
WHITE



NOISE

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HAM RIDES THE CREST OF THE WAVE WITH THE NAVY

Bill Manley KB4XE

Tom Kneisel K4GFG is literally riding the crest of the wave in the pursuit of his Amateur Radio hobby. He has experienced many of the operating modes and now creates a new one. Tom is experimenting with satellite detection and identification by radar. But Tom's radar station consists of standard amateur radio components and a good deal of ingenuity.

As Tom describes it, there is a government radar curtain spanning the continent at about 33 deg north latitude. The Navy Space Surveillance System (NAVSPASUR) operates CW near 217 MHz. It has been in service 24 hours a day since July 29, 1958. DOD's ARPA authorized Naval Research Lab to do it. There are 3 transmitting stations and 6 receiving stations (plus Kneisel's in Davie, FL). The transmit sites are at Gila River Az, Lake Kickapoo Tx, and Jordan Lake Al.



The signal from the Kickapoo, TX transmitter is so strong (ERP = +98 dBW, 6.3 billion watts) that it can be copied via moonbounce with only a dipole for a receiving antenna. Their antenna has a gain of 40 dBi, and is 3.2 Km long. The site consumes over 1 million KWH per month!

The NAVSPASUR system catalogs and tracks around 8000 objects. It can detect objects the size of a basketball at 2000 miles, and larger objects out to 10,000 miles.

Tom learned that, as satellites cross the curtain, they are detected, identified and cataloged by the Navy. "Well If they can do it, so can I", Tom figures. And so he did.

"I've detected objects as small as 14" diameter at 1700 miles distant. Many hamsats, too. Maximum range on a large object was 7000 Km. I estimate my system can determine the position of a satellite to within 1 Km accuracy after tracking for 2 days, and the velocity to within .001%.", says Tom.



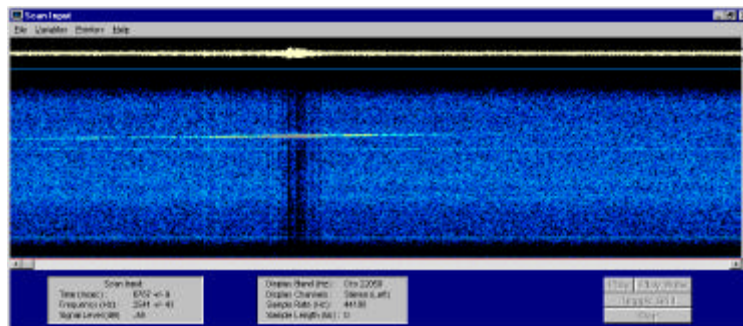
The heart of Tom's system is his KLM 14 element Log Periodic 220MHz antenna, mounted on a tower at 50', and steerable in azimuth and elevation. As a satellite passes through the Navy RF curtain it reflects a signal which is sensed by the station. The signal is detected by his ICOM R7000, mixed with a home brew 444KHz precision oscillator for calibration purposes. The receiver IF is downconverted to baseband audio which is input to his computer sound card.

Using freeware and home brewed software he precisely measures the tone and chirp (rate of change of tone) to generate the orbital elements of the satellite. From those, Tom predicts the next pass. His software can also compare the elements to a published almanac of orbital body ephemerides and select the best fit to identify the space object. His system stands ready to automatically record the event confirming that the detected object is the object identified even while Tom is not present.

Sounds simple? Well perhaps. Listening to radar echoes on a SSB receiver is simple enough to stimulate the construction of similar stations among other hams with whom Tom stays in touch to compare notes.

As Tom demonstrated the system, during my visit, a number of satellites pinged the system. There are thousands of objects up there. He often gets several pings per minute. They paint his computer screen in real time. The display shows a spectrogram of frequency versus a moving time axis. The doppler shifted tone is visible from left to right as the satellite moves through the curtain. The vertical position on the screen is indicative of the received doppler shift of the ping.

A brilliant prolonged trace caught our attention as we chatted. "That was a big one", said Tom, as he brought up his data reduction software which ultimately identified it as an early Cosmos 2082



The system can be used in a number of modes Tom says. With orbital elements available from an outside source, it can be used to validate those elements by comparing the predicted radar fence crossings to actual measurements. It can catch unknown satellites and identify them by comparison to a known almanac which is available on the internet. If orbital elements are not available, it can acquire unknown satellites and generate their orbital parameters.

Did I wet your appetite? Visit Tom's web site: <http://www.gate.net/~tomk>

“... and enjoy your stay in Dayton”

Bill Manley KB4XE

VHF frequency 146.94 was very busy indeed at Dayton during the third weekend in May. One-by-one, visitors confirmed directions to the Hara Arena. Parking instructions were relayed repeatedly by the Dayton Amateur Radio Association (DARA) control operator. In every case the instructions were followed by a welcoming “... and enjoy your stay in Dayton”.

This was our first visit to the Dayton Hamvention. Like hams everywhere, my wife and I attended having made the trip from South East Florida to Dayton as part of a planned vacation. Lu and I quickly learned that you really cannot “see” Dayton with a single visit. It is simply too large to cover in the allotted 3 days. The indoor exhibitor booths numbered to 749 spread over 5 buildings. These alone were a challenge to visit. In addition the outside exhibitor’s area numbered 4266 tables spread over the surrounding Area lot.

During the closing ceremonies the DARA officials announced that 28,500 people attended this 49th Hamvention. The vendors generously offered \$80,000 worth of prizes. Neither Lu nor I were among the fortunate recipients but I did buy a new dual band HT and some software. We also attended the much exclaimed Hamvention Grand Banquet held at the Nutter Center. Local weather man Carl Nichols N8WFQ was the Master of Ceremonies. Keynote speaker FCC’s Special Council for Enforcement Riley Hollingsworth K4ZDH apologized for the agencies’ past laxity regarding ham radio enforcement and assured all that that policy has now changed. (Just check out 14.313 and note the absence of nonsense compared to just a few months ago - ed.) Following the banquet the Center was opened for general admission to attend the entertainment offered by the Smothers Brothers. I’ve been a fan of Tom and Dick Smothers brand of humor since the beginning of their 40 years in show business. I remember seeing them in person in San Francisco and since have enjoyed every performance they offered on television. During the short interval that they stopped clowning and sang I was enthralled with the quality of their voices. The Banquet was an occasion to remember. (Photo: DARA prize committee find a winner in the stands).



We had an eyeball schedule with Doug Welcker, his wife Julie and John Green set for Saturday morning. Doug is the president of the Palm Beach Packet Group and John is a Director. The three of us attended the informal get-together with Alan Waller who is the web master of the QSL.NET which hosts our web page which can be found on <http://www.qsl.net/pbpg>. Doug presented Alan with a donation in gratitude for the web service he provides to ham radio and to the PBPG.

(Photo left to right: Lu KB4XE/XYL, John WB4MOZ, Doug WB4KGY, Julie WB4KGY/XYL, Alan K4TKJ).

On the return leg of our 2600 mile vacation Lu and I agreed that we really did not “see” the Hamvention. We more likely viewed it. We’ve tentatively planned to return for the 50th Hamvention to view some more. Did we enjoy our stay in Dayton?

You bet we did!

Summer Vacations and other things

As you noticed in the previous article, key players in the publishing of the WHITE NOISE attended the Dayton Hamvention. Their absence necessitated the delay of the May issue. Thus we have dubbed this issue the MAY-JUNE issue.

There is more to come.

Vacation plans for those same people are not firmed up as of this printing. But it is all but certain that future summer issues will also be delayed and/or combined. Please be patient with us and we will be back again as the Fall season approaches.

-ed

PBPG MINUTES **April 13, 2000**

OPENING AND REPORTS

President Doug Welcker WB4KGY brought the meeting to order at 19:30 hrs. All present introduced themselves, using their names and call signs.

The treasurer's report was given by Treasurer Marvin Kaskawits KD2CK. The report itself will be made available on the pages of "White Noise".

The technical committee report was given by Doug.

1. Doug, John WB4MOZ and Andy KF4ATC returned the Stuart/Vero link to 1200 baud. Several tries couldn't make 9K6 work, but they will try again in the future.
2. Wayne N4PZJ, Andy, and John spent Friday, April 6th fixing the antenna problems in Stuart. The APRS J-Pole was moved up the tower to near 300 feet and a new Tri-Band antenna was installed at 200 ft plus level. The transmission line for this antenna had both connectors replaced as well as a new jumper between the antenna and hard line.
3. Ed N9HFR who operated the Charlotte County BBS and node is interested in converting to FPAC and is working with John.
4. John got the 9K6 link working to Joel N4JOA BBS. After many months of chanting radios, antennas, and TNC's it turned out to be a bad DED EPROM in the TNC.

OLD BUSINESS

PBPG was asked by Adelphia to move to temporary shelter, and to provide that shelter during expansion to their existing facility. John, Andy, Doug and George Milhet of Channel 2 met at the site to coordinate plans. Channel 2 would help pay for some of the costs. WPB radio club volunteered their communications trailer, which was inspected with Manny W4SS. Just before moving the trailer, Adelphia said "Stand by till we call you." When we called, they had changed their mind and cancelled the construction project till further notice.

NEWS AND INFORMATION

John and Doug attended the FADCA meeting last month. Bud N0IA is working hard on the Orlando LAN. Doug WB4KGY is now the Director for District 2.

PBC Sheriff Comm Div wants to share our 2M Switch Antenna. More on this later.

The March of Dimes Walk will be Saturday, April 29th. Dick can still use some more help.

NEW BUSINESS

As listed above under NEWS, Doug is now the Director for District 2 of FADCA.

ADJOURN\BREAK\WORKSHOP

The next meeting will be Thursday, May 11th. Dick Scofield will be the temporary secretary since Burck will be out of town. Doug will discuss towers. He will also discuss Sheriff's Office re: remote receivers.

There being no further business the meeting was adjourned at 20:15 hrs.

PBPG MINUTES

May 11, 2000

OPENING AND REPORTS

The meeting was called to order at 19:30 hrs. by President Doug Welcker WB4KGY. Dick Scofield AF4OR will be secretary in Burck's absence.

The technical report was given by Doug Welcker.

Doug Welcker will be away for 2 months this summer. John Green WB4MOZ will also be away for 2 months. The White Noise may have some interruptions but Doug will get info to Bill Manley for printing.

The statement from the Credit Union was not received by the treasurer in time for the meeting. When received the report will be forward to the Editor of White Noise for publication.

Doug read a letter concerning the situation with the QRZ.NET being priced out of its current server. The letter was a request for donations to help supplement the cost of equipment and operation. As QRZ.NET provides the PBPG web page and postings of the White Noise a donation was deemed in order. A motion was made by John Green and seconded by Bob Pasquale to send a \$50.00 donation. The motion passed by unanimous vote.

Field Day was discussed as Larry Lazar, Wellington Radio Club, has invited the PBPG to participate with digital modes. Anybody interested, please let Doug or Board members know.

Doug Welcker said next month's meeting will be an interesting meeting with pictures of commercial antenna sites.

Dick Schofield will talk to Larry Lazar regarding packet setup with the E.O.C. from the hospitals. Larry is the liason with communication group for the ARES group. This was requested by Marvin Kaskawits KD2CK.

There being no further business, the meeting was adjourned at 20:30 hrs. Next meeting will be June8, 2000 at the Picadilly Restaurant.

Submitted by Dick Schofield

APRIL BARDS MEETING

Bill Manley KB4XE

The meeting was opened without fanfare at 0900 by Carl W9ZGU.

He protested the perception of his traditional April presentations as being suspect and identified others' whose were even more outrageous. When the gawfaws subsided he proceeded with his a demonstration which (allegedly) demonstrated how replacement of standard light bulbs with a 24 volt version would reduce the household electrical bills. Carl had samples of each item which he adjusted to like brightness. Then, using tried and proven and beloved metering systems, he proceeded to demonstrate that the 24 volt bulb consumed less power than the 120 volt variety.

Attendees conducted themselves with an appropriate distrusting demeanor and a snickering overtone pervaded the Motorola conference room. Carl relented to the pressure and commenced with the final part of his presentation.

With the aid of an oscilloscope which monitored the voltage waveforms to each bulb he showed that the effective (RMS) voltage to the 24 volt bulb was quite different than represented by the beloved metering instruments. An enlightening discussion of the differences between RMS and average followed and commenced with appropriate applause for Carl and a job well done.

MAY BARDS MEETING

May 13, 2000

We very good attendance at the May meeting with 10 hams including a licensed XYL, Cheryl, KE4WAI.

The program started with an excellent discussion by Grant Porter, KI4CA, of a 300 foot APRS site that will be primarily funded by BellSouth.

Bill, KB4XE, and Bob, N4CU, teamed up for a program on contesting software. Both Bill and Bob entered the Florida QSO Party contest and contacted each other on the air. After the contest Bill and Bob discussed the different software they used and it may be a good subject for a program. Murphy struck the program before it even got started. Bob's floppy died just before the contest was over. Use of the floppy for automatic backups is hard coded into his program. Oh bother... But that would only make a small dent in the program. Plenty of good stuff still to show. So the Bob and Bill team started the show. For computer oriented BARDS presentations we use a LCD panel for an overhead projector. The slide projector has an automatic function that is supposed to recognize a VGA display. It decided not to be automatic. We got it to work just before the coffee break. After coffee break, Bill started his portion of the presentation. The computer decided to swallow his data CD-ROM. So that was the end of what we thought was a carefully prepared program. We did manage to describe what the programs should do.

Fortunately, we had some time to do some planning. We all know Carl, W9ZGU, is the master of hose jobs. We decided to hose the hoser. Carl likes antennas so we dreamed up a story of an antenna and propagation program and it went like this->"The originally scheduled program was on contesting programs by Bill, KB4XE and Bob, N4CU. Motorola had a visitor for an in plant seminar, K7VVV, Paul Cook. Paul has been author of the weekly ARRL Propagation Bulletin since 1990. Paul gave an excellent presentation on propagation and the advantages of different antennas during different propagation conditions."

The next meeting is June 17th, the regular third Saturday. The program will be by Al, N2EPI, on Solar Power. But don't tell Carl. He thinks we just delayed the Contesting Program Presentation. Let's see how long we can keep him hosed. I'll send out a "correction" just for him before next meeting. And when you see Carl, just think GOTCHA!

Bob, N4CU