SCOPE

THE PALOMAR AMATEUR RADIO CLUB NEWSLETTER

The **annual picnic** of Palomar Amateur Radio Club is scheduled for Sunday August 18, 2013 at San Deguito County Park Area 4. Hours are 9:00 AM to Dusk (or so).

This is the time to redeem participation points for tickets for the drawing. A participation point is registered for you each time you sign in for an event or meeting of the Club. A maximum of 20 tickets per individual is allowed.

The club will provide the main course. Guests and members are asked to bring an item from the following list and some drinks. Last names beginning with: A-K: side dish or casserole, L-R: dessert, S-Z: salad, vegetables, or fruit, and Conrad: BROWNIES.

A HF radio with an antenna tuned to 10/15/20 meters will be there to used for finding obscure contacts. A 40 meter dipole will be brought, but we will need to support it as the trees have moved. What will Ron K2RP bring from the vintage collection?

Two or three fox (T) hunt transmitters will be available for seeking out. We hope to have cards with information about frequency, duration, and message. A drawing can be held for a Kenwood TM 281A 2 meter Mobile radio, preprogrammed with the open San Diego County repeaters. It will require the sale of 70 $2.00 tickets. As always, bring stories about the elusive contacts you made or how you solved your radio problems.

Most of all, Come out and have a great day with other HAMS.

Dennis KD6TUJ, President PARC

The **next meeting** of the Palomar Amateur Radio Club, meeting the first Wednesday of the Month at Calrsbad Safety Center, 2560 Orion, Carlsbad, California, at 7:30 PM will be: "Propagation 101"

AK6QJ describes how he used a basic understanding of HF propagation and readily available free (!) software applications to plan his Field Day strategy. Featured will be 24 hour animations of worldwide propagation for selected bands. While the material is geared to the new HF operator, more experienced hams might find the animations of interest.

Presented by Jerry AK6QJ

Below, a small sampling of the call sign plates spotted at this year's PARC Field Day event. Photo by Paul KB5MU.

See more photographs from Field Day in this issue of the Scope. It's never to early to start planning for next year!

Save the Date

Club Meeting
7 August 2013

The 7:30pm program is about HF Propagation and is presented by Jerry AK6QJ

Board Meeting
14 August 2013

Palomar Amateur Radio Club board meeting at 7:30pm at W6GNI QTH.

Club Picnic
18 August 2013

Join us at San Deguito County Park Area 4. Hours are 9:00 AM to Dusk (or so).

Fold & Staple for JULY SCOPE 2013

Al W6GNI & Kathy, Sonny WA5ACE
Art KB6YHZ and Janet Meyer
Jo KB6NMK and Toby Ashley

Advertisements are free for members

Have items that need to find a new home? Advertise here! Send your ads to scope@palomararc.org

For Sale:

1) New Butternut HF9V 9 band vertical antenna (80, 40 30, 20, 17, 15, 12, 10 and 6 meters) and Butternut CPK Counterpoise Kit. Both antenna and CPK kit are unopened in original boxes. I am selling as a package only - $475.00

2) New Diamond DPGH62 6 meter monoband base station antenna - 21 ft., 6 dB gain. Unopened in original box - $100.00

3) Icom IC-208H 2 meter + 70 cm mobile radio. Excellent condition in original box - $225.00.

4) Icom IC-7000 all mode HF/6 meter + 2 meter + 70 cm mobile radio. "Like new" condition with very little use. MB-62 mobile mounting bracket included. In original box - $850.00.

5) Astron RM-35-M rack mount 25 amp linear power supply with meters. Excellent condition, low use - $200.00
Contact Dean W6DBJ at 760-727-5954 or deanjacobsen@earthlink.net

For Sale

I have for sale an MFJ-1786 Super-Hi Q loop antenna for 10-30 mHz. In excellent condition and handles 150 watts. Can be mounted horiz or vert. $300 and pick-up in Vista.

Marsh 760-536-3220

For Sale

Four rolls of Mil-C-18/ UG218. The rolls are about 140 feet long with N connectors. Insertion loss is .9 dBa per 100 feet at 150 mHz. $250.00 per roll or $800.00 for all of them.

Glenn
N6JAI
619 654 1402

PARC APPAREL SALE

PARC apparel will be ON SALE at this month's club meeting.

1. One Time late 2013 Field Day T-Shirt Sale.- For members who desire to purchase a PARC 2013 Field Day T-Shirt. This is a one-time order that will not be repeated. Prices and details are:

T-SHIRT WITH CLUB LOGO + FIELD DAY 2013 PRINTED ON THE BACK, PLUS OWNER NAME AND CALL SIGN ON RIGHT BREAST.

100% cotton. Light blue T-Shirt. Logo, Name and Callsign embroidered in Navy blue.

Men and Ladies styles available

Sizes (S, M, L, XL)	$17.00
Size XXL	$19.00
Size XXXL:	$21.00

2. PARC Standard T-Shirts. This marks the first sale of what will be standard PARC T-Shirts. 100% cotton. The T-Shirt details are as follows:

Standard T-Shirt light blue has PARC Club Logo in Navy blue on right breast.Men and ladies style available.

Sizes (S, M, L, XL)	$12.00
Size XXL	$14.00
Size XXXL:	$16.00

Options

Pocket over LEFT breast	+ $1.00
Name & Call over LEFT breast	+ $5.00

For example, an order for a Large T-Shirt, with pocket and owner's call sign and name will cost $18.00. If the owner is in need of a size XXL, then the cost is $20.00

In the near future the Club will also start sales of Polo Shirts, ball caps, and miscellaneous apparel.

Membership Info for August Scope

While we certainly appreciate Reinstated members, we believe many "Reinstatements" are due to members not aware that their membership was due.

Since many members now get the News Letter (SCOPE) on the web, they don't receive the paper copy that we mark blue when membership is almost over, and red when the time for renewal has passed.

The Board has recommended that we publish member's calls that are getting close to renewal time. The following members are due for renewal in a month or so. Hopefully, if your call is in this list, you will find time to send a check, or tell PayPal to renew your membership. HD0IF, KI6PTN, WA7TCD, WJ6YPR, W0NI, K7ELH, AK6QJ, WZ6RAM, KK6OT, KI6RF, N6URW, WB8BHE, K6BZZ, KJ6DPT, KC6YSO. - more next month! JULY IS ALWAYS A BAD MONTH FOR PARC! This goes all the way back to when all memberships rolled over in July. Please check – did your membership expire in July 2013??

Thank you,
Al W6GNI
Membership

Preliminary A/B/C tests Flex 6700

By Howard S. White Ph.D. P. Eng.KY6LA

Finally came home from my 5+ week extended travels and in spite of severe Jet Lag I was able to install the Flex 6700 and put it through a few basic tests.. especially a comparison A= Flex 6700, B= Flex 5000A, C= Icom 756 Pro 3.

Test Setup with Flex 6700 on Top of Pro3, front and back.

Installation was a breeze. Open box, plug in antenna, GPS antenna, microphone, speakers, Ethernet cable. Connected a 12V power supply, downloaded the SmartSDR Preview Beta Test Software (V0.12.17). It installed automatically. Firmware was updated on the radio, and Voila, I was on the air.

More significantly, the radio is controlled by an Ethernet connection (It has its own IP). I could run the radio from any of the computers on my network. NO SPECIAL COMPUTER required. While I prefer to use a superfast modern W7 machine, it ran easily on my oldest 1999-era computer running Windows XP SP3.

Now, the software is clearly "Beta Test Software" as I reported back in April from Visalia. Many things do not work yet but a heck of a lot more stuff is working now and the receiver performance has improved significantly.

Out of the box, the first thing you notice is the almost complete absence of background static compared to a traditional radio. It is a direct sampling radio, so there are NO NOISE SOURCES like local oscillators and mixers and amplifier stages to inject noise into the receive chain. In spite of being so quiet, it really hears better than any other radio I have ever owned.

So how did we do in the tests?

I set up an antenna switch as follows:

A= Flex 6700,
B= Flex 5000A,
C= Icom 756 Pro 3

HAM RADIO OUTLET

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Jose XE2SJB
Jerry N5MCJ
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Directions: On 163, take **Clairemont Mesa Blvd**. off ramp to East. Stay in right-hand lane. Turn right at stoplight. As you are turning right you can see our beams in this shopping center. Travel 100 yds. On Kearny Villa Rd. and U-turn back to shopping area and HRO sign. Be sure to see our equipment in action on **real** antennas!

All three were on my SteppIR MonstIR and could be switched instantly so I could sample the different signal sources.

Sensitivity

1. The Icom is basically deaf… even with preamps it misses a lot of signal in the static..
2. The Flex 5000A would hear signals that were copyable that the Icom could not hear let alone copy.
3. The 6700 could hear signals that were copyable that the Flex 5000 could hear but were not copyable.

Case in point, I did 3-way QSO with a DU2 station on the front of my beam and a W2 station coming off the back of my beam. Needless to say the DU2 was 20 over S-9 or better on all radios. I could copy the W2 on the 6700 (No PreAmp). I could hear his presence on the 5000 but not make out anything intelligible even with preamp. I could not even hear him at all on the Pro 3 even with the preamps on.

Minimum Discernible Signals (MDS)

All Measurements were taken with the pre-selector ON in Narrow Spectrum Mode. Note that Lab measurements can vary by at least 1dBm in practice. For reference S0 = 127 dBm

141dBm is equivalent to almost – S2…. i.e. 2 S units below S0

Internal Pre-Amp Gain	10m MDS	6m MDS
0 dB	-122	
10 dB	-125	
20 dB	-136	-138
30 dB	-141	-141

From 160M- 15M there really no need for the Pre-Amp as the MDS was below -143dBm

Bottom Line.. it looks like the 6700 is going to be a killer DX Radio for capturing those really weak DX Signals.

Dynamic Range:

I found a couple of really strong SSB stations (S9+50db). Then I looked for really weak stations (S0 – 127dbm or less) close to those strong stations to see how close in I could copy a weak station before the strong stations totally swamped my front end.

continued on page 15

Field Day Photos from Paul KB5MU

Satellite operations
Art KC6UQH

THE BIRDCAGE

POWERED BY THE SUN - WWW.SLEEPINDARKNESS.COM

YOUNG MARINES

PC Tips from Dick K6KAL

PC Tip No.2:

Phantom ports

Some of the following info was gleaned from the N1MM on-line documentation.

Many users of USB to serial adapters may have noticed relatively high port numbers being assigned. And some if not most of the lower COM ports are all committed to other things. It has been found that this strange behavior is in fact 'relics of the past'. As an example, COM3 used to be the standard port for built-in modems, and even though those modems have largely gone the way of the dinosaur, many computers still show COM3 as committed to that use.

If you are familiar with the use of Device Manager, you can always set up several hardware profiles, including one for ham radio that deletes the devices that are getting in your way (printers and so on). That way, you are only a reboot away from being ready to go for radio or being back in everyday mode.

Sometimes, though, ports will not seem to be committed, but when you try to create virtual serial ports (with a USB-to-serial adapter and Bluetooth adapters for example) Windows will inexplicably skip some lower number ports, or complain that they are 'In Use'.

Often there are ports assigned which no longer have devices connected to them. These are called "phantom ports". These can be discovered and removed. It may then be possible to move ports around to accommodate the individual needs of the program(s).

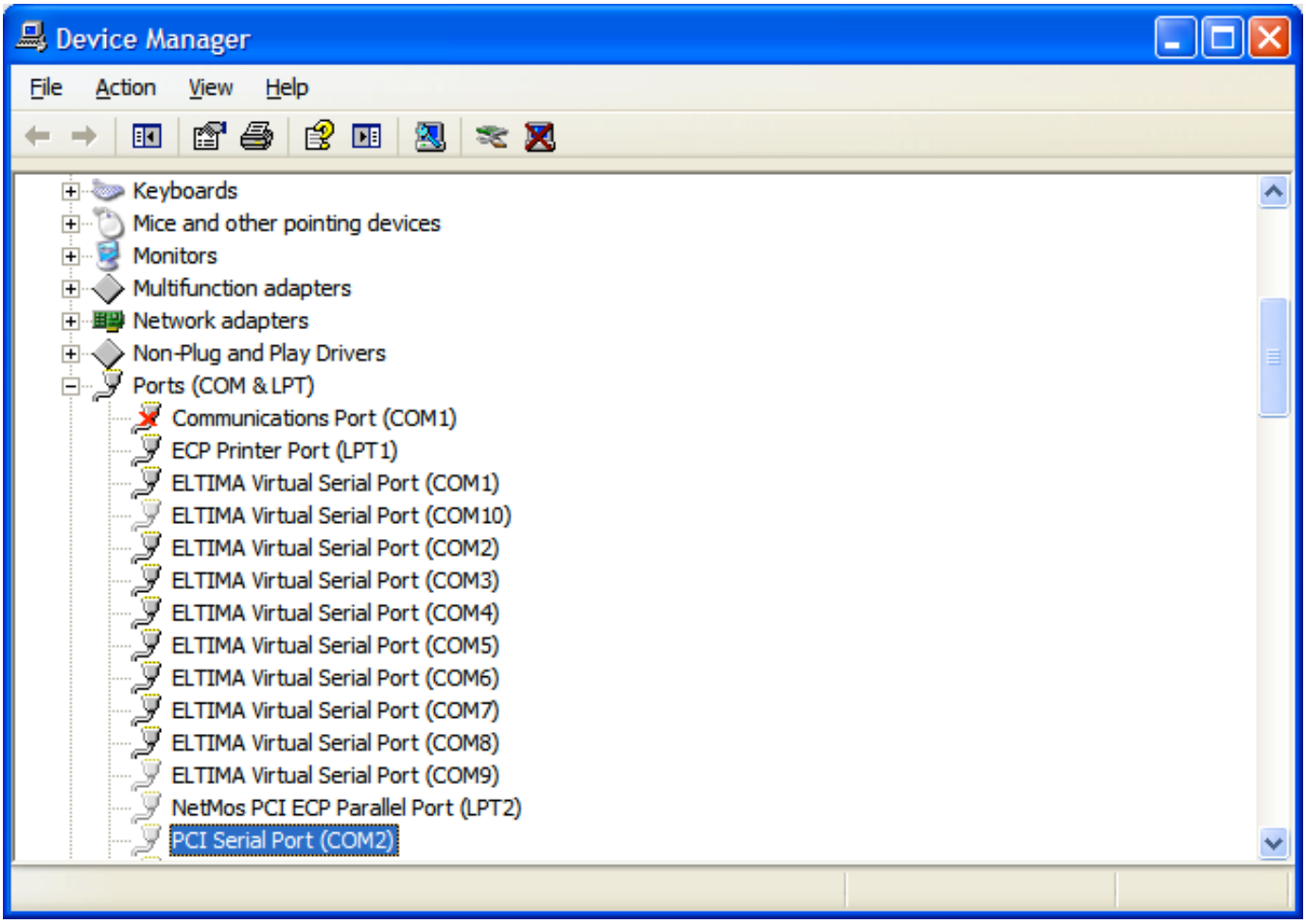
Here is how to have Device Manager show any "phantom" ports. (WIN 7)

Most of these steps are similar in win 7 (Vista) and Win XP

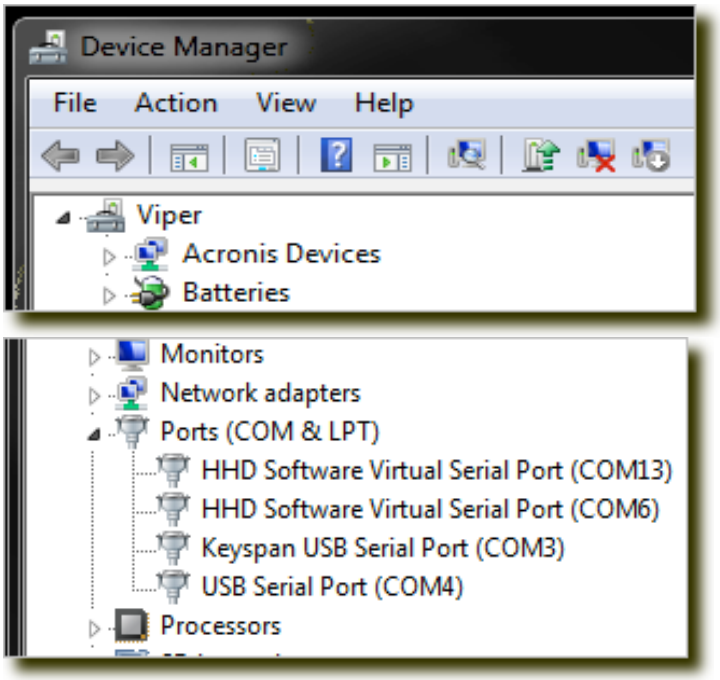
1. Click Windows 'Start' Icon
2. Click Control Panel
3. From Control Panel, Select 'Device Manager'
4. When the device manager opens, click the 'View' menu
5. Click 'Show Hidden Devices'. You may see lots of other devices, but we are looking for just the serial ports here.
6. Click on the + sign next to the Ports to see the full list of Com ports being used
7. Highlight the port you wish to delete and then press delete

   Accept when asked to do so and continue with any more that you wish to delete.

Here's what the Device Manager may look like before you delete the phantom ports. In this example, a 'Micro Ham' router or other 'Virtual Serial Port' emulator was loaded, which accounts for all the ports with the similar description.



And this is an example of another serial port emulator.

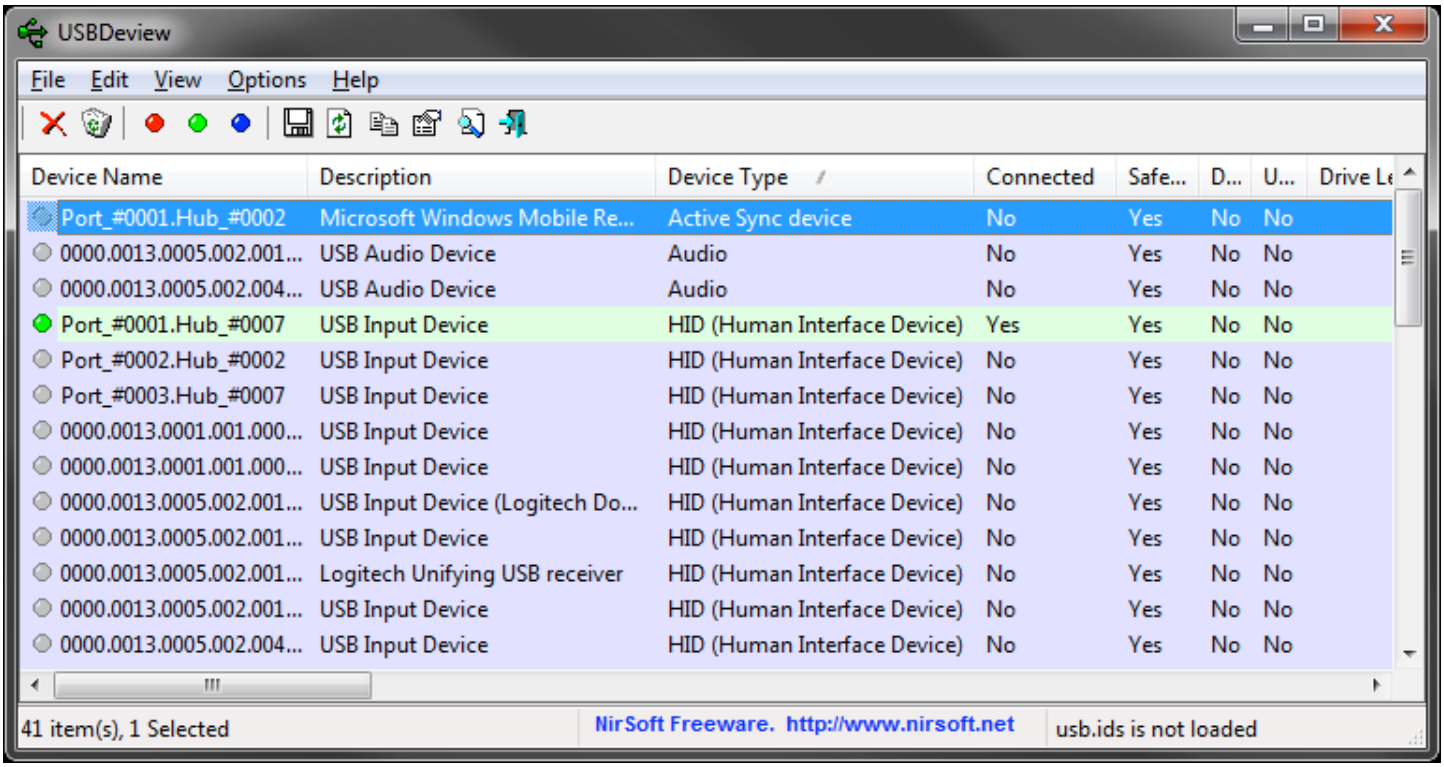


If you want, you can right-click on any of the shaded ports and examine their

properties. Each one that is inactive will show up as a "device no longer connected to this computer."

If you are unsure as to weather the driver is in use don't worry. If windows needed them, it will reinstall the driver.

There is a 'Freeware' utility called USBDeview available at 'nirsoft.net' that is very slick.



To see the unused or old drivers, select Options, and check 'Display Disconnected Devices'.

As you can see in the example the 'green' line is the only device connected, the grey lines are those that are not.

My first use of this utility produced a list of over 145 devices that at some time in the past were plugged in. In many cases they were the same device plugged into different hubs. If you scroll the window to the right you can see the 'Last Plug/Unplug Date'. You may be surprised as to how long ago this device was last used.

Pretty neat ? Well how does Microsoft keeps tract of these devices. For each device driver that is loaded on a USB hub / port, some data about each device (as you can see from the column headings in the utility) are kept, which allow MS operating systems to load or re-load the drivers as needed.

But old or unused drivers just take up space, and when a device is plugged in, the operating system must scan this growing list of devices to find what it thinks is a compatible driver.

Right clicking on a line will bring up a menu that will allow you to select 'Uninstall Selected Device', effectively removing the unused driver.

There you have it. Cleaning up old Phantom ports has lead us to cleaning up old USB drivers. While this is not a big game changer as far as performance, it will allow for improved USB device load / unload, as the pool of drivers would be smaller, saving time.

As an aside, this utility also shows the power consumption of each USB device, driver version and many other interesting facts. Remember each port is limited to 100 ma, and a fully loaded hub could be shutdown by the operating system if the ratings are exceeded. Then you would need to purchase a 'powered' hub to give your system the extra power it may need.

Participation points are earned by members supporting Palomar Amateur Radio Club. Support comes through attendance at meetings, work parties, operating events, and community support. These points can be redeemed for tickets at the annual picnic held in August. Points can accumulate up to a maximum of 20 per individual. Historically there are several gift certificates available to win. The real reward is your participation in ham radio. (But maybe a small bribe (***editorial note: to the EDITOR!***) will help!)

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Mayor Woods, Scouts, Fred, and Greg at PARC Field Day 2013. Photo by Conrad.

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1. The Pro 3 was swamped by anything less than about 10 KHz away so it became really difficult to copy when you had a strong station nearby.

2. The 5000 was pretty good down to at least 1 KHz (as long as it was not in the passband) before I heard some bleed thru but was still copyable.

3. The 6700 was almost unaffected by close in strong stations. And, realistically, unless the strong station was actually in the receive passband, it really did not seem to hurt reception.

One unique feature of an SDR is that the filters can be incredibly narrow (1Hz or less) and you do not hear any ringing. They do not need roofing filters to keep out the junk as they do a much better job in software.

The Flex 6700 only has a 16 bit S/D Converter so how can you get more than 96 dB of instantaneous dynamic range out of a 16-bit A/D converter?

You may think that one can only achieve 6 dB per bit, which would be 96 dB. Technically the theoretical maximum limit is 6.02n + 1.67 dB (where n is the number of bits. What many people fail to understand is that dynamic range is a meaningless term without knowing the final detection bandwidth (i.e. 500 Hz CW filter).

Instantaneous dynamic range increases with decreasing bandwidth by a factor of 10*log*(bandwidth change). That means that a 50 Hz filter will provide 10 dB higher dynamic range than a 500 Hz filter. That is why you hear less noise in the smaller filter. The actual receiver noise figure (NF) of the radio has not changed but the detection bandwidth has. Thus the SNR and dynamic range improves accordingly.

The dynamic range of any ADC is normally assumed to be specified over the Nyquist bandwidth, which is equal to 1/2 of the converter's sampling rate.

With the ADC used in the FLEX-6000 series, the Nyquist bandwidth is 122.88 MHz. To calculate instantaneous dynamic range, one needs to know the converter's specified signal to noise ratio (SNR), maximum peak signal handling capability, sampling rate, and final detection bandwidth.

The bottom line is that the FLEX-6000 ADC running at 245.76 Msps provides a nominal instantaneous dynamic range on the order of 130 dB in a 500 Hz bandwidth or about 140 dB in a 50 Hz bandwidth. Compare this to the new FT-DX5000 which touts a dynamic range of 112dB as its proudest achievement.

Bottom Line…it looks like the 6700 is going to be a killer contest and pileups radio when they finish the contest modules.

Transmit

Here the 5000 got glowing reports for my audio. The Pro 3 got pretty good reports.

The 6700 transmit audio definitely needs work!

However this is beta test software and I know they have not released the final transmit audio module.

So what is next? Software updates seem to be coming out regularly so more and more bugs that we discover are being fixed.

Performance should improve even more over the next few weeks.

I went to HRO today and bought a 4 positions coaxial switch so I can test the 6700 against the Flex 5000, a IC-7800, IC-7700, K3 and KX3.

If someone has a Yaesu FTdx-5000 or a Heiberling that they wish to lend to the test, I would love to add them to the test schedule.

I figure I should be able to do more intelligent testing once my Jet Lag subsides and I am sure that Dennis N6KI will think of some tests I have not even considered.

Find the manual for the 6000 series here:

http://www.flex-radio.com/FLEX-6000_v2.pdf

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Presented by Jerry AK6QJ

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