-ax for capacitor 30pf approx.
Rig used IC706MkIIG

TEST using MFJ-259 Analyzer

Frequency	SWR	R	X
50.026	1.4 – 1	52	17
50.156	1.3 – 1	50	15
50.300	1.3 – 1	47	13
50.500	1.2 – 1	43	8
50.800	1.2 – 1	40	3
51.000	1.3 – 1	39	5
51.500	1.6 – 1	49	24
51.976	2 – 1	56	36

TEST with Rig and SWR/PWR Meter

Frequency	SWR	TX Pwr in Watts
50.025	1.25 – 1	10
50.150	1.2 – 1	10
50.300	1.2 – 1	10
50.500	1.25 – 1	10
50.800	1.35 – 1	10
51.000	1.6 – 1	10
51.800	1.8 – 1	10
51.950	2 – 1	10

Approximate cost to make 2Mtr £8. 4Mtr £11 6Mtr £13

I am using the Halo but I have not done any checks using horizontal to horizontal polarization.
Vertical to horizontal is down in signal strength see article Antenna Polarization

I have also made a Gibraltar Special designed by ZB2GS. See article May 09 Q5. This 4Mtr antenna worked ok. Test on SWR see chart. Reports were compared against my Vertical and Halo G8CKK.

TEST using Ascom rig SWR/PWR Meter

Frequency	SWR	TX Pwr in Watts	
70.425	2.2 – 1	13	(adjust capacitor)
“”	1.8 – 1	10	“”
“”	1.5 – 1	10	“”
70.100	1.25 – 1	11	

Antenna Polarization Considerations.

Polarization Mismatch Loss. To transfer maximum energy between transmit and receive antenna, both must have the same orientation. If not there will be a reduction in power between the two antennas.
When the transmit and receive antennas are both linearly polarized, physical antenna misalignment will result in a polarization mismatch loss which can be determined using the following formula.

Polarization Mismatch Loss (dB) = 20 log (cos0)

Where 0 is the misalignment angle between the two antennas.
The Table shows some typical mismatch loss values for various misalignment angles.

Polarization Mismatch Between Two Linearly Polarized Waves as a Function of Angular Orientation.

Orientation Angle	**Polarization Mismatch (dB)**
0.0 (aligned)	0.0
15.0	0.3
30.0	1.25
45.0	3.01
60.0	6.02
75.0	11.74
90.0 (orthogonal)	infinity.

Ref Cushcraft Corporation.