



# SHACKNEWS

## HIGHVELD AMATEUR RADIO CLUB

### MARCH 2012

### COMMUNICATION IS THE NAME OF THE GAME

**Meeting** There was no official meeting this month. Next meeting takes place on Saturday 21 April at the usual venue.

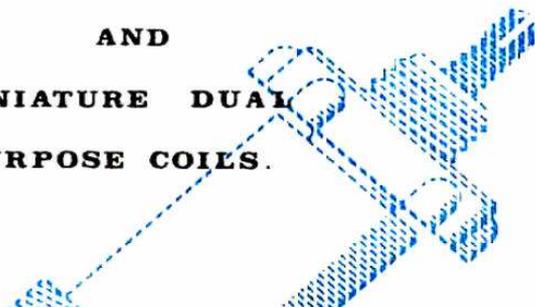
**ZS6SSC Social Club** The meeting held at Rex's home was reasonably well attended. The weather turned out very well and we were able to sit outdoors. Thanks to Rex and Ingrid for the use of their home and all the ladies who brought along extra goodies to eat. The next SSC do will be at the home of Berridge and Sandra on the 16 June. It is a public holiday but should have no effect.

Remember these ?

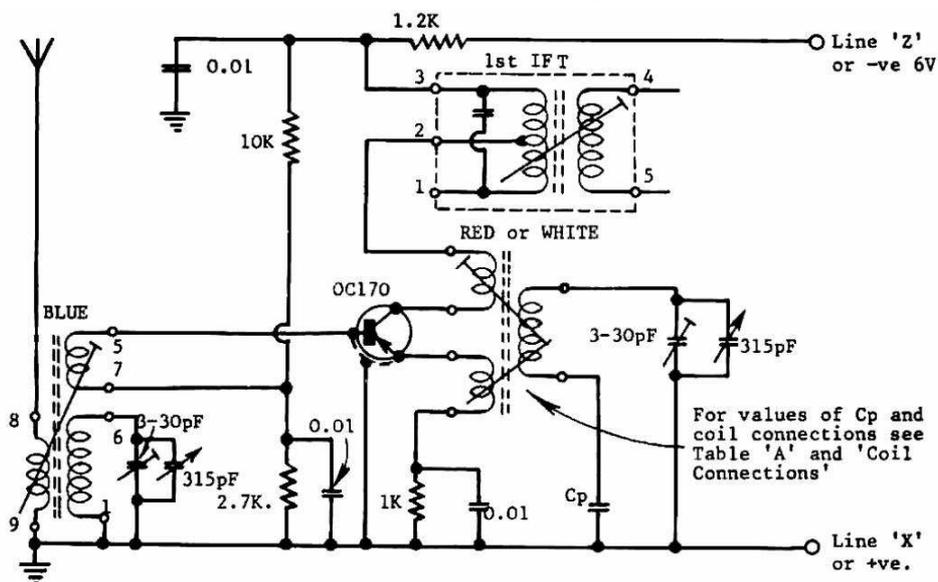
# MAXI-Q

TRANSISTOR

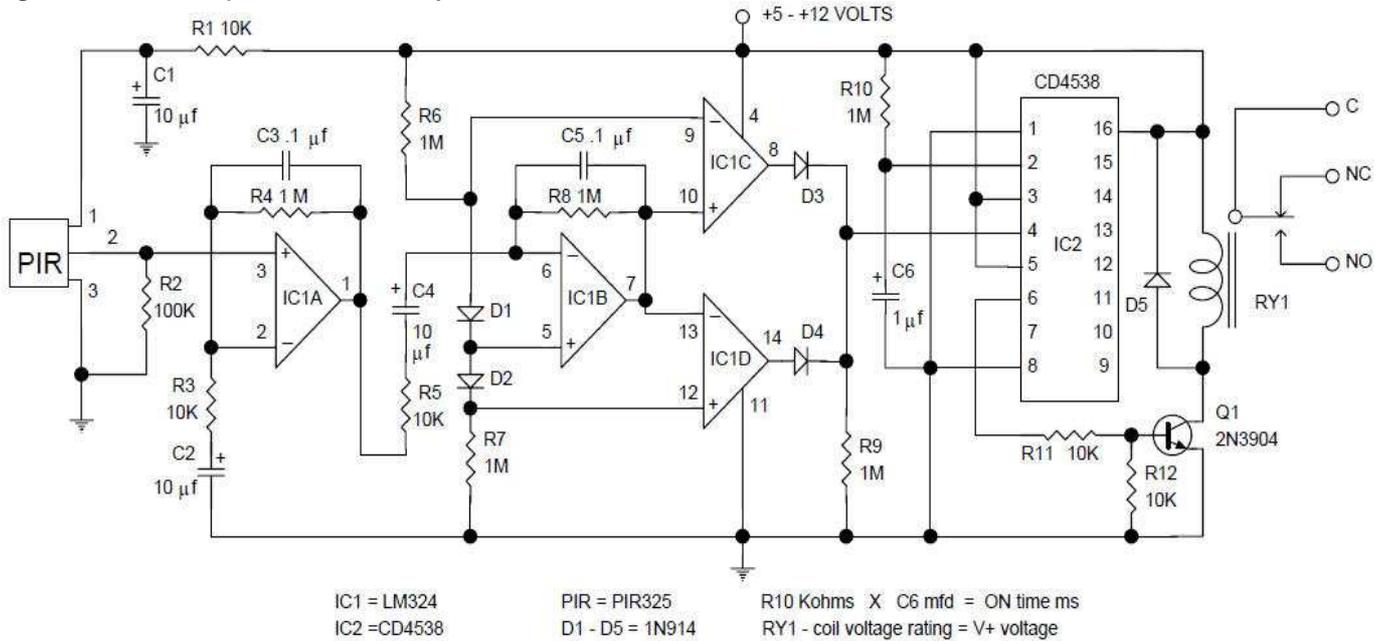
AND  
MINIATURE DUAL  
PURPOSE COILS.



Used in circuits like this



Might have a couple of these in your home



### MOTION DETECTOR

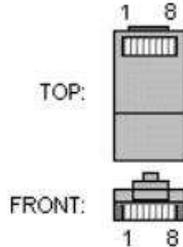
General purpose motion detector

This motion detector circuit uses a low cost LM324 quad operational amplifier as both a two stage amplifier and a window comparator. Amplifiers IC1A and IC1B have a gain of 100 each for a total of about 10,000. IC1C and IC1D form a window comparator that responds to signals about 200 millivolts above and 200 millivolts below  $V_{cc}/2$ . This window is set by the low current voltage drops across D1 and D2. Comparator outputs feed through D3 and D4 that pass only the positive transitions into CD4538 CMOS single shot IC2 which feeds into Q1 that drives relay RY1. The R10 and C6 time constant determine how long the relay remains energized after motion is detected. All components can operate on 5 to 12 volts. This type of circuit is often used to turn a light on outside of a house when motion is detected.

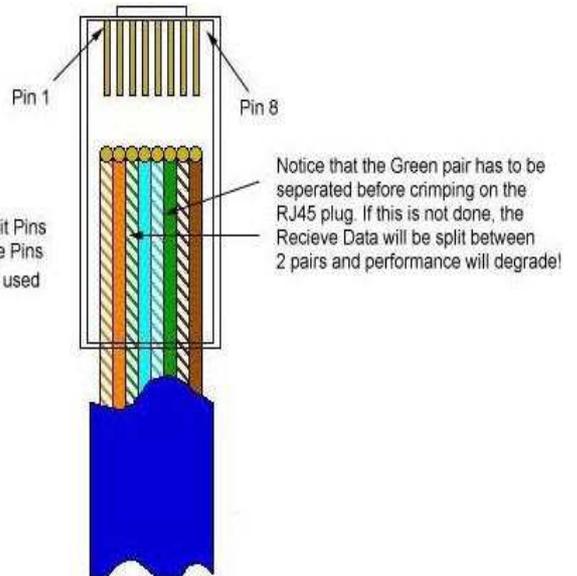
### The RJ45 common wiring



Pin 1



Pins 1 & 2 are the Transmit Pins  
Pins 3 & 6 are the Receive Pins  
Pins 4, 5, 7, and 8 are not used





Properly matching the antenna impedance to the line impedance is important, especially if you're using an automatic antenna controller. And, if your HF antenna doesn't require matching to provide a low SWR then you need a better antenna, a better mounting position, or both!

Further, proper matching reduces the chances of RF flowing on the outside of the coax feed line (common mode currents).

First, DC grounding helps control static discharges from the antenna, thus reducing some of the received hash we all put up with. Secondly it is a safety issue. If the antenna were to come into contact with a live overhead power line, DC grounding will help prevent damage to your equipment and perhaps to you as well. Newcomers might think that a DC grounded antenna won't work, but this is not the case. Just because we DC ground the antenna, doesn't mean it is RF grounded too. There are several ways to accomplish a DC grounded, RF match.

A simple inductor, like the one shown in the photo (upper right), will suffice. One end is attached to the antenna feed, and the other end is connected to ground. The ground end of the coil should be collocated with the coax shield ground. This coil has 7 turns, and .75 inches in diameter. The requisite number of turns, depends on the quality of the antenna, the mounting location and style, and the amount of ground losses present.

The coil at top left has 9 turns, is 1 inch (25.4mm) inside diameter, and wound with #14AWG (enamelled) wire. In actual use, the turns are spaced a little further apart to adjust the inductance. The coil needs to be about 1 uH, but in the real world, the value may be between .5 uH and 1.5 uH depending on the actual input impedance at resonance.

The coil's form factor should be kept close to 1:1 (length to diameter). Long skinny coils do not work nearly as well. There is a specific procedure which must be followed if proper adjustment of a shunt matching coil is to be achieved (read that as a relatively low SWR over a very wide range of frequencies) In addition, the coil must be correctly configured. Further, for best results the coil should be installed as clear of surrounding sheet metal as possible, not enclosed in any material, even plastic (especially gray PVC!), and not short-tapped! When matching coils are mounted close to mounting brackets, vehicle sheet metal, enclosed in any material other than air, or have some of their winding shorted out, their performance and linearity will suffer! Matching is achieved by borrowing a small amount of capacitive reactance from the antenna (the antenna is tuned slightly above the actual operating frequency), and the inductance of the coil. Together, they form a highpass, LC network which transforms the antenna's low impedance (typically 25 ohms or so) to that of the 50 ohm feed line.

The coils shown were wound using a sparkplug socket wrench as a form. For best results, the coil should be about 1 to 1.25 inches ID (25 to 32mm)

## More puns

I changed my iPod's name to Titanic. It's syncing now.  
When chemists die, they barium. Jokes about German sausage are the wurst.  
I know a guy who's addicted to brake fluid. He says he can stop any time..  
I stayed up all night to see where the sun went. Then it dawned on me.  
This girl said she recognized me from the vegetarian club, but I'd never met herbivore.  
I'm reading a book about anti-gravity. I just can't put it down.  
They told me I had type-A blood, but it was a Type-O.  
I didn't like my beard at first. Then it grew on me.  
Did you hear about the cross-eyed teacher who lost her job because she couldn't control her pupils?  
When you get a bladder infection urine trouble.  
Broken pencils are pointless.  
I tried to catch some fog, but I mist.  
What do you call a dinosaur with an extensive vocabulary? A thesaurus.  
England has no kidney bank, but it does have a Liverpool.  
I used to be a banker, but then I lost interest

### **CLUB INFORMATION**

**Postal address** PO Box 19937 Sunward Park 1470

**Website** <http://www.zs6hvb.za.net>

**Back Issues of Shacknews available on the club website**

**e-mail** [zs6hvb@zs6hvb.za.net](mailto:zs6hvb@zs6hvb.za.net)

**Repeater** 145.1875 MHz input - 145.7875 MHz output

**Linked** to 70 cm - 438.850 Mhz (Sunday bulletins)

**Bulletins** Sunday morning - 145.7875 MHz & 7062 KHz @ 08h45.  
Relay - 80M - 3662KHz

#### **Monthly meeting venue**

Germiston Methodist Church  
Room at back of the offices  
Lady Duncan Rd  
Germiston

*3rd Saturday of the month at 14:30*

#### **Committee**

Chairman	Ton van Dijk	ZS6ANA	011-432-5494
Secretary/Treasurer	Berridge Emmett	ZS6BFL	011-893-1291
Repeater	Ton van Dijk	ZS6ANA	011-432-5494
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#### **Club bank details**

First National Bank - Current Account 62116557309. Branch Code for EFT 250655  
Branch Code 201209 - Sunward Park