

Can All VHF-Plus Propagation Be Predicted?

In a controversial article posted for download on Volker Grassmann, DF5AI's website, Bob Gyde, ZL3NE, claims that all VHF-and-above propagation through 70 cm can be predicted. In addition, he says propagation up to 23 cm can be predicted with reasonable accuracy. Here are some of Bob's points:

Bob's history of VHF activity dates back to the 1950s. For the past 25 years he has published papers on his beliefs about propagation based on his observations, which have included logging every contact along with the weather pattern at the time of each contact. Based on his extensive record-keeping, Bob has developed the following position: For 2 meters the following seven conditions produce propagation: (1) anticyclones, with an air pressure of 1026 mb and an air temperature of around 28 to 30° C; (2) anticyclones, with an air pressure of 1032+ mb, and an air temperature of 26+° C; (3) frontal activity, whether cold or warm fronts; (4) lightning flashes from thunderstorms traveling at the leading edge of cold fronts; (5) ducts traveling in the warm winds ahead of cold fronts (specifically in the Southern Tasman Sea); (6) ducts traveling in jet wind streams at a height of 10 km; and (7) aurora and aurora-induced sporadic-E.

Regarding lightning, Bob made the following observation on May 22, 1999:

On that date I was looking at the North American weather map which showed where thunder/lightning storms of high intensity were located, and above the location of the Millstone Digisonde station there was a sign of good activity. This looked interesting, so I looked at the <dxworld.com> 6 meter page and here we had contacts taking place from Canada to the United States directly over the lightning storm as shown in the map. Armed with this information I connected to the Millstone web page and looked up the time list, downloaded the charts, and there it was showing up very nicely. The chart showed that the E layer had reached 12.5 MHz. Taking the usual multiplication factor of 5, we now had propagation recorded for 6 meters. A confirmed mode of propagation lightning, as we had the weather map showing the lightning storm, the contacts, and the ionsonde charts showing ionization to 12.5 MHz all at the same time. When the storm died out, the ionsonde data returned to normal.

Later in the paper Bob commented: "During December (or June in the Northern Hemisphere) all modes are available, so we can really get lots of propagation. At that time of the year look for connecting extensions, like in December 2004 when we had triple hop, with two lightning storms and a large anticyclone producing propagation to 5500 km." Finally, Bob commented on the weather patterns known as *La-Niña* and *El-Niño*, stating the following:

Most of you will have heard of the terms such as *La-*

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VHF Plus Calendar

Feb. 5	First Quarter Moon. Moderate EME conditions.
Feb. 12	Good EME conditions.
Feb. 13	Full Moon.
Feb. 14	Moon Apogee.
Feb. 19	Poor EME conditions.
Feb. 21	Last Quarter Moon.
Feb. 26	Good EME conditions.
Feb. 27	Moon Perigee.
Feb. 28	New Moon.

—EME conditions courtesy W5LUU.

Niña" or *El-Niño*, but probably not the term *Normal*. These relate to the sea temperatures, with *La-Niña* meaning warmer sea temperatures than usual, normal is self explanatory while *El-Niño* means the sea is colder than usual. What has that to do with propagation? A lot! Cold fronts come from the cold climates and as they move farther towards the equator the sea temperatures are the biggest temperature changes or killers of cold fronts. If you are waiting for propagation from a cold front and it meets warm sea temperatures, the cold front will die out and become an occluded front. I have mentioned earlier that occluded fronts never produce any propagation, as there is very little change in temperature from the warm side to cold side of the front. The propagation you were looking for would never come! These weather conditions are very important, as for the last 50 years my records prove *La-Niña* produced very little propagation at 38 degrees south; in fact, only about one-third the amount produced by *El-Niño* and Normal conditions.

Whether you agree or disagree with his conclusions, he certainly gives a lot to think about.

Bob's complete paper can be downloaded in pdf format at: <<http://www.df5ai.net/Material/articles6.html#PaperZL3NEPropPredict>>.

New 134 GHz World Record Claimed

The following is from *The ARRL Letter*, Vol. 24, No. 48, December 9, 2005:

Brian Justin, WA1ZMS, who enjoys plying the microwave spectrum, is claiming a new world DX record for the 134 GHz band. Justin says the December 8 contact between W2SZ/4 (WA1ZMS operating) and W4WWQ (WA4RTS assisting) was possibly a first on that band for the U.S. The QSO between W2SZ/4 in FM07fm and W4WWQ in FM06hx (both in Virginia) spanned a distance of 60.1 km (approximately 37.3 miles). The mode was FSK CW. Justin says the previous 134 GHz DX record of 56.4 km was held by JA1KVN and JA1ELV. "The signal margin on both ends of our QSO was a few dB, so there is a chance we could better our DX," Justin said, adding that he first needs to check out some equipment issues. Justin notes that as a result of some microwave spectrum reshuffling the 134 GHz band last year replaced the 145 GHz amateur radio allocation. Last year, the ARRL Board of Directors honored Justin as a recipient of the 2003 ARRL Microwave Development

Award, for his pioneering work in developing the Amateur Radio microwave bands above 30 GHz.

Another Record?

Dick Beerman, W5AK, reports the following, which might be a record for digital meteor-scatter propagation on 6 meters:

I want to let you know about my JT6M QSO with Dennis, K7BV/1, on December 11, 2005. We have been running schedules for a year or two on 6 meters WSJT. Finally, on December 10 we made it with quite a bit of ease at my end. I had multiple callsigns and multiple grid squares (we are running in the NAMS Group Rally).

The contact was completed at 0325 UTC. It took less than 30 minutes. The distance is 1,537 miles according to K1JT's program. It's my longest MS QSO by far on 6 or 2 meters and Dennis said that it was his longest as well. Dennis's station can be seen at his website: <<http://www.qth.com/k7bv/>>. Mine is only a TS-2000X at 100 watts and an old M² 5-element Yagi at 40 feet that I have been running for over 10 years. As a result of this QSO I learned that like EME, a large and efficient station at one end of the circuit can overcome low power and small antenna at the other end of the circuit.

Modifying the IC-7000

Last month in my product announcement of the ICOM IC-7000 I commented on the television reception capability that was promoted in early brochures. It seems that feature was nixed at the last minute as the radio was going through the FCC type-acceptance procedure. Several ideas have been suggested as to why this might have happened, with the safety and legality issue of having television reception available to a driver of a vehicle while in motion being the most likely winner of that speculation.

One of the early purchasers of the radio is Steve Hicks, N5AC, who also was curious about the television reception. Being *really* curious, he pulled the cover off and discovered how to make a modification to enable the reception. Here is his report with the following caveat: *Making modifications to your new radio may void the warranty.* Therefore, proceed accordingly.

The ICOM IC-7000 just released in December 2005 promised to have the capability to receive TV broadcasts off air and display these on the IC-7000's 2 1/2" TFT display. The feature was disabled at the last minute due to liability concerns, which is understandable given the many disparate state laws on TV displays in vehicles. Re-enabling the TV functionality is simple and can be performed by anyone who feels comfortable with a soldering iron and a pair of tweezers. In addition, the out-of-band transmit modification can also be done at the same time.



Photo A— The ICOM IC-7000 HF/VHF/UHF transceiver. (All photos courtesy of N5AC)



Photo B— Arrows point to the two screws holding the CPU/DSP module in place. Step 3 requires their removal. Step 4 requires the removal of the module.

Since you will be inside a microprocessor-controlled unit and you will be removing the processor unit itself, it is best to have all tools ready and in one place before beginning. Static discharge can harm or destroy parts of the radio and static buildup is always greater in the dry winter months. Be sure to touch the outer chassis of the radio and discharge any static buildup if you do find yourself walking around the room during this procedure:

1. Remove the top cover of the radio using a Philips-head screwdriver by removing two black screws on each side of the radio holding the top (total of four) and four screws on the top of the radio not immediately adjacent to the speaker (see photo A).

2. The cover of the radio should lift up easily. The speaker cable snakes under the CPU/DSP unit (business-card-size metal enclosure) and can be moved out from under this module. It is not necessary to unplug the speaker. The cover can be just set to the side or if you are more comfortable you may unplug the speaker.

3. Remove two silver screws holding the CPU/DSP module in place (see photo B).

4. Pull up on the CPU/DSP module and remove it from the radio. The unit can be set to the side.

5. Directly under the DSP unit are a number of integrated circuits (photos C1 and C2). Between the two white connectors that the CPU/DSP unit plugs into are four identical integrated circuits, three in a line and one next to the left-most one in the line. These are CMOS 4094 shift registers that are used by the processor to read the diodes on the board that control radio options. All four chips on my radio have the Texas Instruments logo and the part number "HJ4094."

6. Toward the front of the radio are rows of surface-mount (SMT) diodes. The diodes have silver paint on top and the letter "A" clearly marked. Using photo D, locate either or both diodes required for the modification. You may remove one diode for TV reception enable and another diode for MARS out-of-band transmit. The diodes may be removed in any number of ways. For most with limited equipment, a good pencil iron and a pair of tweezers can be used. I generally alternate heating up either side of the diode (there are two pads that barely stick out to each side of the diode on the short sides) with the iron and applying *gentle* pressure to the diode until it moves. Once it moves, it will have moved off both solder pads because it is so small. I then wrestle it into place with just one pad touching and reheat the diode to get it to adhere to the board. This is so that I can go back and add the diode back later if need be. With just one lead soldered, the diode will not operate in the circuit and will be in the radio if you need it later. You may also remove it completely if you like.

7. To enable TV, remove diode number two on the left of the set of diodes in front of the *middle* 4094 (see photo D).

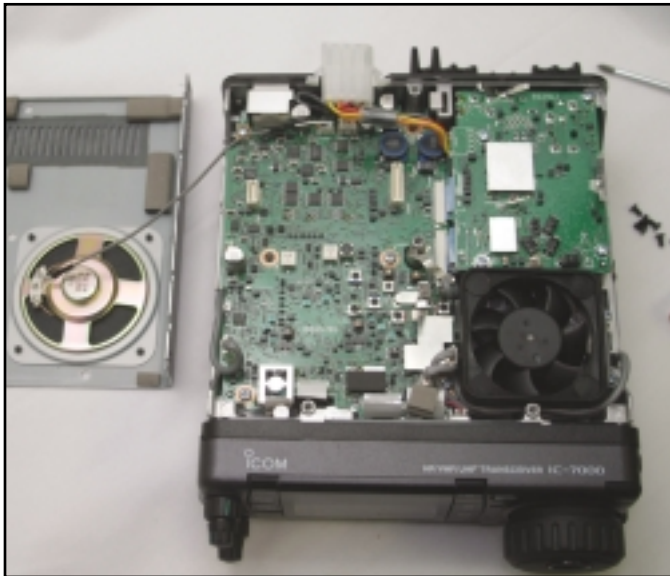


Photo C1— With the CPU/DSP module removed, the four 4094 shift registers are exposed. They can be identified by the Texas Instruments logo and part No. “HJ4094.”

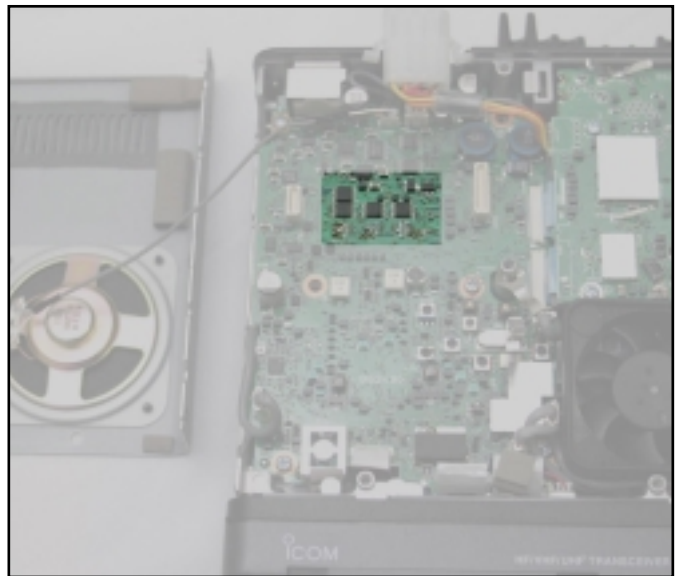


Photo C2— This photo highlights the four 4094 shift registers mentioned in step 5.

8. For MARS operation, remove diode number two on the left of the set of diodes in front of the *left two* 4094s (see photo D).

9. When you are done with the diodes, just reassemble the radio in reverse order. After putting the CPU/DSP unit back into the radio, be sure to slide the speaker cable gently under the upper left and lower left corners of the CPU/DSP module. If you do not do this, you will have trouble putting the top back on the radio.

To use the TV receive mode, press and hold the upper-left knob marked AF(SET) on the radio for one second. The normal radio screen will be replaced with a TV receiver screen. The receiver will tune US TV broadcast channels 2–13 by using either the band-up and band-down buttons or the [M-ch] inner knob on the lower left of the radio. TV channel 2 uses the HF antenna port on the back of the radio, while TV channels 3–13 use the VHF port on the radio. Specific channels can be tuned to a different frequency in the 49–218 MHz range and can be skipped from the channel-up and channel-down function by pressing in the AF (SET) button momentarily and following the prompts.

You can also put an ATV downconverter (such as the one from P.C. Electronics, <<http://www.hamtv.com>>) between the VHF antenna port and your antenna to receive ATV. Unlike your TV set, however, RF can come out of your VHF port, so you will want to be sure not to transmit through your ATV downconverter after you are through watching ATV.

Steve has also written an extended first-look review of the radio from the VHF+ perspective. It is scheduled for publication in the Winter 2006 issue of *CQ VHF* magazine. Here is an excerpt from that review:

For weak-signal contest work, the question of when and how we might use the spectrum or band scope arises. I wondered how strong of a signal is required in order for it to appear in the spectrum scope. I hooked up my HP 8640B signal generator and put it on 144.100 MHz. I was able to hear a signal at –145 dBm on the IC-7000. I put the band scope on in both fast and slow speeds and found that it required a signal of about –95 dBm before it showed up on the band scope. The question here is that if you are meeting someone on 2304 MHz and he is not exactly on channel, would you be able to jump over to the band scope and quickly find him? The received signal would need to be well above the noise for you to spot it on the scope, so conditions and the received signal level will dictate whether you will be able to use the band scope for this purpose. You can also use the band scope as a mini spectrum analyzer for work under 470 MHz.

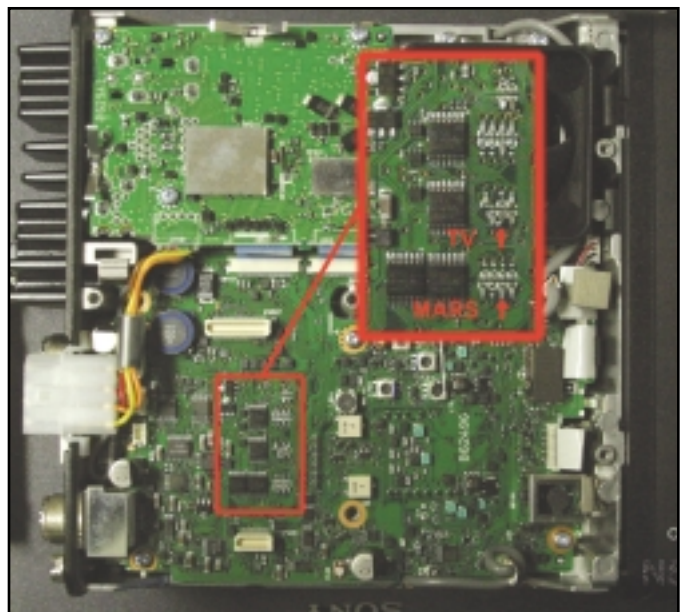


Photo D— Arrows point to the SMT diodes targeted for removal for the modifications. See steps 6 and 7 for instructions on how to remove them. Note that this photo is oriented 90 degrees counter-clockwise from photos B, C1, and C2.

More information on the radio can also be found on the Yahoo IC7000 users group site at <<http://groups.yahoo.com/group/ic7000>>.

In addition, Frank Floyd, AA7BQ, has written and published an extensive review on his QRZ.com website (<http://www.qrz.com/ib-bin/ikonboard.cgi?act=ST&f=3&t=108633>). It is followed by a growing list of comments.

Calls for Papers

Calls for papers are issued in advance of forthcoming conferences either for presenters to be speakers, or for papers to be published in the conferences' *Proceedings*, or both. For more information, questions about format, media, hardcopy, e-mail,

etc., please contact the person listed with the announcement. The following organization conference organizer has announced a call for papers for the forthcoming conference:

EME Conference 2006: The EME Conference 2006 will be held in Wuerzburg, Germany on August 25 to 27. Interested authors are invited to present a paper(s) for the EME Conference 2006. Electronic submissions in Word97, Word2000, Acrobat5 (pdf), or text format will be accepted by e-mail or CD. Please ask if you are using another format. If you are interested in writing and/or presenting a paper for the conference, send an e-mail to Rainer Allraun, DF6NA, at: <df6na@df6na.de>. Please contact him as soon as possible with an abstract or even a general idea. This will help the conference team with its planning activities. For more information about the conference go to: <<http://www.eme2006.com>>.

2006 Eastern VHF/UHF Conference: This event will be held on April 21–23 in Enfield, Connecticut. It will be the first major VHF+ conference event of the year, so please mark your calendars and plan to attend. They are looking for submission of papers and pre-

sentations for the conference and also people to help out with the event. Contact Bruce Wood, N2LIV, conference chairman, at: <bdwood@erols.com> or 631-265-1015 (home), 516-938-6938, ext. 210 (work).

Southeastern VHF Society Conference: The 10th annual Southeastern VHF Society Conference will be held on April 28–29 in Greenville, South Carolina. The society is calling for the submission of papers and presentations at the conference. Papers and presentations are solicited on both the technical and operational aspects of VHF, UHF, and microwave weak-signal amateur radio. Some suggested areas of interest are transmitters, receivers, transverters, RF power amplifiers, RF low-noise pre-amplifiers, antennas, construction projects, test equipment and station accessories, station design and construction, contesting, roving, DXpeditions, EME, propagation (sporadic-E, meteor scatter, troposphere ducting, etc.), digital modes (WSJT, etc.), digital signal processing (DSP), software-defined radios (SDR), amateur satellites, and amateur television (ATV).

In general, papers and presentations on non-weak-signal-related topics such

as FM repeaters and packet will not be accepted, but exceptions may be made if the topic is related to weak signal. For example, a paper or presentation on the use of APRS to track rovers during contests would be considered.

The deadline for the submission of papers and presentations is March 3, 2006. All submissions should be in Microsoft Word (.doc) or alternatively Adobe Acrobat (.pdf) files. Pages are 8½ by 11 inches with a 1-inch margin on the bottom and greater than 1-inch margin on the other three sides. All text, drawings, photos, etc., must be black and white only (no color). Indicate when you submit your paper or presentation if you plan to attend the conference and present there or if you are submitting just for publication. Papers and presentations will be published in bound proceedings by the ARRL. Send all questions, comments, and submissions to the technical program chair, Jim Worsham, W4KXY, at <w4kxy@bellsouth.net>.

Correction to the December 2005 Column

The following correction concerning the “More about EchoLink” piece in the De-

ember 2005 column comes from Phil Stalnaker, W3ICF:

Concerning the "More about EchoLink" piece, you stated that the U.S. Novice Class could use EchoLink. Information from the website states as follows: "Novice-class callsigns in the U.S.—Novices do not have privileges on the frequencies on which most EchoLink nodes operate and will not be validated."

The only way they can use it is by third party and under direct control of a validated licensed ham of a higher class.

I also felt you were confused about the use of -R and -L designations. Also from the info on the website: When running in Sysop mode, the callsign entered in the Station options tab must have either an -R or -L added to the end. The -R indicates that you have connected EchoLink to a rig tuned to the frequency pair of a local repeater (or connected it directly), whereas -L indicates it is tuned to a simplex frequency. This distinction is helpful to stations which connect to your link, since operating practices differ somewhat between repeaters and simplex frequencies, and it is useful to know (before connecting) which type of link is being provided.

A lot of folks missed the fact that -R is used anytime you connect to a repeater pair and -L is used only for simplex frequency. This is true if using a direct wired connection or a RF linked connection via radio to the repeater.

I have answered these two questions several times for new users and send them to the website sections shown above in the FAQ for Authentication advanced operating.

Silent Key

The following was received from Lauren Libby, WØLD:

On November 13, 2005 we lost another VHF enthusiast. Dr. Hal Bergeson, WØMXY, of Colorado Springs, Colorado became a silent key.

Hal served as vice-president of The Central States VHF Society in 1995 and co-hosted the 1995 conference held in Colorado Springs that year.

He was very active as one of the original rover stations in the early 1990s. He was, for several years, a co-holder of the 24 GHz U.S. distance record with KXØO (now WØLD). They were on one end of the record shot from Pikes Peak to northern Colorado. Hal also operated with the WBØDRL contest station in the 1990s.

Hal helped lead a successful fight to keep amateur radio towers in Colorado in the mid 1990s. He served as a member of the Pikes Peak FM Association Board of Directors, the Pikes Peak Amateur Radio Association Board, and was a member numerous professional societies.

He was a professor of communications at Pikes Peak Community College in Colorado Springs until his retirement two years ago.

Hal was a true man of character, a lifetime ham, and a true ambassador for amateur radio. He was respected in many communities, including ham radio. His gentle,

diplomatic spirit will be missed by all who knew him. Ham radio and the VHF community have lost a true friend with his passing.

And Finally . . .

Phil Stalnaker, W3ICF, shares the following regarding our amateur radio hobby: "While working at a government site, I was questioned about being an amateur radio operator . . . after all, we are professional communicators. I answered that question by saying that one does not understand what AMATEUR stands for. The word is an acronym and stands for **A Master And Technical Expert Using Radios**. Why change our title just to make it mean something?"

Again this month we have another full column. If you missed getting your important information into it, please e-mail me at the address at the beginning of this column and we will present it in a future column.

Thank you again for your support for this, your column. I look forward to hearing from you via the usual e-mail route or even snail mail, if you must.

Until next month...73, de Joe, N6CL
