

70cm DF antenna
Lets build one
and go fox hunting!

30 June 2014

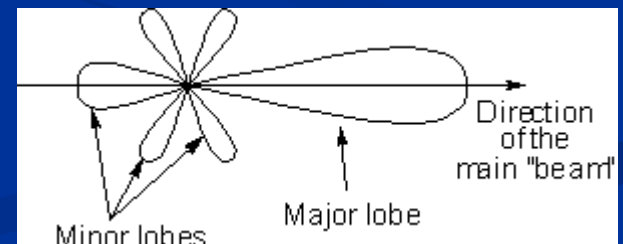
G0CJG

Why DF with FM handhelds

- Inexpensive
- Widely owned
- Their size and weight permit the building of DF systems that are easy to carry and orient.

Just use a Yagi?

- Either no S meter or a limited range one
- Can't differentiate minor and major lobes
- When close to the fox receiver is swamped



Yagi Polar Diagram

Use phase difference between 2 dipole antennas

Switch
at say
500 Hz

Dipole 1



Switch



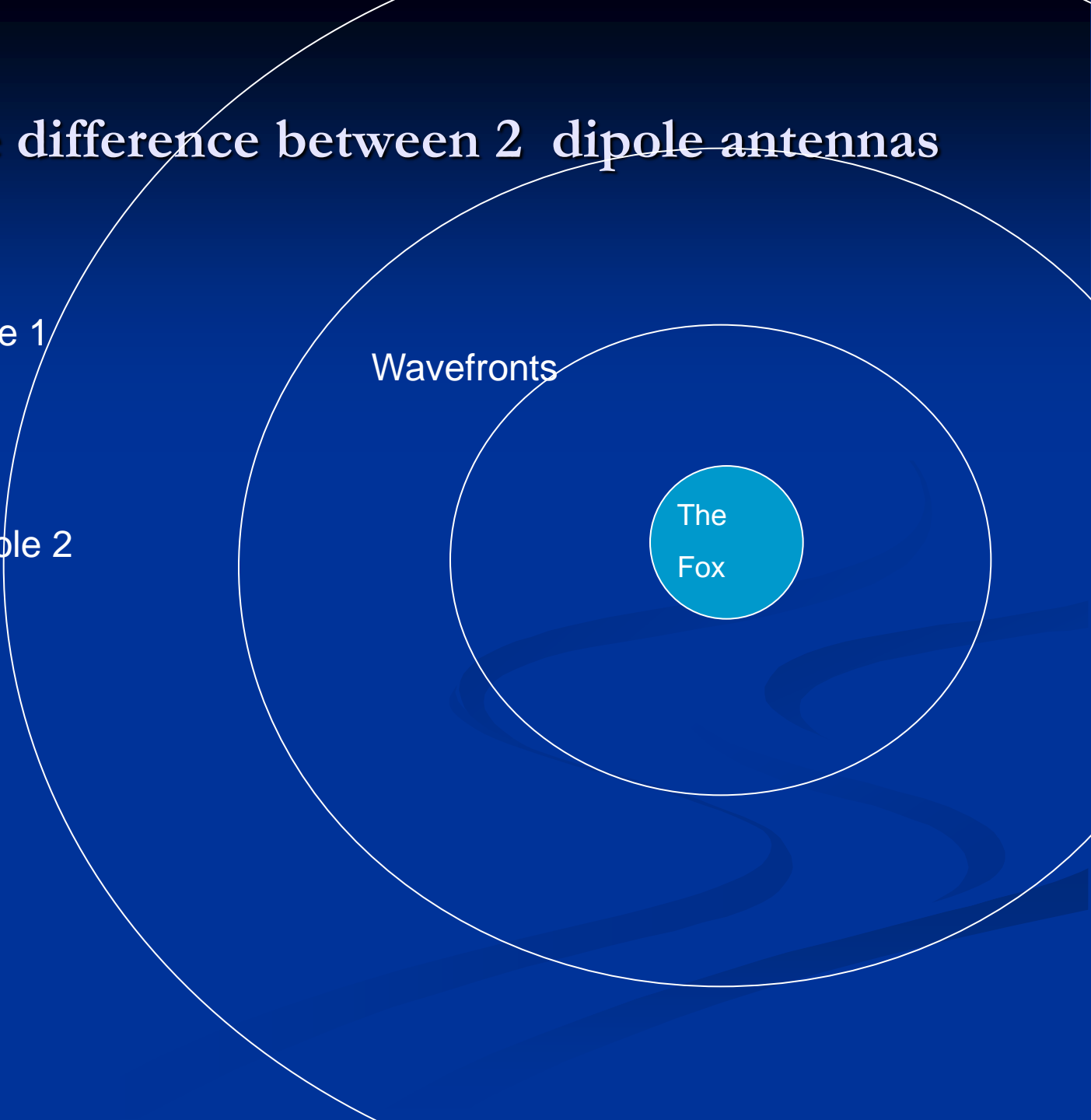
Dipole 2



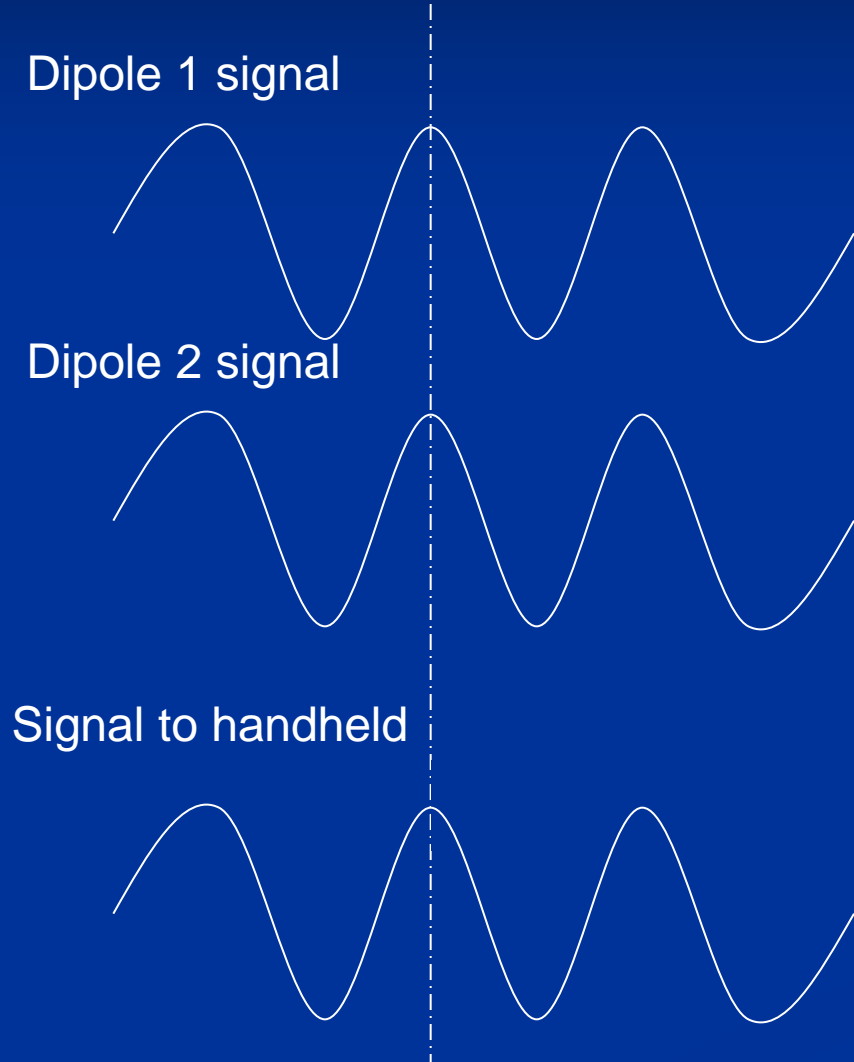
Wavefronts

The
Fox

FM
Handheld



Dipoles equidistant from fox



Switch
at say
500 Hz

Switch

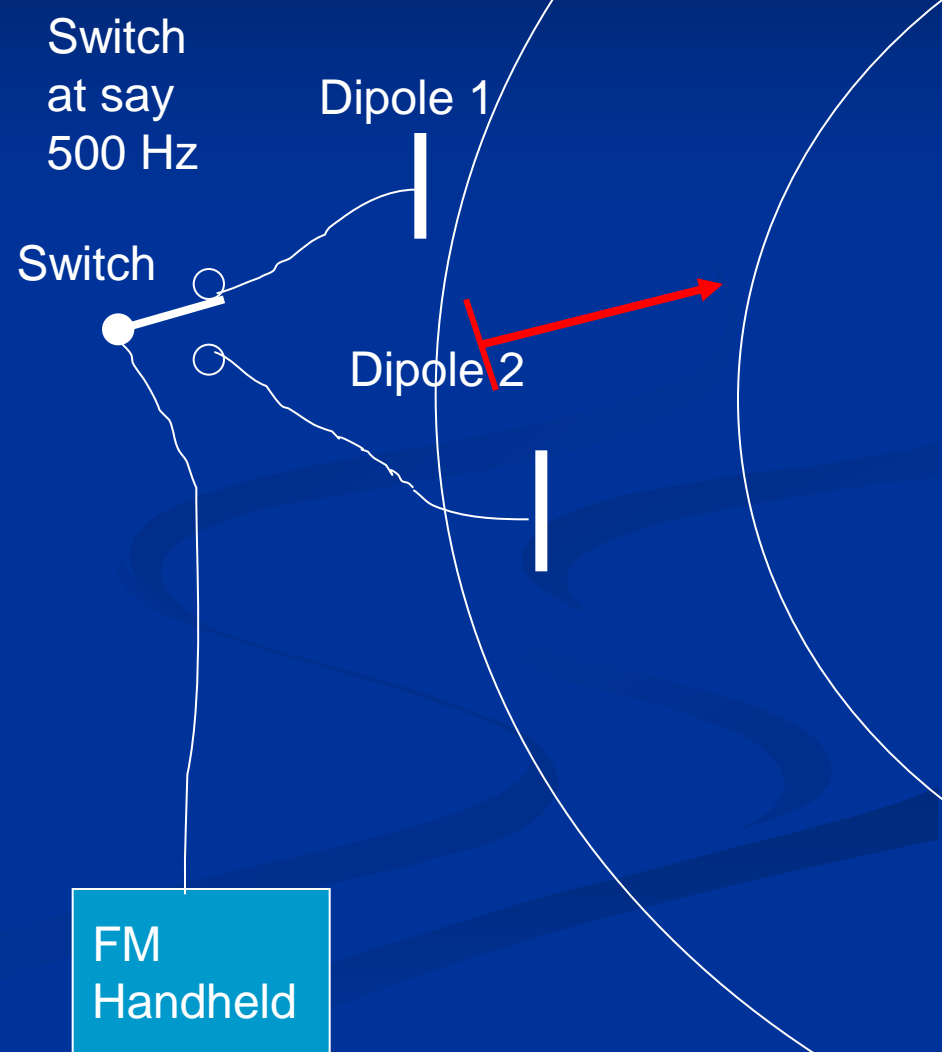
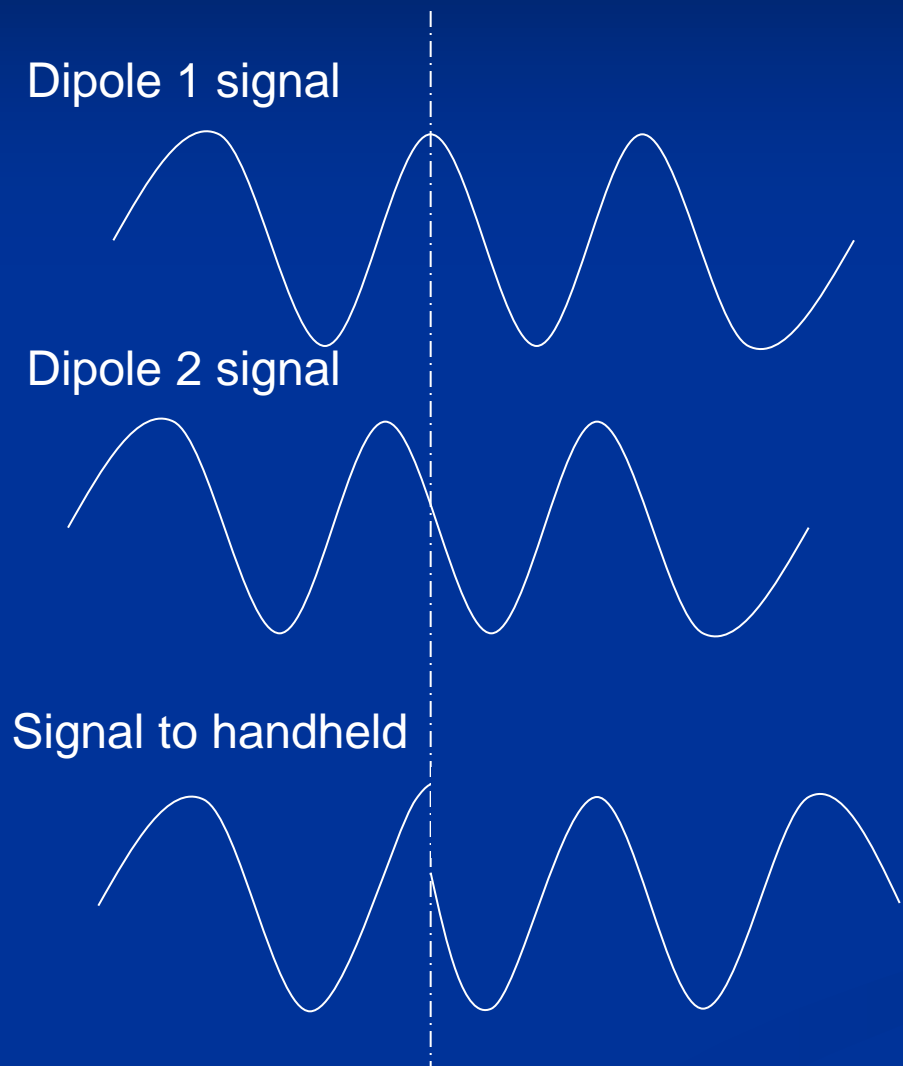
Dipole 1

Dipole 2

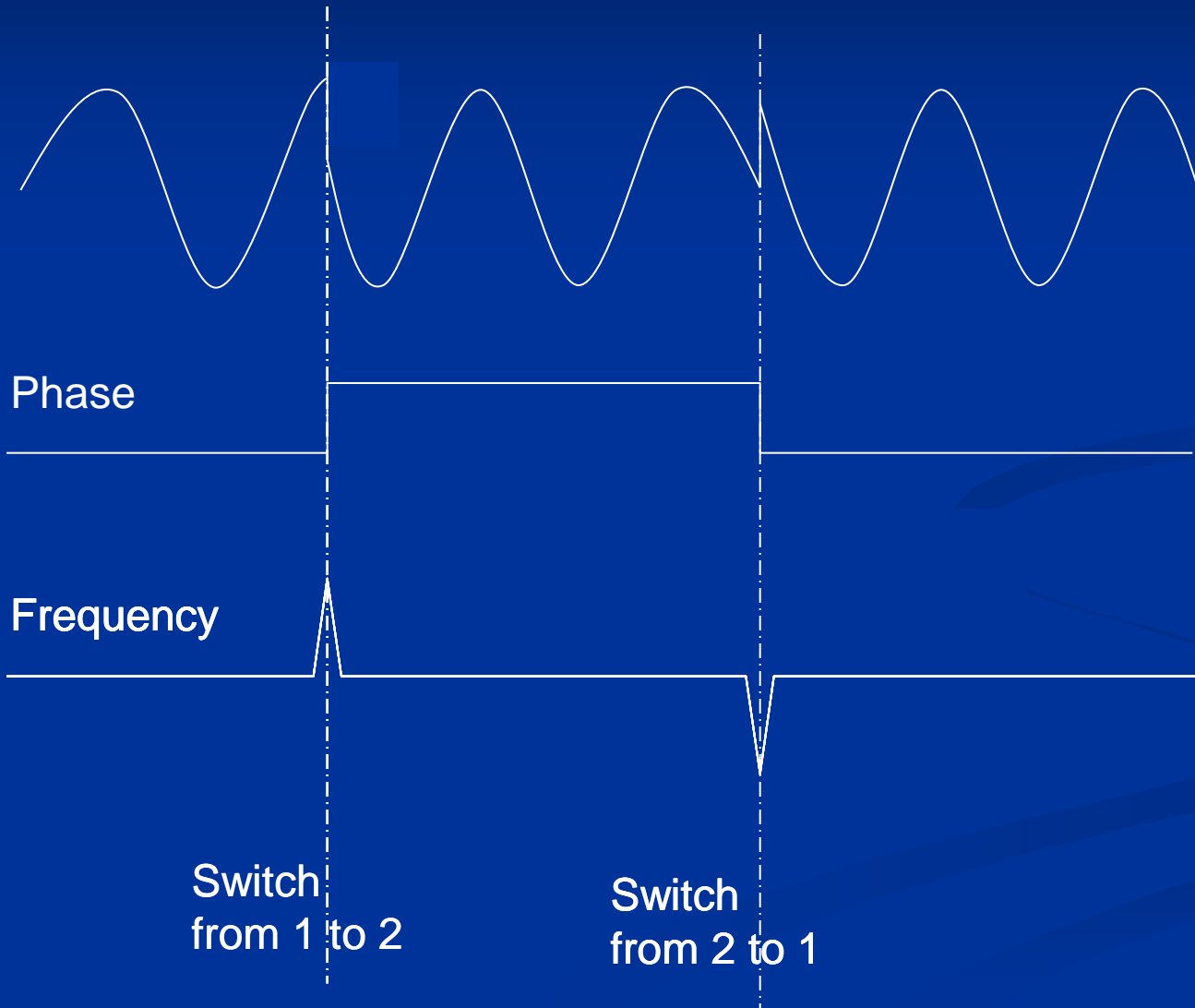
FM
Handheld

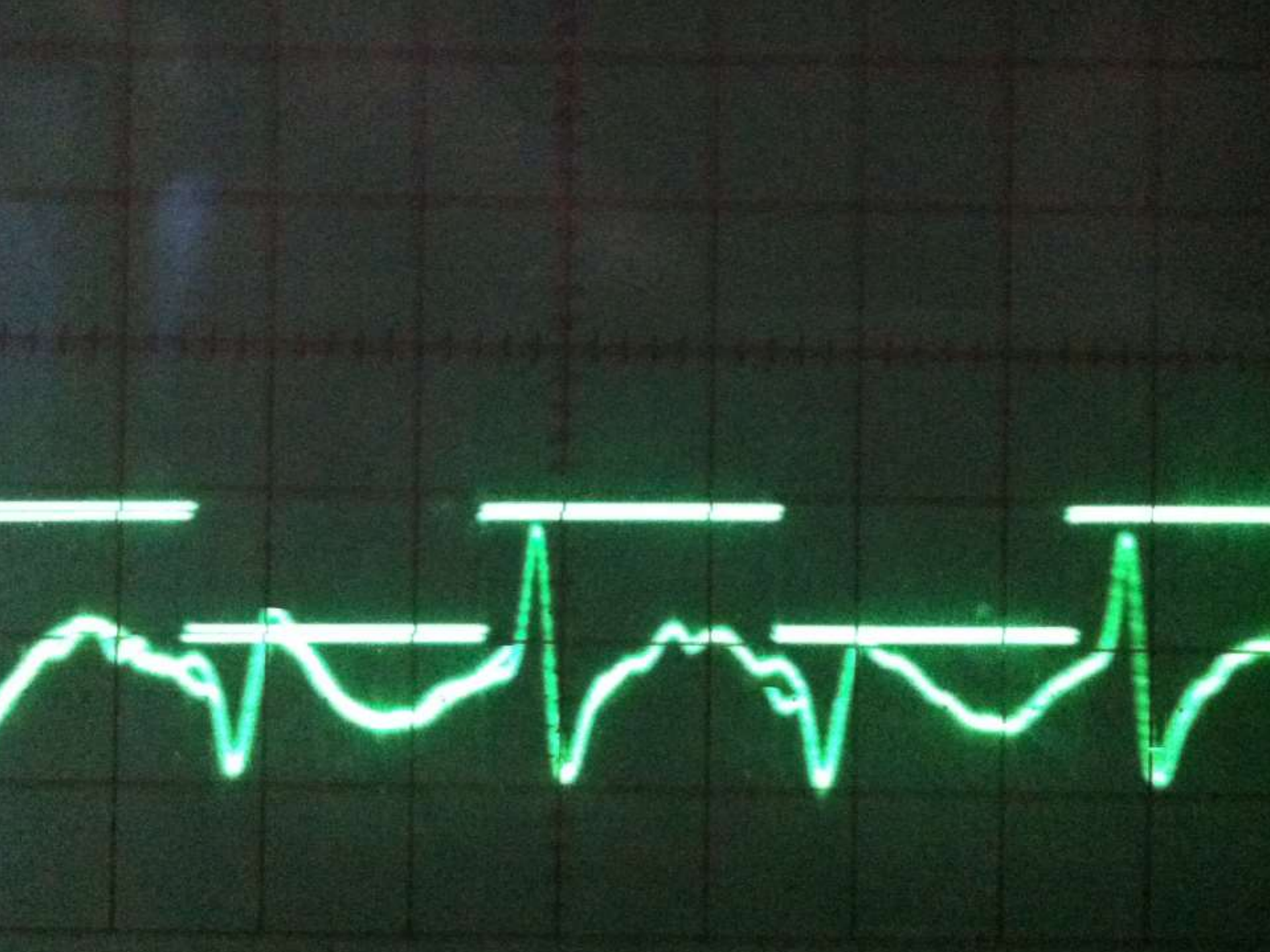


Dipole 2 closer to fox

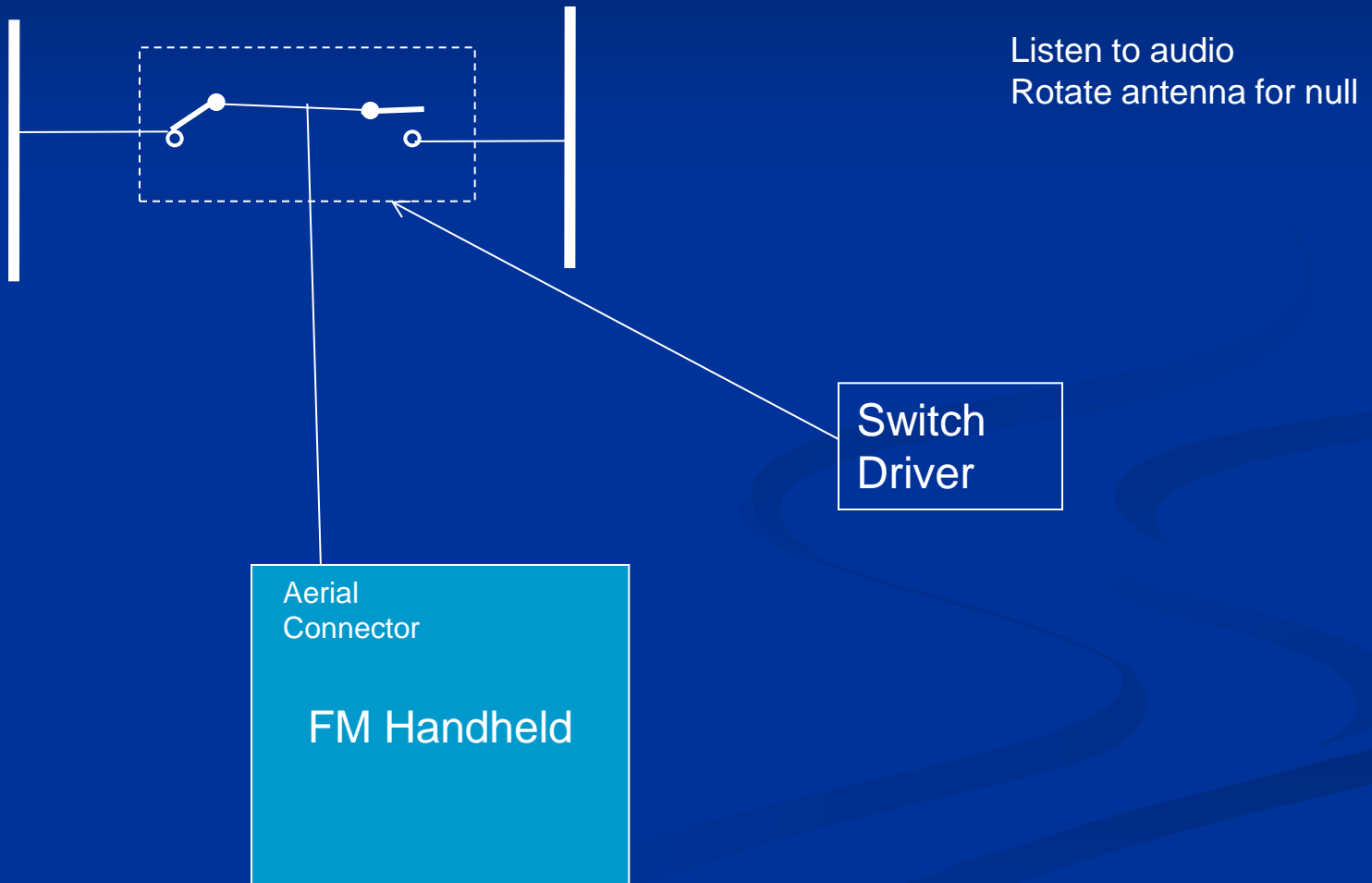


Input to FM detector





Basic System

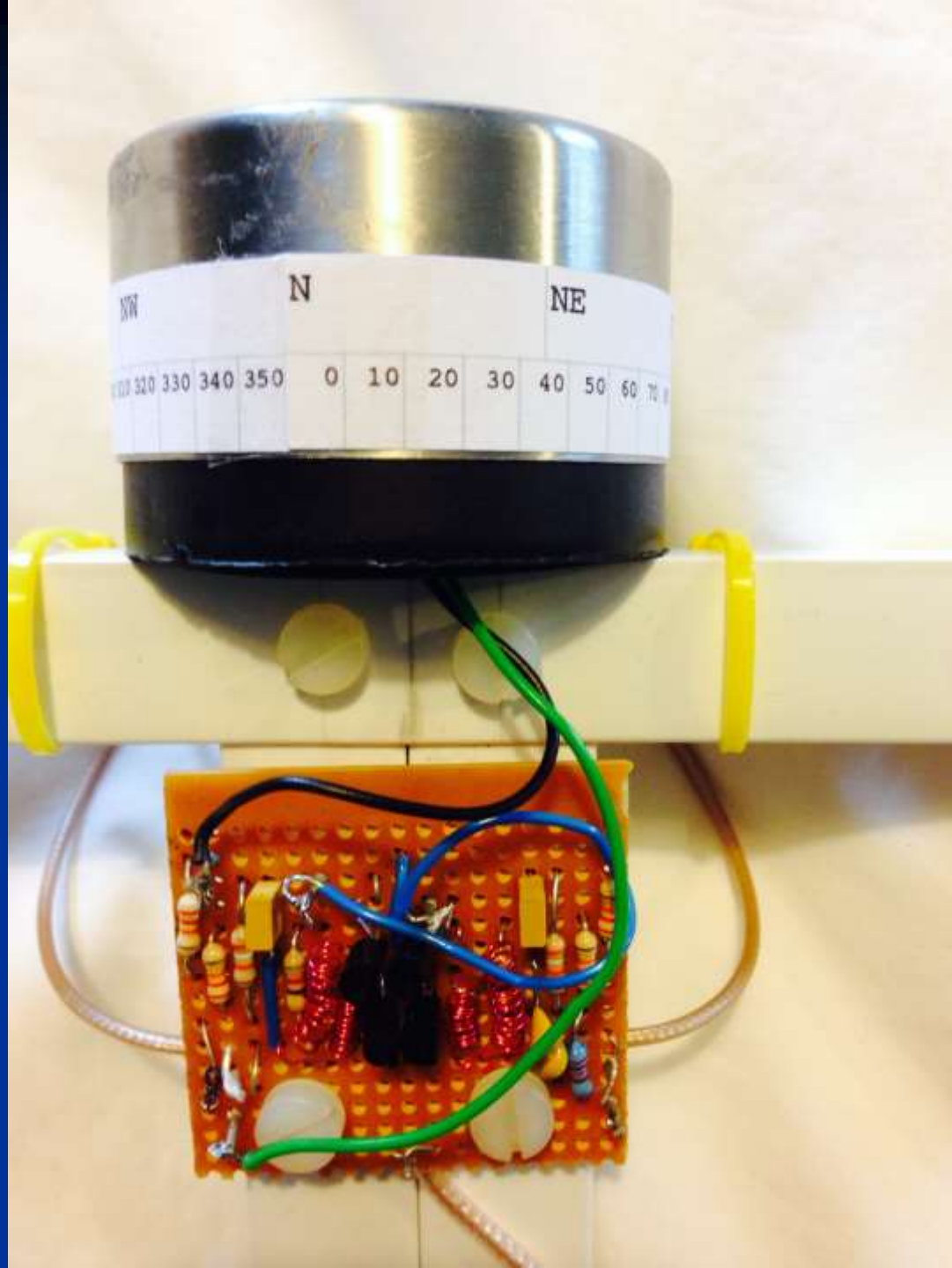


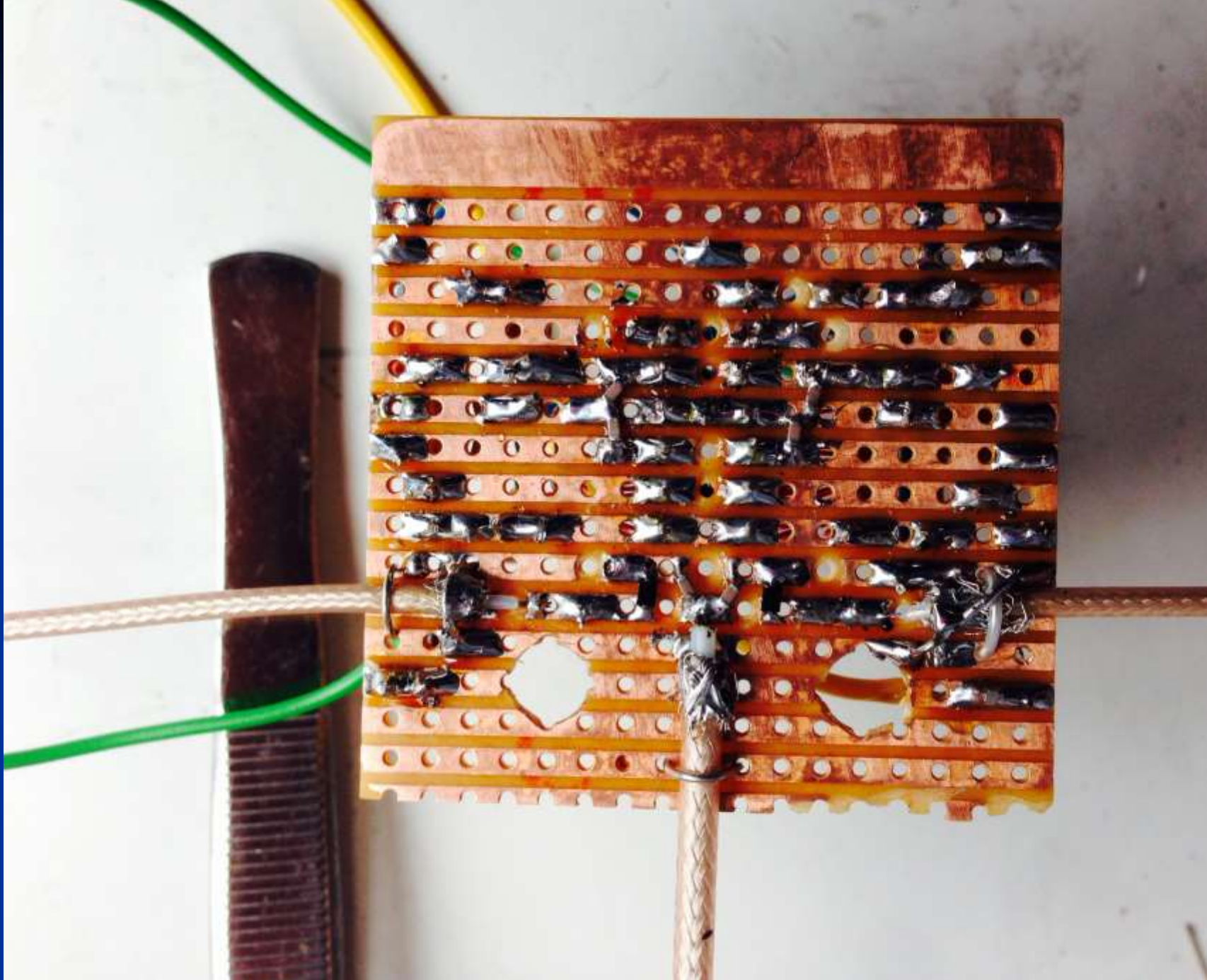
An inexpensive solar df antenna

- Less than £10 for parts
- Why solar
 - Because it's novel and fun
 - Recycles inexpensive solar accent lamp (£1)
 - The sun doesn't run down (OK, not quickly)









Aluminium angle
35*35*40 mm

2 PNP & 2 NPN transistors
e.g. 2N5087, 2N5551

miniature coax 50 ohm
20 cm each

30 SWG enamel wire
2* 10 cm,
2* 11.5 cm

8*5mm Plastic
nut & bolt
Length >10mm

4* 100pf

5* 22K

2* 100pf 50V

2 PIN diodes
BAP64-03,115
(farnell)

2* 47nF

Veroboard
14 tracks of 17 holes

1* 10 uF

SPDT

1 schottky diode (hidden) 2.5 mmsq mains wiring
length 40 cm

SMA pigtail
female chassis
connector

>14cm
length

Plastic
angle
18*18*500 mm

2* 39K

2* 4K7

3A terminal block

module from
solar light
£1 from Maplin

QTY Description

2 BAP64-03 PIN diodes 21p
6 100pf chip capacitors nc
2 2N5087 PNP transistors 12p
2 2N5551 NPN transistors 9p
1 Schottky Diode nc

1 RF pigtail >14cm long SMA female chassis connector ebay (lowest about £1.10) ?rally

1 sma male to male adaptor if required for Icom Yaesu etc (ebay > £1.50) ?rally

2 4K7 resistors 8p

2 39K0 resistors 8p

4 22K0 resistors 16p

1 10uF capacitor 10p

2 47n capacitors 53p

1 Veroboard 14 tracks of 17 holes £1.35 (assumes splitting a 40*41 farnell board)

50 mm of 30SWG (or thicker) wire nc

40 cm of miniature rf coax ?Rally

1 Maplin Solar Light (currently £1 while stocks last)

1 small SPDT switch ?Rally

2 pairs of 3A terminal block 60p (from 36 pack maplin)

Aluminum angle 35*35*40 mm (use 25*25*40) 12p

Plastic angle 18*18*500 mm about 60p (split 2.4m)

8 plastic nuts and bolts 5mm dia 10 mm long (use M3*10) about 60p
hobbytronics

DF Antenna Switcher

Part List

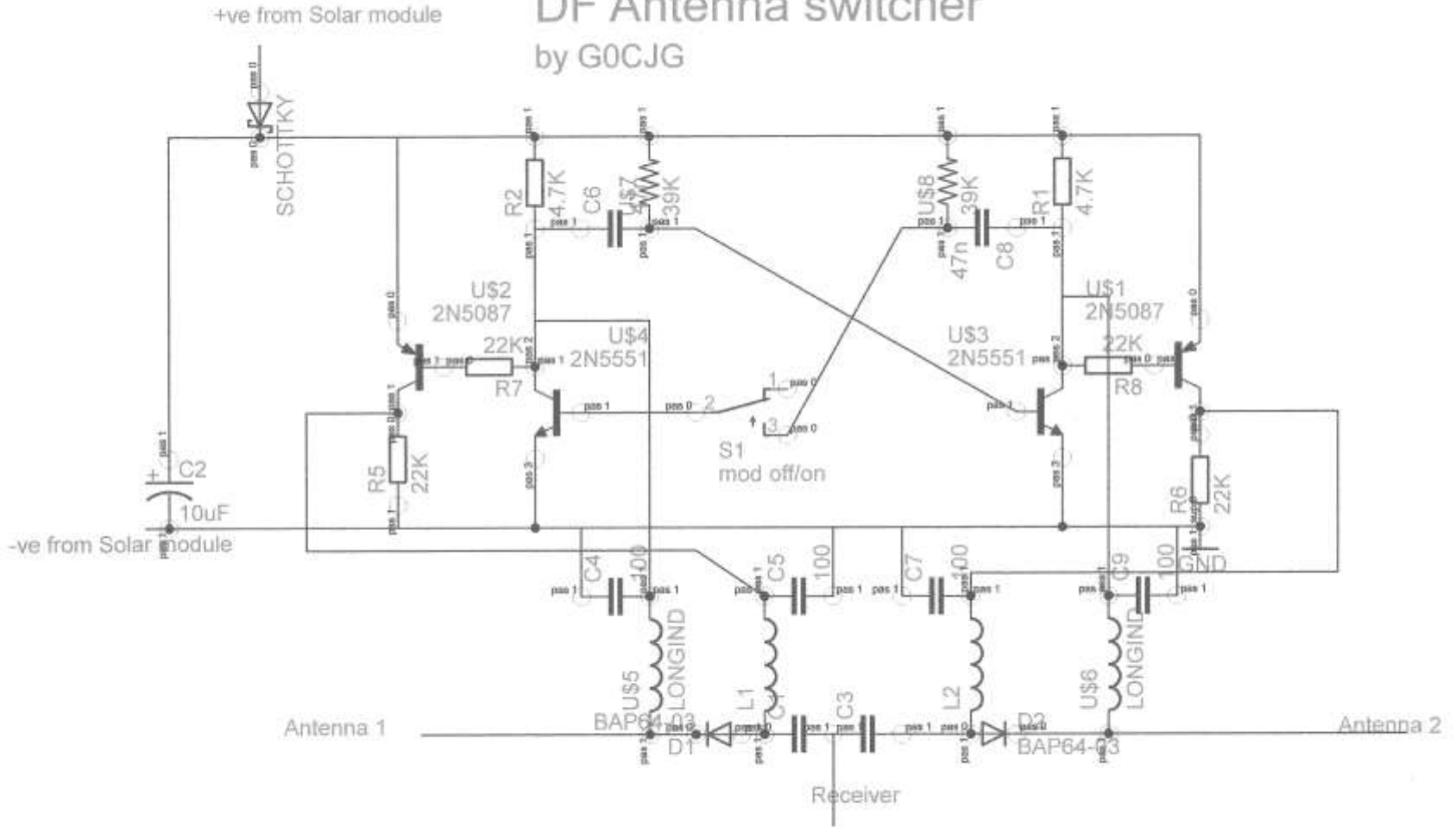
27/05/14

G0CJG

davidslatter@blueyonder.co.uk

bottom line under £10

DF Antenna switcher by G0CJG



Veroboard layout and bottom mounting components

Start with a piece of veroboard comprising 14 tracks each with 17 holes. Tracks 13 and 14 just provide space for mounting holes.

The board view shown is looking from the non-copper side and assuming the board is transparent. I haven't shown tracks where they are not used but there is no need to remove them.

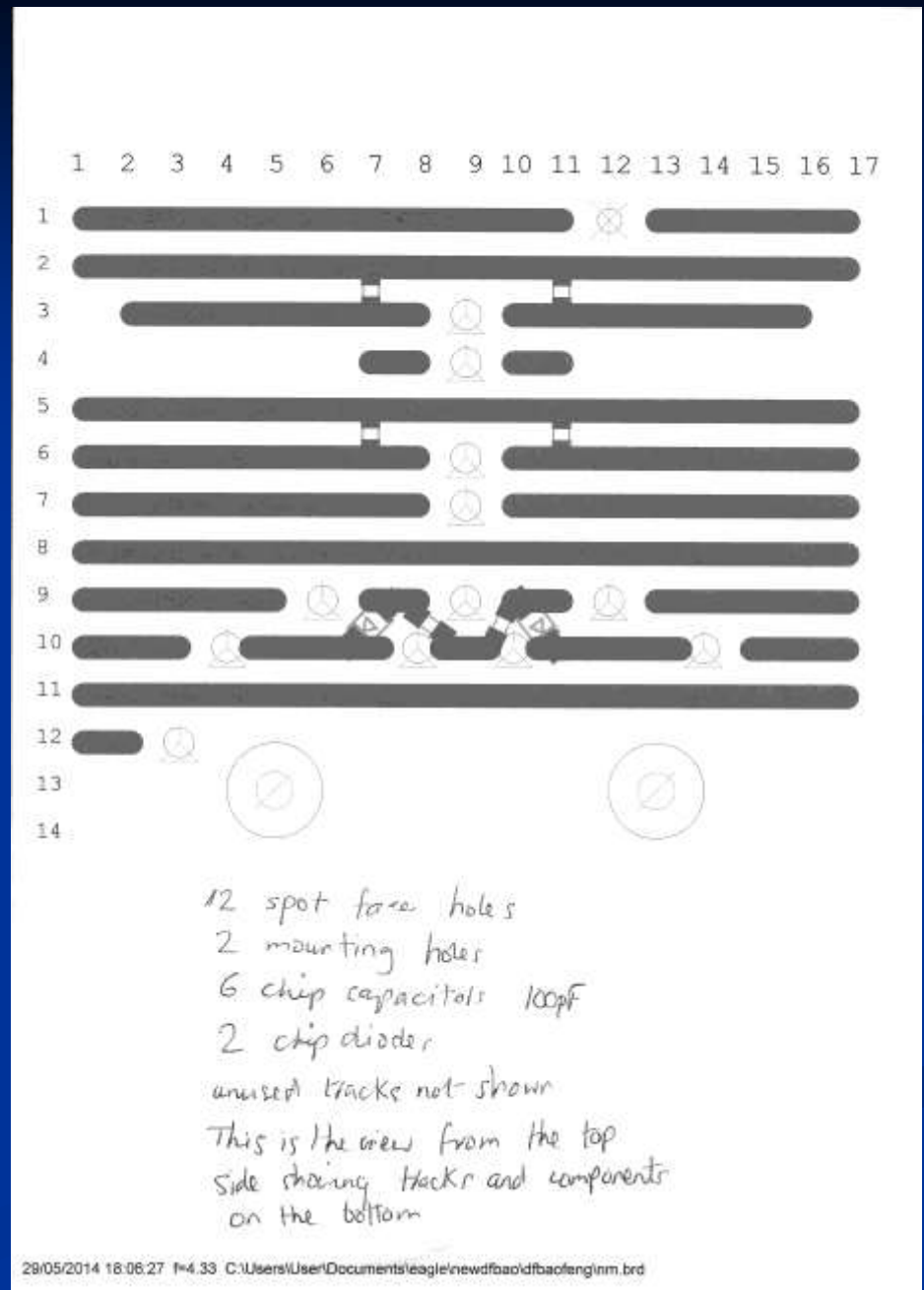
Make gaps in the tracks with a 4mm drill. Gaps are at (row,col)(1,12)(3,9)(4,9)(6,9)(7,9)(9,6)(9,9)(9,12)(10,4)(10,8)(10,10) (10,14)

Mounting position for the 6 chip capacitors and 2 pin diodes on the bottom of the board can be seen (ask for help if you don't know how to do this)

The coax cables from the dipoles comes in from the left and right along row 10. The outers are soldered at cols 2 and 14 and the inners at col 5 and 13

The coax cable to the handheld comes up column 9 with its outer soldered at row 11 and its inner at row 10.

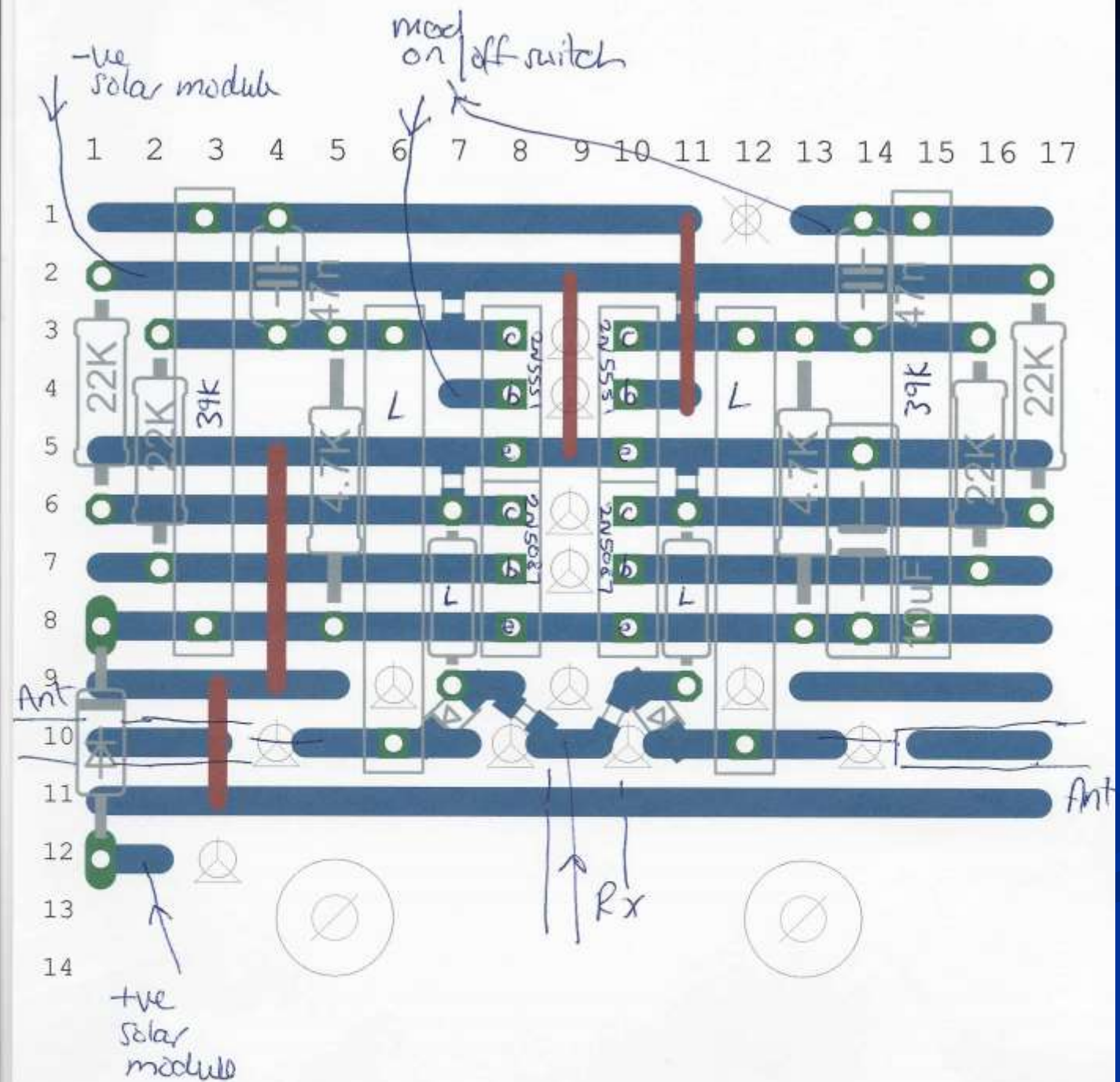
Make loops of wire through [(9,1),(11,1)], [(9,17),(11,17)] and [(12,8),(12,10)] to provide strain relief for the cables.



The brown tracks are link wires on the top of the board.

The components marked L are about 10 turns of 30 swg enamelled wire. A 2mm drill will make a suitable winding former

Pins could be inserted at (row,col)
(2,2)(12,2)(1,13)(4,7)
to make attaching the external wires easier



What next?

- Build one for a DF hunt in late July
- I'm sure club members with the necessary skills would be glad to help others complete their project.
- Take a parts list, today.
- Email me what you need. I'll coordinate the procurement.

The super deluxe version

