

Mich-A-Con RF

Iron Mountain, Michigan

August 2004

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Visit the ARRL's web site at:
<http://www.arrl.org>

A 20-Meter Half Square Antenna For QRP Portable Operation by Mike Bray, K8DDB

I've always enjoyed tinkering with wire antennas with the hope of finding a magic configuration that was easy to erect and also made good use of the meager power from my QRP rig. The idea for a portable half square came about while learning to use EZNEC¹ antenna modeling software.

I found that I could get a fairly good radiation pattern with the horizontal portion of a 20-meter

half square antenna only 20 feet above the ground. I decided to use two SD-20², 20 foot telescoping fishing poles to support the antenna. They are light weight and collapse to a length of 4 1/2 feet.

The base of the poles are fitted with a 1 1/4 inch PVC sleeve, PVC fittings, a wooden dowel and a 12 inch spike for easy mounting in average soil.

The half square is made of a two strand computer ribbon cable 100 feet long, 47 feet of which is used for the balanced feed line. The remainder of the cable is peeled apart to form the radiating elements. The vertical elements are 17' 8" long and the horizontal element is 35' 5" (see Figure 1.) Using ribbon cable for the feed line is not the most efficient approach, but I felt it was an acceptable compromise for the sake of portability.

The antenna is attached to the SD-20 poles with fishing swivel-snaps, one at each corner. The swivel-snaps are held in place with nylon tie-wraps. Small fishing sinkers are attached the vertical element ends after the antenna is erected to keep them taut. Banana plugs are placed on the end of the feed line to allow easy attachment to my Emtech ZM-2³ tuner which is used as an in-

terface between the rig and antenna. The antenna is stored on a 7 inch tape reel, which allows for tangle-free deployment and compact storage.

The SD-20 poles are made of graphite and tend to detune a resonant antenna if the wire is close to the poles. To solve that problem, I spread the base of the poles a few more feet apart than the

horizontal part of the antenna. The poles flex to keep the horizontal part taut and the vertical elements away from the poles. The antenna is easy to erect, and by using two SD-20 poles it can be set up independent of other supporting structures. In

addition, the antenna can be "rotated" by moving the pole that is the farthest from the feed point in an arc.

Does it work? Within a month of building the half square I had worked 21 states, Italy, Belarus and three Australian stations QRP, one of which was Alan, VK6PG, in Noranda Western Australia. The distance to his QTH is 10,869 miles, my farthest QRP QSO yet!

As a further test, I decided to try the 20 meter half square and my Sierra for Field Day 2002. My cousin Don and I operated class 2B-Battery from Lake Mary Park, about a half mile from my home. Our intention was to operate casually, only a few hours each day. So, we had to break down our stations Saturday afternoon and set up again Sunday morning. Setup and breakdown were easy, taking only about 20 minutes includ-

(Continued on page 3)

WESTERN AUSTRALIA — ITU ZONE 58

VK6PG RSGB
RSARS
WIA

21579018 02956

CONFIRMING QSO

TO RADIO	DATE	CST	MHZ	MODE	RST
K8DDB/ARRL	8-9-00	1335	14.058	2x4W	439

73 DE *Alan*

ALAN J. GIBBS 223 CRIMEA STREET,
NORANDA 6062.

FSE
TNX
QSL

Words from the President

I am scrambling for “words” this month so please try to follow along as my mind wanders on many topics. [Some of them might actually be related to ham radio!

I spent several hours the past few days printing QSL labels and getting cards ready to mail.. I received my last envelope from the 8th Area QSL Bureau in July and I thought that I’d better get going on the replies. If you don’t have an envelope (or more) on file with the bureau, please do so. You’d be surprised at the number of hams around the world that need Dickinson county or Michigan. It is also good practice to answer the cards that have been sent to you. This is, of course, assuming that you have made contact with hams that are out of the USA. Information about the 8th Bureau can be found at arrl.org. You don’t have to be a member of the League to use this service.

You do have to be a member to use the ARRL Outgoing QSL Service. This bureau will send your cards to various QSL Bureaus throughout the world. For ten cards the fee is \$1. I usually send out 30 to 60 cards every four months and this cost is about \$4 for each batch. I only use this service for replying to cards. I send a SASE, IRCS (International reply Coupons), or cash to receive cards from countries I need for my DXCC credit, or for various modes. I have 314 worked out of 335 total countries and 307 confirmed. QSLing can be expensive but so are most hobby related materials. I have saved a

few foreign stamps from hams throughout the world if anyone is a collector. Let me know if you’re interested.

Fall is in the air...UGH! Where did the summer go? What summer? Oh, we did reach 88 degrees one day in May. I like fall. I hunt waterfowl, hunt deer, fish for walleye, and fix antennas. This is a nice time of year to do some maintenance on those dipoles and beams before the snow flies. Of course, you wouldn’t be a ham if you hadn’t climbed a tower, or tree, on a 20 degree, snowy, windy day. I finished my tower and antenna installation in late November 2001. Notice that when your fingers are frozen that you don’t feel the cuts and scrapes? Now, where did all of that blood come from??? Try to get out there in the next few months and check the coax, waterproofing on connectors, and support rope.

Finally, take a look at the bottom of your operating desk. Is there a mess of wire and cable? I spent four hours the other day organizing power warts! I also went to a wireless mouse a few months ago to get rid of one cable. Next, will be a wireless keyboard. I’m sure that I have some RF floating around because of the miles of cord around, under, and on top of this desk. This can be most troublesome when you are running the full limit. Mike, you don’t have this problem; do you?

[Stray RF from a QRO station? Your stray RF may be more powerful than the output of my QRP rig! - Mike]

Contests

North American Sprint-CW
0000-0400 Sep 12

Tennessee QSO Party
1800 Sep 12-0100 Sep 13

North American Sprint-SSB
0000-0400 Sep 19

South Carolina QSO Party
1300 Sep 18-2100 Sep 19

QRP Afield
1500 Sep 18-0300 Sep 19

Arkansas QSO Party
1400 Sep 25-0600 Sep 26
& 1800 Sep 26-0200 Sep 27

Texas QSO Party
1400 Sep 25-0200 Sep 26
& 1400-2000 Sep 26

Alabama QSO Party
1800-2400 Sep 27

Classic Exchange
1300 Sep 26-0700 Sep 27

Contest dates are UTC
see the ARRL web site
Sept Contests or September
QST for more information and
for a complete listing of
contests:

<http://www.arrl.org/contests/>

Mich-A-Con ARC Activities - Sept 2004

SUN	MON	TUE	WED	THU	FRI	SAT
			1	2	3	4
5	6	7 Net	8	9	10	11
12	13	14 Meeting	15	16	17	18 Breakfast
19	20	21 Net	22	23	24	25
26	27	28 Net	29	30		

September Club Activities

Club Net on Tuesday the 7th, 21st and 28th at 6:30 PM on the 2-meter repeater. We are still looking for a Net Control, please notify Tom, W8JWN if you can help.

Club meeting on Tuesday the 14th at 6:30 PM in the Grace United Methodist Church, 721 Norway Street, Norway Michigan. The meeting room is upstairs next to the Sanctuary.

Saturday Morning Breakfast, 9:00 AM on the 18th at the Holiday Kitchen in Iron Mountain. Breakfast's have been changed to the 3rd Saturday of the month to avoid holiday weekends, etc.

License Study Materials Available from the ARRL:

Technician Class:

Now You're Talking - 5th edition - Order No. 8810 \$19.95

ARRL's Tech Q&A - 3rd edition - Order No. 8829 \$12.95

ARRL Technician Class Video Course - 4th ed. DVD Course No. 9116 VHS Course No. 8837 \$149 each + \$12 s&h

General Class:

ARRL General Class License Manual - 5th ed. Valid beginning July 1, 2004 - Order No. 9205 \$16.95

ARRL's General Q&A Valid beginning July 1, 2004 - Order No. 9213 \$12.95

ARRL General Class Video Course Order No. 8349 \$149 + \$12 s&h

Your Introduction to Morse Code - Pass 5 wpm test Cassettes No. 8322 Audio CD No. 8314 \$14.95 each

Ham University - Complete Edition - Learn Morse code with this easy to use software. Includes a written exam quiz generator with all three question pools. CD-ROM for Win95-XP Order No. 8735 \$39.95

Phone: 1-888-277-5289

or

<http://www.arrl.org/catalog/lm/>

<http://www.arrl.org/catalog/8330/>

<http://hamuniversity.com>

20-Meter Half Square

(Continued from page 1)

ing the antenna and rig. I had 91 QRP QSOs using the half square: 39 on 20 meters, 41 on 15 meters, 9 on 40 meters and 2 on 10 meters. The antenna seemed to perform well on 20 and 15 meters.

I'd say the half square is a good compromise between performance and portability. If you enjoy portable operation as I do, give my half square antenna a try, I think you'll like it!

See companion article "The Thrill of QRP" on page 8 of this issue.

Notes

¹ A free demo version of EZNEC antenna modeling software can be downloaded at: <http://www.ez nec.com/demoinfo.htm>

² One source for the SD-20, telescoping 20 foot fishing pole is WorldRadio Magazine. The current price is \$19.95: <http://www.wr6wr.com/>

³ The Emtech ZM-2 QRP tuner will handle a maximum power of 15 watts. The kit is currently priced at \$65 and the built version is \$90. <http://emtech.steadynet.com/zm2.shtml>

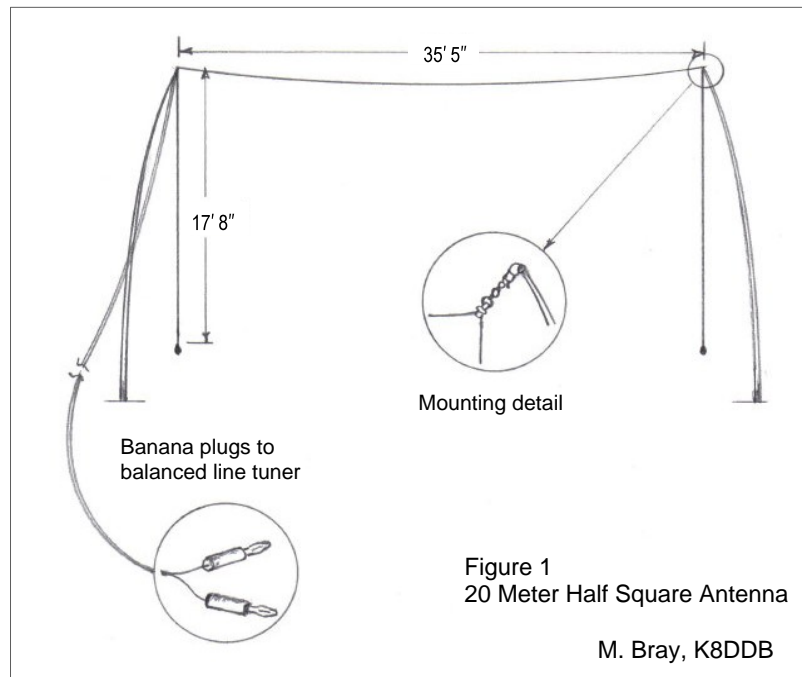


Figure 1
20 Meter Half Square Antenna

M. Bray, K8DDB

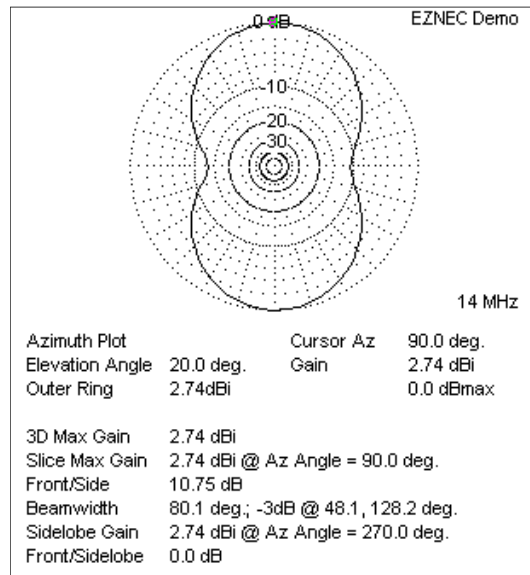


Figure 2—Azimuth Plot

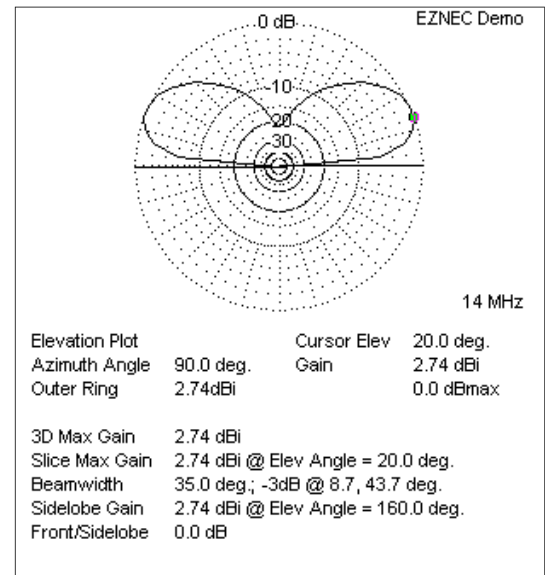


Figure 3—Elevation Plot

Choosing The Right Battery For Wireless Communications

Research has brought about a variety of battery chemistries, each offering distinct advantages but none providing a fully satisfactory solution. With today's variety of battery types, better choices can be made to suit specific user applications. This paper talks about the recommended battery chemistry for cell phones and two-way radios in terms of energy density, durability and price.

What's the best battery for cell phones?

Early cell phones were powered with nickel-based batteries but most newer phones are now equipped with lithium-ion. This chemistry is lightweight, offers high energy density and lasts long enough to span the typical life of the product. Lithium-ion contains no toxic metals. To obtain thin geometry, some cell phone manufacturers switched to lithium-ion-polymer.

This satisfied consumer requests for slim designs. In the meantime, technological advancements also made low profile lithium-ion possible. lithium-ion packs are now available in 3 mm, a profile that suits most designs. Lithium-ion has the advantage of lower manufacturing cost, better performance and longer cycle life than the polymer version.

Lithium-ion is a low maintenance battery. No periodic discharge is needed and charging can be done at random. A random charge means that the battery does not need to be fully depleted before recharge. In fact, it is better to recharge before the battery gets too low. Full discharges put an unnecessary strain on the battery. A recharge on a partially charged battery does not cause memory because there is none.

Charging lithium-ion is simpler and cleaner than nickel-based batteries but the chargers require tighter tolerances. lithium-ion cannot absorb overcharge and no trickle charge is applied on full charge. This allows lithium-ion to be kept in the chargers until used. Some chargers apply a topping charge every week or so to replenish the capacity lost through self-discharge while the battery sits idle in the charger. Repeated insertion into the charger or cradle does not damage the battery through overcharge. If the battery is full, no charge is applied. The battery voltage determines the need to charge.

Taken from Battery University web site
<http://www.batteryuniversity.com/index.htm>

On the negative side, lithium-ion gradually loses charge acceptance as part of aging, even if not used. Lithium-ion batteries should not be stored for long periods but be rotated like perishable food. The buyer should be aware of the manufacturing date when purchasing a replacement battery. Aging affects battery chemistries at different degrees.

Counterfeit cell phone batteries

The number of substandard batteries being sold by street vendors or on the Web is growing. Cell phone manufacturers have issued warnings, saying that these batteries are unsafe. Some lithium-ion packs offered do not include a safety circuit to shut off the power source when reaching full charge and the battery overheats. Enough heat is generated to melt the phone's plastic casing and destroy the phone's internal circuits.

Cell phone manufacturers advise customers to replace the battery with a recommended brand. Failing to do so may void the warranty. The problem with counterfeit cell phone batteries has become acute since the beginning of 2003, especially in Asia, Africa and Europe.

Most cell phone manufacturers act out of genuine concern for safety, rather than using scare tactics to persuade customers to buy their own accessories. They do not object to batteries and chargers being offered by third party suppliers as long as the products are well built and are functioning properly.

The buyer often cannot distinguish between an original and a counterfeit cell phone battery because the labeling may hint to a bona fide brand. Some packs are labeled to contain lithium-ion but contain lower cost nickel-based cells. Battery analyzers are able to identify most counterfeit batteries.

Caution should also be exercised in purchasing counterfeit chargers. Some units do not terminate the battery correctly or they rely on the battery's internal safety circuit to cut off the power on full charge. Counterfeit batteries, and those with damaged safety circuits, may not terminate the fast-charge. The battery may heat to the point of venting with flame.

About Battery University

Battery University is an institution that provides practical battery knowledge for engineers, educators, students and battery users alike. The papers address battery chemistries, best battery choices and ways to make your battery last longer.

The presentations are easy-to-read and are limited to about 1000 words. The material is based on the book *Batteries in a portable World - A handbook on rechargeable batteries for non-engineers*, and is written in condensed form. The 300-page book and a library of battery articles are available on: <http://www.buchmann.ca> Battery service products are shown on: <http://www.cadex.com>

Battery University is sponsored by Cadex Electronics Inc., a manufacturer of battery analyzers and chargers. The material is free of charge for the benefit of all battery users and cannot be used for profit. If intended for publishing or educational purposes, please obtain permission from: Isidor.Buchmann@cadex.com

Battery University is organized into three parts:

Part One addresses the 'mechanics' of the battery and deals with chemistries, charging, discharging, storing and recycling.

Part Two looks at the personalities of different battery systems and describes ways to get the most out of them.

Part Three reveals who is behind Battery University and provides links to various products to service your batteries. I hope you will enjoy the reading.

Isidor Buchmann
President
Cadex Electronics Inc.

REGULATION BY BAND WIDTH

Thanks to concerted effort by a few ARRL Board members, including yours truly, you have seen a historic degree of discussion of the Board's petition to move from regulating our amateur bands based upon type of emission to regulating by the bandwidth of emissions. To this date, I've received (via forward from HQ or direct E-mail) only a half dozen comments since the proposal was published in synopsis form on the web.

One of these strongly favored the proposal while two were in the manner of questions for clarification. The other three notes expressed disapproval although there were no technical reasons cited for the disapproval. A number of Great Lakes Division members had asked questions prior to the publication of the proposal's synopsis after reading comments I have made on the proposal over past months. Again, these questions expressed uncertainties over the proposal, but this was natural. The details of it had not yet been published. I intend to give my formal blessing to forwarding a petition for rulemaking to the FCC to regulate by bandwidth and not by mode of transmission. My reasoning for this is: 1) There has been quite a bit of discussion via the E-mail and in forums I've presided over in recent months about the bandwidth proposal. 2) There have been no firm objections raised against the bandwidth proposal by you members. 3) Finally, I believe after reviewing the proposal and the background to it that regulation by bandwidth vs. mode is the best way to go to promote the future development of Amateur Radio.

ARRL Great Lakes Division
Director: Jim Weaver, K8JE

k8je@arrl.org

What's the best battery for two-way radios?

Most two-way radios use nickel-cadmium. These batteries are durable and forgiving if abused. But nickel-cadmium batteries have only moderate energy density and are environmentally unfriendly. Environmental agencies have been discouraging its use, especially in Europe. The recommended alternative is nickel-metal-hydride, a battery that has higher energy density and contains no toxic metals. nickel-metal-hydride has been tested in two-way radios for a number of years but the results are mixed. Shorter than expected service life is the major drawback.

For two-way radios, nickel-metal-hydride has a cycle life, which is half that of standard nickel-cadmium. Nickel-metal-hydride prefers a moderate discharge current of 0.5C or less. A two-way radio, on the other hand, draws a discharge current of about 1.5A when transmitting at 4W of power. High discharge loads and sharp pulse currents shorten battery life.

To compare the longevity of nickel-metal-hydride under different load condition, a test was carried out in which batteries of the same type were discharged with a DC and digital load. In both tests, the batteries were discharged to 1.04 volts per cell. The DC load was a steady 500mA; the digital load simulated the Global System for Mobile Communications (GSM) at 1.65 ampere peak for 12 ms every 100 ms with 270 mA standby. (Note that the GSM pulse for voice is about 550 ms every 4.5 ms).

With the DC discharge, nickel-metal-hydride wore out gradually, providing an above average service life. At 700 cycles, the battery still provided 80% capacity. By contrast, the same battery type faded more rapidly with a digital discharge and the 80% capacity threshold was reached after only 300 cycles. This phenomenon indicates that the kinetic characteristics for nickel-metal-hydride deteriorate more rapidly with a digital than analog load. Although the test was simulating a GSM cell phone, Tetra and other digital two-way radios have similar loading.

Let's briefly compare the characteristics of nickel-cadmium and nickel-metal-hydride. Nickel-cadmium has the advantage of maintaining steady high capacity and low internal resistance through most of its service life. Nickel-metal-hydride, on the other hand, starts with good capacity and low internal resistance but the resistance increases after a few hundred cycles, causing the voltage to

drop on a load. Even though the energy may still be present, the battery cannot deliver the high current during transmit and the message cuts off. The radio becomes unreliable.

Nickel-based batteries are high in maintenance. Periodic discharge cycles are needed to prevent crystalline formation on the cell plates, also known as memory. Nickel-cadmium is more receptive to memory than nickel-metal-hydride because both nickel and cadmium plates are affected by memory.

Nickel-cadmium should be exercised once every 1 to 2 months, whereas nickel-metal-hydride can get by with a deliberate full discharge once every 3 months. Without proper maintenance, the advantage of nickel-cadmium over nickel-metal-hydride in terms of cycle life cannot be realized.

Lithium-ion has been tested for two-way radios and the results are positive. Substituting lithium-ion with nickel-based will require chargers specifically suited for this chemistry. While nickel-cadmium and nickel-metal-hydride can often share the same charger, lithium-ion uses a different charge algorithm. There is also a cost premium for lithium-ion. Future two-way radios will undoubtedly be fitted with lithium-ion.

Created: May 2003, Last edited: July 2003

About the Author

Isidor Buchmann is the founder and CEO of Cadex Electronics Inc., in Vancouver BC. Mr. Buchmann has a background in radio communications and has studied the behavior of rechargeable batteries in practical, everyday applications for two decades. Award winning author of many articles and books on batteries, Mr. Buchmann has delivered technical papers around the world. Cadex Electronics is a manufacturer of advanced battery chargers, battery analyzers and PC software. For product information please visit: <http://www.cadex.com>

Club Picnic

Eight people attended the August 10th picnic. The weather was overcast, windy and cold. The temperature was 60 degrees at 6 PM and by 8:15 PM everyone's lips were turning blue, so we called it a day. Despite the weather, we had a good time.

More Resources For Learning CW

For those of you that are looking for yet another way to learn Morse Code, read on.

The ARRL has a web page with links to a wide variety of study material and software. Chuck Adams, K7QO, and Rod Dinkins, AC6V, offer some good tips to get you started. The URL is: <http://www.arrl.org/FandES/ead/learncw/>

Anthony Luscre, K8ZT, has a multitude of links for Morse Code on his web site. Check it out at: <http://www.qsl.net/k8zt/morse.html>

The W1AW code practice files are available for download: <http://www.arrl.org/w1aw/morse.html> Simply choose the speed (WPM) of the file you wish to download and within a few seconds you can play the wave file on your computer. A text version of the file can also be downloaded to check your copy.

Ray Goff, G4FON, offers a “Koch Method CW Trainer”. The software is free and can be downloaded at: <http://www.qsl.net/g4fon/> (use the UK Mirror site to download, it’s much faster than QSL.Net.) The program has many features and is very easy to use. Character speed (minimum is 15 WPM), and the effective code speed (minimum is 1 WPM) can be set independently. Training begins with two characters, M and K. Once you’ve mastered them, set the “Characters” spinner to three and so on. The characters are printed on the screen as they are sent (or with a selectable delay) so that you can check your copy. After you’ve learned the characters you can select distracters such as Background Noise Level, Signal Strength, QSB, QRM, Chirp and “Straight Key” to test your copying ability under somewhat realistic conditions. When the “Characters” spinner is set to 40, other options appear at the bottom of the window which allow you to select “Sample QSO”, “Common Words” or “Play Text File”. The trainer will accommodate speeds up to 50 WPM, so even veteran CW operators can use the program to help increase their copying speed.

G4FON also has a Contest Trainer available for a \$40 registration fee. I haven’t tried it, but if it’s anything like the Koch Trainer, I’m sure it’s worth the money.

K8DDB

DX Worked With The KC8VC Club Callsign



Leo, CX3AL, Montevideo, Uruguay. Worked by Tom, W8JWN on 40 meters SSB during the CQ WW WPX Contest in March of 2003.

CX3AL—Icom 7561-A and Kenwood TL 922 amp to an inverted vee antenna
 KC8VC—Yaesu FT1000MP and Dentron amp to a 40 meter delta loop antenna



Larry, T32WW, Captain Cook Hotel, main camp, Christmas Island, East Kiribati. Worked by Mike, K8DDB on 30 meters CW in November of 2003.

T32WW—Icom 756PRO to a monoband 2 element phased vertical array
 KC8VC—Ten Tec Argonaut V at 5 watts to a wire vee beam antenna

All club members are invited to use the club callsign to help the club attain WAS and DXCC. As club callsign trustee, I have been keeping a computer log of all KC8VC QSOs, so if you use the club call please notify me as soon as possible so I can enter it into the log. Please give information required for the log such as: station worked, date and time (UTC), frequency, RST sent and received, mode and power. Also give me a description of the equipment you were using.

Club QSL cards are available from me. Send me an email or give me a call and I will get them to you.

K8DDB

N8LT's Workbench

Club Membership Drive

Of the twenty-eight members that paid dues in 2003, twenty-three have renewed their membership. May 11th was the deadline for the payment of dues. Those that didn't pay were dropped from the active membership list and will no longer receive correspondence via regular mail. Former members with an up to date email address will, however, continue to receive email as there is no cost to the club to do so.

We were able to attract thirteen new members to the club this year and we are seeking more. A single issue of this newsletter is being sent to a new local Ham every month in an effort to increase club membership. Please pay us a visit at one of our monthly meetings or just complete the application/renewal form on page 9 to become a member.

N8LT's Workbench

This series, written by our resident expert on the technical side of things, focuses on technical topics that you, the reader, want him to write about. Lee wants your input. This is your chance to get those gnawing questions answered so that you can become more self-reliant when repairs are needed to your electronic gear.

What subjects would you like to see covered?

Please send your input to me and I will collate the responses and give them to Lee.

Send your input to:
mikebray@chartermi.net
(906) 563-7020

Mike Bray, K8DDB
W3821 Waucedah Road
Vulcan, MI 49892-8483

Of SHORTS and LIGHT BULBS

When ever something electrical suddenly goes dead or flickers off and on there's usually someone around to declare "must be a short circuit". That's probably because most every one has heard of an electrical short circuit but few, it seems, know of open circuits; yet, by far the most common circuit failure is an open circuit. When it comes to power circuits it's easy to tell them apart. Short circuits snap, hiss, smoke, and blow fuses. Open circuits simply shut things off. In fact, that's the commonality between on/off switches, pulled out power plugs, and blown fuses; they all create open circuits. Of the two, shorts can sometimes be the more difficult to locate. If it blows fuses there is no way to take advantage of a powered circuit to help you trace down the problem.

ONCE UPON A TIME...

Many years ago while I was in grade school, I chanced to visit the home of a friend. The home owner was preoccupied with a problem in a branch circuit that was blowing fuses in the homes' fuse panel (in those days everyone had fuse panels, homes didn't have circuit breaker panels). He had been in the process of finishing the upstairs of the house and thought that perhaps he may have inadvertently driven a nail through some wiring in the walls. After removing several panels of drywall he had still not found the problem. When I arrived he was in the process of soliciting help from his next door neighbor who happened to work on a line crew of the local power company. The neighbor, after being appraised of the problem, proceeded to screw a light bulb into the fuse panel in place of the blowing fuse (screw-in plug fuses share the same Edison screw base as light bulbs). The bulb lit up brightly indicating a short circuit. He then proceeded to follow the circuit from the fuse panel to search for the short. It was found in a basement light fixture not too far from the fuse panel.

Now, this nifty trick did not escape my notice though it would be many years before I would have an occasion to use it myself. (How do I remember these things?)

EUREKA!

If your wheels turn like mine do, your probably thinking that this trick is not limited to fuse panels. Suppose the next time you hook up your trailer lights you suddenly find the light circuit fuse blown. You try another fuse thinking, of course, that the

first blown fuse must have been some kind of fluke like a power surge form the battery or something but no, the second fuse blows instantly too and you begin to suspect that there might actually be a problem. You could go back and pull on a wire or jiggle something then put in another fuse to see if that fixed it, but then, at today's fuse prices taking it to a garage might seem cheaper. Eureka! Why not just connect a light bulb in place of the fuse then go poke around? When you find the short the light will either go out or get noticeably dimmer. Try that with an OPEN circuit!

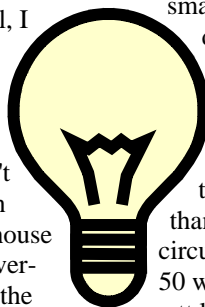
Simple as this technique is it can mislead you if your not careful. If you choose too small a light bulb to replace the fuse, such as a pilot or dash lamp, it will probably light up brightly even with a normal circuit. That's because all those tail lights connected in parallel (or other loads) have a combined resistance much below that of such a

small lamp and all the available voltage will drop across the small lamp lighting it up brightly leaving none to power the circuit load. Larger lamps (higher current or wattage) lamps work better. On the other hand a test lamp should never be used that is capable of drawing more current than the fuse it replaces can pass or that the circuit can handle. For 12 volt circuits a 25 or 50 watt RV lamp will usually work fine, the 50

watt lamp drawing up to about 4 amperes and the 25 watt lamp about 2. For 120 volt circuits there is a wide variety of wattage's (hence, currents) to choose from, a 100 watt lamp drawing a little under 1 ampere maximum. It's easy to figure, simply divided the rated wattage of the lamp by its rated voltage to get the lamps current in amperes at full voltage (like when it is working into a short circuit). For smaller lamps that are not marked with their wattage simply look the lamp number up in a radio handbook or parts catalog to get its rated current. Of course you could always connect it to an appropriate voltage source and simply measure the current (horrors). If you can't determine the current the lamp can draw find another lamp to use.

It's simple, it's crude, but, it can sometimes beat a meter, especially when your working alone.

N8LT



The Thrill of QRP

I was very excited after my QSO with Alan, VK6PG. Western Australia was my farthest QSO yet and I had done it using an antenna, rig, tuner and wattmeter all built by me. To think that my 4.4 watts had traversed the 10,869 miles to Alan's QTH was amazing! I hurriedly composed an email to Alan and here is his reply. It seems he was almost as excited as I was.

From: Alan Gibbs [vk6pg@tpg.com.au]
 Sent: Friday, September 08, 2000 23:47
 To: Mike Bray
 Subject: Re: VK6PG QSO with KA1DDB/qrp

At 04:34 PM 8/09/00 +0100, you wrote:

Hello, Alan -

Hello Mike ...
 Delighted to receive this message.

Thanks for your patience in getting my information from my weak signal. You did a superb job! Using grid square information I calculated the distance between our stations to be 10,869 miles, which is my farthest QRP QSO yet!

That's great stuff and I was excited too. I'll get your QSL off to the FISTS buro in the post this weekend.

My station consists of a Sierra QRP kit at 4.4 watts into a homebrew 20 meter half square antenna at a height of 20 feet. I built the antenna about a month ago using 28 gauge wire from a 100 foot coil of computer ribbon cable. It is supported by two 20 foot telescoping fiberglass fishing poles mounted on the ground. The feedline is also made of the ribbon cable—two conductors of the cable are used to form a balanced feedline which is fed via a homebrew z-match tuner. Although the station was built with portability in mind, I was using a regulated power supply this time. My portable power supply consists of a 7 ampere hour gel cell and a 10 watt solar panel.

How interesting Mike. It seems you have miles of ribbon cable, Hi.

I am 60 years old and retired from the power company. I worked in the Operations Department of a nuclear power plant for almost 30 years.

Here I'm now 65 and been QRV for 50 years. Ex electronic engineer and technical teacher but retired now for the last three years and getting back into my favorite pastime—Ham Radio, Hi. See attached photo of me in the shack.

Your QSL card will surely be conspicuously

displayed in my shack! My QSL card will be sent via the FISTS buro.

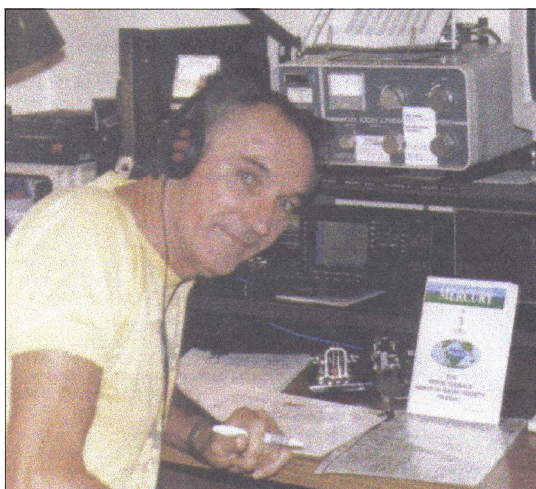
You are most welcome. When condx are good, I'll drop the Icom down to say less than 5W and we'll see if we could manage a QRP/QRP contact. That would impress the natives, Hi.

Yes, it was a struggle but these are usually the best contacts if both stations have the patience to persevere. I have also a Timewave DSP9 on the end of the Icom which was enough just to wrinkle you out of the noise!

Thanks for the FB DX QSO -

The pleasure was all mine.

Mike, KA1DDB/qrp
 Grid EN65cr



Alan Gibbs, VK6PG, Noranda, Western Australia

Like Alan said, the QSO wasn't easy from his end. Many operators when confronted by these conditions would say "Sorry OM, but you're too weak" and let it go at that... and I wouldn't blame them at all. But Alan stuck with it, asking for a single bit of information until he copied it and sent it back to me for verification. Then asked for the next bit of info and then the next. Great operator!

If you no longer experience excitement in Ham Radio, the thrill of QRP can bring it back. But, to have a successful QSO it sometimes takes an exceptional operator with a lot of patience and skill at the other end. Thanks, Alan.

K8DDB

Club Apparel:

Our club apparel is supplied by:

Shirt Tails
 408 S Stephenson Ave.
 Iron Mountain, MI 49801

Phone: (906)774-3370
 or
 finleyd@up.net

Prices:

Jacket with liner \$45
 (Tall add \$5, 2X or 3X add \$5,
 to add your name or call sign
 on the front is \$5)

T-Shirt - \$10
 (2X or 3X add \$1)
 Sweatshirt - \$16
 (2X or 3X add \$2)

If you wish to have the club logo printed on an item of clothing that you have purchased elsewhere, there is charge of \$6.

Club patches are available from:

Steve Johnson, KC8RY Y
 917 Coolidge Ave
 Kingsford, MI 49802

They are 3 inches in diameter and sell for \$3.00 each. If ordering by mail, please include a SASE along with your payment.



Mich-A-Con Amateur Radio Club
Membership Application/Renewal Form

Please remit dues to club treasurer:
Steve Johnson, KC8RYY
917 Coolidge Ave
Kingsford, MI 49802

Name: _____
Address: _____
City, State, Zip: _____
Call Sign: _____
Email Address: _____
Phone: _____

ARRL Member? Yes _____ No _____

Single \$20 _____ * Family \$30 _____ *

If family membership, please list additional names and call signs:

* The dues for NEW members are prorated - you only pay for the remainder of the year! Please remit \$1.67 per month for a Single membership or \$2.50 per month for a Family membership.

Exam Schedule

City: Iron Mountain
Location: Dickinson County Library
Room: Conference Room
Time: 9:30 AM Central Time
Contact: Mark Lewis, N8UKD
Telephone: (906) 774-6598

Exam Date: Nov 6, 2004
Exam Date: Feb 5, 2005
Exam Date: May 7, 2005
Exam Date: Aug 6, 2005

Examinees should bring 2 pencils, a pen for the official paperwork, the originals AND copies of any previous credit that you have earned (Certificates of Successful Completion or current license), 1 photo id (usually a driver's license) and 1 other id. (usually a birth certificate or SS card), a calculator if needed (make sure your memories are cleaned out), and the test fee (2004 fee is \$12).

Mich-A-Con RF is published by the Mich-A-Con Amateur Radio Club of Iron Mountain.

Items for Mich-A-Con RF should be in the editor's hands by the first week of the month to be included in the next edition.

Our newsletter needs contributions from the membership to help keep the information presented each month new, interesting and fun to read. Please consider writing an article related to Amateur Radio to share with your fellow members. Send the article in plain text and attach any photos, etc., don't worry about format, that's the editor's job.

Send to:
mikebray@chartermi.net
(906) 563-7020

Repeaters

The club maintains two repeaters, which are located on Pine Mountain in Iron Mountain, with tower and facilities provided by the Wisconsin Electric Power Co.

Identifier: WA8FXQ/R IMT

Output	Offset	PL Tone
146.850 MHz	minus	—
444.850 MHz	plus	100

Both repeaters have an auto patch with a toll restriction. The auto patch on the 2-meter repeater can be used with permission. The 440 auto patch is for club use only.

A club net is held on the 2-meter repeater every Tuesday at 6:30 PM except the 2nd Tuesday of the month, which is club meeting night.

Mich-A-Con RF

Mich-A-Con ARC
c/o Michael F. Bray
W3821 Waucedah Road
Vulcan, MI 49892-8483

Mich-A-Con RF

Club Meetings

The Mich-A-Con Amateur Radio Club meets on the second Tuesday of the month at 6:30 PM in the Grace United Methodist Church (upstairs in the room next to the sanctuary), 721 Norway Street in Norway, Michigan. Visitors and prospective members are always welcome!

The URL for the Mich-A-Con ARC web site is:

<http://www.qsl.net/ka1ddb/>

Previous editions of Mich-A-Con RF can be accessed by a link on the news page.

The ARRL DX Bulletin on the Upcoming Activities page is updated each Thursday and the contests section is updated on a monthly basis.

CLUB OFFICERS

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mikebray@chartermi.net

Treasurer:

Steve Johnson, KC8RYY
(906) 776-1597
sjohnson4@chartermi.net

Reminders

The monthly meeting for September is on TUESDAY the 14th at 6:30 PM in the Grace United Methodist Church, 721 Norway Street, Norway, Michigan. (upstairs in the room next to the sanctuary.)

We are still looking for a Net Control for the Tuesday 2-meter net. Please contact Tom, W8JWN if you can help.

Saturday Morning Breakfasts have been changed to the THIRD Saturday of the month at the Holiday Kitchen -Sept 18th @9:00 AM

Don't forget to provide input on the articles you would like to see in Lee's new column, N8LT's Workbench.

Please let Mike, K8DDB, know what club equipment you have in your custody so he can update the Club Equipment List.