

Quarter



Wave

Newsletter of the Twin City

FM Club—TCFMC

The TCFMC is dedicated to furthering amateur radio and friendships in Minnesota and throughout the world.

Volume 36 Number 3 November 2012

WØEF Repeater System

- 146.760- Tone 114.8 Hz
- 444.100+ Tone 114.8Hz
- 444.125+ Tone 114.8Hz

Visit our website for full length articles and photos at www.tcfmc.org

November Meeting: Top Ten Things To Do In The World Above 50 MHz

When you look back at 2012 you will remember seeing one of the most fun and idea packed programs this year! I am talking about the talk by Jon, WØZQ titled : "Top Ten Things To Do In The World Above 50 MHz!" You don't want to miss Jon's talk no matter what your operating habits are as you will learn

more about our hobby and the reason so many amateurs love the UHF/VHF bands! Jon will outline the fun he has on the high bands for all amateurs and how simple it is and how you need very little money to get it done! Be at the Ridgedale Library on Wednesday, November 14, 7 PM for the TCFMC Meeting

and WØZQ's fun packed presentation the "Top Ten Things To Do In The World Above 50 MHz" ! Jon's talk will certainly highlight your year of 2012 in amateur radio!!!!!!



ARRL
Affiliated
Club

Field Day 2012 #3 In The Nation in Category 3A

Reported by Bert Benjaminson WBØN

TCFMC entry WØEF was third in the nation in category 3A !! We did one super job!!!! It's the best ranking ever for TCFMC! The Rochester Club topped us by a small amount in the new Minnesota Cup Award but we met our goal of

top five nationally!, I would like to thank all who participated. It was indeed a team effort, and shows the country we can work effectively in an emergency type operation. It is a real pleasure working with you all in this event 2012

Field Day Event. On behalf of WGØG and I and KEØL, KØ-MPH and the Twin City FM Club thanks to everyone!!!! 73 de WBØN and WGØG Co-Chairs - for TCFMC Field Day 2012

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TCFMC President Mike, KØBUD presents the first Minnesota Cup Award to Rochester Radio Club president Scott, KØMD (left) and to Grant, K1KD Rochester's Club FD Chair. Just a few hundred points separated the two Clubs in Field Day 2012. The presentation took place October 8 at a Rochester Club meeting.



All the Ships At Sea



Mike Sigelman KØBUD

I first got active in the TCFMC as the Club was looking for leadership and a President and people to support the 146.76 Repeater. Some things never change! I called Hans, KØHB and asked if he would take the leadership of the TCFMC and he said he would. I was leaving for Pittsburgh and didn't want to see the Club running loose with a lack of leadership. From those beginning days to now leadership and participation has always been challenges for the Twin City FM Club as it is for most amateur radio clubs. From the early days of repeaters and repeater tech's Gene and Roger to several Presidents later I have found some great people involved with the TCFMC.

The Club grew but needed cash and therefore Hamfest MN. I loved our success with Hamfest Minnesota which grew to giant proportions.. It put the TCFMC on the map! It was a bit of a risk but a giant success. We did it in the boom growth days of amateur radio a few years ago when volunteers were pounding on our doors with the fervent desire to get a license and the Club was there on the right track! Repeaters were fewer and active clubs a little less common. Amateur radio like many other hobbies and interests have taken it in the chin the last few years. It has partially drained our financial coffers and made us limited on the things we do so well. We can no longer buy new repeaters whenever we wish or replace other equipment at will. It becomes more difficult to do our regular business but we have to persevere. There still is and has always been a spirit of excitement in the TCFMC! Great Field Day operations like last year and setting new records in contests; and fun packed events like our annual picnic go on and continue with the thrust we have always had as an active Club. These are the things that have kept me moving forward with the attitude that you haven't seen anything yet. I think the best is yet to come. The Twin City FM Club now maintains three repeaters and serves the public with the same vigor we have always had. Technical help with the repeaters is still tough to earn but with the support of people over the years like Tim NØBYH, Brad, KCØHCP and Jathan, WØFOF, and others we have kept the repeaters going no matter what the situations, and that work seldom gets the applause it deserves. I truly appreciate the work they have done including others in other areas such as Matt, KØBBC; Paul, WGØG and Jeanette, NØJBW; Tom, NØZK; Fred, WØFHB; Dick WØDIK; Rusty, KCØVCU; and Bert, WBØN! I appreciate all the work that was performed by so many including Paul, KBØN who may still be hanging out there on our Club Station tower somewhere fixing a antenna problem (I say that with a smile!). Mark NØPFY Mandy KGØAY where there years ago and believe me we needed them. So was Steve, KNØF; and Ray, KGØDK; Erv, KØIVO; Harry, KØVZT; Walter, WØWAK; Jim, AAØUP; Jim, WBØKZB, Don, NDØM; Ted, KØLTX; Rick, WØRDT; Al, KØAD; Bruce, KCØTPV; Joe, WØWD; Tom, NØZK, Cliff, KØGWI; Bernie, WØNXZ; Ivan, KØTKS; Carl, KØTNT; Steve, W8GAZ; Mike, NØNY, Al NØQPM, Mike KØMSX and Mike WA1GWE. Steve WAØNJF and so many more. I might not have them all in this list but thanks to all who have helped to make the TCFMC roll to success as one of the older but still rolling Clubs in town. Also thanks to those that helped in so many ways such as Greg, NØGEF; Mike Sell, KØCOM; Jay, KØQB, Brian, NØBM and Greg, KØGW, Glenn, KIØKL; and let me not forget Skip, KSØJ; Dave, NØKBD; Ann, KØANN; Gale, NØMGQ; Zack, AAØU; and Hans, KØHB! A special thanks to my wife Judy, NØOEL who has not only helped in so many Club projects but also has supported me with positive direction for so many years in my work for TCFMC! All of you and so many more have made my job possible and a little easier and I thank you all. I am NOT saying "goodbye" fellow members as KØBUD will still be around the Swap Shop and the Quarter Wave but I am stepping back from the job as President, as I have before, with the hope that someone will step up to the challenge. Being President of an amateur radio club is sometimes thankless and exhausting. Sometimes no matter what one does there is always someone to question it but fortunately there many more to support your efforts in a positive way and help make the Club a giant success. Thanks, many thanks to you all. Long live TCFMC! 73 Mike, KØBUD

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The @ symbol has been replaced with the word "at" to thwart spam e-mail engines.

Beefing up the Kenwood TS590S (and others) Main Tuning Knob

Written by Carl Vangsness KØTNT

Once upon a time long ago in a land far away, it was a dark and stormy night and KØTNT was tuning the HF bands with his Yaesu FT-890 transceiver. A nice compact little rig with a decent feature list for the price. BUT using the 890 tuning knob was a little frustrating due to the lightweight plastic used in the design. I had grown sensitive to the issue after taking a turn at the TCFMC Field Day operation where the rig of the day was a Kenwood TS850, a rig with serious weight/mass in the main tuning knob. (I did say it was a long time ago!)

What to do about the 890? The knob was hollow on the reverse side so something could be stuffed in the spaces near the outside of the knob, but what to use? In another life, I imagined I would be a competent golfer and had a full set of clubs and all the usual gear. I had attempted to alter the swing weight and balance of the woods (it was a REALLY long time ago!) by using lead backed tape, available then and now at major golf supply stores. Taking pieces of lead tape and placing as much as I could in the 890 main knob made a real difference in the “feel” of day to day tuning across the bands.

Many years and rigs later, I purchased a Kenwood TS590S and have enjoyed all the modern features and capabilities it possesses. Except for one thing: the lightweight main tuning knob. A really nicely designed knob, machined from aluminum, with a good rubber grip-ring on the outside. But what to do about the weight/inertia or lack thereof?

First thought was to repeat the 890 experience and stuff lead or something heavy in the spaces in the back of the knob. Oops. After a herculean effort to remove the rubber grip-ring, guess what? Solid aluminum! That's as good as it will get. I briefly considered drilling holes in the knob and putting some form of high density material in the holes, but reality set in, along with my recalling my very poor mechanical construction skills. I don't have any. I also didn't want to go the Elecraft K3 route and pay over \$100.00 for a stainless steel version – way too much money and complication. Then I remember the lead tape routine. Since the knob is well made, I finally realized I could accomplish what I wanted by simply winding lead tape on the knob next to the raised shoulder at the back of the knob.

After getting two rolls of lead tape (six feet per roll of one-half inch wide, 0.013 in. thick tape), I faced the next task – removing the previously mentioned rubber ring without destroying the rig! Solution can be seen in the photo below:



I inserted cable ties (serrated side up!) between the knob and the ring and was able to pull the ring off with a pair of forceps (or small needle nose pliers).

Next task was removing the knob. I don't remember the source of the info but you can have it for free: you will need (for this rig) a 1.5 mm Allen wrench. The setscrew is REALLY small and so is the wrench. If you don't have one the fits the Kenwood setscrew, try some of the actual hardware stores like Ace and True Value.

Now to winding the tape on the knob. First hint: REMOVE the setscrew. Since the access hole will be covered by the tape during the winding, and you will need to puncture the tape every other layer with an awl or similar tool, bitter experience taught me that lead debris can fall and accumulate in the access hole if you leave the setscrew inside. It doesn't take much time before the small setscrew 1.5 mm. hex head socket gets filled with little pieces of tape and stops you from getting the setscrew out. (Spare setscrews: McMaster-Carr part number 92029A102, 1 pack of 25 Metric Type 316 Ss Cup Point Set Screw, M3 Size, 5mm Long, 0.5mm Pitch. The Cup Point is key to not scarring the encoder shaft.) I found these by looking at the drawings on the catalog page for hexhead metric setscrews with a hex socket dimension of 1.5 mm. \$5.69 plus shipping (no minimum billing at McM-C – one of my favorite suppliers) gets you a pack of 25, plenty of leftovers for the ones you drop!



The photo above right shows the knob with one roll of tape wound and installed back on the rig. Not very pretty at this point. Which leads to one last minor task – cut the rubber ring in half and install on the modified knob. The effect is much better looking and keeps hands and fingers away from contact with the lead tape.

*** Caution Note ***

The lead tape package contains extensive warnings about prolonged exposure to lead so don't eat the tape while you are working with it and wash hands thoroughly when finished.

*** End of Caution Note ***

Now if only I would leave well enough alone. NAH. I went back and wound the entire second roll on the modified knob which resulted in a truly hefty main tuning knob that keeps on going during quick band activity checks on 6 meters.

The last cosmetic touch came from a product called PlastiDip (also found at Ace, True Value, etc.), a plastic rubberlike liquid compound normally used to insulate the handles of various tools like pliers. I dipped the oversized knob in the liquid several times to build up a coating that completely covered the exposed lead tape. The covering is almost the same as rubber and can be removed at any time without damaging the finish of the original tuning knob.

Final result – a tuning action that is every bit as smooth as the larger rigs today (and probably those of yesterday) at pretty minimal cost and trauma to the TS590S.

(Note – for a really boring math analysis of the weight and inertia calculations involved, as well as the physics of the main tuning encoder, see the companion article - “A Really Boring Math Analysis of the Hefty Tuning Knob and Other Alibis”.)

Shortwave Listening

Steve Kremer KNØF

How many times have you heard how the Internet will change our lives? Want to find some information? Look on the Internet. Want to communicate with just about anyone in the world with computer access? Fire up Skype and not only can you talk to another person, but with a camera-equipped computer you can have a virtual face-to-face encounter along with your conversation. With the proper setup, you can write an article like this one on your mobile phone or pad, save it to a cloud computer and print it from anywhere in the world on your wireless printer. Wow! Mostly flawless performance.

Now, let's take this idea of using the Internet a step further. Remember days of listening to HF broadcasts on a radio, using an antenna and hoping for great propagation so you could hear your target station and actually understand the announcer? Actually, as you well know, you can still do all of this with ease. Turn on your HF radio, find a good, active SW broadcast band and sit back to enjoy good worldwide programming.

Now, let's imagine that HF propagation is poor and you really want to listen to the latest BBC news broadcast. Before the Internet, you were basically out of luck until band conditions improved. However, with the Internet, you can find just about any SW station streaming broadcasts to your computer. Let's use the BBC as an example of what you can hear. Not only can you stream the BBC and its World Service, you can also find sites for local radio stations of the BBC; you can hear programming that would never be available with a mere radio! Not only that, but the audio quality is near perfect. High fidelity!

Where can you find your favorite stations online? I have found a great source for streaming broadcasts is www.tunein.com. You can search this site for not only hearing stations through your PC but you can also find apps for your mobile device that allow you to listen to just about any area in the world. You can hear broadcasts in native languages along with English programming. Also, check apps stores for phones and tablet devices. You will be amazed at what you will find. Not only are there apps for SW, but there are programs to hear everything from local broadcasts around the world to public service scanner communications. Find a scanner app and listen to Las Vegas Police; it's a blast!

Finally, I must admit that there is still nothing to take the place of real shortwave radio, with its good and bad band conditions, fading, lighting and static crashes and all of the great noises that fire our imagination and listening skills. The Internet may get all of the broadcasts to you, but it is without the magic of real radio! However you decide to listen, have fun and enjoy travelling the world.

Repeater Update

Tim Arimond, NØBYH

Presently we have MSF 5000 on 444.1 with 75 watts of power, however the receiver is not as sensitive as the old Micor. So at this time we are back on the old Micor. The programming for the MSF 5000 is not complete. We cannot run both frequencies yet. The interference is apparent on both repeaters. We still need people to help triangulate the source of the signal. Just monitor near the input frequency (25 to 50 KHz away) and record the signal strength with the location, date, time. I

will try to correlate the data and see what we can find. The repeater committee is still waiting for the go ahead to purchase a new 444.1 machine. We expect the Micor to fail in the not too distant future. We already know that parts could be very difficult to find. The 76 machine seems to be working fine. The St. Paul site seems to be working as well. We are still looking for a good source of Internet for this machine with no luck at this point. If you know of a good cheap wireless service (less

than \$25.00 USD per month) please let me know. The .125 machine continues to work with limited range due to the low power. Respectfully Tim NØBYH

A Really Boring Math Analysis of the Hefty Tuning Knob and Other Alibis

Math: The previous article, Beefing up the Kenwood TS590S (and others) Main Tuning Knob, describes a process for adding weight and inertia to the solid aluminum main tuning knob on the TS590S. The original knob measures 1.50 in. O.D. X 1.0 in. H., with a back shoulder of 1.79 in. O.D. X 0.179 in H. Aluminum has a density of 0.097 lbs./in³. The density of lead is 0.41 lbs./in³.

The spreadsheet below shows the weights and inertias of the various combinations.

Inertia calculation for solid and hollow cylinders									
	590 knob			590 back disk			Lead Tape		Oz.
Outer Diameter	1.497000	in.		1.795	in.		2.158	in	
Inner Diameter	0.000000	in.		0.000	in.		1.497	in	
Height (thickness)	1.000000	in.		0.179	in.		0.500	in	
Density	0.097000	lbs/in ³		0.097	lbs/in ³		0.410	lbs/in ³	
Volume	1.760083	In ³		0.453	In ³		1.829	In ³	
Weight – each piece	0.170728	lbs	2.732 oz	0.044	lbs	0.703 oz	0.400	lbs	6.396 oz
Weight - knob, back	0.214666	lbs	3.435 oz						
Weight – knob, back, tape	0.617000	lbs	9.087 oz						
Weight increase	287.42%								
Inertia	0.000124	Lb-in-sec ²		0.000046			0.001		
total inertia without tape	0.000170	Lb-in-sec ²							
total inertia with tape	0.001038	Lb-in-sec ²							
Inertia increase	611.89%								

As you can see, the adding of the lead tape in the form of a hollow cylinder with 2.158 in O.D., I.D. Of 1.497 in., and thickness of .5 in. triples the overall weight of the knob from .22 lbs. to .62 lbs. But the real effect is the increase of inertia from 0.000171 to 0.00139 lb-in-sec²! Like going from a thin steel disk to a tractor tire.

Alibis: Comments were made on the 590 reflector about the possibility of damage to the main tuning encoder and circuit boards attached to the encoder. Fortunately the encoder is made of very sturdy construction and its housing is bolted, I say again BOLTED firmly to the 590 front panel. A 0.25 inch shaft over one inch long connects to the encoder rotor thru a brass bushing. This shaft/bushing combination has to be able to withstand the abuse of hams less cautious than you and I who would occasionally lean on the knob, strike it with some force, unintentionally or otherwise, or even try to use the knob as a lifting point to move the radio.

Second, the rotor has no mechanical connection to anything in the encoder body. The rotor itself is a disk with 250 tiny magnets impregnated in the disk and moves close to but not touching the sensor that produces the pulses used for tuning.

Third, the encoder electronics connect to the main circuit by way of a simple wire cable and plug combination, with no physical or mechanical connection of any kind. Any mechanical shock imparted to the encoder/front panel would have no effect on the main tuning circuit board.

This same encoder has been used for years in the Kenwood TS850, TS830 and several older Kenwood rigs, and has been suggested as a less expensive (~\$60.00) alternative replacement for Icom rigs in the 756 series.

In other words, the manufacturers anticipated the abuse to which we would subject their rigs and, for once, foiled our silly efforts to hurt their products. So wind away and enjoy the feel of a truly Hefty Knob!

(P.S. If you're wondering why I bothered with the calculations above, it comes from 27 years in the servo motion control industry, deciding how big a motor is needed to move a customer's load!)



Twins Cities FM Club

Home of the 444.1 444.125 146.76 Repeaters

PO BOX 580555

MINNEAPOLIS MN 55458-0555

Next Meeting

November 14th, 7 P.M.

Ridgedale Library

12601 Ridgedale Drive

Minnetonka

Located behind the Ridgedale
Shopping Center.

Twins Cities FM Club Gear

Prices starting at: (Extra charges apply for 2X+ Large and Tall sizes)

Navy Hat **\$13.95**

Navy Jersey Golf Shirt **\$24.95** (pocketed shirt also available)

Denim Medium Stonewash Long or Short sleeved Shirts **\$30.95**

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All items include the TCFMC logo and your callsign.

Shirt and Jacket prices include your name on right side.

To Order: B & B Embroidery / 817-471-4488 / www.hamthreads.com / SEE WEB CATALOG OTHER ITEMS

Questions: A.J. Hirman - KCØPVC at KCOPVC@ARRL.NET or 763-412-9014

