W6VIO Calling

JPL

Jet Propulsion Laboratory Amateur Radio Club
PO Box 820, La Canada CA 91012-0820

Volume 33, Issue 3 **March 2004**

Contents

Meeting Notice

By Chris Carson, KE6ABQ

The March General Meeting of the JPL Amateur Radio Club will be held March 10th at noon in the conference room in 238-543. Topics will include Open House and Field Day. The March JPLARC Board Meeting will be held March 24th in 161-230. Everyone on Lab at the time is welcome to attend either meeting – bring your lunch if you want. ■

President's Message

By Jim Lux, W6RMK

There's a lot going on, both for the club locally, and in a more national sense. Here are some highlights: FMT – I guess our inquiry to ARRL HQ about doing a west coast Frequency Measurement Test hit home. It was mentioned in the ARRL bulletin and on the web site. Now we'll actually have to do it. There's a lot going on right now, but I think that we can get something pulled together by next fall.

We'll want an omni-directional antenna up on the mesa, a way to generate a stable (over the several minutes) transmitted signal, and, most important, an accurate way to measure the frequency. Several people have made useful suggestions, and I'm looking for good ideas (and, eventually, volunteers to help put up the antenna, run the test, etc.) Speaking of volunteers: We need volunteers for JPL Open House (Mid May) and for Field Day. We also needed volunteers for the L.A. Marathon, but by the time you read this, the Marathon has probably already run.

Calendar of Events

March 10	General Meeting, Noon - 238-543
March 20	[CMRA Hamfest, Cal Poly, Pomona, 7 AM]
March 24	Board Meeting, Noon - 161-230
March 27	[TRW Swap meet, Redondo Beach]
April 3	[Fontana Swap Meet, A. B. Miller HS, Fontana]
April 14	General Meeting, Noon - 238-543
April 17	[CMRA Hamfest, Cal Poly, Pomona, 7 AM]
April 24	[TRW Swap meet, Redondo Beach]
April 28	Board Meeting, Noon – 161-230
May 1	[Fontana Swap Meet, A. B. Miller HS, Fontana]
May 12	General Meeting, Noon - 238-543
May 15	[CMRA Hamfest, Cal Poly, Pomona, 7 AM]
May 19	Board Meeting, Noon - 161-230
May 29	[TRW Swap meet, Redondo Beach]
June 5	[Fontana Swap Meet, A. B. Miller HS, Fontana]
June 9	General Meeting, Noon - 238-543
June 19	[CMRA Hamfest, Cal Poly, Pomona, 7 AM]

On the subject of Open House, we're likely to get a huge turnout this year, and I'd like to put together a good demonstration. We've talked about stringing a dipole in the trees on the Mall and showing HF voice and CW. One or more APRS trackers on the shuttle buses along with a WinAPRS type map display would be nifty. Some digital mode demos would be nice too. I'd like to show what other stuff amateur radio can do, other than talking on an HT (which seems too much like a cell phone to today's jaded kids). Let's make this sort of like Field Day; although, hopefully without the all-night operation and fumbles at putting up antennas.

BPL – The curse is upon us! There's a Notice of Proposed Rulemaking (NPRM) out, and it made the *L.A. Times* business section. NTIA hasn't weighed in yet, and, since I'm an optimist, I'm hoping that their study will be favorable to our cause.

Basically, though, BPL is going to have to abide by Part 15, which says that if it interferes, they have to shut it down. The challenge is going to be establishing that it's interfering. Remember that in these sorts of cases, a general "I think he's interfering" doesn't carry much weight, but a bunch of pages

of measurements does. Here's where hams need to get busy. We need to make (and record in writing!) regular measurements of the "background" noise at various locations, across many frequencies (not just the ham bands!), preferably with directional antennas. Then, when BPL gets deployed in a particular area, you can show a correlation between the increase in background noise and the deployment, hopefully with some geographical correlation as well. This will go a long way towards getting the FCC on your side. ■

Club Meetings

By Jonathan Cameron, KF6RTA

General Meeting, February 11

Jim Lux opened the meeting at noon. Club members present were included Robert Blakely (N6MTI), Jonathan Cameron (KF6RTA), Chris Carson (KE6ABQ), Bob Dengler(NO6B), Jim Lux (W6RMK), Walt Mushagian (K6DNS), Scott Nolte (K6SN), Bob Polansky (N6ET), Mark Schaefer (WB6CIA), Ivan Schmeluitz (VR2DUM/2NO), Phil Smith (WB6LQP), Jan Tarsala (KB6VRN) and Dick Wetzel (WA6IBZ).

All of Bob Polansky's responsibilities have been successfully delegated to current JPL ARC members including Rob Smith, Chris Carson, Mike Tope, and Jay Holladay (FD).

Bob Dengler gave a presentation on the new 2m TASMA band plan. For more details, see http://tasma.org. ■

W6VIO Station News

By Rob Smith, W6GRV

Bob Polansky has asked Mike Tope, W4EF, and me to take the lead on the numerous club issues that he was somehow handling all by himself. Bob handed Field Day coordination off to Jay Holladay, W6EJJ. I am Rob Smith, W6GRV, and I have been at JPL since November of 1988. I was asked to share with you a little bit about who I am for this newsletter, so here goes:

I earned my novice license in February of 1976, and slowly worked my way up to my current extra class amateur radio license.

In 1980, I operated for two months from the Dominican Republic relaying medical traffic back to doctors in the United States as I provided basic health care needs to rural communities in coordination with their health department. Similarly, in 1981, I spent 10 weeks in the jungles of Ecuador, north east of Esmeraldas.

In the 1990's, I helped relay emergency traffic such as traffic collisions and debris reports on a local 2 Meter repeater, and was a member of Los Angeles County Disaster Communications Service (at the Lakewood Station).

I enjoy operating CW, SSB, and some of the digital modes like PSK. I primarily operate on HF and occasionally on amateur satellite, at least prior to AO-40's recent anomaly. I actively chase DX, and participate in many of amateur radio contests.

For our club, I have maintained our DXCC and WAS records for the past few years. The station trustee on the W6VIO FCC license has been transferred from Bob Polansky to me.

Bob and I met with the JPL institutional interfaces to continue our good relations all of them, including Plant Protection and Facilities. Mike Tope and I divided up the tasks that Bob was tackling before.

As a general rule, Mike will handle the technical issues while I will look after the management tasks. I am looking forward to continuing with these activities, and hope someday to be able to do them as well as Bob Polansky did. ■

Use 2 Meters? Read This!

By Bob Dengler, NO6B

Last December, the Two Meter Area Spectrum Management Association (TASMA) revised the 2 meter bandplan for Southern California. In addition to performing repeater coordination for our area, TASMA also maintains a bandplan which helps keep incompatible modes such as voice and packet separate from each other so as to minimize interference between users of the band.

The Southern California 2 meter bandplan hasn't been changed since 1998. Since then there have been many changes in our hobby that have affected how the 2 meter band is being used. One of the most dramatic changes has been the advent of internet linking. While IRLP, Echolink and eQSO are being used to link repeaters together, many use these internet linking applications on simplex base stations at home so that they may communicate over long distances via the internet without tying up a repeater. As a result, simplex internet "nodes" have sprung up all over the 2 meter band, sometimes inadvertently causing interference to normal voice simplex communications.

TASMA has responded to this need by modifying the bandplan to create six new channels specifically for "fixed simplex base station" frequencies that can be used for simplex internet links. The frequencies are 145.710, 145.725, 145.740, 145.755, 145.770 and 145.785 MHz. If you operate a simplex internet node on 2 meters, make sure it's on one of these six frequencies. If you're just looking for a node to try out, just listen for activity on those channels. If you hear a node, find the CTCSS tone it uses (the "tone search" feature found on some radios comes in handy here), then jump on in anytime the transmitter drops. Most simplex internet node owners are quite friendly and will be more than happy to hear from you and let you use their node; if not, just move on to the next frequency.

In addition to the creation of the simplex internet link channels, TASMA also made some other changes to the bandplan as well. A dedicated crossband repeater input/output frequency of 144.910 MHz was assigned. This is intended for use by dual-band mobile radios with crossband repeater capability so that one can access their favorite repeater with an HT even when out of range by using their mobile radio as a repeater. Another "specialized use" repeater pair of 147.585 in/144.930 out was also created specifically for portable repeater usage. This wide-split pair is a great boost for public service and emergency communications as it formally enables

the use of small, truly portable 2 meter repeaters that utilize duplexers over 50 times smaller than a 600 kHz split VHF duplexer.

For the complete revised 2 meter bandplan as well as other important 2 meter information, visit the TASMA webpage at http://www.tasma.org ■

LA Marathon Wrap-up

By Bob, NO6B, and Jay Holladay, W6EJJ

Once again JPLARC club members came to the rescue to help make the 19th City of Los Angeles Marathon a safe and successful one. This year's Marathon saw a lot of changes compared to the past several years.

Our long-time Communications Coordinator Scott Fraser KN6F was unavailable this year, so Greg Powell KD6AIS stepped in to fill some rather large shoes. Greg has also been a marathon volunteer for many years serving as Lead Vehicle Net Captain, and did a superb job of coordinating the entire amateur communications effort on short notice.

This year also saw the return of our own John Tallon, N6OMB, to the Medical Net. John has also been involved with the LA Marathon for many years and last year transitioned over to volunteering directly with the medical teams.

Jay Holladay, W6EJJ, had a new assignment this year. He served as the radio "shadow" for Art Sibley, who was in charge of the Family Reunion tent. This operation, located just beyond the finish line and medical area, provide waiting family members and friends with information on whether a runner had crossed the finish line or when they were expected. Activity for the radio shadow became more intense later in the day when a few runners in the Family Reunion area became ill from the effects of the near record heat and medical attention had to be called for. Otherwise Jay handled more routine communications chores and learned about the computer network which provided runner status derived from the computer chip device attached to each runner's shoe.

There were quite a lot of logistical changes to deal with this year. The biggest one was "The Challenge": the elite women runners were started 20.5 minutes ahead of everyone else in an effort to match the elite women against the men (as it turned out, the men were no match as the first woman crossed the finish almost four minutes ahead of the men).

As a result of this change, additional non-ham personnel were needed in the lead vehicles, so all the amateur positions in the lead vehicles were eliminated with the exception of the Media Bus and Photo Truck. These two positions were manned by Melinda, KE6ZZX, and Bob, NO6B.

Although we had ridden in these vehicles in years past, we really didn't know what to expect with the two separate starts this year until the elite women were started and the Media bus pulled away while the Photo Truck waited for the main start. At that instant Bob realized that we still had the capability of reporting the position of both the men's and women's leaders to the command post. After asking for permission from Net Control to run an informal undirected net, Bob asked Melinda to report every mile crossing. Between the position reporting, Bob helped his driver locate the lead men's runner in relation to the truck and his usual monitoring of all four nets to assess how well the repeaters were performing along the course. Bob said it was his busiest assignment in many years.

Speaking of repeaters, our club was once again a major contributor to the effort. Of six repeaters used for the Marathon, five were either JPLARC owned or affiliated. One new twist was the first real test of a portable 2-meter wide-split repeater.

This system was literally backpacked up to the roof of one of the shorter high-rises in downtown LA and used for the Mile Net. The wide (> 2.5 MHz) split allowed the use of a small "flat pack" duplexer (mounted on top of the radio). Despite the nearby taller buildings blocking the signal, the coverage was just good enough at the far reaches of the course.

All in all, it was a fun and challenging communications event. Lessons learned from this year are already being discussed, and plans are being made for next year. We could definitely use more help, since the number of volunteers has been steadily decreasing over the years. If you plan that far ahead, consider signing up for next year's LA Marathon. As it will be the 20th anniversary of the Marathon, it promises to be a blast. ■

Taking Key Clicks Out of the Yaesu FT-1000

By Michael Tope, W4EF

In the rush to embrace new technology or fancy bells and whistles, amateur radio equipment manufacturers sometimes forgot about the basics. Nowhere is this more evident than with Yaesu's FT-1000 line of HF transceivers. Despite their hefty price tags, all of these radios (FT-1000, FT-1000D, FT-1000MP, FT-1000MP MKV, etc) seem to be plagued with CW key clicks, a problem that is usually dealt with in Radio Design 101.

This systemic problem in the FT-1000 line gives new meaning to Yaesu's marketing slogan "Yaesu did it again." Yes you did it again, Yaesu; you built a $3500 rig that has hideous key clicks that could have been eliminated with an extra $0.50 worth of electronic components!

If you own one of these otherwise fine rigs, don't hold your breath waiting for a factory recall. Yaesu is taking the "see no evil, hear no evil" approach to this problem. Fortunately,

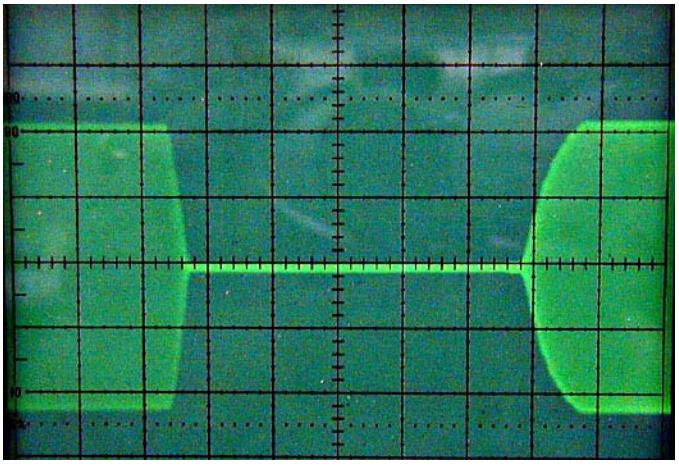
thanks to the work of 160 meter aficionado Tom Rauch, W8JI, if you're reasonably competent with a soldering iron and can follow his simple instructions (see http://www.w8ji.com/keyclicks_1000D.htm), you can install the $0.50 worth of parts needed to de-click the FT-1000 yourself.

In fact, I did just that recently with one of W6VIO's two FT-1000 transceivers. The modification involves breaking the interface between the T_CTL signal coming from the FT-1000 IF Board and the diode RF switch on the AF Board which is used to turn the IF carrier on and off during CW generation.

A simple 3 component circuit consisting of a 2N3904 transistor, a 1.5K resistor, and a 10uF capacitor forms a pulse shaping circuit which slows down and shapes the edges of the T_CTL signal. The results are fairly dramatic. To get a feel for what an unrepentant stock FT-1000 sounds like, take a listen to the .WAV file at the following link: http://www.dellroy.com/W4EF's-Ham-Radio-Page/W6VIO_FT1000/Images/FT1000_STOCK.wav

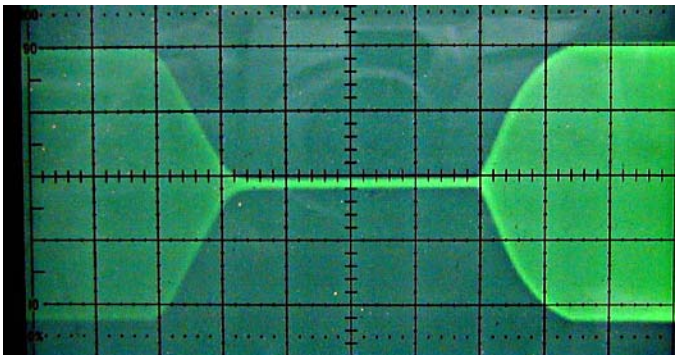
This recording was made using the club's other FT-1000 as the receiver. To simulate the how key clicks from a strong adjacent channel signal can cause interference to a weak signal QSO, the bandwidth of the receiver was set to narrow (250 Hz IF filter) and the center frequency was adjusted to be 1 KHz above transmitter frequency. Using a step attenuator, the signal level was adjusted for an S9+20dB reading on the FT-1000 S-meter. Pretty yucky, eh? Now take a listen to the modified FT-1000 under the same exact conditions: http://www.dellroy.com/W4EF's-Ham-Radio-Page/W6VIO_FT1000/Images/FT1000_DECLICKED.wav

A little bit of phase noise, but no clicks. To understand why, one need only look at the keying envelopes from the FT-1000 before and after the modification.

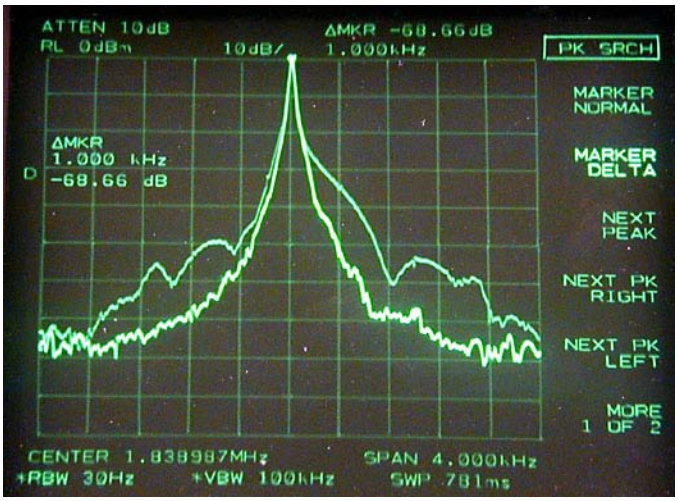


This shows the keying envelope of W6VIO's FT-1000 in its stock configuration. As you can see, there is a sharp corner on the falling edge of the keying envelope and the fall time is fairly fast (1 to 2 ms). This results in very nasty key-click sidebands.

Newsletter Deadline:
Friday, March 27 for the April issue of W6VIO Calling. Your articles, ads, photos, diagrams, letters to the editor, or technical material should be submitted to the editor via email (bill.wood@direcway.com) or regular mail to: Bill Wood, 31094 Hemlock Ave, Barstow, CA 92311.



Contrast this with the keying envelope of the modified FT-1000 shown above. The sharp corner is gone and the rise and fall times are slowed considerably, but not so much that keying doesn't still sound crisp.



This shows a spectrum analyzer plot of the FT-1000's transmit spectrum before and after the modification. The plot was made using the analyzer's "MAX HOLD" display function. As you can see, the peak sideband energy from the modified radio is considerably lower than that produced by the stock radio.

By the way, if you are wondering how the club's other HF rig, the Kenwood TS-850S does in the key-click department; take a listen to the following: http://www.dellroy.com/W4EF's-Ham-Radio-Page/W6VIO_FT1000/Images/TS850S_STOCK.wav

Not a trace of key clicks. Seems that the Kenwood engineers paid attention during Radio Design 101. For those interested in the mathematical underpinnings of proper CW wave-shaping, Kevin Schmidt, W9CF has a very thorough article on the subject on his website at http://fermi.la.asu.edu/w9cf/articles/click/index.html. ■

Treasurer's Report

By Chuck Sarture, KG6NF

"February, 2004"
General Club Account

	Beginning of Month Balance:	**$3,186.27**
Income:		
Memberships		$260.00
	Total Income:	$260.00
Expenses:		
No Expenses This Month		$0.00
	Total Expenses:	$0.00
	End of Month Balance:	**$3,446.27**

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First Class Mail

JPL ARC Repeaters			
Pasadena:			
WR6JPL	147.15 MHz	(+)	PL 131.8 Open
WR6JPL	224.08 MHz	(–)	PL 156.7 Open
WR6JPL	224.70 MHz	(–)	Closed Autopatch
WR6JPL	445.20 MHz	(–)	PL 103.5 Open
W6JPL-1	145.09 MHz		Packet Node/BBS
W6JPL-1	223.54 MHz		Packet Node/BBS
Table Mountain:			
WR6AZN	145.28 MHz	(–)	PL 131.8 Open
WR6AZN	223.96 MHz	(–)	PL 156.7 Open
WR6AZN	447.20 MHz	(–)	PL 94.8 Open