

# ANODE

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## Editor's Comments

**July 2004**

This is the last Anode issue for this year. If you look at the top of the Anode, you will see that we have got to issue 12. That's the end of this volume. That also means: -

**Club AGM on 17th of July at 14:00 in the clubhouse.**

Your subs are due then as well so start saving your R75 (6.25 pounds sterling)

**You still need lightning protection in winter!**

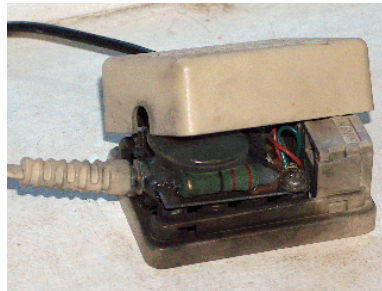
It might be mid-winter but the lightning struck my tower Wednesday fortnight ago. The resulting induction blew up the lightning protection unit. See below.

[Lots of nice gadgets seen in the U.K. Rechargeable batteries of the Nickel Metal Hydride type, at very reasonable prices.]

**News**

**Ham Radio In Space: Echo Is Up And Running**

The newest Amateur Radio satellite is now in orbit and doing fine. Chuck Green, NOADI, *(Continued on page 2)*



## EH Coffee Can Antenna WOkph's Coffee Can 20 Meter Antenna

**Building The Antenna**

The antenna is built around two one pound coffee cans. The spacing between the cans is one can diameter. I used 3/8" Lucite square rod as the support elements. These were each 14 7/8" long. In the centre of the bottom can, I mounted a Lucite insulator. The voltage at the top of the coil is very high, and a suitable insulator must be used. This one had a thickness of 1/8". The



connected as close as possible to the top of the centre of the bottom can.

Note: must be connected to the outside of the can, not inside the can....

The coil is mounted on the inside of the bottom can on standoffs made of 3/8" inch Lucite rod. The centre of the coax is connected to a small clip to adjust the coil so as to resonate it to the desired centre frequency. When *(Continued on page 5)*

**Special points of interest:**

- Contact details on back page
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## Editors Comments & News

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reported by phone from the Baikonur Cosmodrome that the launch of AMSAT Echo and the other satellites occurred on time on June 29th at 0630 UTC. He watched the rocket climb out and said it appeared to be flying straight and true. A second phone call from Chuck 18 minutes later confirmed that the launch carrying AMSAT OSCAR Echo was successful and that all spacecraft had separated successfully.

Chuck was assisted in the final integration and checkout process at Baikonur by the team from SpaceQuest, which included Dr. Dino Lorenzini KC4YMG, Mark Kanawati N4TPY, and Lyle Johnson KK7P. The SpaceQuest team members are also AMSAT members and volunteers.

First contact with Echo was at 1452 UTC on June 29th. After collecting a bit of TLM the 435.150 MHz transmitter was turned off at 1500 UTC. The preliminary keps were observed to be pretty close. The first look at Echo's telemetry shows things are looking good.

The battery was fully charged and the panels were delivering about 950mA, which is fine. The panels were supporting the transmitter power adequately at about 2.3W output. The bird appeared to be tumbling as expected. Internal temperatures are around 10 degrees Celsius which is also as expected.

On the second pass the loading of software began and good progress was made.

Telemetry continues to look very good. While fades clearly indicated Echo continues to tumble (as expected), at 2.2 Watts output good bits were received without difficulty. Rather than turn the transmitter off at the end of that pass, based on a very good-looking power system, the power was turned down to about 0.3 Watts.

The hour between passes was spent closely examining the captured telemetry and comparing it to pre-launch testing, as well as tweaking the keps a bit.

During the second set of passes approximately twelve hours later, the command team finished loading the house-keeping software. The house-keeping task is up and running as of June 30th at 0525 UTC. With more data available on the power systems performance the transmitter has now been left at about 1.2W.

The morning passes on June 30th concentrated on gathering telemetry. The evening passes continued with checkout activities.

A telemetry decode program, TLMEcho, is available for those who would like to view and report data from Echo. It may be downloaded from AMSAT.ORG in the Echo project area,

<http://www.amsat.org/amsat-new/echo/>

If you record telemetry please send the CSV files to [ke4azn@amsat.org](mailto:ke4azn@amsat.org).

Please do not transmit to Echo until checkout and commissioning has been completed and the satellite is made available for general use. Unexpected uplinks may cause delays in verifying the proper operation of ECHO and delay the opening of the transponders to general use.  
(AMSAT, WD0E)

### **A Searchable CQ Magazine Archive**

Finding an article or an advertisement in a back issue of CQ Magazine is about to become only a mouse click away. This, as CQ Communications and Buckmaster Publishing announce plans to create a searchable on-line archive of CQ magazines back issues.

Buckmaster, which produces the Hamcall CD has for decades filmed issues of CQ onto microfiche for use by researchers and hobbyists. Buckmaster also provides advanced scanning and searching technology for on-line posting of documents for major corporations. Now this same technology will be applied to back issues of CQ.

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## Editors Comments & News

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As currently envisioned, searches will be free, while access to reading and printing specific pages will require a subscription at a nominal fee. Eventually Buckmaster plans to have every issue of CQ available dating back to the magazine's first issue in January 1945.

A beta test version covering CQ from 1990 to 2002 is already on-line. The archive may be accessed at <http://hamcall.net/cgi-bin/cqcgi>. (CQ)

### **Broadband Power Line - Score one for the good guys**

A major broadband-over-power line pilot test by Alliant Energy in Cedar Rapids, Iowa is shut down after local hams document the harmful interference and the Federal Communications Commission gets a formal complaint from the A-R-R-L. We get the details from Amateur Radio Newsline's Mark Abramowicz NT3V:

It took nearly three months to accomplish the mission, but amateurs in Cedar Rapids - armed with ample data and the muscle of the American Radio Relay League - convinced Alliant to prematurely halt their B-P-L test.

Jim Spencer, W0SR, first discovered the interference on his HF radio right after Alliant

launched its B-P-L testing March 30.

Spencer, who quickly mobilized other Cedar Rapids hams to form a technical committee, says the interference was so severe that it wiped out his and others' ability to use their radios.

Spencer says the group worked with Alliant officials to try to resolve the interference and conducted several test measurements with the utility's cooperation.

Spencer tells Amateur Radio Newsline the group appealed to Alliant to shut down the system and stop the interference on several occasions. But it was clear the B-P-L industry was telling Alliant's managers something else.

"There's a lot of regulatory uncertainty here," Spencer explains. "And that what the hams were calling harmful interference - in my case S-9 signals, you know, every 1-plus kilohertz across the band, they were being told that wasn't really harmful."

Spencer says communications between his technical group and Alliant officials were civil, but they accomplished little action. He says he and others filed complaints with the FCC.

"I think in 21 communications I received one simple response basically told me to go back to the power company -

the operator of the system," Spencer says. "And, of course, I had done that all the time. So, we had been asking the utility company to close it down, we had been asking the FCC to help us and then the ARRL went and escalated that."

Wade Walstrom, W0EJ, is the ARRL's Midwest Division Director. He says the league's FCC complaint finally got the utility's attention.

"The thrust of the complaint was that they were now aware that the system was causing interference and didn't shut the system off so now that makes it willful interference," Walstrom said...

Alliant stopped the B-P-L pilot test on June 25 saying it had gathered the necessary data to make a determination on whether a general rollout of B-P-L would be worth pursuing, according to Spencer. He says Alliant's project leader told him the ARRL's FCC complaint was just one factor in the company's decision.

"Obviously we're happy, but we didn't feel like we had won," Spencer said. "We felt like this was a technical problem and that we tried to communicate some of the technical parameters to them and that they'd made a good business decision."

Spencer says an Alliant representative told him the company

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## Editors Comments & News

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has no plans to pursue B-P-L at this time.

"In order to distribute it out to a sparsely-populated rural area with all the equipment it would take, it's not clear that this thing makes economic sense," Spencer says. "And that this really can meet the goals of the rural user which is one of the things that people touted."

The ARRL's Walstrom is cautiously optimistic Alliant's decision might have a ripple effect.

"We would hope that other utilities or other organizations that were looking to possibly use B-P-L as a source of revenue will look and see the decision that Alliant has made and re-think their own plans and hopefully decide that maybe there are other ways to provide broadband internet connections to the population as a whole," Walstrom says.

Walstrom says the Cedar Rapids group led by Spencer has set a precedent. "All the proof on how well it's going to work isn't there yet," Walstrom says. "And the proof that we have established here in Cedar Rapids and is coming out from other parts of the country is that it's not an interference-free system by any means and in fact it causes a lot of interference and we've documented that here."

Spencer says his committee, consisting of a group of engineers - most of them retired

from Rockwell Collins - stuck strictly to technical evidence in communications with Alliant. But he says its clear B-P-L has taken on a very political tone.

"Obviously the problem has got a lot of political implications, but the thing that hams can do is remain professional and keep it primarily on a technical level," Spencer says.

The ARRL's Walstrom says if he could stand before the FCC panel to make his case, he would strongly urge the commissioners to postpone action on or even walk away from B-P-L.

"I think they need to delay it until they're satisfied that they're able to mitigate any interference problems at all and by mitigate from an amateur radio standpoint that really means eliminate," Walstrom says.

Spencer adds, there are no hard feelings toward Alliant. Spencer says he and members of his technical group still have a good, working relationship with the utility.

"We've had quite a bit of communication back and forth through this whole thing," Spencer says. "I mean I've had many, many e-mails and some phone calls and I would say that it was pretty positive and still is."

For the Amateur Radio Newsline, I'm Mark

Abramowicz, NT3V, in Philadelphia.

### **Cw Is Going Strong**

If you think Morse code is on its way out, the ham radio business community probably disagrees with you. At least that's the impression one gets thumbing through the articles in the July issue of CQ Magazine.

Not only are the ads for Morse related products holding steady, but the new products area has some reviews of the latest CW related products. And not to be outdone, Dave Ingram, K4TWJ, devotes his World of Ideas column to Morse Keys from around the world.

If you are a Morse lover, this is the CQ edition for you. It's on your newsstand now.

More information is on the web at [www.cq-amateur-radio.com](http://www.cq-amateur-radio.com).

See you at the AGM.

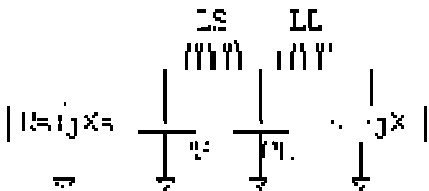
JB

## EH Coffee Can Antenna

### W0kph's Coffee Can 20 Meter Antenna

(Continued from page 1)

you are finished with the construction of the antenna, measure the capacitance between the two cans. It will be in the range of 8 - 10 pfs. This will be used in the design of the antenna tuner....



I used a 3/4-inch board to mount the antenna on. The p.v. c. pipe connector is a three-way one-inch T connector cut in half and fastened to the wood base. I mounted the coax connector to a small metal plate and fastened it to the base with small wood screws.



#### Building The Antenna Tuner

In my junk box I had two MFJ-160-10 antenna tuners. I had



**Antenna shown mounted on an 8 ft PVC pole on the Balcony Railing**

not used them for years, so I tore them up as the base for the antenna tuner. They cost 49 dollars, so I suggest that you build an antenna tuner from scratch. Its a lot cheaper that way.

The first step is to run the Java Script program and get the design of the tuner. Measure the capacitance between the two cans, input the frequency

desired. I used two steps to get the proper phase shift and impedance match to the antenna. 50 to 20 ohms for the L network and 20 -30 ohms for the T network.

To get the actual value for the T network, load you can build up the cans, mount the coil in the base of the bottom can. take the antenna out into the open

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## EH Coffee Can Antenna

### WOKph's Coffee Can 20 Meter Antenna

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area. Connect a MFJ 259B and adjust the coil to get zero reactance. This will cancel out the capacity of the two cans. In other words, resonate the antenna... The MFJ will show you the value of for the output of the T network. I find that 30 ohms gets me very close... The antenna tuner consists of two coils and two variable capacitors. I used a large trimmer for

Then in the antenna itself I used a small copper clip to adjust for the extra inductance (see picture). The antenna tuner should be weather proof. I should be mounted just below the antenna on the pole. I mounted them at the base of the antenna because its easier to reach to tune up the system. Its your call.....

it. When you are finished you should have a perfect 1:1 at 14.1 MHZ. the band pass 2:1 on my antenna was 13.3 to 15.8 MHZ.

Connect it to the transmitter and have a ball...

Last updated on February 20, 2003



the first cap, and the tuner variable with a small trimmer to ground to get the computed values. There are two coils. The first coil,  $L_s$ , is connected between the input and the main tuning cap. The second coil I made the same value as  $L_s$ ,

#### **Tuning The Antenna**

Once you have finished both the antenna and the tuner. Put the antenna in place. Connect up the tuner. I connected the tuner to my MFJ259B. Tune the bridge to the desired frequency. I used 14.1 as my centre frequency. Adjust the tuner to get as low a SWR as Possible. the tune up and down to find the lowest SWR. If the lowest SWR is below 14.1, move the clip on the coil for less inductance. Retune. This means that you will have to take the antenna down, open it up and change the coil clip. Its gets kind of tiresome, but I really don't know any other way to do



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**Bulletins** (Sundays at ...)  
11h15 Start call in of stations  
11h30 Main bulletin start

**Frequencies**  
439.000MHz 7.6MHz split  
(West Rand Repeater)  
145,625 MHz (West Rand Repeater)  
10,135 MHz (HF Relay)

## Radio Amateurs do it with more frequency!

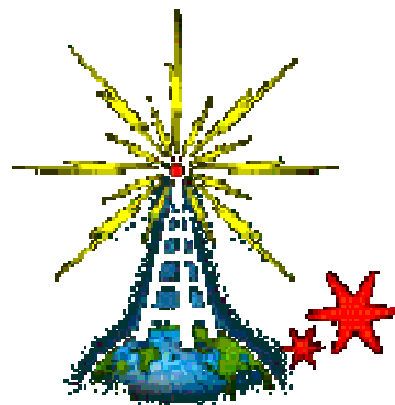
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## West Rand members - we need your input!

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.

In July 2003, we re-published an Anode Compendium on CD. It has the issues from July 2000 until June this year. This included the new Adobe reader. It has been updated, check with the chairman for details.



**We need your input! Email us articles, comments and suggestions please.**  
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