

W6VIO CALLING



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Jet Propulsion Laboratory
W6VIO CALLING M/S 264-419
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Club Meetings:

Everyone is welcome - Bring your lunch.
12 Noon in 238-543
Second Wednesday of month (Program)
Fourth Wednesday of month (Business)

Newsletter Article Deadline: The 5th. day of each month. If the 5th. falls on a weekend, the following Monday will be the deadline.

Your articles, ads, photos, diagrams, Letters to the Editor, or technical instructions should be submitted to Editor at address above.

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EDITOR'S NOTE: THIS OCTOBER
W6VIO CALLING WAS SUBMITTED
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Neptune Encounter QSL's

George W6ABW reports that there were more than 8200 contacts made during the Voyager 2 Neptune Encounter operation by our Club.

The party is over and now it's time to straighten things up. All of those 8200+ contacts need to be logged into a Data Base file so labels can be printed for our special QSL cards. The data base will also be useful in sorting out duplicates and multi-band contacts by the same station. Contacts will be logged on DD/DS 5 1/4" disks using IBM PC, XT, AT or Compatibles and DBase II. Disks will be prepared and sent with instruction and a log book to persons volunteering to help. If you can log some contacts, please call Rick McKinney at EXT 4-3968. The more loggers we have the fewer contacts there will be for each one.

About 3000 QSL cards have been received at JPL so far and more are arriving every day. In reviewing the first batch, I found several requesting some picture in addition to our special QSL card. I called Peter N6TGZ and he arranged with PIO to make picture sets available to all persons sending us QSL cards. Since these won't fit in the usual SASE that we receive with QSL requests, there will be a lot of cutting and pasting to do when we send out our QSL cards. More volunteers are needed!

Jan N6USE is working to get the QSL cards ready and off to the printer. She presents images at the September club meeting. Two color and several B&W images were selected for the QSL card by the members present. Those images are now going to graphics where the art work for the card will be prepared.

Everything seems to be off to a great start; let's keep it moving. 73,

Rick, KA6DAN

NEW HAMS

The JPL Education Department gave some Novice Exams to the summer hire teachers. Gene Vosicky, a JPL employee passed along with 3 Navaho and 2 local teachers. Congratulations to Gail Elliot, Sady Yazzie, Doug Perkins, May Yuan. (Mark, WB6CIA)

OOPS

Anyone who read the green September 1989 issue of VIO CALLING noticed that the Education Report got discombooberated (it's a real word, I hear it in cartoons all the time). In order to decipher what seemed to be disjointed ragging of no-code try this. The article starts on page 2 under Education Report, next goto page 3 second column third paragraph for the rest of the page, next goto page 3 first column sixth paragraph and continue on through the top of the second column for the last two paragraphs of the article. Maybe I should have relayed it via CW. (Mark, WB6CIA)

SATELLITE NEWS
Courtney Duncan, N5BF

The Voyager 2 / Neptune Encounter Commemorative operation at the satellite position was a big success. The new IC-275H performs even better than expected, both in transmit and receive. At least half a dozen operators logged a few hundred contacts with stations all over the world. We did not attempt SSTV transmissions and there was no indication that many of the satellite operators we were working were properly equipped for reception. In any case, many stations in the U. S. were worked both on HF and via AO-13. This was clearly the way to beat the pileups. Often five or ten stations would be worked in rapid fire, but as is the hallmark of satellite work, things were more relaxed and conversational, both with local neighbors and rare DX. Based on our commemorative experience, the consensus is that we finally have an excellent, solid station for modes B (435 MHz up and 145 MHz down) and J (reverse of mode B). This capability affords at least eight or ten hours of operating opportunities per day.

At the satellite position in the shack, between the radios, Commodore computer, and other material, there is enough information to get on the air and make contacts. Some operators have been able to figure out the details for themselves. Basic operation is mainly a matter of knowing where to point the antennas and what corresponding frequencies to transmit and receive on. Members with keys to the shack (and a Technician class license or better) are welcome to try the equipment out for satellite work or just local VHF/UHF contacts. If you need help, there are several people around the club who know enough about OSCAR operation to be helpful. These include Mark Schaefer, Peter McClosky, Stan Sander, Jan Tarsala, and myself.

Be careful and don't swing the antennas into the diesel generator exhaust stack on the pump house next door. Our antennas were there first, but . . . Due to a combination of increasing job responsibilities and pressing commitments with AMSAT, this will be my last regular amateur satellite column for a while. I have also resigned from the JPL Amateur Radio Club's Board of Directors and the position as Club Secretary. I will continue to participate in club activities and contribute to the "W6VIO Calling" on a sporadic, ad hoc basis. I know that there are several members with significant knowledge and experience in both amateur satellite and packet radio operation. Perhaps one of them will pick up the thread and carry on.

EDUCATION REPORT
by Mark M. Schaefer WB6CIA

The GRAND FINALE to the GRAND TOUR sure was fun. You couldn't of asked for better conditions on Earth or Neptune. Sending all those fantastic pictures over the air via SSTV was loads of fun. You could just hear the hams on the other end falling out of their chairs. There were so many people in the club who came through to get the stations on the air and to make this commemorative such a success. So here's my thanks to everyone who grabbed a soldering iron or a microphone and everything in between. - TNX! - I wish we had a quarter for every time someone said they enjoyed "reading the mail" about Voyager info or wanted to congratulate everyone at JPL for a job well done. Of course we probably will get a 25 cent stamp for each of the stateside QSO's we made. Just to remind you, "The job isn't done till the paperwork is finished" Rick McKinney will be glad to have you help fill out the QSL cards (whatever they look like). This encounter came at pretty close to the Sunspot Cycle peak. I logged on to the NOAA BBS to check conditions and was receiving MUF's (Maximum Usable Frequency) higher than 6 Meters into Australia! You don't often get the chance as a W6

Facilities Report

Bob Deen, N5DPU, Facilities Chairman

It took a lot of last-minute scrambling, but we got the station and antennas in working order just in time for a great Neptune encounter! It took a lot of help from a bunch of dedicated workers to get everything running, and I'm sure I left someone out below. I'm sorry, believe me it's not intentional.

The Sommer antenna was quite balky at first. It took several fits and starts to get the rotator calibrated, but we finally succeeded. It's amazing how much easier it is if you just read the manual! Thanks to Jerry Hawkes, Kent Kellog, Walt Mushagian, Larry Ruple, Stan Sander, Mark Schaefer, John Tallon, and Sam Weaver for their help. Special thanks go to Mark, Walt, and Sam, who spent much of the week right before encounter testing the SWR, replacing a coax up on the hill, and tuning the antenna. It's still pretty bad on 40 meters, but it's usable on most other bands. Walt and Jerry quickly put together a 40-m dipole to take care of that, and Larry Ruple and George Morris got the 80-m dipole working.

The TV cable to the shack that carries the real-time images didn't work, and it took some REAL last-minute scrambling to dig up and repair the cable, and to put in some amplifiers. Thanks to Sid Johnson, George Morris, Phil Smith, Dick Wetzel, and Art Zygielbaum for taking care of that. Also, thanks to John Adams for getting the slow-scan system in shape.

On the OSCAR/VHF side, Courtney Duncan, Steve Jenkins, Peter McClosky, Don Ritchie, Stan Sander, Mark Schaefer, and Jan Tarsala spent a good bit of time getting everything set up.

Of course, it never would have happened without George Morris running the show, and all the operators who ran the station. And, last but certainly not least, thanks to the Voyager team for putting on such a great show!

station to get pileups and tell the South African stations to all please standby while your working Europe on SSTV. The satellite station was loads of fun. Calculating the Ephemeris on the computer. Making the signal up on the beacon. Coping the CW message to find out the satellite mode schedule. Making the QSO's became the easy part. The only difficulty was on mode B when the navy was using radar over the entire 440MHz band, picking up SSB was impossible but I was still able to pick out some Russians on CW. In the last twenty years I noticed that the UA's have always had some of the best fists on the air but they no longer have the characteristic chirps and buzzes on their signals. Anyway I can't wait for another excuse for a commemorative, at least until the next wind storm blows the beams into the next grid square. So now is the time to operate the station that you can't or don't have at home while it's up and running and so are the conditions. If your not familiar with the equipment get a hold of me (or a more accessible club member) and we can give you a demo and key info and you can become a Wiskey - Six - Very - Important - Operator

W6VIO VOYAGER NEPTUNE ENCOUNTER George Morris, W6ABW

The W6VIO Voyager Neptune Encounter special event operation was very successful. We made 8,230 contacts between August 19 and September 3. We contacted stations in every state and 65 foreign countries. A list of the foreign countries contacted is included below.

This contact total amounts to an average of 514 contacts per day or 21 contacts per hour assuming we operated 24 hours per day. Assuming we operated 8 hours per day on weekdays and 16 hours per day on weekend we averaged 47 contacts per hour.

The number of contacts by band and mode are:

| BAND | MODE | CONTACTS |
|-------|--------|------------|
| 75 | SSB | 4 |
| 40 | SSB | 539 |
| 40 | CW | 56 |
| 20 | SSB | 3973 |
| 17 | SSB | 81 |
| 15 | SSB | 1486 |
| 15 | CW | 256 |
| 10 | SSB | 1346 |
| 2 | SSB/FM | 176 |
| 220 | FM | 182 |
| 440 | FM | 2 |
| OSCAR | SSB | 129 |
| | | TOTAL 8230 |
| | | PHONE 7918 |
| | | CW 312 |

I want to thank the 34 operators who made this special event such a success. A list of those operator is included below. I want to thank Jim Lumsden for providing the newly released photographs each day which made the SSTV operation a success. I also want to thank the many people involved with preparing the antennas and station equipment for this event. Bob Deen has a separate article in this issue thanking those people individually.

COUNTRIES WORKED DURING VOYAGER NEPTUNE ENCOUNTER

Aland Island
 Anguilla
 Antigua
 Argentina
 Aruba
 Asiatic USSR
 Australia
 Bahama Islands
 Barbados
 Belize
 Bermuda Island
 Borneo
 Brazil
 British Virgin Islands
 Canada
 Cayman Islands
 Central African Republic
 Chile
 Colombia
 Costa Rica
 Cuba
 Dominican Republic
 Ecuador
 England
 Falkland Islands
 Fiji
 Finland
 Galapagos Islands
 Guatemala
 Haiti
 Italy
 Jamaica
 Japan
 Johnston Island
 Korea
 Liberia
 Luxembourg
 Mexico
 Netherlands
 New Zealand
 Northern Ireland
 Panama
 Paraguay
 People's Republic of China
 Peru
 Portugal
 Puerto Rico
 Scotland
 South Africa
 South Cook Islands
 St. Helena Island
 St. Vincent
 Surinam
 Swaziland
 Sweden
 Switzerland
 Tahiti
 Tokelau Island
 Trinidad Island
 Ukraine
 Uruguay
 U.S. Virgin Islands
 Venezuela
 Wales
 West Germany

OPERATORS PARTICIPATING IN ENCOUNTER

Stan Brokl
 Norm Chalfin
 Gil Clark
 Bob Deen
 Glen Deen
 Bob Dengler
 Courtney Duncan
 Bill Fesler
 Jerry Hawkes
 Steve Jenkins
 Sid Johnson
 Kent Kellogg
 Bob Layne
 Merv MacMedan
 Dick Malm
 Nancy Malm
 Peter McClosky
 Jim McGregor
 Connie Morris
 George Morris
 Walt Mushagian
 Ted Pfeiffer
 Merlin Raines
 Len Reder
 John Repar
 Mel Roberts
 Larry Ruple
 Patti Ruple
 Stan Sander
 Mark Schaefer
 Carl de Silveira
 John Tallon
 Sam Weaver
 Dick Wetzel

AMATEUR PACKET RADIO INTRODUCTION
 Courtney Duncan, N5BF
 Part II

While preparing to complete the packet tutorial that I started a few issues back, I received my September 1989 73 magazine in the mail. It is a special packet radio issue devoted to articles just like the column I had already written here and the one I was about to write. Rather than spending a lot of time rehashing what has been said in that magazine here, I just recommend that you pick up a copy for tutorial and reference information. Most but not all of the articles are by WB6RQN and cover many aspects of amateur packet communications from "what is it all about" up to advanced protocols and high speed trunking techniques. Equipment reviews and articles on how to hook the new boxes up to your existing station are also included.

For my part, I will just make a few comments concerning my views and perceptions of packet radio.

First, there is a tendency among prospective packet operators to use the opportunity of entry into digital radio to get into everything at once. "Multi-mode" controllers are available which do everything from RTTY through packet, CW, SSTV, and WEFAX. For the "occasional" operator, this is fine. If your intention is to listen on packet once in a while then shut down and do something else, listen on RTTY for a while then shut down and do something else, copy a few pictures off the air then shut down and do something else, this is probably the way to go.

Packet radio was designed for something more than just occasional operation, however. A packet radio node (such as the one you will operate when your radio and terminal are on the air) is not only your entry into the network but it is a functioning part OF the network as well. Your node is a resource that other network operators can use to relay or extend their own operations. It is also a terminal for electronic mail in some form or another. These new uses of ham equipment and frequencies mark a philosophical break with the traditional concept of amateur radio that a station is on the air when the operator is present and using it and that it is off at all other times. To be a meaningful part of the network and an electronic mail terminal, however, the equipment needs to be on most or all of the time. Unattended, automatic operation is legal, and there are parameters within the TNC that allow for automatic IDs to be sent, etc.

As an example of automated operation, the W6VIO Voyager 2 / Neptune Commemorative packet operation conducted about 100 contacts automatically at all hours of the day and night. These were all recorded on disk for logging purposes.

To join the network in this sort of functional way, I recommend one of the plain, single purpose TNCs such as the MFJ 1270 or 1274, the PK-87, or the Heathkit "pocket packet." One of these small units costs a half or a third of what the multi mode ones do and doesn't have to be taken off the air whenever SSTV or WEFAX operating is conducted.

Packet operation on HF requires a 300 baud modem and a TNC tuning indicator is highly recommended. Audio frequency is critical. This is no problem on FM but on SSB when a 50 Hz error in tuning means a 50 Hz error in all audio frequencies, it can make the difference between copy and no copy. Such a tuning indicator is the main difference between the MFJ 1270 and 1274, for example.

Packet radio "protocol" operation virtually guarantees that digital data is passed error free. This mode of operation is most common and requires the operator to command his TNC to "connect" to another TNC. Once the virtual connection is established, the TNCs on both ends assume responsibility for checking and retrying data until everything is passed in each direction. If data reception is not confirmed after a certain number of tries, the TNC will give up and notify the operator. Connected operation is a "get it perfect or die trying" proposition.

There is a less stringent mode of operation called "unproto" for "no protocol." This mode allows an operator to "read the mail" and transmit on the channel without a specific destination. Data received in error is lost but this is not as much of a problem as you might think at first examination. Unproto operation is used largely for round tables where many operators are participating, as on a repeater.

Getting set up on packet radio is about as straightforward as getting set up on ATV. You acquire a TNC that comes with cables. The cables are usually already made up for the TNC end and you simply put connectors on the other end for your radio and computer or terminal. Start out on 2 meter FM, 145.01 or another nearby frequency in the packet group (144.91 to 145.09 in 20 KHz steps). There is packet activity on 6, 220, 440, HF, and other bands, used largely (but not exclusively) for trunking. For users, connectivity is the name of the game so the more populated user frequencies on two meters are the places to start.

There are audio levels to adjust but these can usually be handled in the beginning with microphone gain and AF gain controls on the radio. I've used an IC-02AT off and on at the office and in the car for the radio of a portable/mobile packet terminal for three years without ever needing to resort to any microphone level adjustments on the hand held.

There are local packet bulletin boards on 145.05, 145.36, 146.745/.145 duplex, and other frequencies. There is also a Southern California DX spotting service on 145.68. Get on one of these frequencies and read the mail to get call signs and other information.)

Although there are specialized packet radio terminal programs, any computer terminal program (Crosstalk, Procomm, etc.) will work fine as will the comm option on a TRS-80 Model 100 (or equivalent) or just a simple VT-100 type unit.

For a ham who already has a computer and 2 meter FM rig, there is little standing in the way of getting on packet radio. The single purpose TNCs start in the \$100 - \$150 range new.

Finally, a word about higher level networking protocols.

After the explosive success of the TNC-2 in amateur and commercial marketplaces, it was hoped that further evolution in digital radio would be equally universal, straightforward, and effective. This has not been the case in any respect. A number of different Network and Transport protocols have been introduced into the amateur networks each having strengths and weaknesses. There is little connectivity between the various virtual networks so the hope for more than a local or regional