

ANODE

Inside this issue:

Editor's Comments	1
Transistor Spot Checker	1
A Crossed Dipole Antenna for 2m for ARDF	2
The Back Page	9

Editor's Comments

**Volume 11, Issue 5
November 2010**

Forthcoming Attractions

Field Day Contest

20-21 November - GPS South 26.23853 East 27.61797

ZS6WR Social and Flea Market

4th December at the Club house. Flea Market will start as usual at 12:00.

{—}

Wi-Fi Direct

[From Wikipedia, the free encyclopaedia]

Wi-Fi Direct, formerly known as Wi-Fi Peer-to-Peer, is a set of software protocols that allow Wi-Fi devices to talk to each other without the need for wireless access points (hot spots). Wi-Fi Direct is developed and supported by the Wi-Fi Alliance, the industry group that develops the Wi-Fi CERTIFIED standards suite and owns the "Wi-Fi" trademark.

Technical Description

(continued on page 6)

Transistor Spot Checker

The simple transistor spot checker is one of the most handy gadgets on the experimenter's workbench, especially if said experimenter has numerous surplus transistors with unknown histories or mysterious "in-house" part numbers. A quick check can confirm that the problem lies elsewhere when a new circuit fails to function properly or help jog the memory on whether a 2N2905 is NPN or PNP without a trip to the data book. The following schematic is of a tester I made about 30 years ago.

(Yes, they had transistors back then.)

The transformer is a miniature type that was used for interstage coupling in transistor radios and it has enough

series resistance to limit the transistor current to about 30 mA. The earphone was commonly used for toy "crystal" radios and it serves as an effective speaker with the earpiece removed. The neon lamp limits the voltage swing across the transistor and lights up brightly for a "strong" transistor. The switch has a centre off position although the circuit will not draw current without a transistor plugged in. Operation is simple: The transistor is installed and the 100k pot is turned to attempt to get an oscillation in one of the two switch positions.

A modern version of the spot checker is shown below:

(Continued on page 4)

Special points of interest:

- Contact details on back page (corrected & updated July 2010)
- Ham-Comp Latest on web site.

A crossed-dipole turnstile antenna for 2-metre ARDF



I came up with this antenna design for use with hidden transmitters on international-rules ARDF events. The rules call for an omni directional horizontally-polarized transmitting antenna at a height of two to three meters above ground level. Here in Southern California we have typically used vertical polarization in the past. This same antenna could be used for satellite or space communications as well with the addition of an appropriate reflector.

The electrical design is a classic crossed-dipole with 75-ohm phasing section. W4RNL has an excellent article on the electrical characteristics of this antenna with schematics and patterns online here. This basic design has a slight mismatch due to the difference between the 36-ohm characteristic impedance of the antenna and the 50-ohm feedline. This results in an SWR of about 1.3 to 1.

The parts used are relatively inexpensive. It will probably be cheaper to build several antennas at once due to the burden of buying some items in small quantities.

Parts:

- 2 ea. 1 1/4 inch trade size PVC pipe caps
- 2 inches long 1 1/4 inch trade size PVC schedule 40 plastic pipe
- 1 ea. 1/4-20 eyebolt
- 2 ea. 1/4 inch internal star lock washers
- 2 ea. 1/4-20 hex nuts
- 2 ea. 36 inch long 1/8 inch diameter uncoated bronze welding rod (see text)
- 4 ea. 8-32 x 1 inch long hex spacers (see text)
- 4 ea. 8-32 x 3/4 round-head machine screws

(Continued on page 3)

A crossed-dipole turnstile antenna for 2-metre ARDF

(Continued from page 2)

4 ea. 8-32 KEPS nuts

4 ea. #8 locking solder lugs [Mouser 534-906]

5 ea. ferrite cores [Mouser 623-2643002402]

16 inches RG-179 75-ohm teflon coaxial cable [Mouser 566-83264]

RG-58A/U coaxial cable of desired length for feedline (see text)

Suitable connector for your radio to fit above cable

Cable ties

Heat-shrink tubing

Silicone sealant

PVC solvent cement

tricky, but the following shortcut works well. Cut a narrow strip of paper long enough to wrap around the end cap at least once. Make a mark on the paper where it overlaps. Remove it from the end cap and fold it in half, aligning the marks. Then fold in half again. Unfold and make a mark at each crease. Now re-wrap it around the end cap and transfer the marks to the end cap. They will be at 90-degree spacing. Mark the end cap in four places, 3/8 of an inch from the lip of the cap where the pipe protrudes.

Drill four 11/64 or #16 clearance holes for 8-



Mechanical assembly

The case of the antenna is made from PVC plumbing pipe and fittings.

Case preparation

1. Drill a 1/4 inch diameter hole in the centre of each end cap.

2. Cut a piece of pipe approximately two inches long. Fit it snugly into one of the end caps. There should be about a half inch protruding.

3. The next step is drilling the element holes at 90 degree spacing around the circumference of the end cap. Aligning these can be

32 bolts at the marks, going through both the end cap and the pipe snug-fit inside. It is not necessary to glue the pipe to the cap. The bolts will hold them together.

4. Thread a nut and lock washer on to the eyebolt. Apply a small amount of silicone sealant to the threads and push the eyebolt through the hole in the top of the end cap/pipe assembly. Thread a second lock washer and nut on from the inside and tighten with a socket wrench.

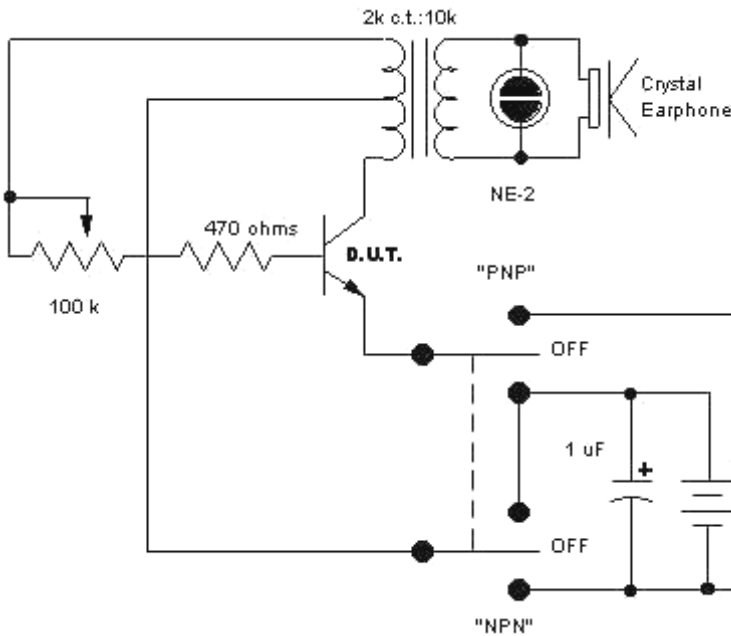
Wiring

1. Thread five ferrite beads on to the jacket of

(Continued on page 7)

Transistor Spot Checker

(Continued from page 1)



The transformer is a 1:1, 600 ohm audio transformer used for telephone line isolation. A centre-tap is made by connecting one winding to the other but the phasing is important. If your tester doesn't work, try reversing the connections to one of the windings.

bullet

The speaker is from a discarded headset for a modern radio or audio player. It should measure a few tens of ohms at least but not more than 100 ohms.

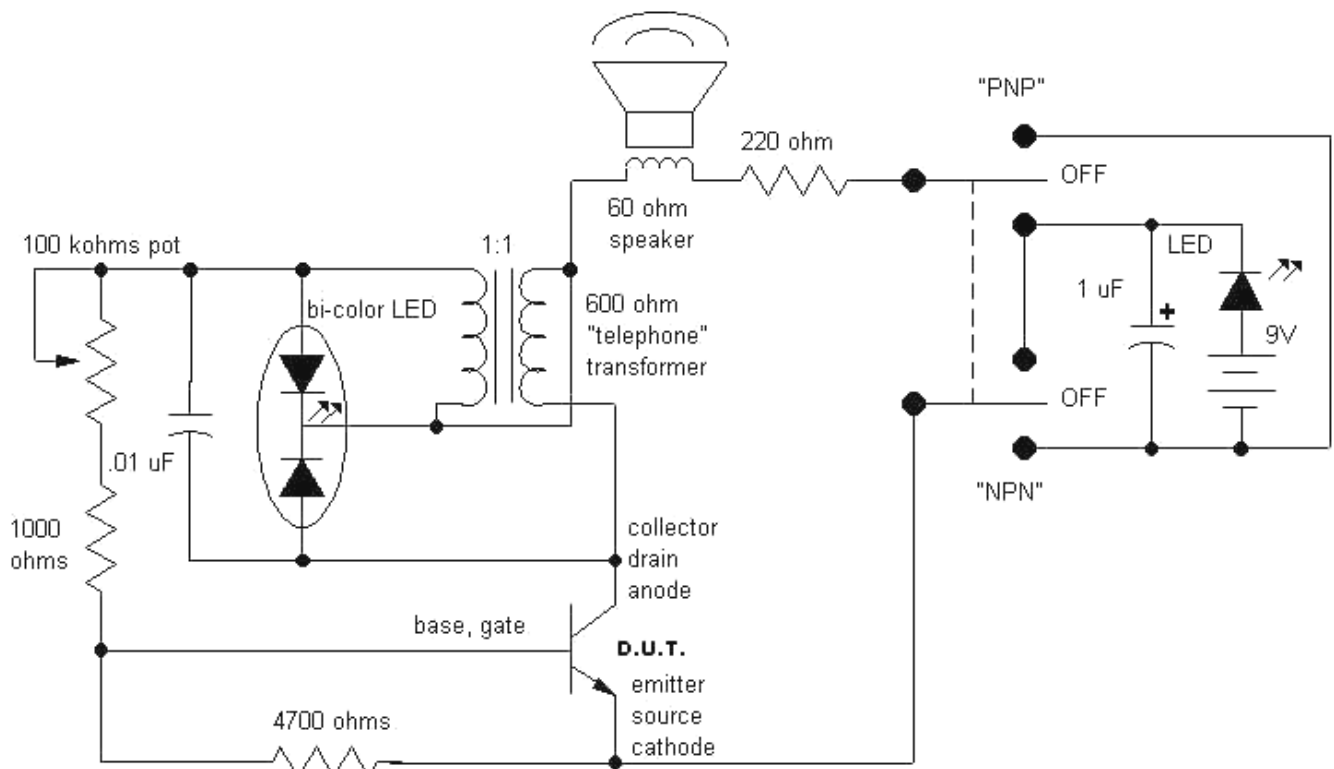
bullet

The neon lamp is replaced by a bi-colour LED which is just two different colour LEDs in one package. The colour changes as the intensity of oscillation varies making it easier to distinguish between different types of transistors.

New transistor tester schematic

It features parts more easily found today:

A significant difference between this circuit and



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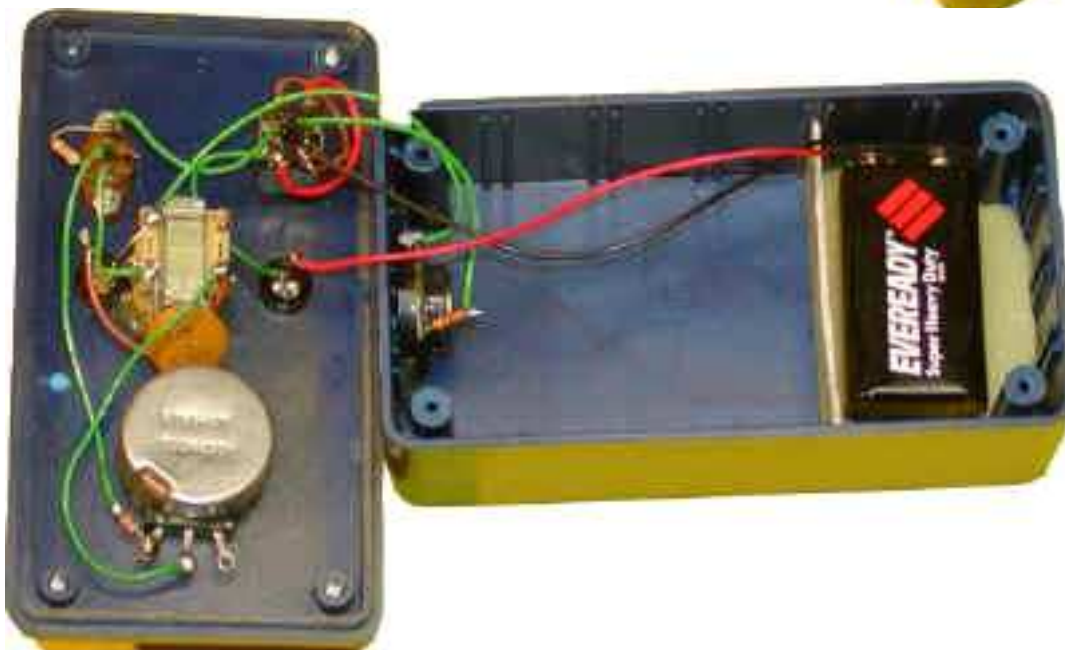
Transistor Spot Checker

(Continued from page 4)

the earlier version is the resistor between the base and emitter. This resistor makes it necessary to turn off the power even when no transistor is installed but it also gives the tester greater utility. It may be left out if only ordinary bipolar transistors will be checked. By including it, the tester will work with a wide variety of semiconductors:

NPN or PNP bipolar: install transistor, switch to NPN or PNP, turn knob until oscillation is achieved.

NPN or PNP Darlington bipolar: same as above, but knob setting will be near the higher resistance end.



VMOS FETs: N-channel will behave like NPN and P-channel will behave like PNP.

SCR: Install gate to base, anode to collector, cathode to emitter and select NPN. Starting with the pot in the highest resistance position, slowly turn the pot down until the power LED suddenly lights indicating triggering. The tester can only supply a few mA of gate current so very high current SCRs may not trig-

ger in this tester.

JFET: Don't plug in the gate lead! Drain and source go the collector and emitter. Turn on unit and touch the gate lead with your finger. "Hum" should be heard in the speaker if the JFET is good. The volume will depend upon the local field intensity and if the field is large enough, the lights will vary, too.

(Continued on page 6)

Transistor Spot Checker

(Continued from page 5)

Diodes: plug into collector and emitter. Power LED should light in only one switch position.

LEDs: plug into collector and emitter. LED will light in one switch position. IR LEDs will act like diodes but will not light (obviously).

Construction

The circuit is simple enough that point-to-point wiring is sufficient. The transformer is glued onto the back side of the front panel, the speaker is glued over a few holes in the bottom side and hook-up wire makes the connections:

Note that the 1 uF capacitor is not really present in either tester even though good design practice would recommend it. schematic.

By the way, watch out for some DPDT switches! Some of these switches short the two centre terminals together when in the off position so don't connect the battery here. The centre two terminals should go to the circuit and the battery connects to the outer terminals as is shown in the



The cheap blue plastic look of the inexpensive enclosure is quite effectively covered by "hammer" look spray paint. This paint is available in art stores and is similar to the grey "hammertone" paint used on factory painted metal boxes.

Editor's Comments

(Continued from page 1)

Wi-Fi Direct essentially embeds a software access point, or "soft AP", into any device that wishes to support Direct. [3] The soft AP provides a version of Wi-Fi Protected Setup with its push-button or PIN based setup.

When a device enters the range of the Wi-Fi Direct host, it can connect to it using the existing ad hoc protocol, and then gather setup information using a Protected Setup-style transfer. [3] Connection and setup is so simplified that some suggest it may replace Bluetooth in some situations. [5]

Soft AP's can be as simple or as complex as the role requires. A digital picture frame might pro-

vide only the most basic services needed to allow digital cameras to connect and upload images. A smart phone that allows data tethering might run a more complex soft AP that adds the ability to bridge to the Internet. The standard also includes WPA2 security and features to control access within corporate networks. [3] Wi-Fi Direct-certified devices can connect one-to-one or one-to-many and not all connected products need to be Wi-Fi Direct-certified. One Wi-Fi Direct enabled device can connect to legacy Wi-Fi certified devices.

The final specification has not been released, [6] and certain aspects of the system have not been mentioned to date. For instance, the system used for discovery and device classification, an

(Continued on page 10)

A crossed-dipole turnstile antenna for 2-metre ARDF

(Continued from page 3)
the RG-58 feedline.

2. Thread the feedline through the centre hole of the other end cap.

the matching section to a solder lug, insulating the shielding with tubing.

7. Similarly, solder both centre conductors to a solder lug.



3. Prepare the matching section of RG-179 by stripping both ends and separating the braid from the centre conductor. Stripped length should be 1 1/4 inches on both ends, with 13 1/2 inches of jacketed cable in between. The velocity factor of RG-179 is 0.69. If you substitute a different cable, adjust accordingly for a 1/4 wave section.

4. Attach solder lugs to one end of the cable, insulating with heat shrink tubing.

5. Prepare the end of the RG-58 feedline in a similar manner, stripping 1 1/4 inches and separating the braid and centre conductor.

6. Solder both the shields of the RG-58 and

Case Assembly

1. Using long nose pliers, thread the two lugs on the loose end of the RG-179 phasing section through two holes 180 degrees apart from each other. Secure in place with KEPS nuts. Tighten the nuts securely while holding the screw head from turning. Take care with the centre conductor as it is rather fragile.

2. Similarly, secure the two lugs on the feedline/phasing combination through the two remaining holes.

3. Secure a cable tie to the feedline below the

(Continued on page 8)

A crossed-dipole turnstile antenna for 2-metre ARDF

(Continued from page 7)

point where the jacket is removed to act as a strain relief.

4. Carefully fold the RG-179 cable into the pipe, watching for possible shorts.

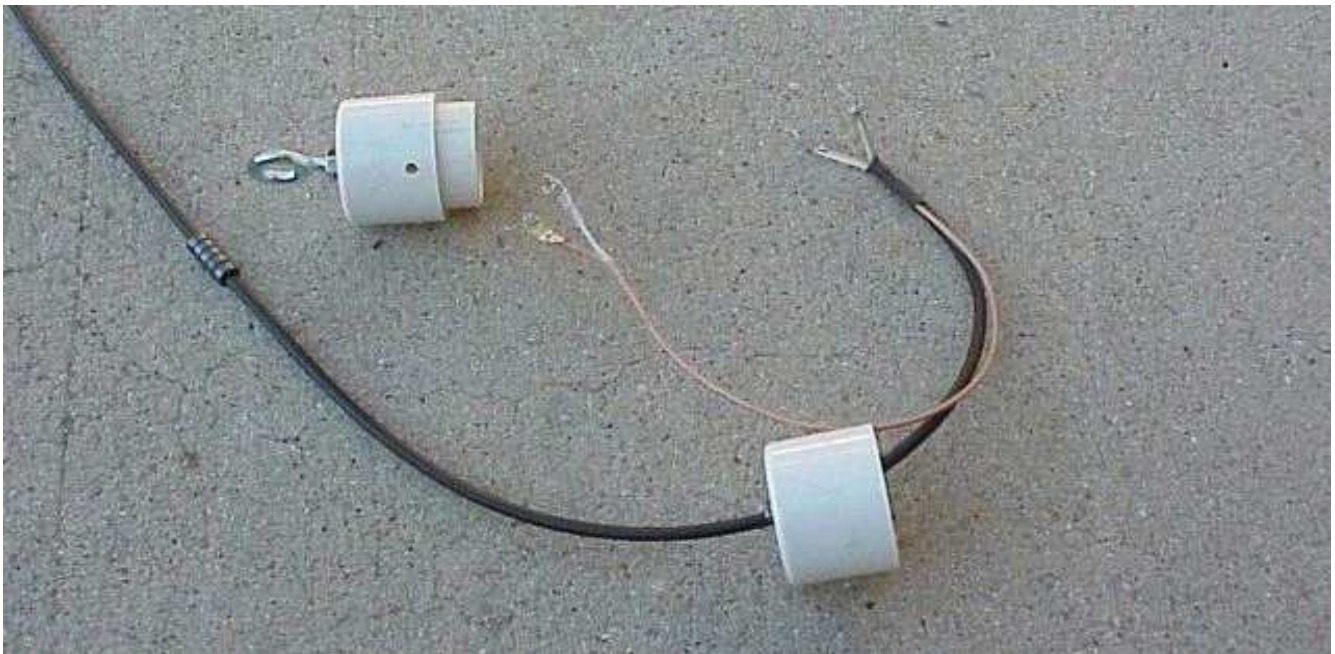
other. Hold in place for a minute or two until the cement hardens.

Element assembly



5. Press the end caps together on the pipe and perform an ohmmeter check. You should see continuity between the two studs connected to the shield braids 90 degrees apart from each other, and continuity between the two centre conductor studs, also 90 degrees apart. The pairs should not be shorted to each other.

The elements are made from 1/8 inch diameter bronze rod, commonly available at welding shops. This material comes in 36 inch lengths and is referred to as material 15, uncoated. I have used it for making numerous antennas and other projects. At one time it was sold by the



6. If all checks out, spread a blob of silicone sealant around the cable tie on the feedline to seal against moisture, apply some solvent glue to the protruding pipe and quickly push the two end caps together until they butt against each

piece. The last time I went to purchase it, I was told that it was only sold in sealed containers by the pound. One pound has eight pieces, enough to make four antennas. Apparently the vendor

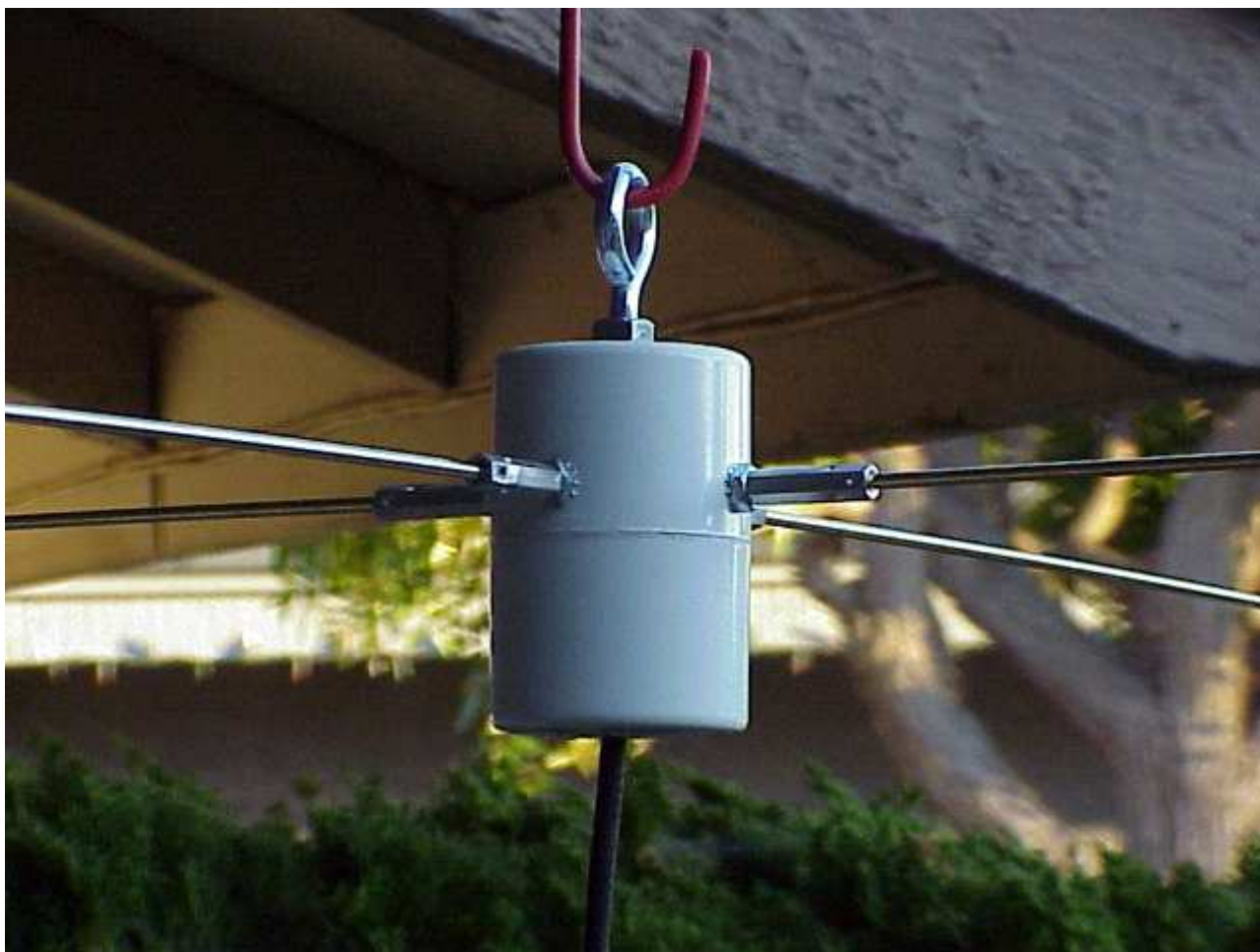
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A crossed-dipole turnstile antenna for 2-metre ARDF

(Continued from page 8)

wants to ensure that the buyer receives warning notices about the dangers of welding, etc. and thus it is now only sold in sealed containers. Your experience may vary. Similar material is likely available at hobby and hardware

for these spacers is 534-1474E. A substantial amount of heat and a good flux is required. Consider the use of a torch if you have one. Take care not to get solder into the opposite end of the spacer where it will attach to the antenna case.



stores at higher cost, but you won't have to buy a pound of it for one antenna. The 1/8 diameter material is a slip-fit inside the 8-32 spacers. Cut the rods exactly in half, yielding two rods 18 inches long. This length plus the added length of the spacer and the case gives a good match in the 2-meter amateur band.

On my first production run of these antennas, I purchased plated brass spacers. I inserted the rod about 3/8 inch into the spacer and soldered them in place. The Mouser part number

When making another batch, I found that the local supplier only had aluminium spacers in stock. Soldering aluminium is problematic at best. As an experiment, I used a prick punch and hammer to crimp the spacers on to the elements. I found this to be very strong and not have the problems of solder wicking into the remaining threads. Over time this method may develop issues with elements becoming loose but so far it looks very good. I made six crimps to each spacer, three near the centre and three

(Continued on page 10)

A crossed-dipole turnstile antenna for 2-metre ARDF

(Continued from page 9)

near the end on alternate faces of the spacer. The Mouser part number for aluminium spacers is 534-2219.

Final Assembly

1. Slide the ferrite beads down the feedline until the centre bead is 19 1/2 inches from the element studs. Secure the beads in place with cable ties above and below. The beads act as a choke balun.

2. Attach a connector to the other end of the feedline to match the one on the radio with which you will be using the antenna (PL-259, BNC, etc.) The feedline length is not critical. Note that ARDF rules specify a height of two to three meters above the ground, and the pattern will be distorted if the antenna is too close to the ground, so it's better to be a little long than a little short.

3. Thread the elements on to the studs. You may want to put plastic balls or wire-nuts on the ends of the elements to reduce the possibility of injury if someone were to run into the antenna.

4. Hang the antenna away from obstacles using the eyebolt, check SWR and performance. Note that the design SWR is about 1.3 to 1.

Improvements and options

Note that the materials and dimensions in inches are based on what is commonly available in the USA. Metric hardware could certainly be used. There is nothing special about the dimensions other than the element and phasing section lengths.

There is no reason that the same antenna could not be adapted for other bands, just scale appropriately.

If you choose to paint the housing to reduce visibility, consider the use of some of the newer spray paints designed for plastics. Regular paint doesn't adhere well to PVC. You might also want to mask off a small area around each element stud. I'm not sure of the RF characteristics of paint.

There is a huge variety of configurations available in the way of PVC pipe fittings. Alternative mounting options like a threaded pipe mount from below as opposed to or in addition to the eyebolt are possible.

Jay Hennigan, WB6RDV 2004

Please report problems to: jay@west.net

Editor's Comments

(Continued from page 6)

analogue of UPnP or Bonjour, has not been mentioned in existing references.

Devices supporting the new standard are expected to appear in late 2010,[6] although some companies announced support in late 2009.[7]

" Bye Bye Bluetooth

[Posted by Mayank Agarwal on Thursday, October 15, 2009]

WiFi & Bluetooth

Come 2010 and no longer would you be using

Bluetooth for short range file transfer. What's coming from the WiFi Alliance is a really ground breaking stuff. WiFi Direct a new set of standards will turn your 'WiFi gadget' into an access point.

What does this mean?

In simple words you would no longer need a WiFi Router for a peer to peer file transfer. This means days of Bluetooth are numbered. This means very high speed peer to peer transfer (30 times faster than Bluetooth) within a radius of 300 feet.

(Continued on page 11)

Editor's Comments

(Continued from page 10)

How will it work?

Any WiFi Device will be able to upgrade to WiFi Direct by a software upgrade and all new devices will be certified as "Wi-Fi CERTIFIED Wi-Fi Direct".

WiFi Alliance consortium includes Intel, Cisco and Apple and almost all big players.

In a press release Wi-Fi Alliance executive director Edgar Figueroa said

Wi-Fi Direct represents a leap forward for our industry. Wi-Fi users worldwide will benefit from a single-technology solution to transfer content and share applications quickly and easily among devices, even when a Wi-Fi access point isn't available."

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From the August 1990 ANODE

1. REPEATER USAGE

The West Rand Repeater, much to the delight of your Committee, is seeing far more activity of late and now appears to becoming a vital link in the P0 (amateur) communications network. In order to maximise this usage some guidelines are offered below:

Listen before calling: It often happens that users simply key microphone before listening to make sure that a QSO is not in progress. Also what happens (believe it nor not!!) is that the audio (volume) on the rig is turned down and thus the potential user thinks his rig is not receiving. Check this before going on the air.

Leave a Pause: Cultivate the habit of hearing a pause between 'overs' and to force this, wait until the "tail" of the repeater drops out. This is especially important to allow other potential

users to break in - possibly to your QSO but even more important - there may well be emergency traffic to be carried.

Simplex wherever possible: The repeater by its nature provides extended coverage for all stations but if at all possible use a simplex frequency for your QSO. However, if a simplex frequency is chosen, stay within the agreed band plan. Try 145,500; 145,550 or 145,200. Avoid 145,800 - 145,999 like the plague!! This latter portion is reserved for satellite usage and much aggravation is caused if this is used for ordinary simplex contacts. Try single sideband on 144,250 or 144,300 for a QSO with a difference!!

The Bandplan for 2 meters, 6 meters and 70 centimetres is enclosed with this issue to help you select your most appropriate frequency.

Whilst on the subject of simplex, our 70 centimetres repeater will, in the very near future, be put into service again on a frequency of 439,000 Mhz (output). If you want quiet, undisturbed contacts don't forget this 70 centimetre band. Coverage is as good as 2 meters with commercial equipment suitable for modification being fairly easily obtainable.

The West Rand Amateur Radio Club

Established in 1938

KG33XU 26.14122 South - 27.91870 East

P.O. Box 5344
Weltevreden Park
1715

Phone: 083 267 3835 (Chairman)

Email: zs6wr.club@gmail.com

Web page: www.zs6wr.co.za

Bulletins (Sundays at ...)

11h15 Start of call in of stations

11h30 Main bulletin start

Frequencies

439.000MHz 7.6MHz split

Input: 431.4MHz (West Rand Repeater)

145,625 MHz (West Rand Repeater)

10,135 MHz (HF Relay)

Radio Amateurs do it with more frequency!

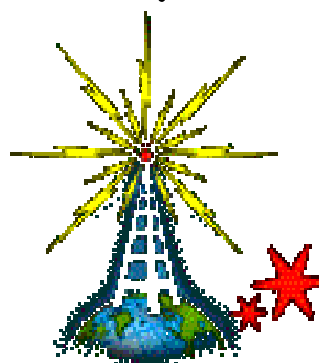
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West Rand members - we need your input!

To make this the best ham radio magazine in South Africa we need your input. Please submit articles, comments, suggestions etc.

Please send plain text with no formatting to the email address below.

See Club website at www.zs6wr.co.za for all ANODE back issues.



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