

# THE VHF JOURNAL

PUBLISHED BY THE ROCHESTER VHF GROUP · NOVEMBER 2000 · [HTTP://VHFGROUP.ROCHESTER.NY.ORG](http://vhfgroup.rochester.ny.org)  
CLUB MEMORIAL CALL: W2UTH

**3 DAYS IN NOVEMBER**

**NOV 9TH:  
SPRINT**



**NOV  
10TH:  
TUNE-UP  
CLINIC AT  
MDS**

**NEW 5760 CLUB PROJECT  
ELEVATION CONTROL REVIEW  
FT736 MODS  
INTERNET LINKS  
BEACONET  
CONNECTOR FACTS  
ZOOM FEEDING YAGI  
ARRAYS AND DISHES**

**NOV 11TH:  
VHF ACADEMY**

**CAN YOU HANDLE IT?**

**THE MEETING IS NOT AT 111 WESTFALL ROAD THIS MONTH!!!**



### Welcome to the November edition of the RVHFG VHF Journal.

-The **902.100 vs. 903.100** discussion is open again. I have input from two hams on the subject, but have concealed their identities to give an impartial hearing to the matter. Don't agree with my methods? Then write something yourself, eh!

-**ZOOM feeding of antennas** is the subject for **K2RIW** in a message forwarded to us by **W2EV**.

-The upcoming 2000/2001 club project is **5760MHz**. Read 2 1/2 pages of info on it here, check the club website for further info, and then place your order.

-**The November All-Band Sprints are upon us!** Are you ready? They take place the night before the November membership meeting. Send your logs to **N2JMH**

-We've got a review of the **Winegaard elevation readout unit** by **VE3AX...** the editorial staff's hint to you is NOT to run right out and buy one of these things... but read the article and see why.

-**Site surveying by remote control using the internet** is the subject of an e-mail turned into an article by **N2DHH**  
**73 es DX2U, EH ...de VE3IEY**

**To Subscribe: Send your address, call, e-mail address and \$10 US funds (or \$15 CDN funds) to: The Rochester VHF Group, PO Box 92122, Rochester, NY, 14692.**

You may elect WEB or MAIL delivery for the same price. You will be notified the very day it is available for download. If you elect delivery by mail, copies are in Black and White- sorry!

**Commentary and articles:** via e-mail to editor VE3IEY: [tantonr@kingston.net](mailto:tantonr@kingston.net). Use standard ASCII text, Corel's Word Perfect or send as a regular e-mail message. **Photos and drawings:** via e-mail, and can be sent in any format that is available (JPG, GIF and TIFF are the most common).

**Assistant Editor, printer, membership & data-magician:** N2KXS

**Advertising space is now available in the Journal.** Contact the editor for One thru Twelve month rates. Layout services are free of charge.

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**Jeff, KB2VGH sez:** "There is only \*one\* mailing list [you'll ever need...]" [Rvhfg@vhfgroup.rochesterny.org](mailto:Rvhfg@vhfgroup.rochesterny.org)  
It is setup to broadcast to all RVHFG members

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***Your Andrew Cable Connection!***

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# November Meeting Notice

10 NOV 00 7:30 PM

## Tune-Up Clinic at MDS

**THE MEETING WILL NOT BE AT 111 WESTFALL.**

Directions:

-From the parking lot @ 111 Westfall, turn RIGHT. At the next light (Rt 15A) TURN LEFT, into the RIGHT LANE. The road splits – stay RIGHT. At the very next stoplight (Science Parkway), make a RIGHT. MDS is your 2<sup>nd</sup> driveway on the right. Park in the upper lot, enter the building by the front doors. Someone will be hanging around there until ~7:45pm or so (locked doors after 5:00pm). **Need more details? See the Chairman's Rant to the Right of this announcement.**

## 2000 RVHFG FALL ALL-BAND SPRINTS ANNOUNCEMENT

... de Jim Howard <n2jmh@arrl.net>

**OBJECT:** 1) To work as many stations as possible on our VHF allocations in a 5 hour period. 2) To have fun!

**DATE:** Thursday, November 09, 2000

**TIME:** 7 PM to Midnight local time. Stations within 50 miles of a time zone boundary may adjust their operating time to that of the adjacent time zone if they wish. You may operate all 5 hours of the event.

**BANDS:** All above 50 MHz, including laser.

**CLASSES:** Single-op, all band only. While there is no rover class per se, a station may change grids, and submit a separate log for each grid operated from.

**SCORING:**

1 point for contacts on 6 and 2 meters.

2 points for contacts on 222 and 432 MHz.

4 points for contacts on 902 and 1296 MHz.

8 points for all bands 2304 MHz and above.

Multipliers are 4 digit maidenhead grid squares.

(January VHF sweepstakes scoring.)

**OTHER RULES:** All other rules are the usual rules for VHF contests (Note to those outside the US: use ARRL January VHF SS rules for all classes worldwide).

**AWARDS:** Certificates will be issued to the top 5 finishers at the National level. We are open to alternative award ideas for next year!

**REPORTING:** Logs are due three weeks after the contest date.

**Electronic:** Submit log and a suitable summary sheet to:

vhf@vhfgroup.rochesterny.org

Log should be in ARRL standard file format.

**Mail:** Log and suitable summary sheet to:

Rochester VHF Group, P.O. Box 92122, Rochester, NY 14692

## Chairman's Rant

... de K2AXX

A big thank-you to AC3A, Scott Olitsky. That presentation on EME was fantastic! If you missed it, you missed an event! Scott showed us that even a single 2m antenna and 150w can certainly work stations off the moon! W5UN, K5GW, SM5FRH... these stations have what it takes to work YOU!



This upcoming November, is the 2<sup>nd</sup> weekend of the **ARRL EME Contest**. You should determine when moonrise / moonset will be, point your stuff towards the moon, and **JUST WORK IT!** I was fortunate enough to go visit and operate from K2DH's station this past Sunday. He's the guy with the big station on 1296. . 650w out to an 18' dish. Let me tell you, signals were **INCREDIBLE!** Our echoes were really pretty good, and hearing stations from all over Europe and North America was a thrill.

Well – start talking it up. The **VHF Academy** is coming! According to Ev Tupis, it is over ½ full. That's **EXCELLENT**. But more important, he needs help! Ev is looking for moderators and hosts to introduce the speakers, help out around the sessions – these are the most important people to the whole operation! **PLEASE**, if you have some spare time, let Ev Tupis know it! Send him a message at [evman@ix.netcom.com](mailto:evman@ix.netcom.com) and tell him you are willing to help out!

The upcoming meeting will be the **annual Tune-Up clinic**, at Microwave Data (MDS, Adaptive Broadband). There will be network analyzers, noise-figure measurement, and all sorts of stuff to do! If you own a preamp, bring it along. Transverters, too. Just get the stuff off the shelf and bring it along to be tested! **AGAIN: THE MEETING WILL NOT BE AT 111 WESTFALL.** (Directions at left in the meeting announcement)

The Rochester VHF Group is hosting the **2nd Annual All-Band Sprint**, November 09, 2000 from 7:00pm to Midnight local time. Make certain to get on using whatever you can! We want to make Rochester **HEARD!** More details on the website.

**FINALLY – the club project.** For those not at the meeting, the formal announcement was made. We are concentrating on 5760, with a group purchase of the DEMI transverter. There are more details on the RVHFG website if you are interested – and more stuff will be posted as time permits. A lot of info. Questions, etc? Call or email me.



# Site Surveying by Remote Control... on the Internet.

by Adam Epstein, N2DHH

These are the relevant websites in this discussion:

<http://www.topozone.com/>

<http://www.arl.org/locate/grid.html>

<http://www.fcc.gov/mmb/asd/bickel/haat.html>

[These links can be used to determine HAAT and help with determining if you have discovered a "good site" to operate from. The following example shows the steps in order using W2SZ/1 on Mt Greylock. -ed.]

<http://www.topozone.com/map.asp?lat=42.6415&lon=-73.1535&size=l&s=25>

Latitude is 42.6414N (4238' 29") 42-38-29

Longitude is 73.1536W (739' 13") 73-09-13

<http://www.arl.org/locate/grid.html>

Grid square: FN32kp

Location is 24.8 mi (39.8 km) from NORTH edge of grid square, 43.0 mi (69.2 km) from WEST edge of grid square.

<http://www.fcc.gov/mmb/asd/bickel/haat.html>

Height of antenna radiation center above mean sea level [RCAMSL] = 1063.0m

Number of Evenly Spaced Radials = 36

**Results:**

Calculated HAAT= 598 meters (Antenna Height Above Average Terrain)

Antenna Radiation Center Heights Above Individual Radials (0 = True North)

0.0 549.1 meters	160.0 602.9 meters	320.0 655.4 meters
10.0 524.7 meters	170.0 639.4 meters	330.0 784.0 meters
20.0 605.1 meters	180.0 599.3 meters	340.0 776.5 meters
30.0 722.3 meters	190.0 625.3 meters	350.0 697.8 meters
40.0 641.4 meters	200.0 528.7 meters	
50.0 549.2 meters	210.0 499.5 meters	
60.0 537.5 meters	220.0 455.8 meters	
70.0 564.0 meters	230.0 538.4 meters	
80.0 625.4 meters	240.0 542.6 meters	
90.0 579.0 meters	250.0 535.0 meters	
100.0 562.6 meters	260.0 551.0 meters	
110.0 545.2 meters	270.0 609.2 meters	
120.0 538.5 meters	280.0 643.9 meters	
130.0 577.1 meters	290.0 644.1 meters	
140.0 563.8 meters	300.0 644.1 meters	
150.0 610.7 meters	310.0 666.8 meters	

## October RVHFG meeting minutes

The second meeting of the year took place at the Monroe County Social Services Building at 7:30 pm on October 13, 2000 with 20 members in attendance.

Started off the night with quick introductions and activity reports by all in attendance.

The secretary's report for September was moved to be approved as posted in the Journal by Jeff kb2vgh and seconded by Frank k2os, all were in favor.

Paul n2opw gave the treasurers report, Bob n2usb moved to accept and Jeff kb2vgh seconded, with all in favor.

Old Business: Wally wy2z and Frank k2os turned in some old records they had saved over the years to the board to be gone over. Jeff kb2vgh reported that there are a few RVHFG mugs still available and Paul n2opw reported that he had the crystals for the DEM 10 gig project for those that needed a replacement. Jim n2jmh gave a brief reminder of the RVHFG sponsored Fall Sprint to be held November 9<sup>th</sup> 2000.

New Business: Walter nq2o reported that P3D is delayed for launch till mid November and approximately 6-month delay until it is operational. John w3oab and Mark k2axx both reported on JOTA operations and requested operators come and help out the scouts in Webster and Honeoye Falls during the weekend of the 21<sup>st</sup>.

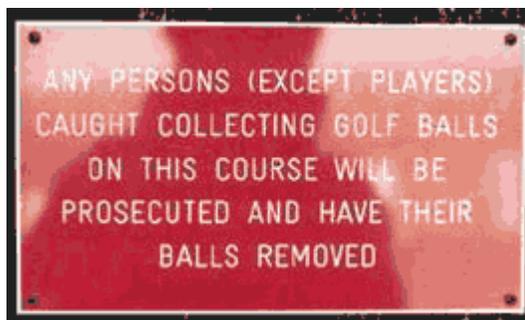
Mark k2axx discussed this years club project will be 5-gig transverter and also said that the club discount should be available to all DEM gear except a few items. A show of hands was 12 parties interested and he said more details including pricing will be posted. The cutoff of for this will be the December meeting.

VHF Academy is November 11<sup>th</sup> 2000 with attendance looking good for this event.

Elections: Paul n2opw nominated Russ w2dyy for Vice Chairman, Judy n2kxs first and Tom ve3iey seconded with approval by all. We are still in need of someone to step up for contest chairman.

Business meeting adjourned at 8:45 and after a brief intermission Scott Olitsky, ac3a gave a detailed overview of small station EME operating .

Jim Howard N2JMH Secretary



# The 2000/2001 Rochester VHF Group Club Project

**NOTE: Read this page carefully.** There are a few “gotchas” you must be aware of prior to planning ANY order. This year, the RVHFG will be concentrating on 5760! We plan to construct the [Downeast Microwave 5760 unit](#), which offers the following specifications: **DEM Part Number 5760-144, 5760K and 5760CK 5.7 GHz. Transverter in Assembled, Board Kit, and Complete Kit forms**

Frequency range:	5.5 GHz. to 5.8 GHz.
Noise Figure and Gain	< 3.0 dB NF, > 10 dB Gain
RX gain with RXIF stage option installed	> 17 dB Gain
Power Output	> 10 mW
IF Power Input (designed for 144 MHz.)	1 mW min. to 2 W max. with PIN Switch
DC Power requirements for 5760CK and 5760-144	10 - 15.5 VDC @ 500 ma

The Club Project will include construction of the 5760-144CK (Complete Kit), and if the buyer purchases, the optional preamp. The facilities of Microwave Data will once again be used for this endeavor. Following are the costs of the items involved:

5cm Products (5760 MHz)	Description	DEMI Price	RVHFG Club Discount Price
<a href="#">5760CK</a>	Complete kit version of 5760-144, machined enclosure and SMA connectors	210.00	189.00
5ULNACK	Complete kit version with weatherproof enclosure and SMA's	85.00	76.50

This price reflects a 10% discount. If we are able to order over \$1000 worth of materials, there is an additional 2.5% taken off the total bill. This will further reduce costs per unit ever so slightly. This will be calculated once the final tally of materials is taken.

This year, we also decided that members who wish to purchase something OTHER THAN 5760 can do so during this purchasing opportunity. However, if you wish to purchase a kit, **you must construct it on your own. The intent of the project is focused on 5760, and the work sessions will be solely for that purpose. DO NOT bring other bands and expect assistance, as we will be gearing all efforts to completing the 5760 transverters in a timely fashion.**

Also - you are responsible for determining the ultimate cost of the product you wish to purchase, as there are far too many items for us to calculate discounts for. Attached below is the text of Down East Microwave's Club Discount Policy. **Section #4 is crucial to your decisions** - amps, antennas, 10GHz transverter. . all items listed are **NOT DISCOUNTED.**

**AND** - built units are only 5% discount, not the 10%. Read these instructions **BEFORE** planning an order. Often, a Kit will be more economical to purchase. More details will follow.

**Deadline for money / order requests will be the December 2000 meeting. No later** - the period expires that night, with hopes of materials received by the January meeting or before. I will be adding an order sheet that you can print off to make it easier in calculating your needs / prices, etc. Please attach this with your order and money.

## **Directly from DEMI Website – CLUB ORDER RULES**

- 1. Furnish Club name and address along with the name, call sign, address, phone number and fax number if available of a contact person. This can be any member of the club but we need one central person to process all orders with.**
- 2. Established one Ship to address along with method of shipment and a Bill to address if different. We suggest that the Bill to address be the contact person mentioned above.**
- 3. Minimum order: \$250.00 (for parts only), \$500 (for kits and parts only) or \$1000 (any order that includes assembled products). These dollar amounts can not include any items in section 4.**
- 4. Discount not available on following items:**
  - o All separate antennas and antenna' accessories (Yagis, power dividers, stacking frames, cable assemblies). But standard discount applies for phased array assemblies.
  - o Hybrid power modules
  - o Standard Power amplifiers, but options for the power amplifiers will be discounted.
  - o ICE, SETI, Lunar-Link Systems products, TVI filters, Teletec, DCI, TOKO, GHP RF amp. or power supplies.
  - o Special non catalog item orders (but we are generous on these anyway).
  - o Repairs
  - o Sale or Surplus items
  - o 10GHz transverter (any form).

**6. discounts:**

- o 10% on all kits except those mentioned in paragraph 4.
- o 5% on all assembled products except those mentioned in paragraph 4.
- o 5% on all Teflon PCB's or PCB material.
- o 10% on all components (MMIC's, GaAsFET's, enclosures, connectors, etc.) except those mentioned in paragraph 4.
- o Free UPS Ground shipping on all orders above \$500.00 (after discount price). For expedited orders you will be charged the difference.
- o Additional 2.5% on all orders above \$1000.00 (after discount price). This will include all items ordered discounted or not.

**8. Terms:**

- o Club orders can not be paid for with credit cards. Check, Money order or COD only.
  - o Payment due on delivery for all orders up to \$1000.00.
  - o Orders over \$1000.00, deposit of 25% of catalog price required, unless prior arrangement is made.
- Even though this is a statement of our policy, there are always exceptions to the rule. Please call and verify prices and availability before ordering. We do reserve the right to change our prices and discounted items. The intention of this policy is to award active clubs and club members with savings over our normal catalog prices. It is more economical for us to process one large order than many small ones with separate ship to addresses. This is why we require one contact person per club and one shipping address. We wish to pass this savings on to your club to help promote activity on the bands and to allow everyone to enjoy their hobby a little bit more. Thank you and good luck on the bands.

**ORDER FORM ON THE RIGHT SIDE OF THIS PAGE >>>>**

## *Brass Tubing Sources*

Chuck Carpenter <w5usj@globeco.net>

Small Parts Inc. <http://www.smallparts.com>

Order catalog on line. S&H \$6.00

1/16 x 12 in, 1 pc, \$1.00 - 10 pcs, \$6.20

3/16 x 12 in, 1 pc, \$1.05 - 10 pcs, \$8.08

Micro-Marc's <http://www.dxmarket.com/micromark/dir>

Call to order catalog. S&H \$5.50 < \$30.00

1/16 x 12 in, 20 pcs, \$10.00

3/16 x 12 in, 12 pcs, \$9.00

Hobby Lobby <http://catalog.craftsetc.com/productSearch.cfm>

Crafts Etc! on-line catalog only. S&H \$3.95/\$4.95

1/16 x 12 in, 3 pcs, \$3.78

3/16 x 12 in, 2 pcs, \$3.78

Tower Hobbies <http://www.towerhobbies.com>

Order various catalogs on line. S&H \$6.99 < \$150.00

1/16 x 12 in, 20 pcs, \$9.29

3/16 x 12 in, 12 pcs, \$8.59

### The Rochester VHF Group - 2000 Club Project Order Form

Name: \_\_\_\_\_

Your Address: \_\_\_\_\_

**Kit Part No (DEMI) + Description**

5760-144CK - 5760 Transverter Kit, with enclosure and connectors

5ULNACK - 5GHz Preamp kit, with enclosure and connectors

**Price (Minus appropriate discount)**

\$189.00

\$76.50

Total Order:

Make Your check payable to **THE ROCHESTER VHF GROUP** **Note:** YOU are responsible for determining the appropriate discounted prices for items OTHER than the 5760 transverter or preamp. We WILL be checking ONLY for items NOT discounted by DEMI's club order policy. The pricing and discount policy has been published on the website AND the November Journal. Deadline for payment is December 8, 2000. Either pay at the meetings, or send checks to: **N2OPW - Paul Meyers 15 Bardney Circle Fairport, NY 14450**

# WINEGARD DIGITAL MAGIC ELEVATION INDICATOR

•••A Preliminary Review



Peter Shilton" <ve3ax@cujo2.icom.ca>

Many of you have probably seen W1GHZ's web page and have checked out this neat little device which has been designed for Digital Satellite TV antenna aiming on recreational vehicles. At first glance it looks like a very simple, and relatively inexpensive means of getting a digital elevation indication. I want to share my experiences so far with this device.

I picked up mine at an RV centre in Nashville many months ago. At almost \$100, I nearly balked, but the gadget seems so easy to install and the thought of a simple, already weather-proofed, digital elevation indicator reeled me in like a hooked salmon. They can be had for about \$79 on the web at Stark Electronics.

The unit consists of two parts; the sensor unit, complete with adjustable aluminum bracket, which mounts at the antenna, while the electronics are mounted "in the RV", or shack, as the case may be. The instructions tell you to set it up at about 22 degrees offset from vertical. This appears to allow for the offset dish feed and a slight non-verticality in the Winegard dish mounts. I could be wrong on this last matter.

The first disappointment was the discovery that the device has a limited range of about 65 degrees. Paul, W1GHZ, failed to mention this in his web article but I see it is mentioned on one of the 432 EME pages (K2UYH's?). You can set it up for any 65 degree "segment" but that means you will be guessing at very high or very low moon elevations. At my QTH the moon goes higher than 70 degrees sometimes.

OK - so I'll have to make do with a 5-70 degree readout and "wing it" above and below that. I installed the device on the new 2m array, but it was obvious very quickly that a static readout was not going to be possible. Even very slight wind movements caused wide excursions of 2 to 10 degrees in the readout, and occasionally it just about jumped off the map! Much of the wandering does not appear to be related to antenna motion in the wind, although I have not yet had a chance to check it out in absolutely still conditions.

Note that the a button must be pressed on the electronics unit to activate the readout, which stays lit for about 1 minute, then goes out to save battery life. The readout is not backlit. The unit can be powered by a 9 volt battery, or an outboard 12 volt DC supply. You cannot program it to stay on, at least not so far as I have found. I had a telephone conversation with the engineer on this project at Winegard, who is also a ham, but alas not a VHF'er. He informed me

that the software used for the device is not Winegard's and is well protected through secrecy agreements with the Florida-based manufacturer. He sounded interest in my intended use for the device (EME), but was skeptical that a program change would be incorporated to expand the 65 degree range.

I threw out the bracket that came with the sending unit for attachment at the antenna and made a simple one using a U-bolt to match my main cross boom and a short piece of aluminum angle stock. I set the antenna elevation to aim at the moon at a known elevation, then mounted the sending unit to the cross boom. I took the electronics with me to the top of the tower and set the reading to the known elevation angle, although the above mentioned readout "wandering" required an average reading to be set. Programming of the readout to read 5 to 70 degrees was done in the shop prior to mounting on the antenna. Once the average known elevation angle was set, the unit was clamped tightly to the cross boom, the electronics were disconnected, and the wires from the sending unit were re-connected to appropriate terminals in my tower-top junction box.

Paul mentions on his web page that it is a simple matter to cut the 4 conductor 12' (or so) cable that connects the sending unit to the electronics in order to install the sending unit on the tower. Of course this part was easy, and the terminal strip on the electronics board is well marked for re-connecting the colour coded wire. At first it seemed that the average readout was going to work just fine for a 4-yagi array but further problems cropped up.

My control wiring to the tower top consists of an unshielded cable with 20 #14 conductors. As the elevation drive was powered up, the digital readout went totally bonkers! As I was changing elevation the readout was absolutely useless. On removing power to the elevation motor (a TVRO jackscrew), the readout returned to its normal 2-4 degree wandering about a central figure. No doubt a separate, fully shielded 4 wire cable would help this situation but that will not happen here. At this point I decided the Winegard unit was not going to live up to my expectations and another solution would have to be worked out. I have not had a chance to use the unit in an RF field, but my experience with the elevation motor leads me to believe it would not yield a reliable readout while keying the

8877 amp. W1GHZ mentions he experienced no problems with 600 watts at 144 Mhz, but keep in mind he was using the readout for a 10 Ghz flyswatter antenna, not a 2 meter EME array.

I have no doubt that the Winegard elevation device works well for its intended purpose, but I have yet to see much written about its use as an EME antenna readout, yet in several places on the web it is mentioned as a good possibility as such a device. I hope this helps someone else make an informed decision about its purchase. I would be interested to hear about others who have tried the unit, especially if they have had better success than I.



# FT736T Output Power Mod for Transverting

George, K5TR

To drop the FT736T output power to use a transverter :

Remove the top cover taking care not to break the speaker lead. There are two circuit boards that we want to check. The board in the middle is the 2M board, and the one on the right is the 70cm board. If you look near the rear end of both boards, you will see a small vertical circuit board. Right near these are three potentiometers.

Let's start with the 2M board. The pots are located behind the small vertical circuit board. The pots are labeled VR02, VR03 and VR04 left to right. First we must connect a dummy load and wattmeter and verify that we have 25w RF with the front panel drive control set to MAX. Set the radio to FM and set the freq. to the center of 2M band. Press MOX and adjust VR02 (the left pot) for the required output level. It will go to zero but the end adjustment is touchy. Next check the front panel meter for an indication of 8 on the PO scale. If not, adjust VR04 (the right pot) for the correct meter indication probably won't adjust to full scale on low levels (below 3 watts).

On 70 cm, the pots are labeled VR04, VR05 and VR06. They are located in front of the small vertical circuit board. The same drill is used here for Power out. Set the freq to the middle of the 70 cm band and adjust VR04 (the left pot) for the required watts out and VR06 (the right pot) for 8 on the PO meter. > That's it for the 70 cm board.

With this mod I managed to get my transverter input drive to the correct 3 watt level easily - its easy to set max output again if required - needed no hardware mods and is foolproof - I can even vary the RF drive input to my transverter using the front panel control!

## FOR SALE:

- 2 meter, 5 element beam, 5' boom, NEW, \$ 50.00
- Mosley TA 31M. 10/15/20 m. rotating dipole, \$ 125.00
- Mosley TW 31M. 12/17/30 m. rotating dipole, \$ 125.00 (All antennas like new, field day op. only and stored inside.)
- Whistler, DC to AC Inverter, 1500w. cont. 3000w peak. \$ 275.00 New in box  
wa2znc@juno.com

**NO ONE GOES THERE  
ANYMORE. IT'S TOO CROWDED.  
YOGI BERRA**

## Leonids & BEACONet ramp up!

W2EV Evhen Tupis <evman@ix.netcom.com>

As has been the case for the past two Novembers, a group of meteor scatter enthusiasts will be activating BEACONet stations to see what they can receive. BEACONet participation is designed to support and coexist with SSB/CW activity; not interfere with or replace it.

Participation is simple. All one needs is a high power FM transceiver (100+ watts will usually do) a small antenna 4-element beam or bigger (for a total of 400+ watts ERP on 2-meters) a Windows based computer, software called UI-View and a KISS capable packet TNC.

You can let your BEACONet station run 24-hours a day through the entire Leonids event, and simply check it from time to time to see what it caught! The BEACONet system operates on 147.585-MHz, so interference to SSB/CW operation is minimal if existent at all. Many folks will choose to operate both simultaneously. Come, join this group of experimenters! There's already quite a few operating on the frequency during the "Fall '00 Tropo Experiment" so there may be signals to test against in your area, prior to the Leonids event.

More information (and a software download and configuration files) may be gathered by visiting the BEACONet website at: <http://go.to/BEACONet>.

## *This Month's Journal* *Internet links*

<http://www.fairradio.com/>  
<http://www.maxpages.com/murphyjunk>  
<http://www.surplussales.com/index.html>

European Microwave News Homepage - [www.emn.org.uk](http://www.emn.org.uk)  
RSGB Microwave Column Homepage -  
[www.emn.org.uk/mwcol.htm](http://www.emn.org.uk/mwcol.htm)  
DUBUS Microwave Europe Column Homepage -  
[www.emn.org.uk/dubus.htm](http://www.emn.org.uk/dubus.htm)

### And this month's internet social commentary:

"We've all heard that a million monkeys banging on a million typewriters will eventually reproduce the entire works of Shakespeare. **Now**, thanks to the Internet, **we know this is not true.**" Professor Robert Silensky University of California

"A million monkeys at a million keyboards **might** eventually produce Shakespeare, **but** they are going to produce monkey porn sites first."

Martin Bredeck, a nobody from the 'burbs.

# Yagi Antenna & Parabolic Dish Underillumination

Dick, K2RIW

If you are seeking an antenna with selectable, broader beamwidth, smooth pattern, KNOWING that the gain will be LOWER, then that's exactly what the Zoom Control I used during contests did, and I enjoyed the benefits for 4.5 years. You're about to ask, "than, what good is it?" I'll explain this.

I used a Zoom Control on my array of 16 yagis on 432 MHz from 1982 until 1985, when Hurricane Gloria used a 105 MPH wind to remove that antenna from my 100 foot tower. The Zoom Control had three switch positions (High, Medium and Low, gain), each separated by 6 dB in boresight gain. The switched positions provided (Horizontal x Vertical) beamwidths of 5.5 x 5.5 degrees, 24.5 x 5.5 degrees and 24.5 x 24.5 degrees, respectively. The High and the Medium gain positions were most used during contests. The Low gain position was used for propagation experiments. The phasing harness relays gave me the ability to feed the whole array of 16 yagis (High gain), one vertical string of 4 yagis (Medium gain) or one single yagi at the top of the array (Low Gain). All of the switched positions were impedance matched.

The High gain position had the greatest gain (near 29 dBi), but it had a large number of sidelobes, back lobes, and many nulls between those lobes.

During contests I would frequently hear a weak station (in the High gain position) and wonder if he was in the main lobe or one of the many side lobes of the array. I could swing the antenna back and forth across ~ 60 degrees (or more) to find out, but that operation would take at least 25 seconds (if there was no QSB); by then he could be gone. Or, I could switch to the Medium gain position in 1 second. If he was in the antenna's boresight, his amplitude would drop by 6 dB. If his amplitude dropped by less than 6 dB, or even increased, than I knew it was time to swing the antenna, if I wanted to peak him up. And, peaking him up while using the 24.5 degree beamwidth (Medium gain), was much easier, and faster. In some cases I would simply answer him in

the Medium gain position (without azimuth peaking), if he had just finished his CQ or was about to QSY to another band.

I'll admit that a Zoom Controlled antenna is not for everybody, but it sure helped me during contests. There were occasions when I took top score in the VHF Contests in the Hudson Division while using nothing but 432 MHz. I believe that the Zoom Control was a factor.

Here are two of my propagation experiments:

(1) During my listening to long range tropo QSO's, occasionally I would wonder if the signal was arriving at an angle above the horizon. Switching between the Medium and Low gain positions would answer that question (5.5 versus 24.5 degrees of vertical beamwidth). If the signal changed by -6 dB, than the answer was no.

(2) I also had a single, rotatable yagi, that was placed, on a yard arm, at the 70 foot level of the tower. By comparing the signal strength of a single yagi at the 105 foot level (Zoom Array in Low gain position) versus the 70 foot yagi, I could see what the height effect was on signal strength. Usually the upper yagi had 10 dB more signal, in most directions. But, there were some foggy nights when the lower yagi had slight more signal for brief periods (about one hour).

During contests it was great fun to leave the 70 foot level yagi aimed at New England and leave the Zoom Controlled array aimed at Philadelphia (or visa versa). I could then rapidly switch between the antennas to catch one of those brief contest stations that are only on 432 MHz for 30 seconds, before they QSY to another band.

Concerning possible 10 GHz mountain top rover operation, I'm not sure what the benefit of a Zoom Controlled antenna will be, although there are a number of ways to implement it (maybe, change the beamwidth in only one plane, for instance). The Zoom Control is not intended for finding a super weak station, unless he happens to be located within one of the pattern nulls of the High gain position. But, when the 10 GHz mountain top QRM is heavy (as it soon will be), I feel that a low cost gain (beamwidth) switching arrangement could

have some hidden benefits.

**“You get better service with please and a gun, than with please alone”**

**Al Capone**

# Summary of Connector Facts

from VITELEC Electronics Limited [www.vitelec.co.uk](http://www.vitelec.co.uk)

## Compiled by N2GKM

Here's a collection of some interesting and surprising information about some typical connectors we use for weak signal applications:

### N Connector

The N connector was invented by and named after Paul Neill of Bell Labs. It was the first connector capable of true microwave performance. N connectors have threaded coupling interfaces and are 50 ohms in impedance. There are also 75 ohm versions available, but they will not mate with the more common 50 ohm version. N connectors operate up to 11 Ghz in the common 50 ohm impedance design. Applications for the N connector include LANs; test equipment; broadcast, satellite and military communications equipment.

**Frequency Range: DC to 11 GHZ**  
**Working Voltage: 1500V**  
**Insertion Loss: 0.17 dB MAX.**  
**RF Leakage: -80 dB**

### BNC Connector

One of the most popular of the coaxial connectors, the BNC was developed in the late 1940's. The name BNC stands for Bayonet-Neill-Concelman. Bayonet describes the coupling mechanism, while Neill and Concelman were the inventors of the N and C connectors.

BNC connectors are available in 50 and 75 ohm impedances, and are intermateable with each other. The 50 ohm designs operate up to a frequency of 4 GHz. BNC connectors are used in many applications some of which are flexible networks, instrumentation and computer peripheral interconnections.

**Frequency Range: 50 Ohms - DC to 4 Ghz.**  
**75 Ohms – DC to 1 Ghz.**  
**Working Voltage: 500V RMS MAX.**  
**Insertion Loss: 0.2 dB Max. @ 3 Ghz.**  
**RF Leakage: -55 db Min. @ 3 Ghz.**

### TNC Connector

The TNC connector was developed in the late 1950's because of the noise generated by BNC connectors under extreme vibration. The name TNC stands for the Threaded Neill-Concelman. The TNC is basically a threaded coupling version of

the BNC connector with 50 ohm impedance and operations to 11 Ghz. TNC connectors are used in mobile communications where optimum performance is required under vibration, or higher frequency applications than that of the BNC.

**Frequency Range:**  
**50 ohms - DC - 11 Ghz.**  
**75 ohms – DC – 1 Ghz.**  
**Working Voltage: 500V RMS Max.**  
**Insertion Loss: 0.2 dB Max. @ 3 Ghz.**  
**RF Leakage: -55 dB Min. @ 3 Ghz.**

### UHF Connector

The UHF connector was invented in the 1930's by E. Clark Quackenbush in the USA for use in the radio broadcasting industry. The plug version is commonly referred to as the PL-259 connector, which is its military part number designation. UHF connectors have threaded coupling interfaces and are non-constant in impedance. Because of their non-constant impedance, UHF connectors are limited to frequencies of up to about 300 Mhz and are generally low cost connectors. UHF connectors are used primarily in low frequency communications equipment such as CB radios and public address systems.

**Impedance: Non Constant**  
**Operating Frequency: DC to 300 MHz.**  
**Working Voltage: 500V**

### Mini UHF Connector

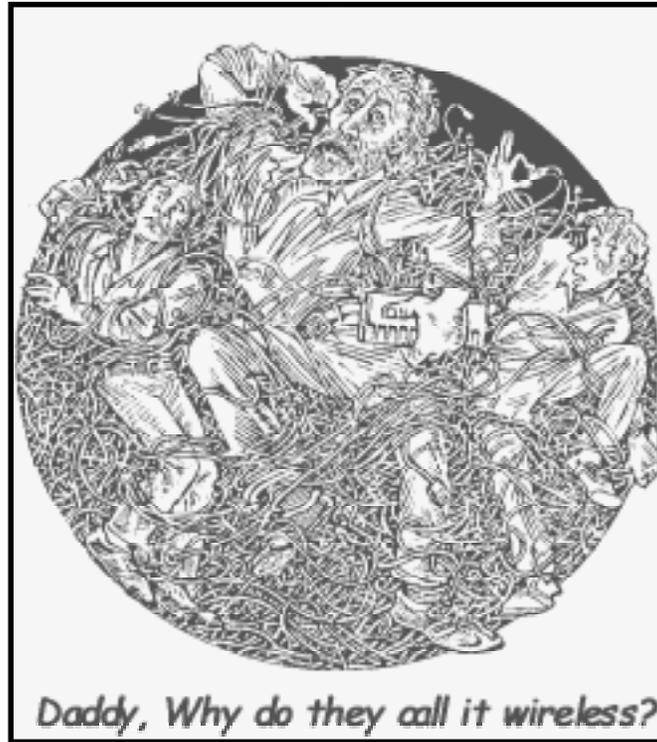
Compatible connector interface for most mobile communications systems where size, weight and cost criteria are important.

**Impedance: 50 Ohms**  
**Operating Frequency: DC to 2.5 Ghz.**  
**Voltage Rating: 335V**

### F Connectors

F Connectors were designed as a low cost method of coupling coaxial cables and equipment used in TV, MATV, and satellite communication applications. They have threaded coupling interfaces and the plug utilizes the centre contacts of the cable rather than a separately applied pin. They are designed for low frequency transmissions (typically video) up to 2 Ghz. Waterproof versions are available for use on outdoor equipment.

**Impedance: Plugs without contact: Non Constant (cable impedance applies)**  
**Plugs and jacks with contact: 75 ohms**  
**Frequency range: DC to 2 Ghz.**  
**Working voltage: 250V**



### SMA Connector

The SMA (sub miniature A) connector was developed in the 1960's for use with .141 semi-rigid cable (RG402) up to frequencies of 18 Ghz. SMA connectors have threaded coupling interfaces and are 50 ohm impedance.

The maximum usable frequency of cabled SMA connectors is limited by the type of coaxial cable which the connector can terminate. They are used in applications where higher frequencies miniaturization and size reduction are key considerations. Microwave uses include transitions from Coax to Waveguide and transitions to Microstrip printed circuit board traces. SMA connectors are also used in amplifiers, attenuators, filters, mixers, oscillators and switches. (Hey, they forgot to mention transverters).

**Frequency Range: When used with RG-402/405 - DC to 18 Ghz**

**When used with RG-58/316 - DC to 12.4 Ghz**

**Working voltage: RG402/58 - 500V**

**RG405/316 - 335V**

**Insertion Loss: > 0.6 dB**

**RF Leakage: -90 dB @ 2.5 Ghz**

**Mating torque: 7 to 10 in. lbs.**

### SMB Connector

The need for a subminiature connector with a quick connect/disconnect interface mechanism prompted the development of the SMB (Sub-Miniature-B) connector. A selfcentering outer spring and overlapping dielectric insulators allow for easy snap-on connections and good performance under moderate vibration. 50 and 75 ohm versions are available. Typical applications for the SMB connector are inter- or intra-board connections of RF or Digital signals.

**Frequency Range: 50 ohm DC to 4 Ghz 75 ohm DC to 2 Ghz**

**Insertion Loss: 0.3 dB @ 1.5 Ghz**

**RF Leakage: -55 dB @ 1.5 Ghz**

### SMC Connector

The SMC (Sub-Miniature-C) connector is similar in design to the SMB. The inner contact and overlapping dielectric insulator structures are identical, but the SMC utilizes a threaded coupling interface rather than a snap on interface. Tighter control of the contact and insulator locations, because of the threaded coupling, allow the SMC to operate up to frequencies of 10 Ghz in 50 ohm impedance designs. The threaded connection makes the SMC a good choice for applications where the need for small size and performance in high vibration environments are concerns. SMC connectors are used primarily in applications for microwave telephony and other non-military telecommunication requirements.

**Frequency Range: DC to 10 Ghz**

**Insertion Loss: 0.25 dB @ 4 Ghz**

**RF Leakage: -60 dB @ 2.5 Ghz**

### MCX Connector

The MCX is a similar design to the SMB in using a snap-on coupling. However, by reversing the coupling spring design, the MCX achieves approximately a 30% reduction in size and weight. The MCX operates up to the increased frequency of 6 Ghz and is well suited for traditional SMB applications, where size and weight reduction are primary concerns. Applications for the MCX include global positioning systems (GPS), automotive, cellular telephone and data telemetry.

**Frequency Range: DC to 6 Ghz**

**Insertion loss: 0.2 dB @ 1 Ghz**

**RF Leakage: -70 dB @ 2.5 Ghz**

# Info for Oktoberfest

## AKA: BEER TROUBLE SHOOTING

### **SYMPTOM:**

Feet cold and wet.

### **F A U L T :**

Glass being held at incorrect angle.

### **SYMPTOM:**

Feet warm and wet.

### **FAULT:**

Improper bladder control.



**SYMPTOM:** Beer unusually pale and tasteless.

**FAULT:** Glass empty.

**SYMPTOM:** Opposite wall covered with fluorescent lights.

**FAULT:** You have fallen over backward.

**SYMPTOM:** Mouth contains cigarette butts.

**FAULT:** You have fallen forward.

**SYMPTOM:** Beer tasteless, front of your shirt is wet.

**FAULT:** Mouth not open, or glass applied to wrong part of face.

**SYMPTOM:** Floor blurred.

**FAULT:** You are looking through bottom of empty glass.

**SYMPTOM:** Floor moving.

**FAULT:** You are being carried out.

**SYMPTOM:** Room seems unusually dark.

**FAULT:** Bar has closed.

**SYMPTOM:** Everyone looks up to you and smiles.

**FAULT:** You are dancing on the table.

**SYMPTOM:** Beer is crystal-clear.

**FAULT:** It's water. Somebody is trying to sober you up.

**SYMPTOM:** Don't recognize anyone, don't recognize the room you're in.

**FAULT:** You've wandered into the wrong party.

**SYMPTOM:** Your singing sounds distorted.

**FAULT:** The beer is too weak.

**SYMPTOM:** Don't remember the words to the song.

**FAULT:** Beer is just right



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The Rochester VHF Group is sponsoring a one-day immersion into the world of VHF and above operation. Saturday, November 11, 2000 is the date for VHF Academy 2000. Spend the day at The Academy learning about VHF Propagation, Satellite Operation and VHF Contesting Strategies. Two more sessions on that day will deal with a technical treatment of equipment performance measurement and a hands-on lab in which Cadets will be able to actually build their own high-performance Rover antenna!

The day will begin at 8:30 am with a continental breakfast and end at 3:00 pm. By signing up early, The Rochester VHF Group will provide a full tuition (no cost to attend!). Additionally, a lunch will be provided (also at no cost). By signing-in at all five sessions throughout the day, you will also qualify for a one-year free membership in the Rochester VHF Group, with members-only access to their website (where you will be able to download the latest issues of The VHF Journal, the club newsletter).

Free VHF Academy attendance is open to any person, licensed or unlicensed, that is presently not a member of the Rochester VHF Group and who signs-up prior to November 5th. The academy will be held in the Rochester suburb of Greece, New York and is easily accessible by I-390. More details to come.

Interested? Visit the Rochester VHF Group website at: <http://vhfgroup.rochesterny.org> for more information and an eMail link. Otherwise, drop a note to express your interest to: [academy@vhfgroup.rochesterny.org](mailto:academy@vhfgroup.rochesterny.org).

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