

# Doppler Direction Finding Unit for Transmitter/Foxhunting - G3KMG

## TECHNICAL FORUM

## Simple heater-voltage stabilizer

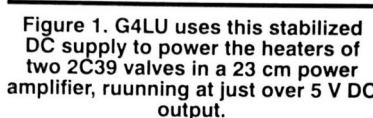
He writes: "The circuit is simplicity itself and the large-value capacitor across the adjusting resistor provides a slow rise characteristic. The LM338K needs a finned heatsink, which is augmented by being mounted on the aluminium bracket for fixing to the case."

## Two metre Doppler D/F

## Two metre Doppler D/F system

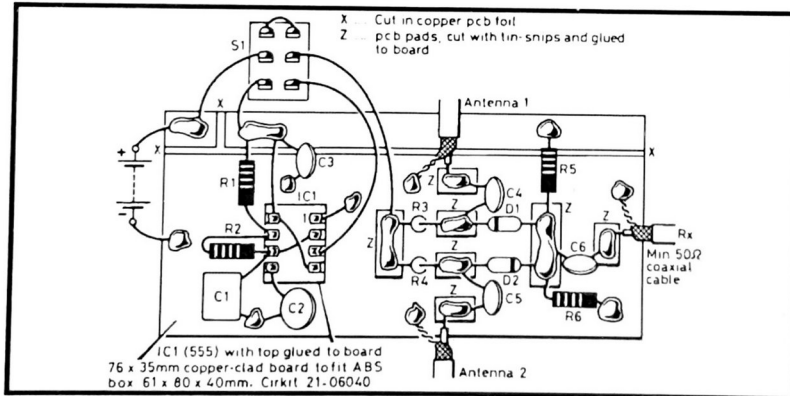
S1  X ... Cut  
Z ... pch

David Angus devised the ingenious automatic polarity selector shown below to protect

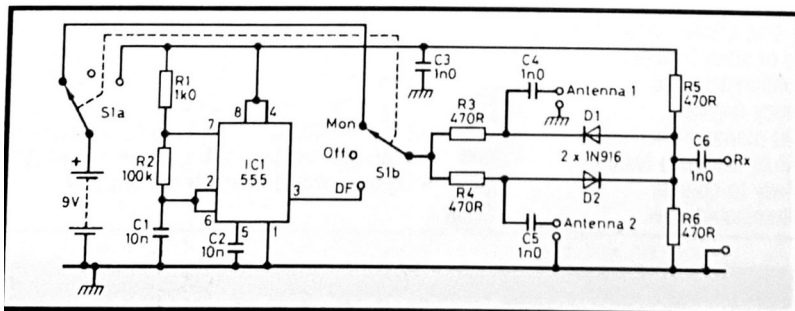


The two antennas are switched sequentially to the receiver at approximately 800 Hz. Whenever the signals reach the receiver out-of-phase due to slight path length differences, the signal presented to the receiver will be phase-modulated at 800 Hz. Only when the boom is exactly broadside to the transmitter will the tone disappear, thus indicat-

opper pcb foil  
ds, cut with tin-snips and glued



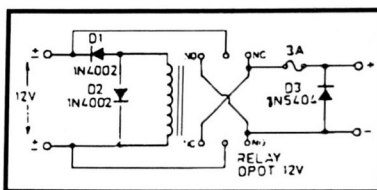
**Figure 2.**



**Figure 3. The 800 Hz electronic switch for Doppler D/P.**

with  
**JOHN WALKER**  
ZL3IB

The relay and D1 either let the power straight through or if the polarity is wrong, exchange the power connections. D2 is to stop the spike from the relay as the field collapses and guse and D3 are in case the device fails. The device draws very little current and has no appreciable voltage drop.

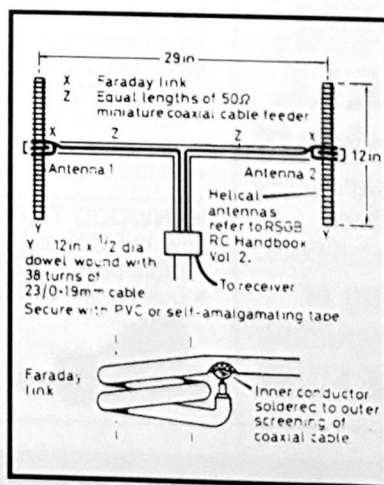


He also comments: "Incidentally I was impressed by the accuracy of the design information on helical-wound antennas given in Volume 2 of the *RSGB Handbook*. They resonated almost spot on, and with balun feed as shown gave a return loss of nearly 20 dB, not that it mattered too much in this instance for reception only."

### Postscript:

G3VA's "T

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**BREAK IN JUNE 1996**

## Schematic and Layout

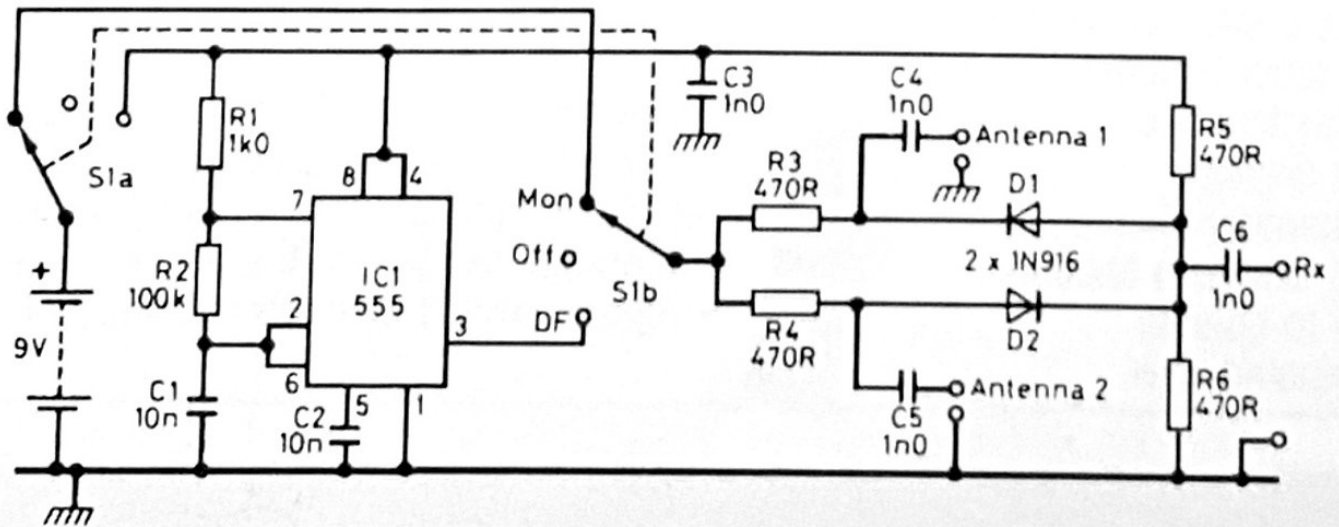
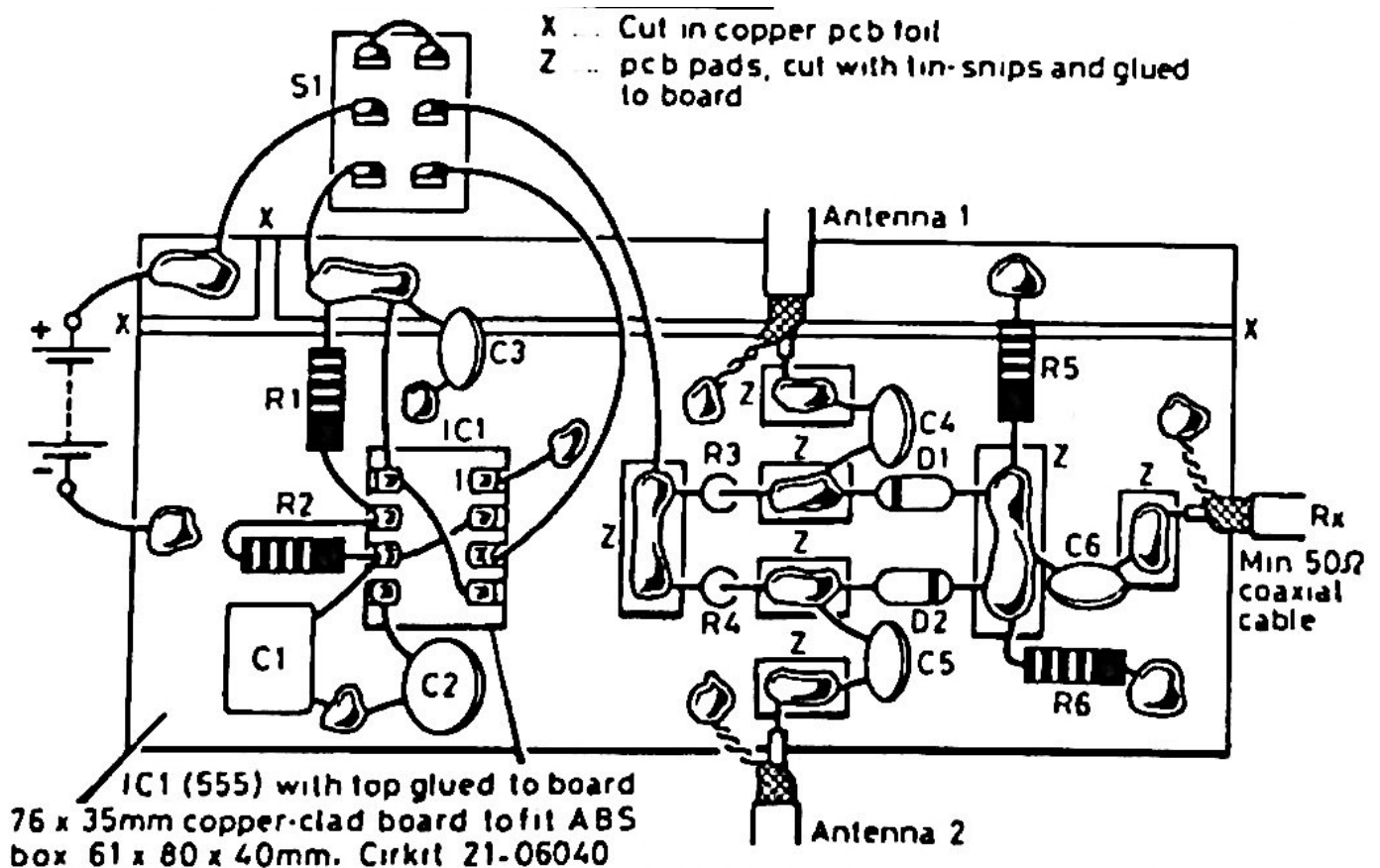


Figure 3. The 800 Hz electronic switch for Doppler D/P.



# Tips on Assembly

## Notes

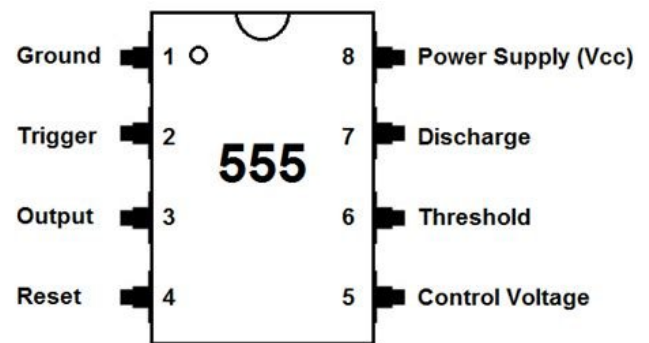
1. The layout shown below uses a piece of blank printed circuit board with the copper facing up, and this acts as "Ground" except for the strip at the top which is +9V.

Clean the copper until it's shiny. Steelo pads or fine sandpaper work well.

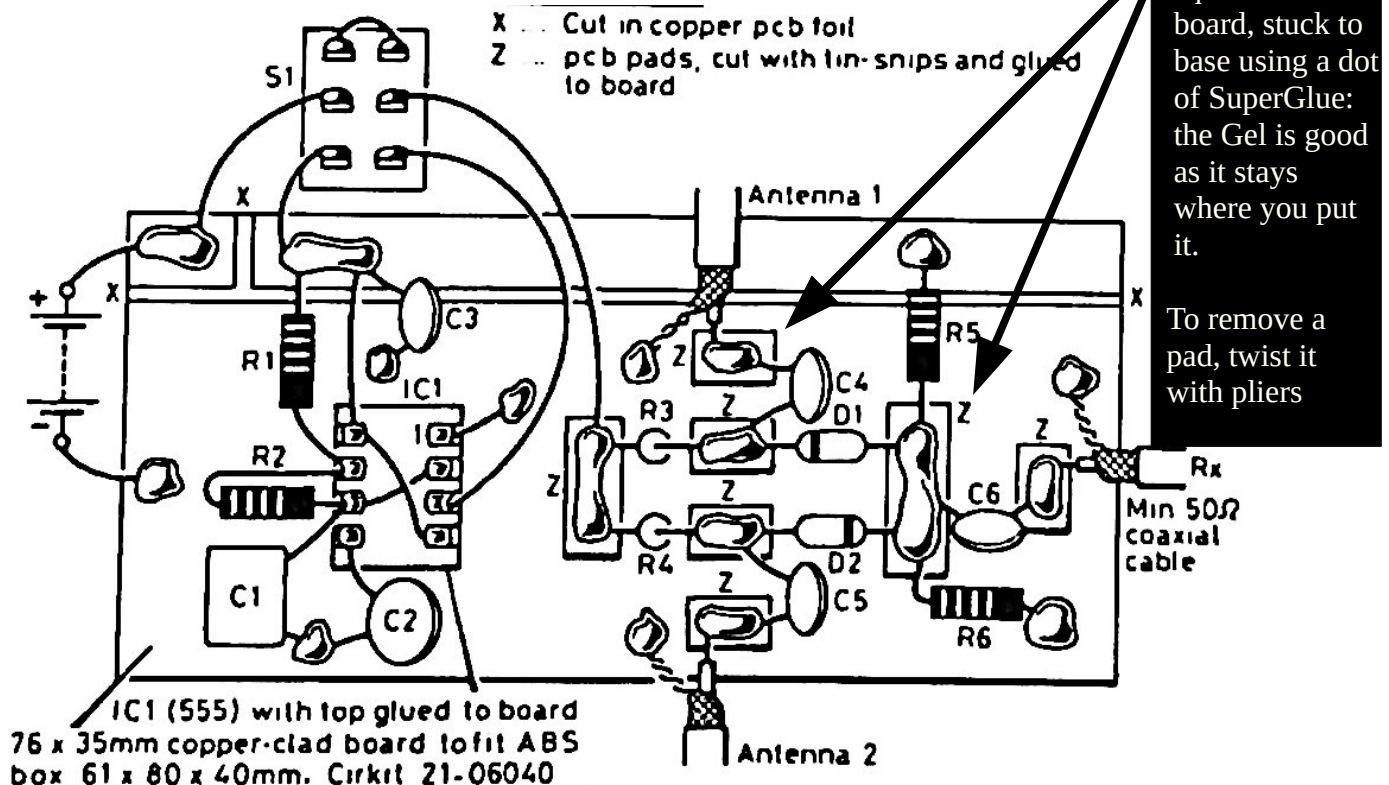
Optionally, spray the cleaned copper with clear plastic spray. This will keep the copper shiny and stop it from oxidising. The "Helmar Crystal Kote" spray for drawings, artwork, photos etc. from the art section of Warehouse Stationery works well. It only takes about 10 – 20 minutes to dry, then you can solder straight through it.

2. the 555 IC is upside down, so it's lettering is facing the printed circuit board, and the pins are pointing up (towards the viewer)
3. The toggle switch is a three-way – with a centre-off position.

If you're not used to dealing with ICs, the end with Pin 1 has a notch in it, and sometimes a painted dot beside Pin1, as shown.



## Using "Manhattan-style" Construction

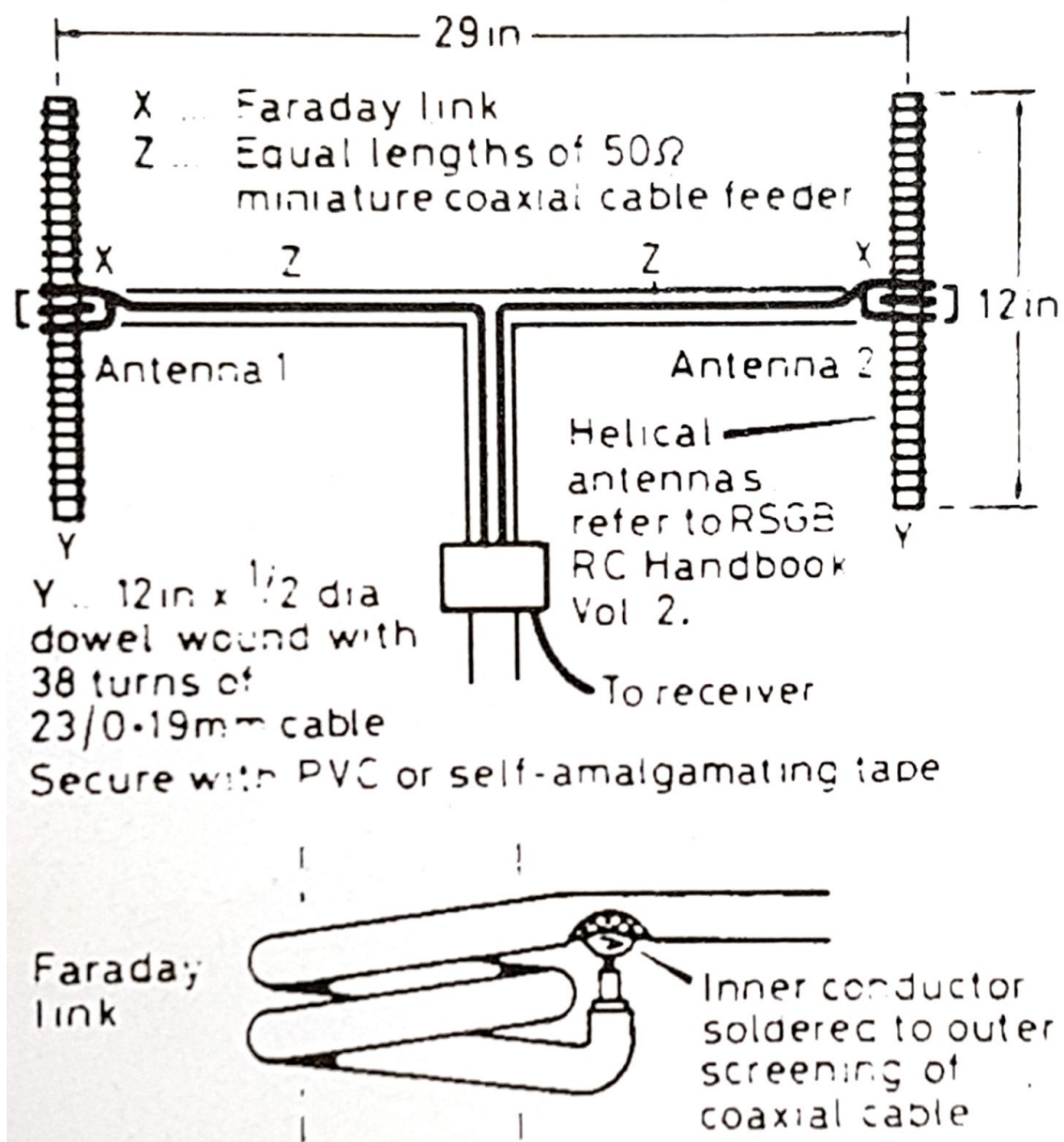


# The Antenna Pair

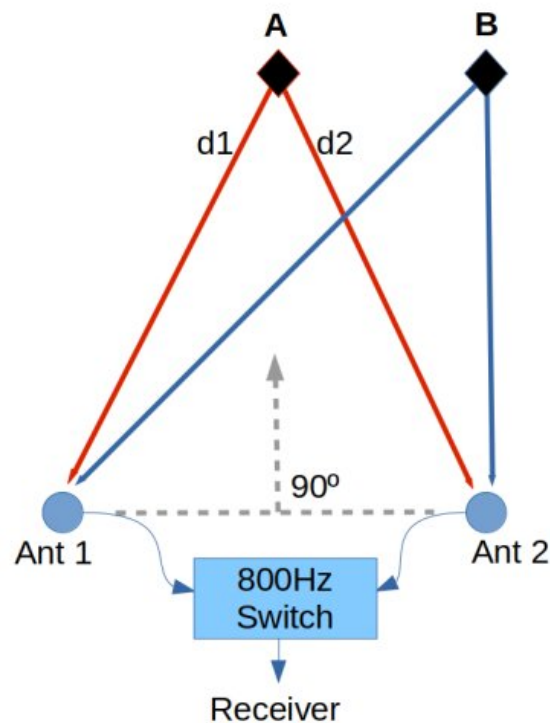
The most important point about the antenna is to keep both sides symmetrical so it's balanced.

The little box with the switching unit is shown mounted down the handle but it could be at the top, halfway between the two antennas.

In use, the helical dipoles are vertical, and there'll be a null when the antennas (and the Z-Z line) is at a right-angle to the transmitter



## In Use



**When transmitter is at A: no phase difference, so tone volume dips**

## Further resources

HomingIn - a site devoted to Radio Direction Finding

-- <https://www.homingin.com>

Intro to Foxhunting on YouTube

-- <https://www.youtube.com/watch?v=y-tLH0Hz08g>

An extensive and practical guide

-- <http://www3.sympatico.ca/alduncan/ham/RDFing.pdf>

Transmitter Hunting - Radio Direction Finding Simplified" - a book

-- <http://www.homingin.com/THRDFSinfo.html>