

The Repeater



The Official Publication of the Twin Cities Repeater Club, Inc.

Mission Statement of the Twin Cities Repeater Club, as Adopted on September 20, 1993

The purpose of the TCRC is to facilitate the local communication needs of its members by owning and operating a state of the art wide area coverage two meter repeater system. The club will further involve itself in secondary activities intended to (1) Promote the exchange of ideas and information related to amateur radio, (2) strengthen the fellowship and camaraderie among the members, (3) serve the local amateur radio community, and (4) increase local public safety.

Field Day 2005 is Almost Here!

This weekend is when the annual ARRL Field Day event takes place. You can read more about Field Day inside this issue. But some of you, especially the more recently-licensed hams among you, may be wondering “what’s it all about?”

Field Day is, among other things, an exercise in emergency communications preparedness. Imagine starting with an empty farm field with no facilities of any sort, and taking no more than 24 hours to turn it into a full-fledged radio communications site, capable of passing “radio traffic” (communications messages) across the country. For the next 24 hours, pass as much “traffic” to as many different stations as possible. Then tear everything down, leaving only the empty farm field behind. You may be asking yourself, “What’s the point of that? We have telephones, cell phones, and the Internet to use.” The answer, of course, is that in many types of emergencies, none of those resources is reliably available. Ask the people in Comfrey, MN, how they communicated their needs after a tornado swept through town and devastated the area. For many days, the only communications in and out of town were on the emergency field radio station set up by a bunch of hams.

So maybe you don’t think that you will ever be involved in emergency communications. Why else should you care about Field Day? There are lots of additional reasons, some of which appeal to individual folks to a greater or lesser extent.

Although the ARRL emphasizes the emergency preparedness aspect of Field Day the most heavily, it is also a contest. In general, the greater the number of valid radio contacts, the higher the score. The TCRC typically posts a very competitive score in the 3A class each year, which gets us our “moment of fame” (bragging rights) when the scores are posted in QST. Your participation can help us score better than ever.

Maybe you have no HF privileges, but have wondered what it is like to operate on the bands below 50 MHz. Or maybe you have wondered what is really possible when communicating at 10 GHz, or through an Amateur Radio Satellite. This could be your golden opportunity to try it out. We will have sufficient equipment and Control Operators on site to allow anyone, whether they are licensed or not, to operate on any of the bands and modes that we have going! Try it, you might like it!

Last but certainly not least, Field Day is the primary social event of the year for the Twin Cities Repeater Club. We gather, we party (responsibly, this is a “family affair”), get to see folks who we haven’t seen since the prior year’s event, or get to meet people face-to-face for the first time even though we have talked to them on one of the repeaters many times, etc. It is an experience like no other in Amateur Radio. We hope you will come!

More information at: <http://www.arrl.org/contests/announcements/fd/>

Spring, 2005 Volume 28, Number 1

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Field Day 2005



Fri. June 24th at 1 PM, Setup begins.

Sat. June 25th at 1 PM, Operation begins.

Sun. June 26th at 1 PM, Operation ends,
teardown begins.

*Please Join Us!
Details Inside!*

The Repeater is published quarterly by the Twin Cities Repeater Club, Inc. (the TCRC). The TCRC is organized as a nonprofit corporation in the State of Minnesota, with Articles of Incorporation and Bylaws. The club elects officers annually. These officers are simultaneously elected for a two-year term on the Board of Directors. The Repeater Trustee is a permanent member of the Board of Directors. Unlike the other Officers and Board Members, the Trustee may select a proxy to serve in his place at meetings of the Board. Membership in the TCRC is \$25 per year. The TCRC is an official ARRL affiliated society.

TCRC Officers:

President: Phil Lefever, KBØNES

Vice President: Mark Neumanm KCØITP

Secretary: Jim Rice, NØOA

Treasurer: Greg Larsen, KCØDMF

Board Members:

All of the above Officers, plus...

Ivan Frantz, WØBU, **Repeater Trustee**

Ivan has currently appointed Mogens Dantoft, OZ9MD, as his proxy for Board Meetings.

Steve Filek, NØOWL, Past Vice-President

Jeff Goodnuff, WØKF

Larry Jenkins, KØLEJ

Artie Johnson, WBØJMG

Technical Committee (a/k/a Tech Team):

Kevin Uhlir, NØBEL, **Chair**

Phil Lefever, KBØNES, **Vice Chair**

Doug LaBore, NØBIS

Mike Ferguson, NØDGG

Rich Kenney, WØRFK

John Toscano, WØJT

John Phelps, KFØZM

Steve Filek, NØOWL

Kent Peterson, KCØDGY

John Laxson, KCØPZN

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Jim Rice, NØOA, **Vice-Chair**

Kevin Uhlir, NØBEL, **Site Setup Manager**

Monica Filek, KBØUWZ, **FOOD Station Manager**

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Phil Lefever, KBØNES, **Assistant Webmaster**

John Toscano, WØJT, **Assistant Webmaster**

Jeff Goodnuff, WØKF, **Web Calendar Maintainer**

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Newsletter Committee:

John Toscano, WØJT, **Editor**

Net Control Operators:

Kevin Plummer, KBØUEU, 1st Tuesday

Larry Jenkins, KØLEJ, **Chair**, 2nd Tuesday

Steve Shaner, ABØYS, 3rd Tuesday

Phil Lefever, KBØNES, 4th Tuesday

John Toscano, WØJT, 5th Tuesday

Jeff Goodnuff, WØKF, alternate

Mark Newman, KCØITP, alternate

Metro Skywarn Liaison:

Jeff Goodnuff, WØKF

Minnesota Repeater Council Liaison:

Jeff Goodnuff, WØKF

President's Report

by Phil Lefever, KBØNES

Summer is almost here, and with that comes the ARRL Field Day event. Once again, the TCRC is planning yet another fun and competitive outing on the weekend of June 24-26th. Be sure to have this weekend free so you can come out and help out and join in the fun! Mark, KCØITP is heading up our effort this year. Look for more information from him elsewhere in this newsletter.

Severe weather season is also here, so keep an ear on 147.21 when the weather turns threatening. For those that are spotters (or just like to keep informed), you can sign up to the TCRC Skywarn email list at www.tcrc.org. This email list will send out a short email message when a Skywarn net is brought up on the 147.21 repeater. If you have a pager or cell phone that has an email address you can be alerted right away when a net is called up.

We have had a couple personnel changes on the Board of Directors. Our long-time treasurer, Pat (KØPC) has handed the reins over to Craig, KCØDMF. Also I have asked Doug, NAØVY to step in as Membership Committee chair to help us out with some of our membership duties.

On the technical side of things, we have a few issues that we will be attending to this summer. Our East site in Hastings has been acting strangely and a trip out there showed that its 2 meter receive antenna was broken in half. Since it is rumored that the water tank that we have been on for years is going to be torn down, we will need to search out a new location. Also, we have plans to replace the 444.300 repeater antenna and possibly the 147.21 2 meter receive antenna as well. We also hope that the North receive site should soon be returned to service. It was down due to some spurious noise on our input frequency. We have modified the remote radio to require a 100 Hz PL tone to eliminate squelch breaks from the interference. Of course, this means that when it goes back online, you will need to transmit the tone to be able to access the repeater via the North site.

Our most recent quarterly club meeting was held on Tuesday June 14th at the Galaxy Library in Apple Valley. We had an abbreviated Net, starting as usual at 7 PM, and the meeting started up at 7:30. We talked about the club's Field Day plans and other club business. Also you are encouraged to bring along a current project as a show-and-tell item, and as usual, these fostered some fun conversation. Of course we also had some good coffee and refreshments!

The next meeting will be held in a few months, and will be announced on the 147.21 repeater, and on the club web site. I hope to see many of you there next time!

And if you can't wait that long, consider joining the TCRC at one of its two weekly gatherings – Tuesday nights at about 7 PM at the Caribou Coffee Shop at 147th and Cedar Avenue in Apple Valley, and Saturday mornings after 6 AM at the Perkins Restaurant, County Road 50 at Interstate 35, a short distance south of downtown Burnsville.

73, Phil Lefever, KBØNES

<http://www.tcrc.org>

Field Day is coming!!

By Mark Neuman (KCØITP)

That is right! Field Day is just around the corner, June 25th and 26th this year, and the TCRC is getting ready to party, contest, and have a good time. The Field Day location will be the same as in past years (about 1 mile south of County Road 42 on County Road 3 in Rosemount), however we are looking for a different spot for next year, so stay tuned.

The TCRC is looking for a number of hardy souls to help put up the antennas on Friday evening, June 24. If you are free, please stop by the Field Day site and help us pull the towers into the sky.

As in past years, we will be operating as a Class 3A station – that is, 3 HF radios (CW, 20M voice, and general voice), and a VHF/UHF station, all operating under the callsign of WØBU, along with a GOTA (Get On The Air) station operating under the callsign KCØJAF. Station managers for the 20M voice, GOTA, and VHF/UHF stations are still needed; please contact Jim Rice NØOA, to sign on.

The TCRC hosts a picnic on the Field Day site on Saturday, starting at about 5:00 PM, so bring your family and friends on by (along with a dish to share) to meet and greet and put a face to those voices you have heard on the best repeaters in the Twin Cities area. And as always, visitors are very welcome.

Now I would like to thank a number of people who have helped me in the early planning for this event:

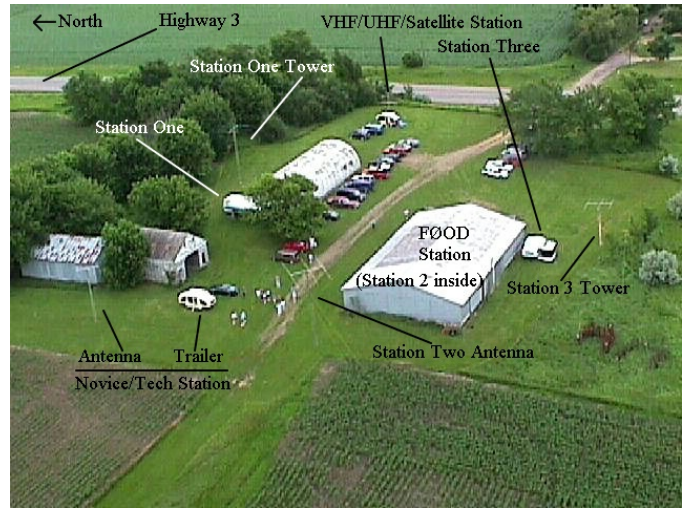
- Jim (NØOA) the oncoming Field Day chair, as I will now be out of contact until field day, operating as KCØITP/OZ.
- Shannon (KCØEIG) for contacting the landowner and getting permission to use the site, along with many other smaller projects.
- Monica (KBØUWZ), and Becky (KBØWZU) for the FØOD station.
- Artie (WBØJMG) for taking on the bonus points coordinator job, and a trailer.
- Phil (KBØNES) for sharing his Field Day planning experience and general help.
- Bill (KØKGS), and Pat (KØPC) for their support with the CW station.
- Janet (KBØZFB) for the use of her trailer for shelter.

All Field Day questions, comments, offers to help should be directed at Jim Rice NØOA, and I will see you all at Field Day 2005.

Mark Neuman (KCØITP)



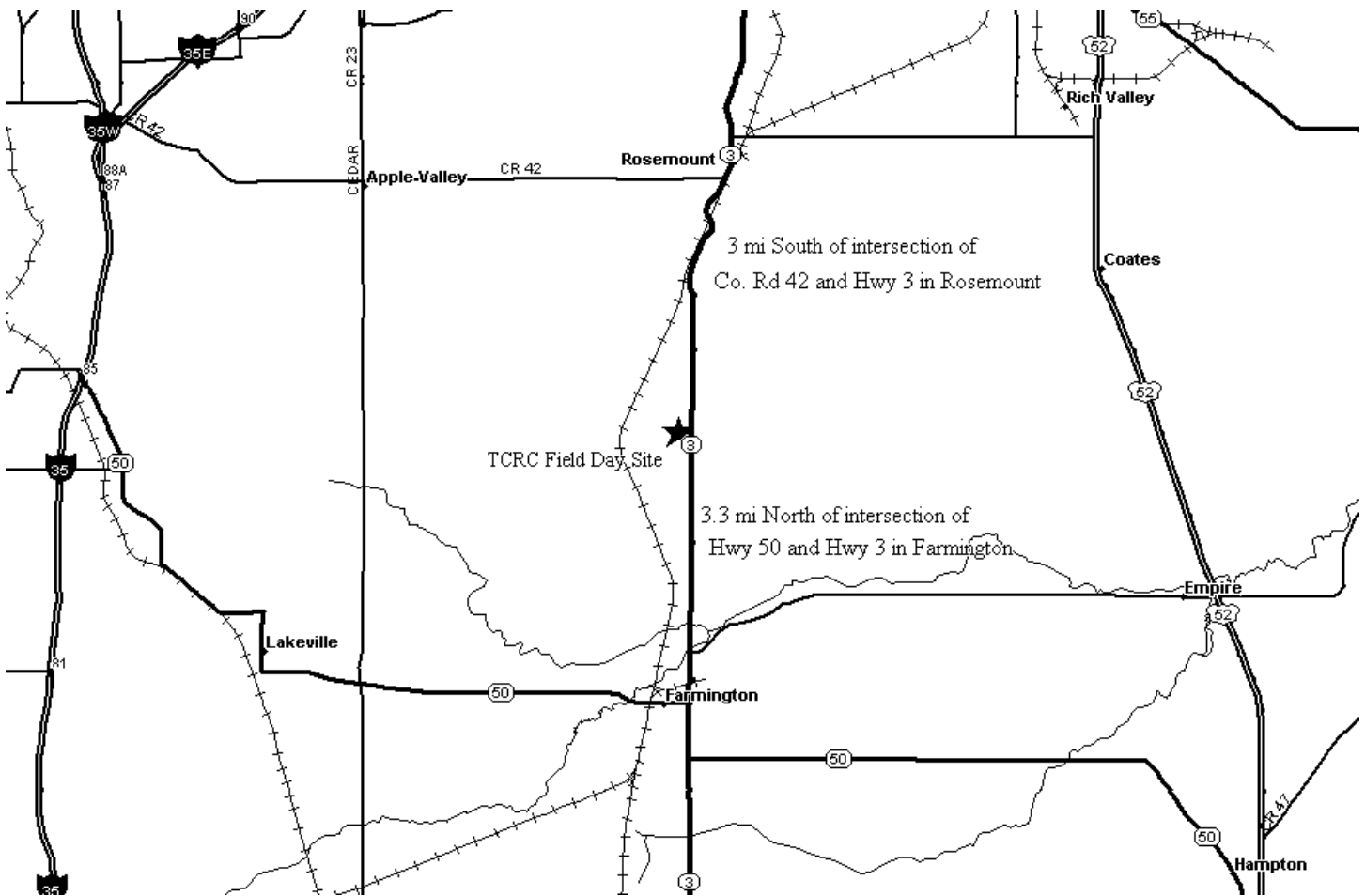
To get you in the mood, here are a couple of photos from the TCRC's Field Day event in the year 2000. . .



Welcome, New Members!

The following folks have recently joined the ranks of the Twin Cities Repeater Club. Please welcome them the next time you hear them on one of our repeaters! The club thanks them for their willingness to participate.

KCØOII	Bradford Blasing
KCØRQJ	Steve Bordeau
KC5PYO	Duane Lindquist
ABØWW	Peter Jacobson
KBØRKA	Marvin Turner
KCØUBU	Kevin Prow
WØQU	George Fisher
KBØWOT	David Osterkamp
KCØTPV	Bruce Schmiedlin
KCØTIN	Carl Marr
KA3TCT	Kenneth Ulmer



Finding your way to the TCRC Field Day site

Hopefully, the map above gives you a decent idea where we will be. County Road 42 runs through Burnsville, Apple Valley, and Rosemount (West to East). Some major intersecting North-South highways include Interstate 35W, Interstate 35E, and Highway 77 (Cedar Avenue). Come east on County Road 42, past the Rosemount water tower, and watch for Highway 3. When you get to that intersection, turn right (South), and make a note of your odometer reading. Mentally add 3 miles to that number, and that is about where we will be found.

As you proceed down Highway 3, you will go past a (now de-commissioned) weigh station on the right (West) side of the road. If you see something that looks like a bunch of Amateurs setting up antenna towers and tent trailers, *you are NOT at the TCRC site yet!* (Other hams sometimes set up in that location.) A little further along the road, as you start to climb a small hill, you may spot a small shack (about the size of an outhouse) up ahead on the right side of the road. You are now getting very close! Watch for a sign on the right side of the road announcing "TCRC Field Day". Be careful, and slow down, because the driveway into the farm property is pretty narrow, and a little hard to see. But the driveway is just past the TCRC sign. Turn right and drive up the driveway. You should see a "Biff" (portable outhouse) strapped to the lightpole on your left. There are open fields to your right (up the hill a bit, where we usually set up the VHF station) and to your left (down the hill a bit, to the large farm storage shed where we usually set up the FØOD station and Station 2).

Talk-in will be available on the 147.21 repeater. We hope to see you there!

Request for Newsletter Submissions

John P. Toscano, WØJT, Newsletter Editor

You may have noticed that there were only three “quarterly” issues of The Repeater last year, and we are off to a bad start for 2005 – the year is half over and this is the first issue for the year. I have to shoulder a lot of the blame for this, as my work schedule has been quite horrible lately, and I just haven’t devoted enough time to the preparation of newsletters. However, in my defense, I have also had a paucity of submissions of articles for inclusion in the newsletter. While I love to write (when I can find the time), this is not John’s Newsletter, this is the TCRC’s Newsletter. And “who is the TCRC?” – well, in most cases, that’s YOU, the readers of this publication. You, the members of the TCRC, have information to share with your fellow members, and this is a highly desirable commodity for your overworked newsletter editor.

If there is some topic you’d like to see covered in a future edition of the TCRC newsletter, I’d love to hear from you. You can send me a finished article, an outline, or even an idea for an article. Don’t worry about your writing skills, I will be happy to do my job as editor and tweak your submissions into an article that meets the high standards our members have come to expect from us. Any document format that Microsoft Word can understand is fine for me, including plain vanilla unformatted ASCII text. Send ideas or articles to me at: WØJT@tcrc.org Thanks in advance!



TCRC Sponsors Two Skywarn Classes This Year

As most of you know, the 147.21 TCRC repeater serves as the primary Skywarn repeater for the south and west metro areas. We have already had several activations of the Skywarn spotter net on the repeater this season.

In case you didn’t already know, Skywarn spotters are not free-lance storm chasers who put themselves at risk for the thrill of getting a good look at severe weather. They are trained volunteers who provide a service to the National Weather Service by providing information on weather conditions down on the ground where radar can’t see very well. The training helps spotters better understand weather conditions and to distinguish threatening weather conditions from the rest. Spotters also get instruction on how to spot safely and how to relay their reports properly to the National Weather Service through an official Skywarn Net.

The TCRC sponsors Skywarn Spotter Certification Classes each year. Spotter certification needs to be renewed every two

years, so if you did not re-certify last year, you needed to take a certification class this year. There are no more classes left in 2005, but the complete list of Skywarn Spotter Training Classes can normally be found at the Metro Skywarn web site, www.skywarn.ampr.org, so check there early next Spring if you are interested in taking a class next year.

In past years, the TCRC has sponsored the first class of each year, usually the first Saturday of March. Because of increased demand, the TCRC sponsored two training classes this year: March 5, from 1:00 PM to 5:00 PM and June 4, from 9:00 AM to 1:00 PM. Both classes were held at Burnsville City Hall, in the council chambers, and were well-attended. Skywarn classes sponsored by TCRC are free to all (no, you need not be a TCRC member). Next year’s classes will eventually show up on the calendar pages of www.tcrc.org, and you can also contact the TCRC’s Skywarn Liaison, Jeff, WØKF, at 952-927-0201, or email at w0kf@tcrc.org, if you want more information.



LDG Z100 Autotuner

Larry E. Jenkins, KØLEJ



Last year I purchased a G5RV Jr. antenna that I planned on using when going to a friend’s cabin. The idea of a single antenna that could be made to work on multiple bands appealed to me – less stuff to take along. I originally was going to use my MFJ Versa Tuner II (MFJ-949E) with the antenna, which is a fairly nice traditional manual tuner, but it’s fairly big.

I had seen advertisements for automatic tuners and noticed their operation looked like it would considerably easier than the older manual style tuner. All of the auto tuners boast that they tune very quickly, with some even tuning in less than a second. The big downfall of the auto tuners is that they need power to run them and are generally limited in the power they can handle through them. Well considering I already needed power to run the radio, and that the radio only puts out 100 Watts, I saw no reason not to investigate.

Auto tuners do exactly the same thing manual tuners do, but handle the operation with an assortment of relays that switch in and out various inductors and capacitors trying to find a 1:1 match. The relays are controlled by a microprocessor and software (firmware) located inside the tuner. Once a tune process begins it only takes a few seconds to find a match.

In looking at automatic tuners I found two basic styles. The first is the traditional tuner that you connect close to the radio. This tuner matches the entire antenna system, including the coax feed line, to the radio. This is the most common type of tuner. Most of the radio manufacturers produce automatic tuners, and include tuners in some of their radios. Third party brands include LDG Electronics, SGC Inc. and MFJ.

The second type of tuner, called an antenna coupler, is designed to be placed at the antenna feed point and tunes only the antenna. Antenna couplers are generally used for long wire antenna, (mobile) whip antennas and loops. Because of their location in the antenna system, antenna couplers tune automatically when they determine it's needed. SGC, Inc. is the market leader in this type of tuner.

When I started looking for an automatic tuner to use with my Yaesu FT-857 I naturally looked at the Yaesu automatic tuner, but the price was high and the performance was not up to the standards of the after-market manufactures. Having read that LDG Electronics replaced their old line of auto tuners with new low cost models, I decided to give them a look. The Z100 model replaced the older Z-11 QRP tuner and the AT-11MP tuner. This tuner looked promising considering its low price. SGC had also just announced a new low cost antenna coupler, the SGC-211, that runs on internal batteries. This tuner was designed for the QRP fancier, but it does handle 60 Watts of power. Time to do some more research....

I initially was leaning toward the SGC-211 because it would handle both balanced and unbalanced antennas, has a metal case, and runs for approximately five years on a set of internal AA batteries (included with the tuner). The tuner only handles 60 Watts of power, but that was not too big of an issue for me as I would simply turn down the output on the radio. A key point for me was the ability to remotely mount the tuner at the antenna feed point providing I put it in a waterproof housing. It looked great at first glance.

After doing a bit more research on how people liked it, however, I found that most of the users were having problems with the tuner continuously tuning, even after it found a proper match. SGC finally modified the unit to include a "lock/tune" switch to prevent the tuner from continuously tuning, but that prevents remote placement of the tuner. Because the price was higher, and the remote mounting feature was not near as appealing with the new switch, I decided to look elsewhere.

Before settling in on LDG I did take a look at the new MFJ line of auto tuners, but they were WAY too new for me. I won't buy the first series of anything as I really don't like being an unpaid product tester. I also remembered what MFJ stands for, at least unofficially.

Finally I turned my attention to the LDG Electronics tuners. LDG had several nice things going for it. The first is that they have been making auto tuners for some time, they make the auto tuners for Ten-Tec systems, their tuners have a two year warranty, and they continue to support their products with new features even after they have been discontinued.

In the LDG line of tuners I had narrowed my choice to the Z-100 minimalist tuner and the fuller featured AT-100 Pro tuner. The AT-100 Pro handles 125 Watts on the HF bands and 6 meters, has 2,000 memory locations (more on that in a bit), allows for manual tweaking of the tuner to hopefully better match the antenna system, and supports two antennas. The AT-100 Pro also has LED meters to show the power output and SWR of the system. Overall, this is a very feature-rich tuner in a metal case. The suggested retail price is \$219.

The Z-100 by comparison handles 125 Watts on HF, but only 50 Watts on 6 meters. The Z-100 "only" has 200 memory locations, has no manual tuner adjustments, only has one antenna connection, has two LEDs and switch, and is in a plastic case. The suggested retail price is \$149.

So why did I purchase the Z100 you ask? It simply came down to cost. Earlier this year R&L Electronics had the Z100 on sale for \$125. At that price I figured why not. I liked the extra LEDs on the AT-100 Pro, but was not willing to spend an extra \$70 for them.

Using the Z100 is about as simple as it comes. With only one button there is not too much to worry about – simply press the button.

As I mentioned earlier, the Z100 has 200 memory locations. These memories are used to store the tuning parameters for the last 200 frequency matches the tuner did. If you return to the same frequency, or even close to the frequency, the microprocessor will set the tuner to the settings last used. If the microprocessor can't find a frequency match it will do a full tune search. If the tuner has the frequency in memory the tuning happens in less than a second. If a full tune is needed the tuner generally takes less than five seconds. I have found that 200 memory locations are more than enough for my casual radio operation as the tuner is very smart in determining what frequency you are on and if it has already tuned for the same frequency or close to the frequency.

The face of the tuner has two LEDs and a single push button switch that performs three tasks. A red LED tells you that the tuner is going through a tuning sequence, either a memory tune or a full tune. The green LED shows you the SWR after the match.

Before using the tuner, it's important to reduce the power output of your radio. I generally tune with a power output of 5-10 Watts. LDG also sells an optional interface for most modern radios that allow the rig to control the tuner or the tuner to control the rig (depending on the brand of radio). It may be possible to leave the radio on high power and rely

upon the radio's fold-back circuitry, but I don't like the idea and have never tried it.

To operate the tuner connect it to a 7-18VDC supply (the manual states you can use two 9V batteries in series), switch the radio to AM or CW, key the transmitter and press the Tune button for one second. If the tuner has already tuned once on the frequency it will grab the settings and almost immediately configure the tuner. If the tuner does not have a match in memory it will go into a full tune mode where it will switch in various combinations of inductors and capacitors until it finds a match.

Once a match is found the green LED will display the status of the match: A steady green LED shows that the SWR is 1.5 or less. A flashing green LED means the SWR is 1.5 to 2.5. If the green LED does not light after tuning it means the tuner could not find a match.

Once you unkey the transmitter the green light will go out and the tuner will go to sleep. The tuner uses latching relays that remain engaged even when the power is removed from the tuner. Once the tuner goes to sleep it draws virtually no current.

The tune button has two additional functions – the first is a bypass mode that is entered by briefly pressing the Tune button. The tuner is taken out of circuit and the signal from the radio is passed directly to the antenna. The second function is a forced tune mode – press the Tune button for longer than 5 seconds and the tuner will go through a full tune cycle even if it already has a match in memory. The full tune option is useful if you use the tuner with multiple antennas or use it in the field where the antenna location changes.

The first time I used the tuner was at the above-mentioned cabin in the frozen north land. I hung the G5RV between a couple of trees, hooked up some coax between the tuner and antenna and powered everything up. After setting the radio output to 5 Watts I tuned into 20 meters and pressed the tune button for one second. The red LED came on and tuner started chattering away. After a couple of seconds the green LED came on full time telling me that the tuner found a match. I let off of the microphone button and the tuner went to sleep.

Next I moved to 40 meters and repeated the operation. Again the same thing happened. Next I tried 10 meters, and the same thing happened. It was obvious the tuner was working. Each time it only took a few seconds to tune.

I went back to 20 meters to see if I could actually talk. I heard a person from Central America calling CQ so I moved off frequency and pressed the tune button. Because the frequency was a bit away from where I originally tuned up on 20 meters the tuner started chattering away, and soon I had the green light. I moved back on frequency, turned up the power on the radio and waited for an opening. Once he said QRZ I keyed up and put out my call sign. As I unkeyed I heard a HUGE signal calling the DX station. Naturally he got through. After

he finished I tried again and to my surprise I heard my call come back. I indeed had caught the attention of the guy in Central America. The QSO was the typical Hi and Bye, but at least I knew the tuner and antenna was working.

For the next hour I had several QSOs on 20 and 40 meters. Each time the tuner worked as expected, including the tune from memory with happens in the blink of an eye.

Just for kicks I tried to tune the antenna on 160 meter (remember the antenna is a G5RV Junior – 40 meter). The tuner tried as best as it could, but finally stopped without displaying the "green light" showing a match. I guess it was a bit much to ask the tuner to tune a G5RV Jr. to 160 meters. I was able to get the tuner to match on 80 meters, but my guess is I was putting VERY little RF.

What about the missing manual tune buttons and the LED power and SWR meter? My FT-857 has a built in SWR meter that shows the "approximate" SWR of the antenna system. Each time the tuner was working it was fascinating watching the SWR meter on the radio jump all over the place while the tuner was trying to find the proper match. Once the tuner found the match the SWR display was virtually flat. There was no need to have a manual adjust as the firmware was robust enough to figure out a match without my intervention. The SWR meter on the radio is the one I'm worried about so I really don't miss another set of LEDs to monitor.

Overall I am very impressed with the little LDG tuner. It's small enough to fit in a backpack, runs on anything around 12 volts, is super easy to use, and most importantly does a great job. I highly recommend the tuner.

73

Larry Jenkins -- KØLEJ

LDG Z100 Tuner Specifications (from the manufacturer's Web site)

- High efficiency switched "L" tuning network
- 200 fast memories
- Optimized, low power consumption tuning algorithm
- Tuning time: 0.5 to 6 seconds, 3.0 average
- Current consumption:
 - Idle - Nearly zero amps.
 - Tuning - 300 mA max
- Voltage requirements: 7 to 18 volts (user supplies power source)
- 1.8 to 54.0 MHz coverage
- Tunes 6 to 800 ohm loads, 10:1 SWR (3:1 SWR on 6 meters)
- Power range: 0.1 to 125 watts (50 watts on 6 meters)
- Enclosure sizes:
 - 5.5" x 5.25" x 1.5"
 - 14.0 x 13.5 x 3.8 cm
- Weight: 14 oz. (400 Gm)



Twin Cities Repeater Club, Inc.
P.O. Box 11534
St. Paul, MN 55111-0534

**Place
Stamp
Here**

Your Membership Dues Have Expired.
Please Renew your Membership Today!

Join the Twin Cities Repeater Club!

P.O. Box 11534, St. Paul, MN 55111-0534

<http://www.tcrc.org>

Fill out this Membership Application Form, and mail it with your check for \$25.00 payable to the Twin Cities Repeater Club, to the mailing address listed above. You can also fill out this form electronically at the web address listed above, and either send us a check, or pay online using the PayPal system.

Name _____ Callsign _____ License Class _____

Address _____ City _____ State _____ Zip _____

Home Phone _____ Work Phone _____ Computer Phone _____

Ok to list your address in club publications? ___No ___Yes

Ok to list your phone in club publications? ___No ___Yes

Are you available for Emergency Service? ___No ___Yes

Are you a member of the ARRL? ___No ___Yes

Are you a member of Metro Skywarn? ___No ___Yes, spotter ID: _____

Are you a member of ARES? ___No ___Yes

Would you like an autodial speed dial number? ___No ___Yes, to phone # _____

Would you like a club ID badge? ___No ___Yes (free to new members, otherwise \$5.00)

What is your internet e-mail address, if any? ___None

Would you like an e-mail alias set up, so that mail sent to **yourcallsign@tcrc.org** gets redirected to the e-mail address you listed above? This can be handy on the air! ___No ___Yes

Do you want a copy of the TCRC Handbook? ___No ___Yes (add \$9.50, which includes postage)

Do you want a TCRC binder to hold it? ___No ___Yes (Add \$5.50 to the above)

This is ___New Application ___Renewal ___Other Change ___Callsign update, old call was _____