# TMRA Amateur Radio Beacon

**The Toledo Mobile Radio Association is an ARRL Special Services Club Serving Northwest Ohio Since 1953**

**January 2006**


## The Prez Sez:

Hello, and Happy New Year... welcome to 2006! Here we go into another (hopefully) prosperous year for all. By the time you read this a couple of events will have taken place. First, the TMRA's Christmas party will have been attended by many members and so far all that I've heard have been rave reviews. Many thanks to the Kehr family, specifically Pat, KC8WQU for the great planning, arranging, and for providing the entertainment. I had no idea she was so talented! Then secondly, we will have gotten back to business with the Executive Committee meeting at the end of December and our new trustees will have gotten 'sworn' in. Hopefully there won't be any swearing, Hi Hi.

The TMRA Membership is doing well... I think we'll finish the year with 207 members, and so far for 2006, with quite a few renewals we are at almost 100 members. Keep 'em coming! Though, I know there are many more of you out there that need to renew! Check with me if you have any questions or thoughts about your membership. As I've stated many times, I'm always available to talk about membership! At the next General Meeting, the second Wednesday in January (the 11th to be exact,) we will have the drawing for the two free memberships (yes, two of them) for the 2007 membership year. Those new or renewing members that have gotten their applications to me before the end of this year will be eligible for this drawing. I hope you are eligible, and if so, I'll wish you good luck!

Hopefully you will have the chance to operate in one of the newer 'contests' that is gaining in popularity... "Straight Key Night" which will be January 1st. I have never been one to favor the 'code,' but it is starting to grow on me, thanks in part to Steve, KC8TVW and the Sunday night Q&A nets and the Morse code practice that starts it off. This will be my first attempt at operating CW and I am looking forward to the journey it will take me during this very casual operating contest. I think it will spur me to do more 'Charley Whiskey' operating in the future.

Another operating event I like is the ARRL Kid's Day on January 8th. This is another 'easy' and casual contest to get your feet wet with and hopefully get you ready for other contests if not at least a primer for Field Day (though it is six months away.) Try to do some operating and give some 'kids' a 'QSO' and show others around the country and the world just how much fun this hobby can be.

73 de KB8PAI,
Tom Swartz, President and Membership Chairman
KB8PAI@ARRL.NET

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Join your friends on Sunday night at 7:30 PM for the TMRA Q&A net, hosted by Steve, W8TER and Steve, KC8TVW. Then at 8:30 PM, the TMRA information net, followed by the Swap-N-Shop net. All this on the 147.270+ TMRA 2 meter repeater.

## Coax Cable Testing For The Layman

Doug, N8WWM(n8wwm@arrl.net)

A big part of a ham's station is the coax cable. Cable quality figures large in how well a station will perform. Cable that is shoddy, old, or substandard for a given frequency will spell doom to weak signal operation. With all the bluster some manufacturers put out about how good their cable is, here is a simple way to determine the quality of any piece of coax cable is without using exotic test equipment. Take 100 feet of any coax and hook one end to a dummy load. Now, hook the other end to a wattmeter and back to the rig with a short jumper. Measure the rig's output at the beginning of the coax run. Call this "watts input to coax". Now, connect the coax directly to the rig, take the wattmeter and jumper down to the far end and hook it in series between the dummy load and coax cable end. Measure your output now, after it travels through the 100 feet of line. Call this "watts output from coax". Now figure your % of loss by conventional division, like this: (watts output/watts input=decimal figure of total watts output left at the antenna feed point) Multiply result by 100 and you get total percentage of power NOT lost. Subtract that number from 100 and you have total percentage LOST. Keep in mind also, that whatever the percentage of loss on the tested piece of cable turns out to be, that loss is also seen in signal loss to your receiver.

This is not going to be 100% accurate due to wattmeter inaccuracies, etc. It will be really close, though. You will get a visual and understandable idea of coax loss at a given frequency for any cable tested. Various cables have better or worse loss factors on various frequencies. Test the same piece of cable on 2 meters and then on 440...YIKES! On 440 the loss will be nearly 3 times as much. You don't even need 100 feet of cable to do this test, the length is immaterial to the experiment. You will get accurate loss figures with any length of cable by using this method. The 100 feet figure is just the number that most cable companies use in their specifications.

To those purists who use exotic test equipment...I know, I know...this ain't super scientific or high tech. It is a simple way for a layman to test coax loss and be as accurate as can be with what equipment is on hand. Don't use RG-58/U or RG-8X<"mini-8"> coax cable on any VHF antenna where the cable run is more than a very few feet. In a 100 ft run of RG-58/U coax cable you can lose more than 50% of your output power before it gets to the antenna. This may be OK with you as long as you can hit the local repeater on 2 meters, but remember that the same is also true with your receive as well. A weak signal on 2 meter SSB or from a distant repeater that is lost due to cheap coax is lost for good, and you don't even know it until your pals ask you why you can't hear that weak one they are copying. RG-8/U cable, such as Belden 8214 or Belden 8237 is the minimum quality of coax cable practically useable on VHF. period. Some guys with deep pockets won't even consider coax cable; they use expensive hardline cable to get the last 1/2 dB of performance. Bottom line: Get the BEST you can afford. It truly does make a difference.

Just about any coax cable spec. can be obtained by searching www.belden.com . In this ham's opinion, Belden is still the yardstick that ought to be used.

This article is intended to provide time tested information on testing and practical application of coax cables for use on VHF frequencies. No part of the information contained here is claimed to be my original concept. I wish to thank a great ham and good friend, Jack Naus, WB8ILD(SK) for all his patient explanation and his gifts of time, parts and guidance when I was a clueless rookie. Thanks. Jack...lots of us are doing what you told us, and passing it on.

73 Doug N8WWM

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**Next TMRA meeting, Wednesday Jan 11, 7:30 PM, at the Electrical Industry Building, Lime City Rd. Rossford.**

## My Antenna Don't Work on Sat's, Why Not?

By: Steve / kb9ups

As you know there are many different types of antennas on the market today, but which one should I use for satellite communications?

Although there are no intrinsic differences between antennas for satellite use and those for terrestrial applications, some designs are clearly better suited to satellite work than others. There are several areas to consider when picking an antenna for sat work. Here are just a few. Directional properties (gain and pattern), Transmitting vs receiving properties, Efficiency, Polarization and Link effects (spin modulation, Faraday rotation)

It's true you can work satellites with your "omnidirectional antenna", but is it doing everything you need it to do all the time? No. The pattern of your vertical omni is like a large doughnut, see a problem already? What about when the bird is over head? I can see it, but I can't hear it, this is because the omni is not meant to send or receive straight up. The omni also has limited gain, so you won't be able to work a bird to far out. Omni antennas for satellite communications take this into consideration as in the Eggbeater or Turnstile type of antennas. They are designed to look up, although the gain is still relatively low. Omni's do have there uses as in receiving close in and over head birds and also "weather satellites".

What is more desirable for satellite communications is a directional antenna, but do they all work and how should it be mounted, vertical or horizontal? Will my old 13B2 work? What about my 70cm beam? Yes and No. Remember when we talk about satellites, they are not only moving across the sky, but spinning too. Now comes some new terms, Faraday Effect and Spin modulation. As a linearly polarized radio wave passes through the ionosphere, the direction of the electric field rotates slowly about the direction of propagation, this is Faraday Effect. Most noticeable at lower frequencies, such as 29 MHz and 146 MHz, sat's use both. What is heard at the ground station that uses "linearly polarized antennas" is slow fades as the angle between the linear component of the incoming wave and the ground station antenna changes during a pass.

A satellite's antenna and its gain pattern are firmly anchored to the spacecraft, a ground station's position relative to the pattern will change moment by moment. Both the polarization and gain of an antenna vary with the observer's location. A ground station will therefore see gain and polarization changes on a downlink signal resulting from satellite rotation. The changes are called Spin Modulation.

To eliminate both the Faraday effect and spin modulation a ground station must use Circular Polarized antennas. The use of your 2 meter and 70 cm yagi beams will work, but you will hear a fade cycle of around ten to twenty seconds. One way that helps this is phasing two of each of the beams together and mount them in a skewed orientation, that is, mount the two 70 cm beams inside the two 2 meter beams and tip the four together at 45 degrees. The left tops skewed 45 degrees right and the right tops skewed 45 degrees left. To use this you must use two of each antenna. In acquiring antennas remember to buy or build them for the "lower" end of the band. Satellite frequency allocation is the lower end of the bands. Although most terrestrial types will work,

**OTHER TOLEDO AREA AMATEUR RADIO ORGANIZATIONS**

**ARES**
Lucas County Amateur Radio Emergency Service meetings are held on the 4th Saturday of the month in the "Private Dining Room" in St. Luke's Hospital, at 9:00 AM. You are welcome to meet in the cafeteria for breakfast before the meeting. Alternate meeting locations and information will be announced on the daily 6:40 PM net. Contact Brenda, KB8IUP at 419-866-5928. **ARES NTS and Training Net** meets daily at 6:40 PM. 146.940- Alternate frequencies are: 147.375+ or 147.270+.
**SKYWARN Net** as needed by the NWS, 147.375+ Alternate frequencies are 146.940-, 147.270+ or others announced by "net control".
**GTARA** (146.610-) Meets on the 3rd Tuesday of the month at the Red Cross Building, 3100 W. Central, 7:30 PM. Contact Martha,K8AAC.
**SARA** Meets on the 2nd Tuesday of the month at the Springfield Twp. Hall, 7617 Angola Rd. at 7:30 PM. Contact Tom, N8MAV, 419-826-7401.
**TRAC** (147.375+, 146.940-) Meets 1st Thursday of the month at the Springfield Twp. Hall, 7617 Angola Rd. at 7:30 PM. Contact Terry Caldwell, KC8HQH, 419-874-2173.
**QCWA Chapter 142**, meets on the 2ndt Saturday of the month at The Big Boy Restaurant, 1402 Reynolds Road, Maumee. (next to Hampton-Inn hotel ) Contact Paul Lentz, K8PL, 419-882-5906. Or email, pelentzk8pl@juno.com
**FRAT** (52.360, 146.835-, 224.280-, 444.650+) Meets on the 1st Tuesday of the month. FRAT net follows the Rain Dialup and Amateur News Weekly on Thursday nights starting at 8:30 PM.

some will not work as well, as in the 440 band. Sat's work at 436 MHz, so if your AR-450 is set at center of 444MHz, give or take, you can see the problem here.

I would like to add here elevation. If you mount your antennas at an elevation of 20 to 25 degrees you will be able to work most satellite passes, then using your omni for higher passes. Of course having a rotor system that will fully elevate your beams to 90 degrees eliminates all dead spots except for obstacles. Remember that FM is "line of sight".

Using one 2 meter and one 70 cm beam (mounted vertical polarized) will work for the FM birds and increase your gain over the omni type antennas, but fade will be something you must tolerate. Also you will hear the SSB birds such as Fuji-Oscar 29 (FO-29) and VUSat-Oscar (VO-52), but expect up to 30 seconds of fade between polarization shifts. This is a long time to wait for a signal when the satellite takes, on average, about 12 minutes to go from horizon to horizon.

One last thing to cover is Link effects. What this means is that your antenna polarization must be matched to the satellite. Let us make five comparisons to explain.

Type 1 link ( Linear Polarized , Linear Polarized ) matched. The received signal level is constant. This link is our reference.

Type 2 link ( Linear Polarized , Linear Polarized ) random. The received signal strength varies monotonically from a maximum equal to the reference level when the two antennas are parallel down to zero (theoretically) when the two antennas are perpendicular. In practice, the attenuation is rarely more than 30 dB for the perpendicular situation.

Type 3 link ( Linear Polarized , Circular Polarized ) random. The received signal strength on this link is constant at 3 dB down from the reference level and is independent of the orientation of the LP antenna and the sense of the CP antenna.

Type 4 link ( Circular Polarized , Circular Polarized ) same sense. The received signal strength on this link is constant and equal to the reference level.

Type 5 link ( Circular Polarized , Circular Polarized ) opposite sense. A simple theoretical model predicts infinite attenuation compared to the reference signal link, but in practice attenuations greater than 30 dB are rare.

There are techniques that can phase two yagi antennas in circular polarization often not true CP, but elliptical and somewhat difficult for the beginner. We can bring this up later.

Status and Frequencies can be found at: http://www.amsat.org/amsat-new/satellites/status.php#ISS

73's for now and I'll see you "on the birds".
Steve/kb9ups
www.qsl.net/kb9ups

**The TMRA *Amateur Radio Beacon* is published monthly by the Toledo Mobile Radio Association. Editors: Brenda, KB8IUP, and Chuck, KB8FXJ. Email,** kb8iup@arrl.net

## Highlights From Weaver's Words -- Happy New Year

Date: Monday, December 26, 2005 10:19 AM

*Great Lakes Citizenship Award*

I like to put my money where my mouth is so I got to thinking that I've been preaching the gospel of involvement -- each member becoming involved in the functioning of ARRL. This is the type of thing we learned in high school civics. To make democratic countries and other groups work fully, we need to get involved in making them work. I had encouraged members in this Division to toss their hats in the ring and run

for Vice Director and Director in the tri-annual election for these positions. A few of you did just this and several others became deeply involved in helping us who declared ourselves candidates work toward being elected.

In elections such as this, only a few can be elected, but in my mind, everyone who ran and everyone who worked to get the candidates elected have demonstrated active interest in being a good Amateur Radio citizen. What could I do about this?

As Director, I've created the Great Lakes Division Citizenship Award. It is given to amateurs and friends of Amateur Radio who demonstrate substantial support for ARRL and Amateur Radio. Twenty amateurs and friends received the first of these Awards.

The recipients included candidates Neil, K8IT, Dan, KB6NU and Gary, KI4LA. Staunch workers were: Kathy Sablatzky, XYL; Sandy, KG8HM; Dick, K4FQT (while still W8FQT); Fred, WA4SWF; Chuck, K8CR; Herb, W8HRN; Jeannie, KB8QLC; Brenda, KB8IUP; Hank, N8XX; Rick, KD4PYR; Sam, KC8QCZ; Gregory, N8GEO; James, WA8AZP; Bruce, N8WWX; John, WB8DEG; Art, KC8WAZ; Raymond, N8CPO; Clairus, KC8QON and Ronald, K8RDR.

Thanks to you who demonstrated so vividly your belief in ARRL.

If you know of someone who you believe should receive a Citizenship Award, nominate them. Tell me who they are and send me an outline of the above ordinary act of citizenship they performed.

*Kids Day, January 8 - A Chance To Promote Amateur Radio*

We hams keep saying we need to get new, younger blood into our great service. The question is: What are we doing to make this happen?

"The second Sunday in January is the day to turn your shack over to the kids for some ham radio fun with a purpose. The first running of Kids Day 2006 begins Sunday, January 8, at 1800 UTC and continues until 2400 UTC with no limit on operating time (the second Kids Day will be Saturday, June 17). Kids Day provides a terrific opportunity to show youngsters what Amateur Radio is all about--and that includes its role in emergency communication. ARRL Education and Technology Program ("The Big Project") Coordinator Mark Spencer, WA8SME, says Kids Day can be a great opportunity spark change and get kids and families thinking about emergency preparedness." From the ARRL Letter, December 23, 2005.

The two Kids Days each year are great ways to introduce youngsters and not so youngsters to Amateur Radio. What will you do to get non-licensed people to participate in Kids Day? What can you do? Check out http://www.arrl.org/arrlletter/audio/ for an audio report or http://www.arrl.org/arrlletter/05/1223/ to read the story. Experience with the ARRL Big Project school program clearly demonstrates that many youngsters become interested in Amateur Radio and become licensed once they have tasted hamming. Please do your part to introduce still mover young people to Amateur Radio. Looking ahead, Kids' Day number two is June 18.

The semi-annual ARRL Board meeting will be in Newington in mid-January. If there is anything you'd like me to check on while I'm there, let me know.

HAPPY 2006 TO ALL!
73,
Jim Weaver, K8JE, Director
5065 Bethany Rd., Mason, OH 45040
E-mail: k8je@arrl.org; Tel: 513-459-0142
ARRL Great Lakes Division
ARRL, the Reason Amateur Radio is!
Members, the Reason ARRL is!

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## HAPPY NEW YEAR 2006

## January 2006

### More from Jim Weaver's "Weaver's Words"

A group in Michigan has asked if it would be possible to extend the long-standing on-air Code Proficiency program so Code Proficiency Qualification runs (tests) could be given locally and not just by W1AW broadcasts. I'm preparing a proposal for the coming Board meeting to do this. It sounds to me that this could be a good program for meetings, hamfests/swaps and similar get-togethers.

I was proud to join with my fellow Directors recently to vote unanimously to award free memberships to servicemen on active duty. The details of how this will work are still being worked out, but I expect them to be announced before the end of January. The Board believes this is the least we can do to recognize the sacrifice and devotion of these servicemen to our country. Watch the ARRL Letter and QST for details.

THE TOLEDO MOBILE RADIO ASSOCIATION P.O. BOX 9673, TOLEDO, OH. 43697-9673
President, Tom, KB8PAI; Vice-President, Steve, W8TER; Secretary, Brian, WD8MXR;
Treasurer, Chuck, N8NIR; Public Information Officer, Steve, KC8TVW.
Board Members: Dave, KB8EH; Ed, WA8BHO; Scott, N8BIR; Howard, W8NEE;.Bob,K8ADK; Steve,KC8TVW.
TMRA Home Page **www.tmrahamradio.org** Webmaster, Becky, KC8ZNX.
TMRA W8HHF Repeaters; 29.680-, 147.270+, 224.140-, 442.850+ (TMRA 2 meter, 220, and 440 repeaters operate with a 103.5 "PL", or a touch-tone access code of 1-2-3) Please "ID" before using phone-patch.
(10 digit dialing, ✶up and #down)
TMRA W8HHF Packet BBS Frequencies 51.780, 145.690, 223.480, 441.060
The TMRA meets at 7:30 PM every second Wednesday in
The Electrical Industry Building, Lime City Rd. Rossford, Ohio.
The TMRA Q & A net meets every Sunday night at 7:30 PM, followed by the TMRA "Information & Swap 'N-Shop" net at 8:30 on the 147.270+ repeater. All amateurs are invited to check-in. *TMRA Voice Mail 419-535-6594*