
W6VIO Calling

JPL



Jet Propulsion Laboratory Amateur Radio Club
PO Box 842, La Canada CA 91012-0842

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Upcoming Events:

- **Emergency Communications Net:** Every Monday at Noon, on WR6JPL 224.08/(-)/156.7 & 445.20/(-)/103.5, or WR6AZN 223.96/(-)/156.7 on Table Mountain.
- **JPLARC Regular Membership meeting:** Second working Friday every month from Noon to 1pm and usually in 180-703C. Call-in: 818-354-4044 ID-number: **997 183 539** (without the spaces). Slides (if any) broadcast via JPL WebEx (same ID-number). **Next is July 15th: speaker is: Gary Wong W6GSW and Jon Bell KA6JON, "Winlink Messaging."**
- **JPLARC Board of Directors (BOD) meeting:** Normally, the first working Friday, every month, from Noon to 1pm and usually in 180-703C. **The next BOD meetings (two!) will be July 29th & August 12th.** Call-in: 818-354-4044 ID-number: **997 183 539** (without the spaces).
- **For more upcoming events, see the ARRL Los Angeles Section website:** <http://www.areslax.org>

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Regular Membership Meeting June 17th

By Chris Gaylord W6YTB & Jim Marr AA6QI

Present were: Gary Block[†] KJ6IZX, Jonathan Cameron[†] KF6RTA, Bob Dengler[†] NO6B, Chris Gaylord^{†*} W6YTB, Josh Miller^{†*} KB3UUS, Steve Noland[†] WA6KLC, Andrew O'Neill KC3HDD, Mike Roche[†] N6XLK, Lew Soloway[†] AC6LS (formerly KK6QJE), Steve Townes^{†*} WB4ILW. On the Phone/JPLWebex: Paul Averill[†] KM6BZX, Chris Carson^{†*} KE6ABQ, Dave Hodges[†] KI6PMB, Jim Marr[†] AA6QI, Michele Marr[†] KC6FSP, Walt Mushagian[†]

K6DNS.

Note: † indicates a 2016 regular voting member (i.e., JPL/Caltech/Retiree and 2016 dues paid), and * Indicates a 2016 BOD member. For a regular meeting quorum, the JPLARC Bylaws require a majority of the BOD (four or more) and at least five other regular members. We had 5 BOD members, 10 other regular members and one non-member (total of 16 attendees), so we **did** have a quorum.

General Updates:

Jim Marr briefly described plans for Field Day 2016 and reminded folks to sign up to participate in Field Day using the SignUpGenius links distributed via the club email exploder.

The new white trailer (T9342) has been moved from next to B329 up to the Mesa. For those that know the Mesa, if you go to the top of the main road (at the 'T'), there is small lot at a slightly lower level directly north of the top of the 'T' where T9342 and the USAR trailer are now located. Container 7111, which has our antennas and coax in it, is in the small lot half way up the road to the Mesa. Plans are to eventually transfer everything from that container to T9342. Note that you do need access

codes to gain access to the Mesa road and you need to also check with the Division 33 range administrator to make sure that you aren't disrupting an antenna range test (see Chris Gaylord for more detail). There is no information yet on the smaller 10'x10' container that is to be placed next to our new B329 shack.

Guest Speaker: Bob Dengler NO6B discussing: PiRLP, a low cost IRLP platform.

What is IRLP? IRLP stands for the Internet Radio Linking Project, which links radios together over great distances, using repeaters linked together over the internet. IRLP is a closed source, secured VOIP (voice over internet protocol) intended for radio links only (repeaters or simplex base stations). Connections are typically point-to-point (e.g. repeater-to-repeater) but multiple nodes can interlink by connecting to an IRLP "reflector." IRLP applications typically run under Linux (typically Debian). For more information see irlp.net.

Raspberry Pi: The Raspberry Pi (Figure 1) is a (\$5 - \$40) single board computer (SBC) typically running Linux but also capable of running Windows 10 IoT core.

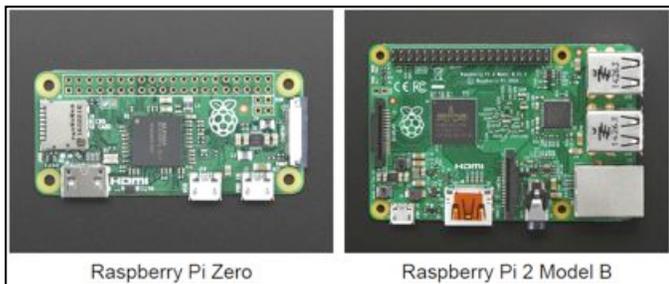


Figure 1: Raspberry Pi computers

PiRLP: IRLP running on a Raspberry Pi (Figure 2), which is available as a preconfigured kit (without case) for \$260 or as a complete packaged unit for \$320.



Figure 2: PiRLP kit (left) and prepackaged unit (right)

JPLARC PiRLP Installation: We purchased the Kit form of PiRLP (Figure 2, left) leaving us with the need to find a case for it. We also need a USB keyboard and some time to work on it.

Current JPLARC IRLP/Echolink Installation (Figure 3) consists of a 220 MHz wire ground plane antenna, a Clegg FM-76 220 MHz transceiver, and a PC running Linux and the IRLP/Echolink applications. The FM-76

is set up to transmit to the input of the JPLARC 224.08 repeater (222.480 MHz) and listen to the output of the 224.08 repeater (224.08 MHz), so it behaves much like your handheld radio except that the person connected to the JPLARC IRLP/Echolink node on our PC controller is the 'operator.'



Figure 3: Current JPL IRLP/Echolink Node in 180-R6. Simple 220 MHz ground plane antenna (left), Clegg FM-76 transceiver (center) and PC running Linux & the IRLP application (right)

How IRLP works on our repeaters: Every IRLP node has a four digit address (e.g. WB8VSU Dayton is 4235). Our IRLP node uses the prefix "8" in front of all IRLP addresses. On our repeaters, you need to press "*" in order to pass DTMF (touch tone) tones from your transceiver to the repeater. Thus, to access the Dayton IRLP node from our repeater using your HT, you would press *84235. This disconnect code is "73" so, to pass the DTMF tones for this from your HT, you would press *73.

IRLP Reflectors connect multiple repeaters together. Reflector addresses begin with "9" instead of "8". You can find a list of reflectors at irlp.net.

Echolink: Echolink is a VOIP system for general amateur use. Echolink runs on Windows, Linux, Android OS and iOS. We run the application EchoIRLP that supports both Echolink and IRLP. EchoMac for Mac computes is compatible with Echolink.

Echolink can be used on repeaters, in the shack or even on your smart phone and any node can be a conference server, however the decentralized nature of Echolink makes it harder to get information on available nodes.

For more information on Echolink, see echolink.org.

Will our IRLP node work via the JPL to Table Mountain Link? This should be possible using DTMF mute disable (33*), so you would prefix commands with 33** (with the second star to unmute tones to the JPL side controller).

Field Day 2016

By Jim Marr AA6QI

Field Day 2016, June 25 & 26, has now come and gone. Thanks to all who helped with the setup, operations and take down. It wouldn't have happened without you!

This year's Field day was again a joint effort with the Pasadena Radio Club (PRC), the JPLARC, and the Caltech Amateur Radio Club (CITARC), although we ended up having fewer stations than in previous years. Stations this year consisted of: our usual CW station (FT-1000D operating into the CITARC antenna trailer and 80/40m dipole), a 20m/15m SSB station (using a Yaesu FT-991 loaned to us by HRO Burbank), a 75m/10m SSB station (the FT-897 in the JPL Communications Van), a 40m SSB station (an IC-7410 provided by PRC's Tom Berne W6TAG), a satellite station (provided by PRC's Tom Mikkelsen WA0POD), and a VHF National Traffic System (NTS) station provided by PRC's Jutti Marsh K6FRG. We also had a welcome tent with lots of information about amateur radio and Field Day.



Figure 4: FD2016 Take Down team photo taken at about 1 PM Sunday right at the end of take down.

We had good turnout for setup (Figure 5), which went fairly well other than having some issues with the 80m/40m dipole balun coming apart, requiring some real time field modifications to get it up and working.

Operations (Figures 6, 7, 8 & 9) were pretty relaxed this year with none of the stations being operated continuously throughout the 24-hour operation period. Still, our team made 457 CW contacts and something like 600 phone contacts (including the ~50 satellite contacts).

Take down was also well supported with many thanks from those of us who were up all night operating. Figure 4 shows a group photo of the take down team, with Steve Townes on the roof during efforts to retract the Comm Van mast.

Jonathan Cameron had requested comments from folks about their 2016 Field Day experiences via email, a few of which follow:

- I want to thank the JPL Emergency & Continuity Management group for the loan of the Emergency Communications Van that we used for one of the HF stations. We had many folks drop by to see it everyone seemed to enjoy seeing it and hearing about it. –

Jonathan KF6RTA

- I really enjoyed the satellite setup. I have always wanted to work satellite and seeing it was very helpful. I think satellite has just become one of my long-term ham radio goals.



Figure 5: Field Day station setup



Figure 6: CW station operators (Left to right: K6ZTA, N6NO & WB6CIA) (JPLARC FT-1000D)



Figure 7: KF6RTB operating the 20m/15m SSB station (HRO's Yaesu FT-991 that they loaned to us for FD)

I would also like to say thanks to the many patient operators that showed my son Skyler (KM6DGR) and his friend, Drew, around. It was an excellent field day with examples of so many modes of operation. Having the antennas, feed lines, and radios out where it all can

be seen really helps paint the picture for folks new to the field. It was definitely a case of accomplishing more together than anyone can do alone.

Thanks again! -Elliott W7QED

- It was very laid back & I liked that, especially since I was a bumbling fool on CW for the 1st hour, but that was OK. Thank you to all!!! BTW, the hot-wings were pretty good, that is if you could handle the "hot" part... - Vaughn K6ZTA



Figure 8: JPL EM Comm Van (left), WB4ILW (center) and KF6RTA (right) operating 75m/10m SSB (FT-897).



Figure 9: N6XLK's wife, daughter (KK6OCG) and son (KK6VFK) operating the 40m SSB station (IC-7410)

- I really enjoyed watching Matt Bennett make over 100 contacts in a 20 minute period from all over the US! It was pretty amazing! -- Janet Cameron KG6JNO

- I really enjoyed seeing my wife and two kids make their first HF contacts on the 40 M station. They were nervous at first but once they made that first contact they didn't want to stop. I am hoping this will inspire my kids (KK6OCG and KK6VFK) to upgrade from tech to general now. I am very glad we signed up for a time on one of the stations.

I also liked seeing the satellite station and watching them make three contacts when a Satellite was overhead. Looks like something I want to pursue more. Great time! -- Mike (N6XLK)

Field Day Visitor: VU3ZVP

By Merv MacMedan N6NO

During Field Day, the Caltech group brought a visitor from India. Aakash Pratil had passed his ham radio exam in India 13 months ago, and just now received his license, VU3ZVP. He was curious about our approach

to field day and so he visited all the tents and setups for the different bands and modes.

Aakash had won a research fellowship as an instrumentation specialist at Caltech working on the LIGO (Laser Interferometer Gravitational-Wave Observatory) project. Operated by Caltech and MIT, LIGO is the largest and most ambitious project ever funded by the National Science Foundation. It recently made history by successfully detecting gravity waves. Congratulations to Aakash on winning his fellowship at Caltech and on becoming a new member of the ham radio community!

BOD Meeting July 1st By Jim Marr AA6QI

Present were: Gary Block[†] KJ6IZX, Jonathan Cameron[†] KF6RTA, Bob Dengler[†] NO6B, Chuck Sarture^{*} KG6NF, Eric Shalov KJ6ARC, Rob Smith^{*} W6GRV, Lew Soloway AC6LS. On the Phone: Chris Carson^{*} KE6ABQ, Jim Marr[†] AA6QI, Steve Townes^{*} WB4ILW.

Note: † indicates a 2016 regular voting member (i.e., JPL/Caltech/Retiree & 2016 dues paid), and * Indicates a 2016 BOD member. For a BOD meeting quorum, the JPLARC Bylaws require a majority of the BOD (four or more) to be present. We had four BOD members present so we **did** have a quorum.

Treasurer's Report: Treasurer Chuck Sarture KG6NF presented the current budget status: Previous balance of \$5,409.86; No income; Expenses for our new EU2000i 2kw generator of \$975.80; Ending balance \$4434.06.

Membership Report: There were no changes in membership so membership remains at 51 total members, of which 42 are voting members and 69% are ARRL members.

Guest speaker update: Now have a speaker lined up for October (see later in this newsletter) but November is still open.

NASA HF Net: No progress yet on being able to participate in the weekly NASA net.

Field Day (FD) Update: Jim Marr AA6QI gave a brief overview of the 2016 Field Day event (see separate article in this newsletter).

A vote was taken to approve reimbursing Jim Marr for the repair of the FT-897 in the Comm Van (he drove it to Yaesu Repair in Cypress, CA and picked it up so that it would be available in time to support Field Day). The repair cost was \$72.31 to replace three failed Toko crystal filters (apparently a common failure mode for FT-897s). The board approved the reimbursement.

Mesa Repeater Antenna Upgrades: Jonathan presented the results of planning by the repeater committee

(Figure 10). Note that proposed 70 cm “eggbeater” receive antenna that would provide circular polarization coverage of the JPL campus.

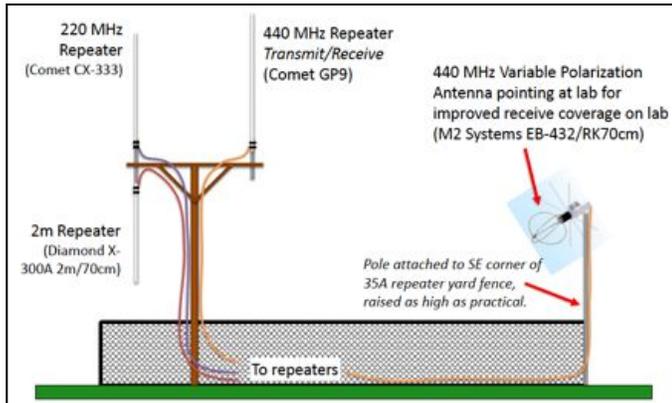


Figure 10: Proposed repeater antenna installation

The repeater committee will be meeting again on July 12th to finalize details of the proposed installation and to start scheduling the implementation work.

The repeater committee is also concerned that the 70 cm repeater antenna preamplifier may not be performing so will plan to replace it to see what difference that makes.

Station Facility Committee: The Station Facility committee met on June 14th with two goals: (1) Plan the next steps to restore the HF antennas on the Mesa and (2) Start the process towards recommending new HF radios for Emcomm and Club use. Present were: Jonathan Cameron KF6RTA, Chris Carson KE6ABQ, Chris Gaylord W6YTB, Josh Miller KB3UUS and Lew Soloway AC6LS.

A Mesa HF antenna work party is planned for next week (next RDO Friday) to begin addressing the Mesa HF antenna action items (Figures 11 and 12).

- Clear the tall grass around the Mesa HF antennas [DONE]
- Catalog our current HF antennas on the Mesa
- Inspect and repair the tower as necessary (may be damage to top section)
- Repair/replace rotator
- Install a junction box on the main tower at waist-level (similar to the one behind B329)
- Verify current tower ground rods (install new ones if necessary)
- Set up ground bus-bar below junction box and attach to ground rods
- Terminate all 4 hardlines at the junction box
- Identify which lines on the mesa correspond to which lines at B329
- Ground all 4 hardlines at the junction box (with polyphasors)
- Cut and terminate antenna lines coming down the tower

Figure 11: Mesa HF antenna Action Items (part 1 of 2)

New HF Radio Selection: The station committee is tasked with identifying radios to replace our existing aging FT-1000D and Kenwood TS-850SAT transceivers. The replacement radios should be: suitable for both Club and EmComm use; have good performance; and be

simple to use.

- Redo antenna tests with band-pass filter
- Perform any necessary antenna repairs
- Perform end-to-end tests of hardlines to/from B329
- Hook up tower antennas to hardlines
- Install an HF patch panel in B329
 - Suggested approach: Drill holes for N panel feed-thru connectors on right end of the two-door cabinet opposite the main B329 door (facing north). There are N-panel feed-thru connectors in 180-R6. We could also create a patch panel using an aluminum box inside the two-door cabinet.
 - Set up the patch-panel grid with 8 connectors for antennas and 4 for radios
 - Find/make N-connector patch cables

Figure 12: Mesa HF action items (part 2 of 2)

A preliminary list of requirements includes: all HF bands; allow out-of-band operation (to support NASA Shares); excellent sensitivity; support ALE (automatic link establishment); 100+ memory channels; support CW and voice; support digital modes (packet, PSK, etc.); auto tuner; dual antennas; waterfall display; computer control; and support for remote control.

A spreadsheet has been started to allow comparison of various candidate radios, which at this point include: the FT-450D; FT-991; and IC-7300. The committee is looking for inputs for what to add to this list.

JPL Interest Fair: Wednesday 9/21/16 from 11am to 1pm on the JPL Mall. We have agreed to staff a table that will be both the JPLARC and JEARS. Steve Townes will take the lead in organizing this but he will need other volunteers to help.

Weekly Net (Noon on Mondays): Weekly net is still having participation from about twenty hams each week.

It was suggested that when you become aware of a fire drill or actual fire/emergency, that you tune your radio to 445.20 repeater.

Related Radio Activities: The PRC holds a net each Tuesday at 7pm on the W6MPH repeater (145.18, -, 156.7). The PRC club meeting is the 4th Tuesday of each month at the Walnut/Los-Robles Kaiser building in Pasadena. See <http://w6ka.net> for details.

The Altadena ALERT net is held on Monday's at 8pm, also on the W6MPH repeater (145.18, -, 156.7). For more information see <http://altadenaradio.com>.

ARRL Membership:

By Jim Marr AA6QI

As an ARRL affiliated club, we need to maintain at least 51% ARRL membership among our voting members.

While there are no requirements to maintain ARRL membership, there are some clear advantages to having ARRL membership. Some of these are:

- Receiving the monthly QST magazine and having access to all back issues electronically.
- Being able to subscribe to weekly ARRL news, propagation forecasts, and satellite ephemeris notifications.
- Being able to subscribe to the electronic monthly Amateur Radio Emergency Service (ARES) newsletter that may be of interest to members who wish to stay current on emergency communications.
- Member discounts on materials and training. For example, the ARRL Introduction to Emergency Communication Course is \$85 for non-members but only \$50 for members.
- You support ARRL, the only significant amateur radio advocacy organization in the U.S. that is fighting to protect our access to the airwaves.

Should those of you who are not already members and may wish to join, **please do so through the Club** rather than joining directly through ARRL. Why? If you join through the Club (new members), the Club retains \$15 of your membership fee to support Club activities. From your point of view, the amount you pay is the same either way. Even if you are a member who is just renewing, doing so through the Club nets the Club \$2, again without changing your costs at all.

To renew through the Club, see Secretary Chris Gaylord who will help you with the paperwork (don't worry, it's really simple!).

Thanks in advance for considering joining ARRL or for maintaining your membership.

Future Meetings

By Jim Marr AA6QI

All JPLARC meetings are being held on non-RDO Friday's from Noon to 1 PM in 180-703C (unless otherwise indicated). Upcoming talks (always subject to change):

August 26th: Chris Gaylord W6YTB, "Great Shakeout Planning." [Alternate meeting room to be announced].

September 23rd: AMSAT's Patrick Stoddard WD9EWK, "AMSAT Future" (Patrick may be coming out to Pasadena to give this talk).

October 21st: Don Hill KE6BST and Joe Ayers AE6XE, "Mesh Networks for Amateur Radio," for some advanced information, see <http://ocmesh.org>. **Nominating Committee chair & members announced.** [Alternate meeting room to be announced].

November 18th: Guest speaker is still TBD. 2016 Officer Candidates presented by the Nominating Committee.

2016 JPLARC Organization:

